



DILLON
CONSULTING

CORPORATION OF THE TOWN OF TECUMSEH

**Oldcastle Hamlet Sanitary Servicing
- 8th Concession Road Trunk Sanitary
Sewer Outlet**

Preliminary Design Report

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Our File No.: 15-2973

May 8, 2018

Corporation of the Town of Tecumseh
917 Lesperance Road
Tecumseh, ON
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Attention: Mr. Phil Bartnik, P.Eng.,
Manager, Engineering Services

**Oldcastle Hamlet Sanitary Servicing
- 8th Concession Road Trunk Sanitary Sewer Outlet
Preliminary Design Report
Revised May 2018**

Dear Mr. Bartnik:

Please find enclosed (1) one copy of the Preliminary Design Report for the proposed sanitary sewer network to be served by the existing 8th Concession Road trunk sanitary sewer outlet. This report has been updated to reflect the requested change in trunk and local sewer classification, as required to facilitate the distribution of cost recoveries being addressed separately by the Town

The attached final report includes your comments and feedback provided during the course of this project. We appreciated the opportunity of collaborating with the Town to undertake this project and look forward to any opportunities to assist the Town during the subsequent implementation stages.

Yours truly,

DILLON CONSULTING LIMITED



Flavio R. Forest, P.Eng.,
Project Manager

Encls.

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1.0

Introduction

1.1 Background

The study area for the 8th Concession Road trunk sanitary sewer outlet is shown in **Figure 1.0**, which includes the following:

- The portion of the primarily industrial employment lands in the Oldcastle Hamlet area that are not within the North Talbot Road sanitary sewer outlet service area;
- The designated future Hamlet development lands; and
- The Oldcastle Hamlet settlement area expansion, as adopted by the County of Essex on February 19, 2014, as part of their Official Plan update.

A wastewater servicing strategy for the Oldcastle Hamlet area was identified in the Town of Tecumseh's 2008 Water and Wastewater Master Plan update (WWMP), and was further defined in the Oldcastle Hamlet Wastewater Servicing Preliminary Design Report (PDR) (August 2009). Two sanitary sewer outlets, on North Talbot Road and on 8th Concession Road, have been established through a Wastewater Servicing Agreement between the City of Windsor and the Town of Tecumseh, as follows:

- The sanitary sewer system served by the 600 mm diameter trunk sewer outlet on North Talbot Road has largely been implemented, directing sanitary flows to the Lou Romano Water Reclamation Plant to a maximum allowable peak flow of 85 l/s.
- The sanitary sewer system to be served by the 900 mm diameter trunk sanitary sewer outlet on 8th Concession Road is the subject of this preliminary design report. This existing sanitary sewer outlet would direct sanitary flows to the Little River Pollution Control Plant to a maximum allowable peak flow of 325 l/s.

The majority of the study area is currently served by private on-site sewage disposal systems that generally consist of septic tanks and tile beds. A small portion of the study area (McCord Lane, Dicocco Court, Picadilly Avenue and Trafalgar Avenue) is currently serviced by a gravity sewer that is temporarily connected to the North Talbot Road trunk sanitary sewer, as shown on **Figure 2.0**, but would be redirected to the 8th Concession Road trunk sanitary sewer outlet as this system is extended.

The primary objective of this preliminary design report is to complete the functional design of the sanitary sewer network within the study area that is to be served by the 8th Concession Road trunk sanitary sewer, to identify the opportunities to expand the sanitary sewer system to serve longer term development in the future, and to establish estimated costs of the trunk and local sanitary sewer system components that may be used as the basis for the Town to recover costs from benefiting properties.

1.2 Purpose

This preliminary design report outlines the proposed sanitary sewer system for the portion of the Oldcastle Hamlet area that is to be serviced by the 8th Concession Road trunk sanitary sewer outlet, including:

- Design criteria and parameters used in the development of the preliminary design of the sanitary sewer system;
- General layout, invert elevation and size of the sanitary sewer system, including the need for sanitary pump station facilities;
- Confirmation of property requirements; and
- Preparation of construction cost estimates for trunk and local sanitary sewer system components.

The Town is currently undertaking an update to the Water and Wastewater Master Plan, which is expected to incorporate the findings of this preliminary design report and address any Schedule B Class Environmental Assessment requirements that may be applicable to the implementation of this sanitary sewer system.

2.0

Study Area

The study area for this project has been divided into 36 sewer sheds, with each sewer shed area being divided into the various land use designations obtained from the Town's Official Plan Land Use Map (December 2015). The sewer shed areas, land uses and associated design population densities are shown on **Figure 3.0**.

Two portions of the study area (identified as Area A and Area B) were addressed as part of the Town of Tecumseh's Oldcastle Industrial Park Area Sanitary Servicing Preliminary Design Report, dated January 2016 and have been incorporated into this Preliminary Design Report.

3.0 Preliminary Design

3.1 Existing Infrastructure

The majority of the study area is served by a municipal water distribution system that is supplied from the City of Windsor. Also in the area, are various municipal drains, storm sewer systems, and other utility infrastructure. The available as-built information from the Town of Tecumseh Interactive Mapping Website was utilized to complete a preliminary review of the existing infrastructure and to identify potential conflicts with the proposed sanitary sewer system.

3.1.1 Potential Conflicts

In general, the design depths of the proposed sanitary sewers have considered the potential for conflicts with known infrastructure in the area. Where there was an identified potential for a conflict with the proposed sanitary sewer and sanitary private drain connections (particularly at existing municipal drain crossings), the as-built information for the existing infrastructure was reviewed and appropriate adjustments made to the proposed grades of the sanitary sewer. Two areas of concern were identified, as follows:

- On Outer Drive north of Highway 3 related to the existing Wolfe Drain; and
- On Walker Road north of Highway 3 related to the existing Collins Drain.

3.1.2 Highway 3 Corridor Requirements

The Highway 3 corridor is under the jurisdiction of the Ministry of Transportation (MTO) and includes various utilities in addition to significant transportation infrastructure. While the Highway 3 right-of-way could serve as a corridor for the extension of a portion of the trunk sanitary system for the study area, it will, at a minimum, need to serve as a corridor to extend local sanitary sewers to serve the adjacent properties that have direct access to this roadway.

Several sanitary sewer options were developed for presentation and review with MTO representatives at a meeting held on March 30, 2016. During that meeting, MTO outlined the following requirements:

- There are limitations in the available right-of-way to accommodate a new sanitary sewer and there may be risks to compromising the existing roadway due to construction activity. Accordingly, MTO recommended that the proposed sanitary sewer be limited to serving abutting needs only, and that this sewer be placed in easements outside the Highway 3 right-of-way.
- Crossings of the right-of-way would be required to service the lands to the south of Highway 3 based on the following:
 - To serve lands in the area of Walker Road, one crossing would be permitted, though preferably not at Walker Road due to the significance of this intersection; and
 - To serve lands in the area of Howard Avenue, one crossing would be permitted at Outer Drive.

The proposed sanitary sewer layout shown in **Figure 3.0** has taken MTO's comments into account.

3.1.3 Incorporating Existing Sanitary Sewer Infrastructure

There are local sanitary sewers that serve McCord Lane, Dicocco Court, Picadilly Avenue and Trafalgar Avenue. These sanitary sewers originally conveyed sewage flows to the Skyway Plaza Wastewater Treatment Plant, which was constructed in 1998, as a temporary package treatment facility that was to provide treatment for a commercial plaza and a 22 lot residential subdivision. This sanitary sewer service area was to be redirected to the 8th Concession Road trunk sewer in the future.

Due to discharge quality concerns and an opportunity to temporarily divert sewage flows to the North Talbot Road trunk sanitary sewer, the Skyway Plaza Wastewater Treatment Plant was decommissioned. These local sanitary sewers are proposed to be redirected to the 8th Concession Road sanitary sewer system when it becomes available.

3.2 Sanitary Sewer Design Criteria

The design criteria for the purposes of completing the preliminary design of the proposed sanitary trunk and local sewers is summarized in **Table 1.0**.

Table 1.0: Sanitary Pipe and Manhole Design Criteria

Description	Sanitary Sewer Design Criteria	
Minimum sewer size	200 mm diameter	
Minimum cover of sanitary private drain connections at the property line	2.4 metres	
Pipe material for diameters less than 450 mm	PVC	
Pipe material for diameters greater or equal to 450 mm	Concrete	
Minimum pipe slopes	Sewer Size (mm)	Minimum Slopes in Metres per 100 metres
	200	0.40
	250	0.28
	300	0.22
	375	0.15
	450	0.12
	600	0.08
	750	0.06
900	0.05	
Minimum Full Flow Velocity	0.6 m/s	
Maximum Full Flow Velocity	3.0 m/s	

Description	Sanitary Sewer Design Criteria	
	Hydraulic losses across manholes	Straight through
45° or less		30 mm
45° to 90° bend		60 mm

The design criteria are in accordance with generally accepted engineering practice and reflect current Town of Tecumseh standards (2008 Water Wastewater Master Plan) and the Ministry of the Environment and Climate Change (MOECC) guidelines.

Sanitary flows were determined using projected sanitary population densities and infiltration allowances for each of the sanitary sewage areas depicted in **Figure 3.0**. **Table 2.0** summarizes the design flow criteria used for the preliminary design of the sanitary sewers. It should be noted that the proposed population densities outlined in **Table 2.0** are for sanitary sewer design purposes; intended to provide the Town with flexibility in considering a range of development alternatives within the study area, as well as the potential to expand the study area boundary, as appropriate.

Table 2.0: Sanitary Flow Projection Criteria

Criteria	Oldcastle Hamlet Design
Hydraulic sewer sizing	Manning's Equation
Manning's Roughness Coefficient 'n'	0.013
Infiltration allowance/peak extraneous flow*	0.117 L/Ha/s (10,110L/Ha/day)
Peaking factor	Based on Harmon Formula
Population densities for Industrial and Commercial*	35.0 persons/Ha
Population densities for Residential*	61.7 persons/Ha
Population densities for Existing Residential*	3.2 persons/unit
Population densities for Hamlet Development Lands*	61.7 persons/Ha
Minimum population density	25 persons/Ha
Average daily domestic sewage flow rate*	300 L/Cap/Day
Sewage flow rate for Schools	70-140L per student
Sewage flow rate for Churches	25 L/day per seat
Sewage flow rate for Assembly Halls	35 L/day per seat

* Population density, infiltration allowance and wastewater generation rate is based on the Town of Tecumseh's WWMP (2008) and Oldcastle Hamlet Wastewater Servicing Preliminary Design Report (2009).

3.3 Sanitary Sewer Flow Determination

The preliminary sanitary sewer layout was initially based on the sanitary drainage area boundary identified in **Figure 5.0 - Wastewater Servicing Option 1**, as presented in the Oldcastle Hamlet Wastewater Servicing Preliminary Design Report, dated August 7, 2009.

The study area was broken down into 36 sanitary sewage areas, with each area being further defined with the existing land uses obtained from the Town's Land Use Map and a corresponding population density, as outlined in **Table 2.0**. Each sewage area was divided, as required to adequately represent the various land use designations. **Figure 3.0** summarizes the sewershed areas with corresponding land uses, area size and design population.

Table 3.0: Sanitary Population Projection

Location/Lane Use	Area (Hectares)	Design Population	Population Density (persons/Ha)
Area 1 – Outer Drive Total	19.22 Ha	624	
• Industrial/Business Park	14.27 Ha	500	35.0 persons/Ha
• Restricted Community Facility	4.94 Ha	124	25.0 persons/Ha
Area 2 – Blackacre Drive Total	4.50 Ha	158	
• Industrial/Business Park	4.50 Ha	158	35.0 persons/Ha
Area 3 – Roscon Industrial Drive Total	13.87 Ha	486	
• Industrial/Business Park	13.87 Ha	486	35.0 persons/Ha
Area 4 – Blackacre Drive Total	6.33 Ha	222	
• Industrial/Business Park	6.33 Ha	222	35.0 persons/Ha
Area 5 – Pulleyblank Street Total	2.16 Ha	76	
• Industrial/Business Park	2.16 Ha	76	35.0 persons/Ha
Area 6 – Blackacre Drive Total	7.93 Ha	278	
• Industrial/Business Park	7.93 Ha	278	35.0 persons/Ha
Area 7 – Blackacre Drive Total	4.20 Ha	148	
• Industrial/Business Park	4.20 Ha	148	35.0 persons/Ha
Area 8 – Fasan Drive Total	38.12 Ha	1050	
• Industrial/Business Park	24.03 Ha	842	35.0 persons/Ha
• Cemetery	14.09	208*	*Flow calculated by fixture unit method
Area 9 – Blackacre Drive Total	7.87 Ha	264	
• Industrial/Business Park	6.63 Ha	232	35.0 persons/Ha

Location/Lane Use	Area (Hectares)	Design Population	Population Density (persons/Ha)
• Restricted Community Facility	1.24 Ha	32	25.0 persons/Ha
Area 11 – Walker Road Total	7.66 Ha	252	
• Industrial/Business Park	6.07 Ha	212	35.0 persons/Ha
• Restricted Community Facility	1.55 Ha	39	25.0 persons/Ha
Area 12 – Walker Road Total	6.16 Ha	218	
• Industrial/Business Park	3.31 Ha	116	35.0 persons/Ha
• Hamlet Residential	2.85 Ha	102	61.7 persons/Ha
Area 13 – Highway 3 Total	12.87 Ha	320	
• General Commercial	5.93 Ha	208	35.0 persons/Ha
• Restricted Community Facility	2.45 Ha	86	35.0 persons/Ha
• Hamlet Residential	4.49 Ha	26	3.2 persons/unit
Area 14 – Highway 3 Total	3.78 Ha	133	
• Restricted Community Facility	3.78 Ha	133	35.0 persons/Ha
Area 15 – Dicocco Court Total	12.54 Ha	439	
• Industrial/Business Park	6.65 Ha	233	35.0 persons/Ha
• Restricted Community Facility	5.89 Ha	206	35.0 persons/Ha
Area 16 – Trafalgar Court Total	3.62 Ha	48	
• Hamlet Residential	3.62 Ha	48	3.2 persons/unit
Area 17 – Picadilly Avenue Total	2.13 Ha	29	
• Hamlet Residential	2.13 Ha	29	3.2 persons/unit
Area 18 – Oldcastle Road	27.33 Ha	1382	
• General Commercial	2.46 Ha	87	35.0 persons/Ha
• Hamlet Residential	7.53 Ha	248	61.7 persons/Ha 3.2 persons/unit
• Hamlet Development	16.50 Ha	1018	61.7 persons/Ha
• Restricted Community Facility	0.84 Ha	29	35.0 persons/Ha
Area 19 – Oldcastle Road Total	11.15 Ha	422	
• Hamlet Residential	5.80 Ha	92	61.7 persons/Ha 3.2 persons/unit
• Hamlet Development	5.35 Ha	330	61.7 persons/Ha
Area 20 – Castlewood Road Total	13.79 Ha	446	

Location/Lane Use	Area (Hectares)	Design Population	Population Density (persons/Ha)
• Hamlet Residential	7.29 Ha	45	3.2 persons/unit
• Hamlet Development	6.50 Ha	401	61.7 persons/Ha
Area 21 – Oldcastle Road	5.81 Ha	359	
• Hamlet Development	5.81 Ha	359	61.7 persons/Ha
Area 22 – North Talbot Road Total	35.63 Ha	1046	
• Hamlet Residential	17.59 Ha	90	3.2 persons/unit
• Recreational	3.64Ha	67	*Flow calculated by fixture unit method
• Hamlet Development	14.40 Ha	889	61.7 persons/Ha
Area 23 – 8th Concession Road Total	27.32 Ha	1545	
• Industrial/Business Park	5.31 Ha	186	35.0 persons/Ha
• Hamlet Development	22.01 Ha	1359	61.7 persons/Ha
Area 24 – 8th Concession Road Total	15.07 Ha	602	
• Industrial/Business Park	12.31 Ha	431	35.0 persons/Ha
• Hamlet Development	2.76 Ha	171	61.7 persons/Ha
Area 25 – 8th Concession Road Total	24.36 Ha	853	
• Industrial/Business Park	24.36 Ha	853	35.0 persons/Ha
Area 26 – 8th Concession Road Total	5.35 Ha	188	
• Industrial/Business Park	5.35 Ha	188	35.0 persons/Ha
Area 27 – 8th Concession Road Total	23.69 Ha	830	
• Industrial/Business Park	23.69 Ha	830	35.0 persons/Ha
Area 28 – Highway 3 Total	18.23 Ha	1093	
• General Commercial	1.20 Ha	42	35.0 persons/Ha
• Hamlet Development	17.03 Ha	1051	61.7 persons/Ha
Area 29 – Walker Road Total	22.58 Ha	858	
• General Commercial	3.43 Ha	120	35.0 persons/Ha
• Hamlet Residential	10.00 Ha	173	61.7 persons/Ha 3.2 persons/unit
• Hamlet Development	9.15 Ha	565	61.7 persons/Ha
Area 30 – Highway 3 Total	15.53 Ha	959	

Location/Lane Use	Area (Hectares)	Design Population	Population Density (persons/Ha)
• Hamlet Development	15.53 Ha	959	61.7 persons/Ha
Area 31 – Howard Ave Total	2.28 Ha	54	
• General Commercial	1.26 Ha	44	35.0 persons/Ha
• Hamlet Residential	1.02 Ha	10	3.2 persons/unit
Area 32 – Howard Ave Total	11.43 Ha	209	
• Hamlet Residential	8.36 Ha	39	3.2 persons/unit
• Restricted Community Facility - Church	1.75 Ha	110	61.7 persons/Ha
• Restricted Community Facility – Legion	1.32 Ha	60	45.0 persons/Ha
Area 33 – Howard Ave Total	3.19 Ha	260	
• Hamlet Development	1.70 Ha	105	61.7 persons/Ha
• Restricted Community Facility	1.49 Ha	155	104.0 persons/Ha
Area 34 – Howard Ave Connector Total	12.77 Ha	788	
• Hamlet Development	12.77 Ha	788	61.7 persons/Ha
Area 35 – Settlement Expansion Total	63.20 Ha	2212	
• Industrial/Business Park	63.20 Ha	2212	35.0 persons/Ha
Area A Total	72.27 Ha	2531	
• Industrial/Business Park	72.27 Ha	2531	35.0 persons/Ha
Area B Total	4.51 Ha	158	
• Industrial/Business Park	4.51 Ha	158	35.0 persons/Ha
TOTAL	570.25 Ha	21540	

* Populations for the cemetery (Area 8) and park (Area 22) were derived from a fixture unit calculation.

Proposed sewage flow rates were computed using the areas and populations presented in **Table 3.0**. Populations for the Restricted Community Facilities (churches, assembly halls and schools) were derived from the sewage flow rate information provided in **Table 2.0**. Using the capacity of each of the facilities, a sewage flow rate was determined. The population was derived from a conversion of the total flow rate from the building divided by the average flow rate of 300 L/cap. per day.

Flows for the cemetery and parks were determined by using a fixture unit rate approach. The number of washroom fixtures for each building was confirmed. Specific fixture unit rates were applied to the total number of fixtures. A summation of the fixture units for each area was calculated and converted to a flow in litres/second. Based on the derived flow and the area depicted on **Figure 3.0**, a population was calculated and applied to each area.

The cemetery lands are comprised of four individual parcels (Municipal Nos. 1125, 1405, 1525, and 1825 Highway 3). It is proposed that these lands be serviced by two connections, as follows:

- Municipal No. 1825 would be serviced by the proposed 200 mm diameter sewer that would extend west along Highway 3 from Walker Road (Area 13); and
- Municipal Nos. 1125, 1405 and 1525 would be serviced by the proposed 200 mm diameter sewer that would extend south from Fasan Drive (Area 8).

It is expected that the sanitary flows from the various facilities located on the cemetery lands will require the use of a private sanitary pump station to convey flows to these proposed 200 mm diameter sewer outlets. Refer to **Figure 7.0** for an illustration of the servicing strategy, including Section 3.10 for a description of the constraints associated with servicing these lands.

The sanitary sewer design sheets have been included in **Appendix A – Sanitary Sewer Design Sheets**. These design sheets present the proposed sanitary sewer system requirements on the basis of the peak sewage flows for each of the 36 sewage subdrainage areas presented in **Table 3.0**. The Oldcastle Hamlet Sanitary Sewer Layout Sheet also included in **Appendix A**, provides a more detailed description of the individual sanitary sewer segments throughout the proposed collection system, including sewer sizes, slopes, invert elevations and resulting depth of cover. As each phase of the sanitary sewer is implemented, a more detailed sanitary sewer design sheet is expected to be required to confirm the results of this preliminary design, including reference to the targeted sewer invert elevations that should be maintained in order to preserve the functionality of the preliminary design.

As presented in the sanitary sewer design sheets, the total peak sewage flow from the study area is estimated to be 264.4 l/s, serving a total area of approximately 570 Ha. This peak sewage flow rate is based on the design criteria outlined herein.

Since the allowable peak sewage outflow rate for the 8th Concession Road trunk sanitary sewer outlet is 325 l/s, there is an opportunity for the Town to consider expanding the study area boundary in the future to accommodate the 60.6 l/s balance in allowable peak sewage flow. The preliminary design of the sanitary sewer system includes allowances for sewage flows from beyond the study area boundary, though the specific location and limits of these potential expansions have not been formally confirmed at this time. Depending on the location and characteristics of any proposed study area expansion, further analysis will be required to confirm whether the associated sewage flows can be accommodated in relation to both the overall study area sewage flows and the capacity of the conveyance system.

3.4 Sanitary Sewer Preliminary Design

The preliminary sanitary sewer system layout was based on the sanitary pipe and manhole design criteria presented in **Table 1.0**. The preliminary sanitary sewer profile was developed in consideration of

the existing topography in the area, which was confirmed through the use of existing as-built information from the Town of Tecumseh Interactive Mapping Website, and supplemented with a topographic survey of select spot locations throughout the study area to confirm existing grades. Refer to **Figures 9.0 to 12.0** for profiles of the proposed sanitary sewer system.

The existing topography of the study area proved to be a significant constraint to the preliminary design of the sewer system. In general, the ground elevations in the study area slope from higher elevations at the northeast to lower elevations towards the southwest, with an overall grade difference of approximately 4 m. The sanitary sewer gradients are required to slope in the opposing direction (i.e. higher sanitary sewer inverts in the southwest required to direct sewage flows towards the 8th Concession Road sanitary sewer outlet towards the northeast), resulting in the need to introduce sanitary pump stations at key locations, as required to maintain adequate cover on the gravity sanitary sewer system.

As shown in **Figure 3.0**, the trunk sanitary sewer is proposed to extend from the existing 900 mm diameter 8th Concession Road sewer outlet at County Road 46, southerly to Oldcastle Drive and towards Highway 3. The preliminary design of the trunk and local sanitary sewer system was based on maximizing the depth of cover by selecting sewer diameters/gradients that would provide an appropriate balance between conveyance capacity, sewage flow depth and self-cleansing velocities.

Due to the existing topography, it was determined that gravity sewers could only be extended as far as Blackacre Drive at Pulleyblank Street, at which point a sanitary pump station would be required to serve the balance of the lands to the south and west, as shown in **Figure 3.0**.

The grade differential between the Howard Avenue area and the southern area of Outer Drive is approximately 2 m. In order to serve the Howard Avenue area, it was determined that another sanitary pump station would be required to serve Areas 31-34, as shown in **Figure 3.0**.

A sanitary pump station is also required to service the northerly portion of Area 35 based on the existing topographic constraints. The proposed location of this sanitary pump station is also shown in **Figure 3.0**.

Cover depths in the proposed sanitary sewer system vary from a minimum of 2.7 m to a maximum of 7.0 m. As defined in **Table 1.0**, the minimum cover for sanitary private drain connections at the property line is defined as 2.4 m, requiring 2.7 m cover for sanitary sewers to account for the additional service pipe required between the property line and the proposed sewer.

The recommended preliminary design of the trunk and local sanitary sewers, as well as pump station locations have been shown on **Figure 3.0**. Pipe sizes in the proposed sanitary sewer system range from 200 mm to 900 mm diameter.

A sanitary sewer design sheet has been included in **Appendix A** that details the proposed sanitary network for the study area, including pipe diameter and gradient, required number of manholes, proposed invert elevations, proposed top of pipe elevations and depth of cover.

3.5 Sanitary Servicing for Areas 28 to 30

While there may be alternative means of extending sanitary sewers to serve the lands located south of Highway 3 (Areas 28, 29 and 30), it is proposed to utilize a sanitary sewer alignment that crosses Highway 3 at Oldcastle Road.

The proposed sanitary sewers in the upstream reaches of Area 30 would have limited cover due to the existing grades in the area.

Potential solutions to overcome the depth of cover constraints may include raising the existing grades and/or requiring the use of sewage ejector pumps for any basement plumbing fixtures (as is currently the policy in the Town of Tecumseh). Alternatively, a sanitary pump station could also be considered for the development of Area 30 in the future.

3.6 Sanitary Servicing for Areas 31 to 34 and Allowances for Study Area Expansion

As outlined in Section 3.4, the Howard Avenue area (Areas 31-34) is at a lower elevation relative to the balance of the study area. In addition, this area has been further separated from the study area as a result of the recent Rt. Hon. Herb Grey Parkway improvements. As a result, a sanitary pump station was determined to be required to convey sanitary flows from the Howard Avenue area to the proposed gravity sewer on Outer Drive, as shown in **Figure 3.0**. The proposed sanitary pump station would be located at the southwest corner of Area 34, including a forcemain discharge crossing Highway 3 to the proposed gravity sanitary sewer outlet on Outer Drive.

In addition, this sanitary pump station could serve to accommodate a southerly expansion of the study area, based on which an allowance for increased sewage flows and depths were included in the preliminary design of the lift station and the downstream sewer network. The potential for expansion of the study area may be a longer term consideration that would be subject to allowable peak flow limitations (325 l/s), as well as rezoning and Official Plan updates.

A conceptual sanitary sewer network is illustrated in **Figure 3.0** to demonstrate a means of servicing this area, including the sanitary sewer sizes and alignments that would serve as outlets for an expanded sanitary study area in the future.

In the shorter term until the expanded sanitary drainage area develops, the upgraded sanitary sewer sizes on Outer Drive required to accommodate additional sanitary flows may require increased maintenance until the design flow depths and self-cleansing velocities are realized.

Due to the comparatively remote nature of the Howard Avenue lands relative to the balance of the study area and the associated complexities and costs of extending sanitary sewers to this area from the 8th Concession Road trunk sanitary sewer outlet, the alternative of having these lands served by the Town of LaSalle was considered. The Town of LaSalle was approached to confirm whether there would be opportunities for the Howard Avenue area to be served from the future extension of their sanitary sewer system. The Town of LaSalle could not commit to providing the required capacity to serve these lands in the future.

3.7 Sanitary Servicing for Area 35 and Allowances for Study Area Expansion

Area 35 is a mostly undeveloped, 63.2 Ha area west of 9th Concession Road. This area was designated as a settlement area expansion in the County of Essex Official Plan Update that was adopted in February 2014. As outlined in Section 3.4, a sanitary pump station is required to service the northern portion of Area 35. In addition, this sanitary pump station could serve to accommodate an easterly expansion of the study area, based on which, an allowance for increased sewage flows and depths were included in the preliminary design of the lift station and the downstream sewer network. The potential for expansion of the study area may be a longer term consideration that would be subject to allowable peak flow limitations (325 l/s), as well as rezoning and Official Plan updates.

A conceptual sanitary sewer network is illustrated in **Figure 3.0** to demonstrate a means of servicing Area 35, including the sanitary sewer sizes and alignments that would serve as outlets for an expanded sanitary study area in the future.

In the shorter term until the expanded sanitary drainage area develops, the upgraded sanitary sewer sizes required on County Road 46 to accommodate additional sanitary flows may require increased maintenance until the design flow depths and self-cleansing velocities are realized.

3.8 Intercepting Existing Sanitary Sewers

There are existing local sanitary sewers on McCord Lane, Dicocco Court, Piccadilly Avenue and Trafalgar Avenue that originally conveyed flows to the Skyway Plaza Wastewater Treatment Plant for treatment. Now that this plant has been decommissioned, these flows have been temporarily directed to the North Talbot Road sanitary sewer through Brendan Lane. Provisions exist for these lands to be permanently directed to the 8th Concession Road trunk sanitary sewer system at McCord Lane.

3.9 Sanitary Pump Station Preliminary Design

A preliminary design was completed for the three proposed pump station sites at Blackacre Drive, Area 34, and Area 35. The preliminary designs of the lift stations were based on the following general design parameters:

Table 4.0: Lift Station Design Parameters

Criteria	Design Parameters
Minimum Wet Well Diameter	3.0 m
Depth Below Invert	2.0 m
Number of Pumps	2 – 1 Duty, 1 Standby
Emergency Backup Power Supply	To be included

The proposed lift stations would generally consist of the wet well, an exposed electrical control panel and back-up power supply, and a meter chamber, as well as site access and paved surface to facilitate maintenance activities.

The proposed Blackacre Drive sanitary pump station would be approximately 10.7 m in depth to the bottom of the wet well, with a peak flow capacity of 77 l/s. It is estimated that 20 hp pumps would be required. In addition, it is proposed that a 200 mm diameter forcemain discharge be provided on Blackacre Drive, from the pump station at Pulleyblank to the outlet sewer on Walker Road. This arrangement is proposed in order to limit the depth of the pump station wet well.

The proposed Howard Avenue sanitary pump station would be approximately 9.4 m in depth to the bottom of the wet well, with a peak flow capacity of 27 l/s. It is estimated that 15 hp pumps would be required, including a 150 mm diameter forcemain to convey flows across Highway 3 to the proposed outlet sewer on Outer Drive.

The proposed Area 35 sanitary pump station would be approximately 8 m in depth to the bottom of the wet well, with a peak flow capacity of 53 l/s. It is estimated that 20 hp pumps would be required, including a 200 mm diameter forcemain discharge.

3.10 Critical Constraints

As outlined in Section 3.4 of this report, the preliminary design of the trunk sanitary sewer was based on limiting the need for sanitary pump stations by selecting sewer diameters/gradients that would provide an appropriate balance between conveyance capacity, flow depth and self-cleansing velocities.

In general, any changes to the trunk sewer profile will result in impacts to the upstream local gravity sewer systems. The preliminary design of the trunk sewer includes allowances that can be considered during the detailed design stages, as follows:

- The depth of cover at the upstream limit of each of the gravity sewers was chosen at 2.7 m. The stipulated depth of bury at the property line is stipulated at 2.4 m, as described in **Table 2.0**. There may be some flexibility in the depth of the local sanitary sewer system, which may be reviewed and

confirmed during detailed design given the Town's policy of requiring basement plumbing fixtures to be served by a sewage ejector pump. Any reductions in sewer depth should be reviewed in relation to potential conflicts with existing infrastructure in the area.

- For preliminary design purposes, manhole junctions have been designed with the obvert of the smaller diameter pipe matched with the obvert of the larger diameter pipe. There may be an opportunity to consider the approach described in the Design Guidelines for Sewage Works 2008 prepared by the Ministry of the Environment and Climate Change, which describes a method to maintain the same energy gradient between pipes by matching the 0.8 diameter point of sewers.
- There are several primary constraints that impact the design of the sanitary sewer network, as follows:
 - **Figure 4.0**, the Wolfe Drain crosses Outer Drive at an invert elevation of approximately 186.1 m. The preliminary design grades provide for the following:
 - Approximately 1 m of vertical clearance between the existing drain invert and the top of the proposed sanitary sewer pipe.
 - Approximately 700 mm of vertical clearance for the proposed sanitary private drain connections crossing the Wolfe Drain.
 - **Figure 5.0** illustrates key preliminary design constraints associated with servicing the existing properties along Highway 3 and the eastern cemetery property (1825 Highway 3), as outlined below:
 - There is a crossing on Walker Road with the Collins Drain which has been considered in the proposed sanitary sewer design.
 - In addition, the proposed 200 and 300 mm diameter sewers at the associated minimum gradient provide the minimum cover of 2.7 m, though there may be increased maintenance since the sewage flows from Area 13 result in reduced flow depths and self-cleansing velocities in the proposed sanitary sewers.
 - For servicing of properties on the north side of Highway 3, it is estimated that the vertical separation distance between sanitary private drain connections and the existing roadside drain would be as follows:
 - Approximately 500 mm of vertical separation to the invert of the existing Collins Drain on the north side.
 - The private connections from the south side of Highway 3 to the local sewer proposed for Area 13 results in the following constraints:
 - Due to the required length of the private drain connections crossing Highway 3, the cover at the property line would be less than the 2.4 m criteria. Based on considering a typical 125 mm diameter private sewer connection at a 2% gradient, the cover at the property line

- would be 1.6 m. The use of sewage ejector pumps for basement plumbing fixtures, as required in accordance with the Town's policy, would address this reduced cover.
- For servicing of properties on the south side of Highway 3, it is estimated that the vertical separation distance between sanitary private drain connections and the existing roadside drain would be as follows:
 - Approximately 300 mm of vertical separation to the invert of the roadside drain on the south side.
 - **Figure 6.0** outlines the depth of cover constraints for Area 22, as also described below:
 - The preliminary design of the sanitary sewer on North Talbot Road includes 450 mm, 300 mm and 200 mm diameter sewers, which results in a depth of cover of 1.5 m at the upstream limits.
 - The use of sewage ejector pumps for basement plumbing fixtures, as required in accordance with the Town's policy, would address this reduced cover. Alternatively, there may be ways to provide for increased cover by oversizing the upstream sewers, though there would be increased maintenance due to the reduced flow depth and self-cleansing velocities that would be available at the upstream limits.
 - **Figure 7.0** outlines the servicing constraints for the cemetery lands south of Highway 3, as also described below:
 - The cemetery lands are comprised of four (4) individual property parcels (Municipal Nos. 1825, 1525, 1405, 1125 Highway 3), of which three (3) currently contain facilities contributing sanitary flows (Municipal Nos. 1825, 1525, 1125 Highway 3).
 - Based on discussions with representatives of the cemetery, it was confirmed that there are currently no plans to construct any new facilities within the site that would contribute additional sanitary flow. Accordingly, no flow allowances have been assigned to Municipal No. 1405 Highway 3, as there are currently no sanitary facilities located within this property.
 - Municipal No. 1825 Highway 3 will be serviced as outlined previously and as shown in **Figure 5.0**.
 - Due to the limitations associated with required length and depth of the private drain connections that would be required to cross Highway 3 to service Municipal Nos. 1525, 1405, 1125, along with the existing depth of the Collins Drain, it is proposed that these properties be serviced by a private pump station with a force main extending north across Highway 3 to the proposed 200 mm sewer:
 - The cost of extending this force main across Highway 3 to the cemetery property line has been included in the cost estimates (**Appendix B**). Costs associated with the private pump station(s) and the sewer network required to convey flows from within the properties to the property line have not been considered.
 - The proposed force main would be tunneled under Highway 3 by directional drilling, leaving a minimum 600 mm clearance below the Collins Drain.

- The force main would connect to the proposed sewer manhole, including an internal drop structure to ensure the flows are directed appropriately within the manhole.

Currently, Municipal Nos. 1825 and 1525 Highway 3 are owned by the same company (Arbor Memorial Inc.) and Municipal Nos. 1405 and 1125 are owned by Victoria Memorial Gardens. It is possible for a single pump station to be constructed by each owner to service their respective properties, diverting Municipal Nos. 1525/1825 to the eastern outlet and Municipal Nos. 1125/1405 to the western outlet as there is capacity in either outlet to accommodate the anticipated sanitary flows.

3.11 Maintenance Considerations

Portions of the proposed sanitary sewer system may require additional monitoring and maintenance based on risks associated with lower self-cleansing flow velocities that could occur during the phased implementation and servicing of the contributing area, as well as upstream reaches of the sewer system that have lower available sewage flows. These maintenance considerations are outlined below.

3.11.1 Construction Phasing

It is expected that the construction of this sanitary sewer system will occur over an extended period of time in multiple phases. This may present increased maintenance in areas of the sewer network that will not realize design flows for many years, examples of which include the following:

- The trunk sanitary sewer on 8th Concession Road and Oldcastle Road will not realize the full design flows until the complete sanitary sewer network is implemented.
- The trunk sanitary sewer on Outer Drive, between Highway 3 and Pump Station 1, would not realize the design flows until the Howard Avenue area (Areas 31-34) is serviced, which may be a longer term project.
- The trunk sanitary sewer on County Road 46, east of 8th Concession Road would not realize the design flows until the development of the settlement expansion area (Area 35) and further study area expansion is implemented, which again may be a longer term project.

Because of these and possibly other locations in the study area with similar delays in their implementation, it is recommended that a strategy for the proposed construction phasing and allowances for increased maintenance be considered by the Town.

3.11.2 Sanitary Sewer Flow Velocities

Upstream portions of the sanitary sewer system with limited sewage flows will have reduced self-cleansing flow velocities. Due to limitations in the available topography, it would not be practical to increase sewer pipe slopes to compensate for these partial flow conditions. In particular, upstream

sanitary sewers in Areas 12-14 and Areas 31-33 are expected to require additional monitoring and maintenance.

4.0

Easements and Acquisitions

4.1 Required Land Acquisitions and Permanent/Working Easements

To facilitate the construction of the proposed sanitary sewer network, several easements and land acquisitions will be required to accommodate sanitary pump stations and to cross privately owned lands. It is generally recommended that a 6 m wide permanent easement for sanitary sewers be provided, with a temporary 20 m wide working easement for construction. Based on the preliminary design, an initial list of the required easements and acquisitions is summarized below and also shown in **Figure 8.0**:

Table 5.0: Required Land Acquisitions and Permanent/Working Easements

Number	Description	Acquisition (A) or Easement (E)	Affected Land Owners	Approximate Size of Acquisition/ Easement	Approximate Size of Additional Working Easement
1	Area 5 - Pump Station Site	A	-957474 Ontario Limited -1099100 Ontario Limited	10 m X 10 m	20 m X 20 m
2	Area 15/18 - Construction within the Chrysler Greenway	E	Essex Region Conservation Authority	6 m width	200 m in length X 20 m width
3	Area 13 - North of Highway 3 to permit construction outside of Highway 3 corridor	E	-Homeniuk, John -Zegrean, Benjamin & Zegrean, Anda Lavinia -Bower, Mack Newton -Brumm, Gerda -Leclerc, Jennifer & Leclerc, Roger -Parr, Marion R -Zegran, Ion & Zegrean, Elena	6 m width	325 m in length X 10 m width
4	Area 14 - North of Highway 3 to permit the construction outside of Highway 3 corridor	E	Essex Region Conservation Authority	6 m width	85 m in length X 10 m width

Number	Description	Acquisition (A) or Easement (E)	Affected Land Owners	Approximate Size of Acquisition/ Easement	Approximate Size of Additional Working Easement
5	Area 18 - North of Highway 3 to permit the construction outside of Highway 3 corridor	E	-Stafford, Joel Douglas - Marentette, Betty Frances & Marentette, Francis Xavier	6 m width	120 m in length X 10 m width
6	Area 28 to Area 29	E	-Singh, Kalminder & Singh, Inderjeet	6 m width	270 m in length X 20 m width
7	Area 34 - Pump Station Site	A	Congregation of the Order Antonin Maronite in Ontario	10 m X 10 m	20 m X 20 m
8	Area 32/33 to Area 34 to Outer Drive - construction within existing road parcel	E	Ministry of Transportation	6 m width	920 m in length X 20 m in width
9	Area 35 - Pump Station Site	A	-Hayes, Anne Elizabeth	10 m X 10 m	20 m X 20 m
10	Area 35 to Pump Station 3	E	-Iacobelli, Angelo & Iacobelli, Palma -Facca, Matilde	6 m width	375 m in length X 20 m in width
11	Area 8 - Fasan Drive to Highway 3	E	-1690022 Ontario Limited -1432351 Ontario Inc.	6 m width	150 m in length X 20 m in width

In addition to the easements presented in **Table 5.0**, it will be necessary to secure the remaining portions of the 6.0 m wide sanitary sewer easement corridor on the east side of Walker Road, which was initiated during the course of the recent roadway improvements. The following is a summary of the existing and required easements along the east side of Walker Road:

Table 6.0: Walker Road Required Easement Summary

Number	Description	Current Easement (Y or N)	Affected Land Owners
12	5420 Walker Road	N	Dixon Tool Company Limited
13	5430 Walker Road	N	Thompson-Orban, Barbara
14	5440 Walker Road	N	Margaritis, Michael & Margaritis, Christine

Number	Description	Current Easement (Y or N)	Affected Land Owners
15	5470 Walker Road	Y	Parks, Jon Marwood & Parks, Kathleen Ann

The existing easements noted in **Table 6.0** have been established for the installation of municipal public services and utilities in favour of the Corporation of the Town of Tecumseh.

5.0

Cost Estimates and Cost Allocations

5.1 Preliminary Cost Estimates

Preliminary construction cost estimates have been completed for the proposed sanitary sewer network within the sanitary drainage area shown in **Figure 3.0**. These estimates have been separated into the following categories:

- Trunk sanitary (estimates WW-11B to WW-11L), which includes any sewers that are larger than 375 mm diameter, including sanitary pump stations and force mains, as shown in **Figure 13.0**.
- Local sanitary (estimates L-1 to L-11), which includes all sewers that are 375 mm in diameter and smaller and the 50 mm force main servicing the cemetery lands, as shown in **Figure 14.0**.

Cost estimates have not been completed for sanitary sewers that are required to service lands which are to be privately developed.

To confirm the total implementation costs of this sanitary sewer network, we have also included the costs for engineering completed to date and anticipated engineering fees associated with detailed design and approvals.

In general, the cost estimates include removals, road work, sanitary sewer installation, restoration and miscellaneous items to complete the construction of the proposed works, including the following assumptions:

- Jack and bore where required for trenchless installations at rail, gas corridor, and Highway 3 crossings.
- One lane of roadway reconstruction included for sewer depths less than 6.0 m.
- Two lanes of roadway reconstruction included for sewer depths greater than 6.0 m.
- No costs were included for watermain or utility improvements.
- No costs were included for sanitary private drain connections and sampling manholes.

In addition, allowances were included for general contingencies (10%), detailed engineering design (15%), geotechnical engineering (2%) and land/easement acquisition costs. Detailed cost estimate sheets for each of the individual trunk and local sanitary sewer segments have been included in **Appendix B**, including specific assumptions associated with each cost estimate.

Table 7.0: Breakdown of Estimated Costs

Trunk or Local Sanitary Sewer	Description	Preliminary Cost Estimate
Trunk	WW-11B to 11D, 11G to 11J, and 11L	\$12,178,201
Trunk	WW-11E Pump Station 1 and forcemain	\$1,302,012
Trunk	WW-11F Pump Station 2 and forcemain	\$1,609,313
Trunk	WW-11K Pump Station 3 and forcemain	\$708,475
Subtotal Trunk	WW-11B to WW-11L	\$15,798,001
Subtotal Local	L-1 to L11	\$13,196,738
Preliminary Design and Class EA Reports	Preliminary design and Class EA reports completed to date	\$175,785
Total Trunk and Local Sanitary Sewer System Cost Estimate	Total estimate to construct the network shown in Figure 3.0 . (Cost estimates WW-11B to M, L-1 to 11)	\$28,994,739

* The total does not account for previous construction work completed north of Country Road 46.

5.2 Basis for Allocating Costs

In order to provide a basis for the Town to determine appropriate cost allocations associated with providing sanitary services to this study area, the area of the lands that would directly benefit from each trunk and local sewer component was determined, as summarized in **Table 8.0**.

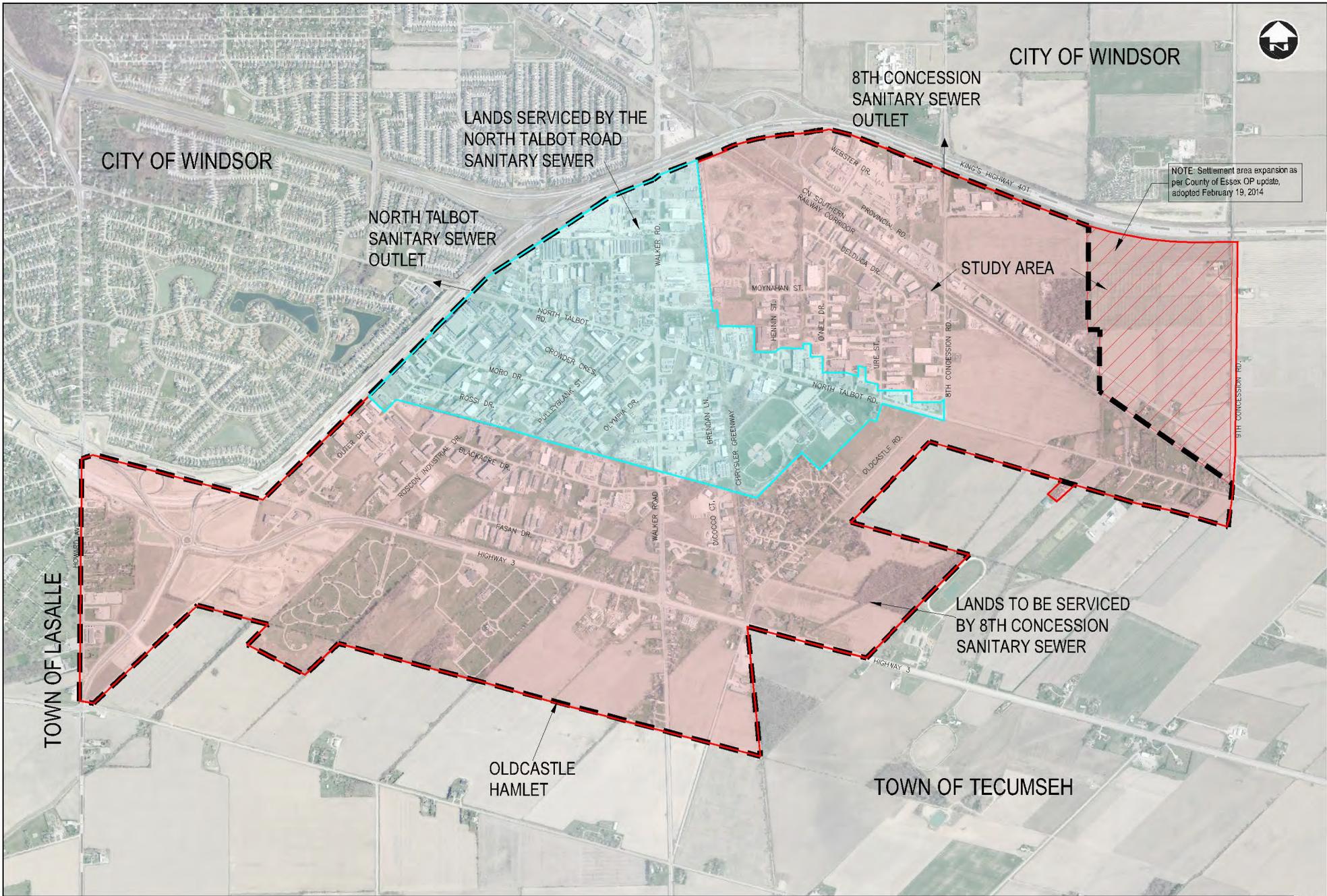
The following conditions were considered in determining the areas associated with the various sanitary sewer components:

- The areas included in **Table 8.0** represent the net area of private properties that are developed or are designated for development within the study area, and exclude any public rights-of-way, the rail corridor, MTO lands, parks, and a portion of the cemetery lands.
- Trunk sewers are considered to have a benefit to all properties in the study area, based on which the total net area has been associated with the trunk sewers.
- Local sewers are considered to benefit the abutting properties they serve, based on which the abutting net area has been associated with each local sewer segment, as outlined by land use in **Table 8.0**.
- Future development lands listed under local sewers (L-#) represent existing vacant infill properties that would be served by the local sewer segment once developed.
- Local sewer costs associated with the local infill development lands would be recovered once the property is developed.
- The extension of new sanitary sewers required to service larger blocks of future development lands would be considered the responsibility of individual developers, based on which these areas were **not** included under the local future development area.

Table 8.0: Summary of Land Areas Associated With Each Sewer Component

Sanitary Sewer Component	Associated Area Number	Land Uses and Areas (ha)				
		Residential	Commercial / Industrial	Restricted Community Use	Future Development	Total
WW-11B to WW-11L	Areas 1-9,11-35 and Areas A and B	54.03	169.42	26.45	273.32	523.22
L-1	Area 27	-	22.66	-	-	22.66
L-2	Area A & B	-	45.50	-	4.59	50.09
L-3	Area 20	6.63	-	-	-	6.63
L-4	Areas 11,12,13	4.77	8.05	4.42	4.95	22.19
L-5	Areas 6,7,8,9	-	29.26	4.76	7.96	41.98
L-6	Area 1,2,3,4,5	-	31.77	2.55	7.23	41.55
L-7	Area 29	4.01	2.67	-	1.67	8.35
L-8	Area 28	-	-	-	7.93	7.93
L-9	Area 14,18	0.56	1.19	0.54	4.94	7.23
L-10	Area 22	12.55	-	-	7.20	19.75
L-11	Areas 31-34	8.71	-	6.17	3.29	18.17

Figures



NOTE: Settlement area expansion as per County of Essex OP update, adopted February 19, 2014

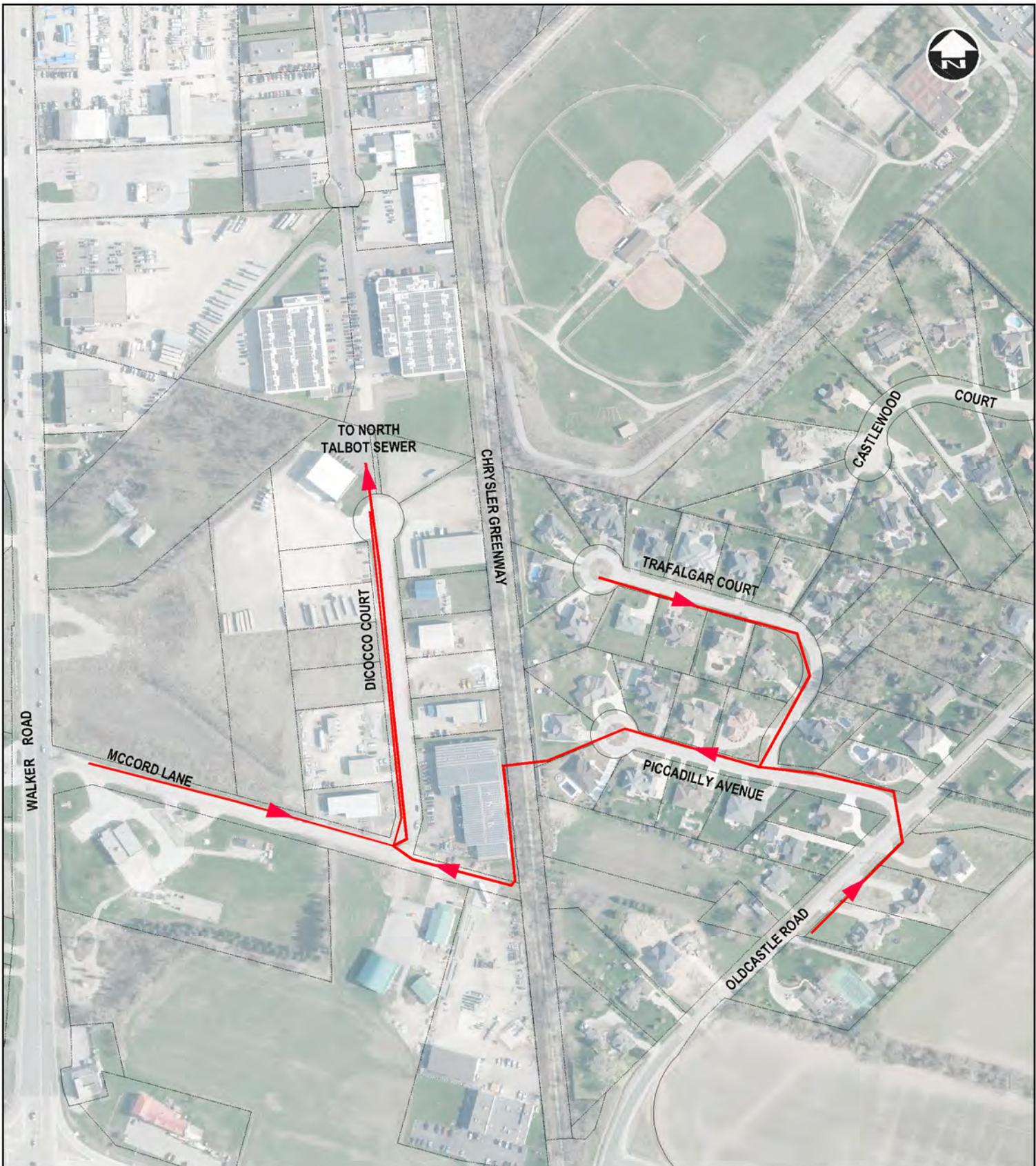
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Town of Tecumseh
Ontario, Canada

**OLDCASTLE HAMLET SANITARY SERVICING
8TH CONCESSION SANITARY OUTLET**

**KEY PLAN
FIGURE 1.0**



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OLDCASTLE HAMLET SANITARY
SERVICING 8TH CONCESSION
SANITARY OUTLET



Town of
Tecumseh
Ontario, Canada

**EXISTING SEWERS IN
STUDY AREA**

FIGURE 2.0

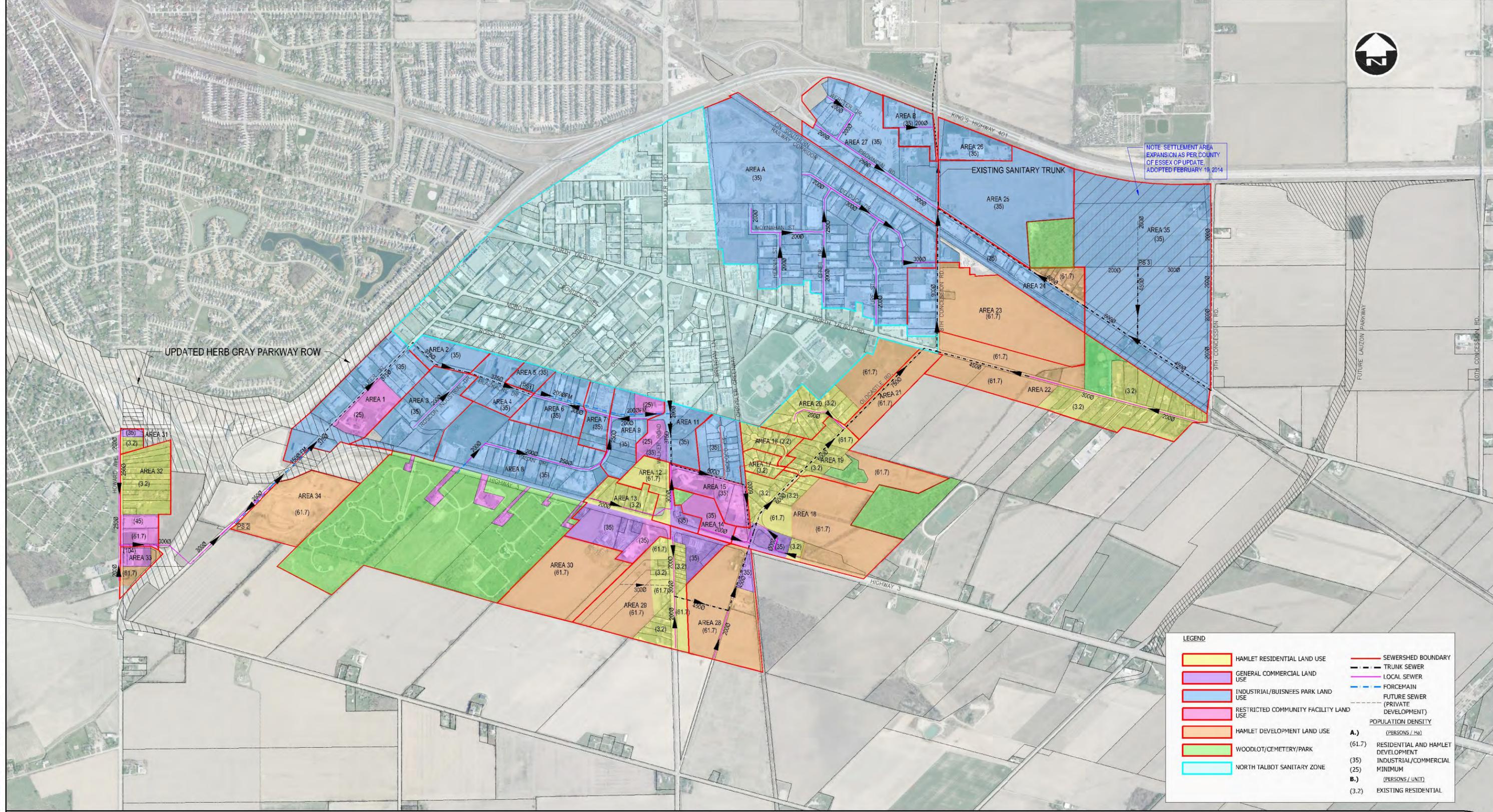


NOTE SETTLEMENT AREA EXPANSION AS PER COUNTY OF ESSEX OF UPDATE ADOPTED FEBRUARY 16, 2014

UPDATED HERB GRAY PARKWAY ROW

LEGEND

	HAMLET RESIDENTIAL LAND USE		SEWERSHED BOUNDARY
	GENERAL COMMERCIAL LAND USE		TRUNK SEWER
	INDUSTRIAL/BUSINESS PARK LAND USE		LOCAL SEWER
	RESTRICTED COMMUNITY FACILITY LAND USE		FORCEMAIN
	HAMLET DEVELOPMENT LAND USE		FUTURE SEWER (PRIVATE DEVELOPMENT)
	WOODLOT/CEMETERY/PARK	POPULATION DENSITY	
	NORTH TALBOT SANITARY ZONE	A.)	(PERSONS / Ha)
		(61.7)	RESIDENTIAL AND HAMLET DEVELOPMENT
		(35)	INDUSTRIAL/COMMERCIAL MINIMUM
		(25)	INDUSTRIAL/COMMERCIAL MINIMUM
		B.)	(PERSONS / UNIT)
		(3.2)	EXISTING RESIDENTIAL



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Town of Tecumseh Ontario, Canada

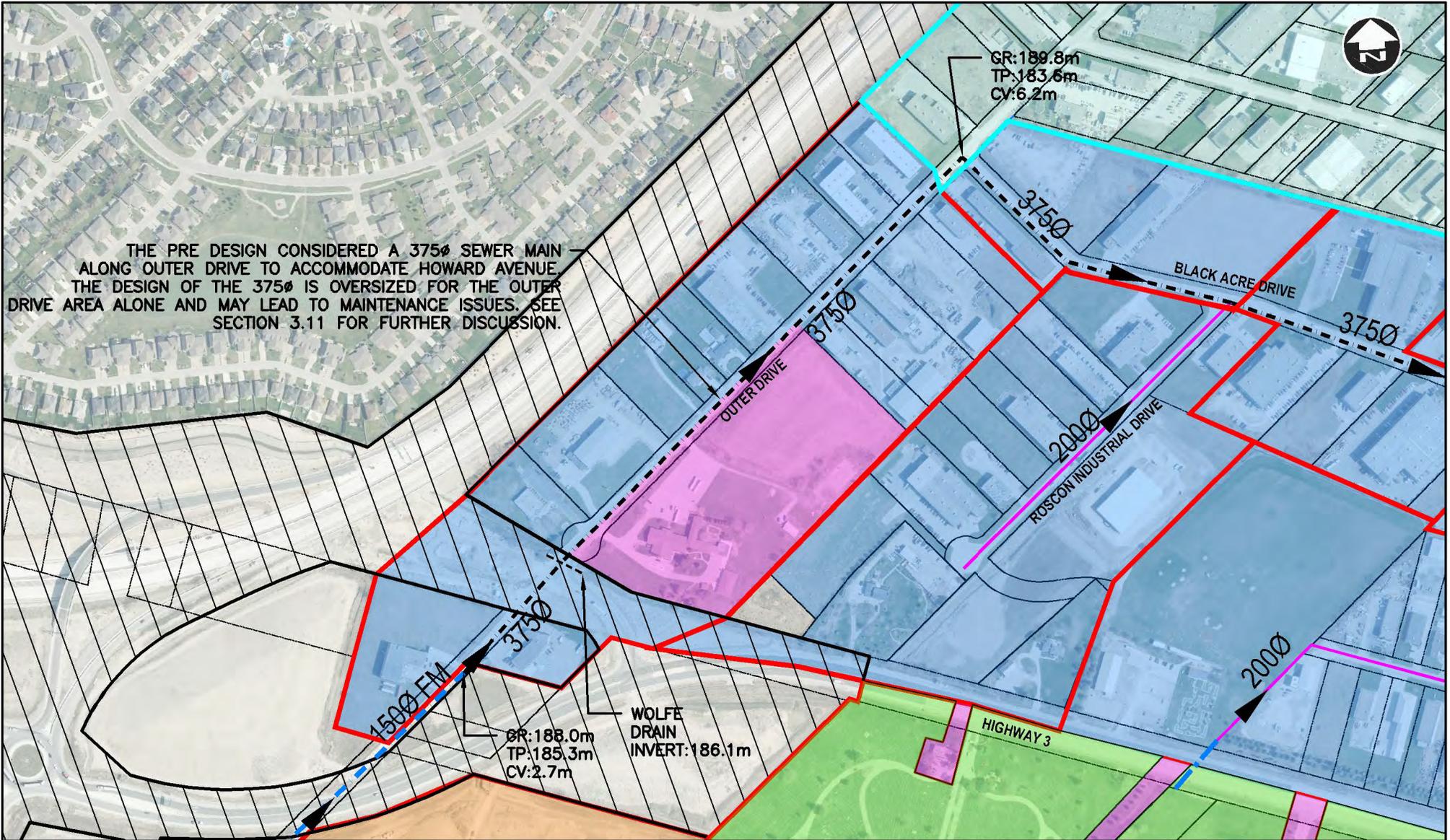
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Date: May 2018



OLDCASTLE HAMLET SANITARY SERVICING
8TH CONCESSION SANITARY OUTLET
SEWERSHED AREAS

FIGURE 3.0

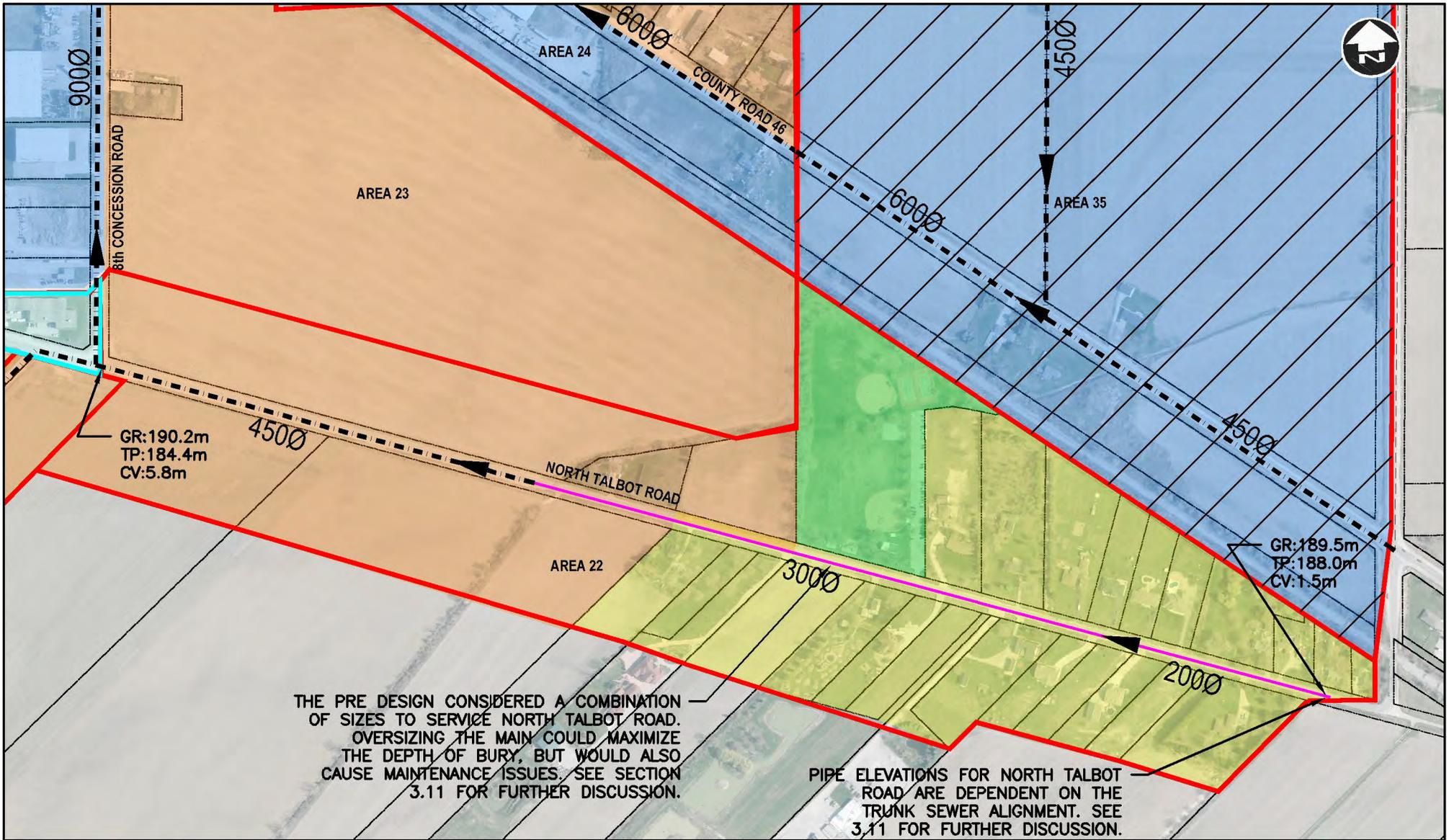


DATE: May 2018
Dillon Proj.No. 15-2973

OLDCASTLE HAMLET SANITARY SERVICING
8TH CONCESSION SANITARY OUTLET

FIGURE 4.0
TOWN OF TECUMSEH

AREA 1 CONSIDERATIONS

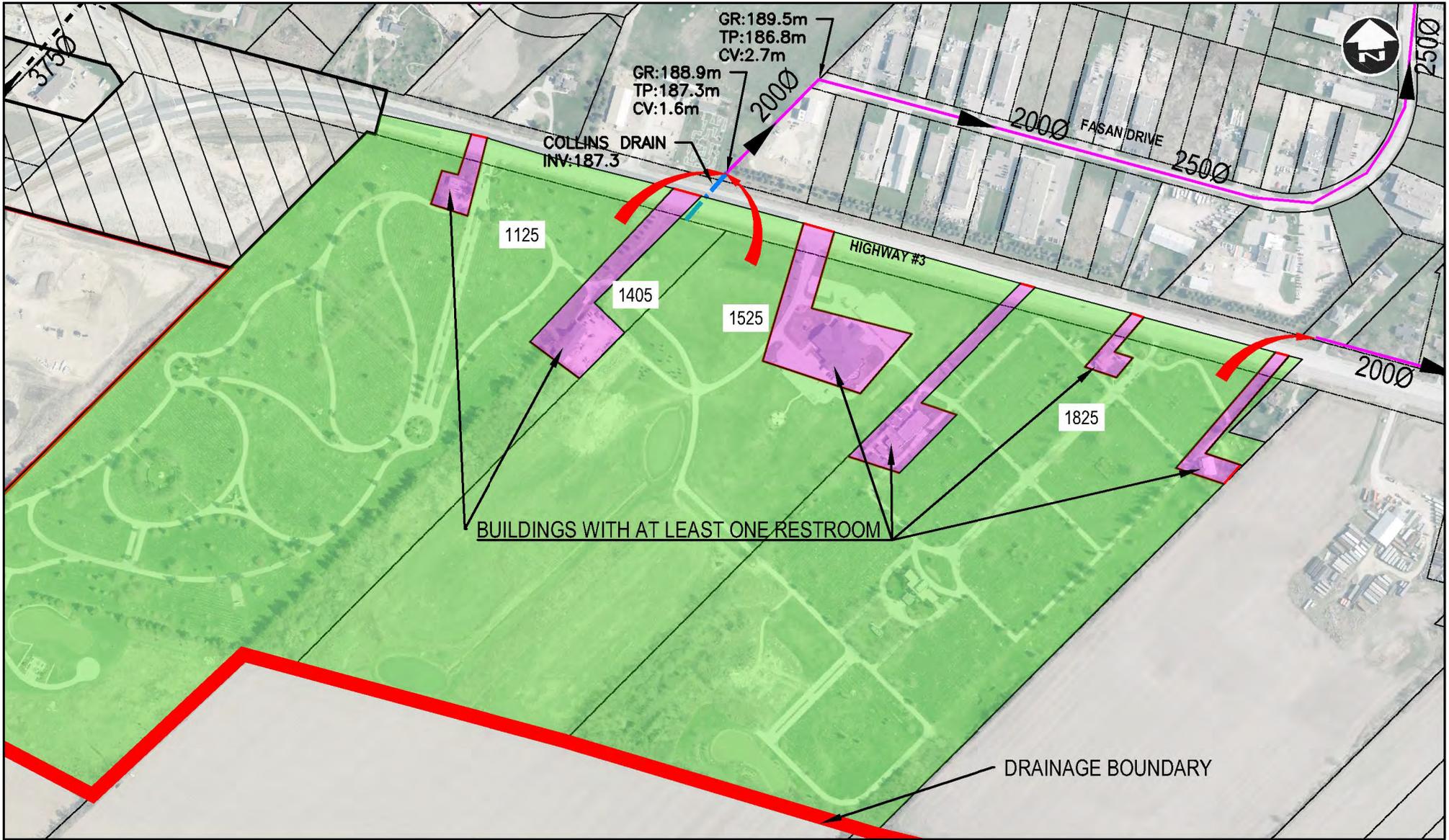


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8TH CONCESSION SANITARY OUTLET

FIGURE 6.0
TOWN OF TECUMSEH

AREA 22 CONSIDERATIONS



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 PROPERTY SANITARY FLOW DIRECTION

OLDCASTLE HAMLET SANITARY SERVICING
8TH CONCESSION SANITARY OUTLET

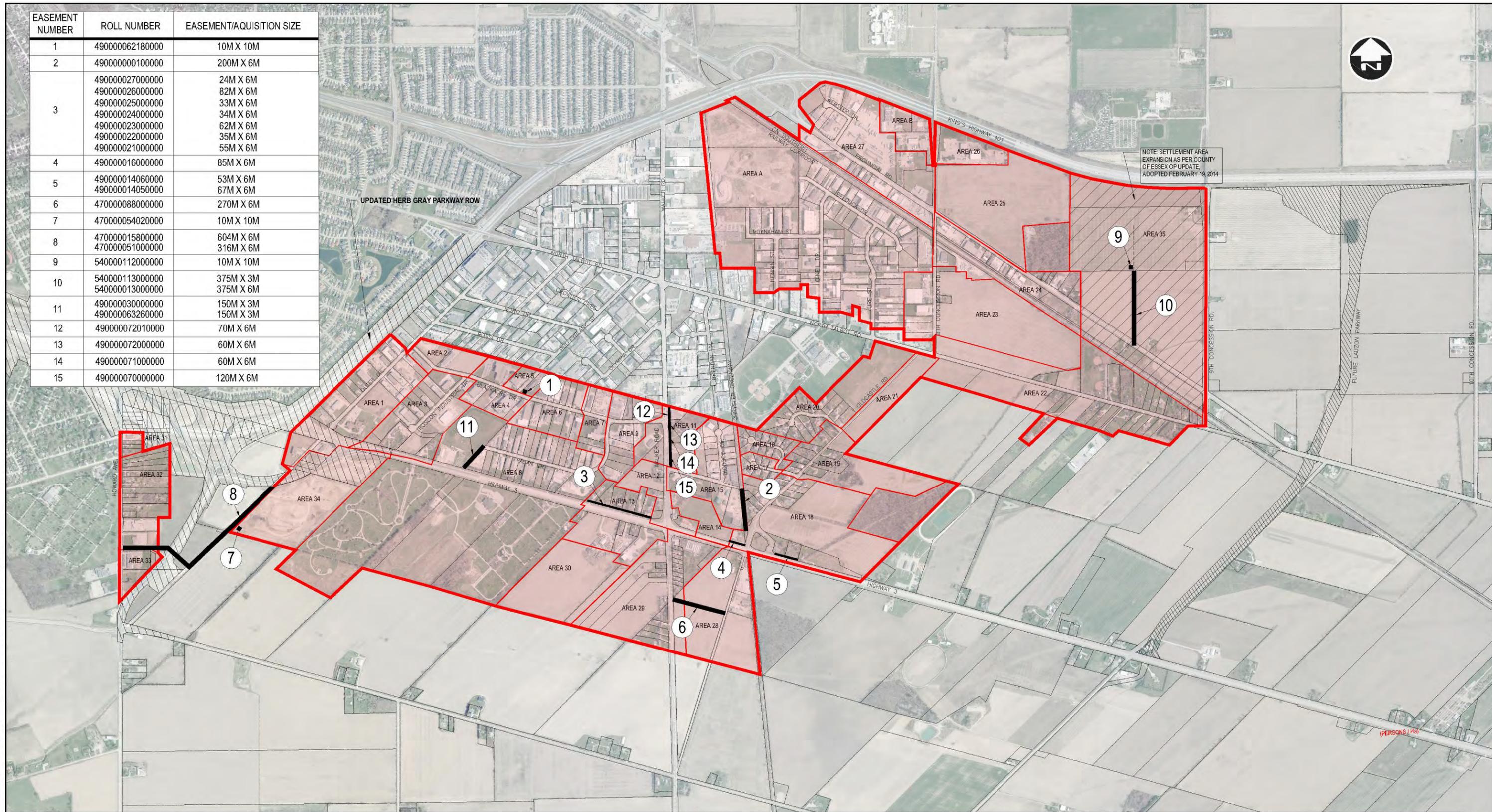
FIGURE 7.0
TOWN OF TECUMSEH



DATE: May 2018
Dillon Proj.No. 15-2973

CEMETERY LANDS SERVICING

EASEMENT NUMBER	ROLL NUMBER	EASEMENT/AQUISITION SIZE
1	490000062180000	10M X 10M
2	490000000100000	200M X 6M
3	490000027000000	24M X 6M
	490000026000000	82M X 6M
	490000025000000	33M X 6M
	490000024000000	34M X 6M
	490000023000000	62M X 6M
	490000022000000	35M X 6M
490000021000000	55M X 6M	
4	490000016000000	85M X 6M
5	490000014060000	53M X 6M
	490000014050000	67M X 6M
6	470000088000000	270M X 6M
7	470000054020000	10M X 10M
8	470000015800000	604M X 6M
	470000051000000	316M X 6M
9	540000112000000	10M X 10M
10	540000113000000	375M X 3M
	540000113000000	375M X 6M
11	490000030000000	150M X 3M
	490000063260000	150M X 3M
12	490000072010000	70M X 6M
13	490000072000000	60M X 6M
14	490000071000000	60M X 6M
15	490000070000000	120M X 6M



Town of Tecumseh
Ontario, Canada

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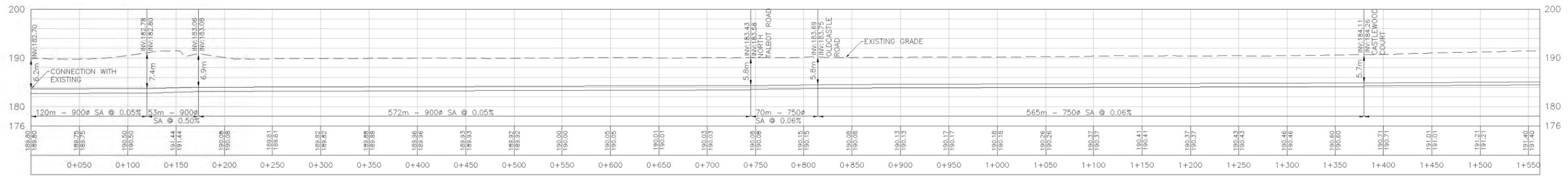
- EASEMENT/ACQUISITION AREA
- SEWERSHED BOUNDARY



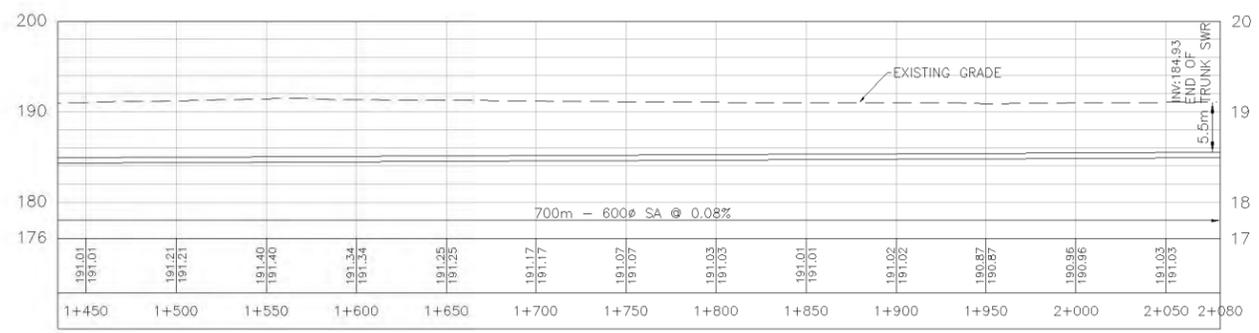
OLDCASTLE HAMLET SANITARY SERVICING
8TH CONCESSION SANITARY OUTLET

EASEMENTS AND ACQUISITIONS

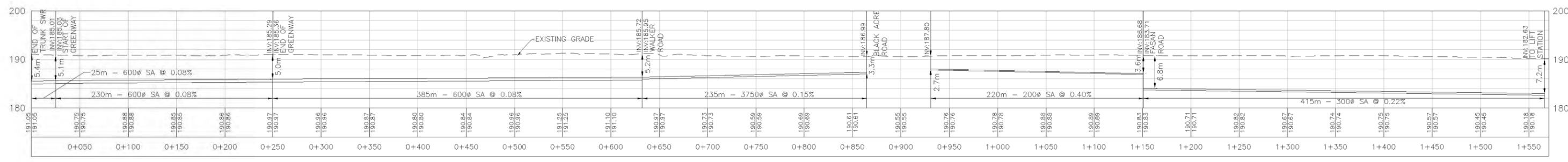
FIGURE 8.0



TRUNK SEWER PROFILE
1:2000 (HOR.) 1:400 (VERT.)



WESTERLY TRUNK AND LOCAL SEWER PROFILE
1:2000 (HOR.) 1:400 (VERT.)



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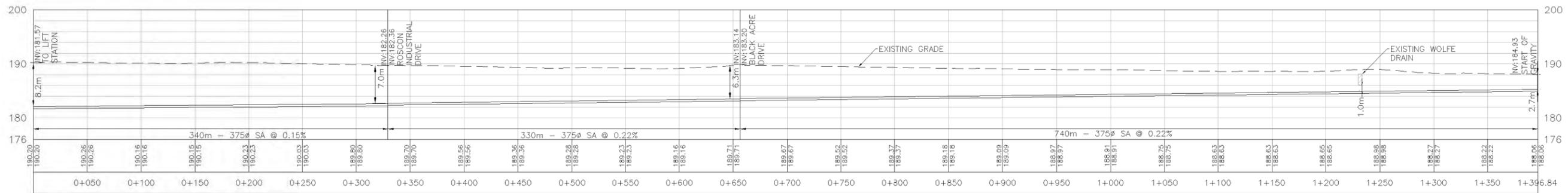
Town of Tecumseh
Ontario, Canada

Dillon Project No. 15-2973

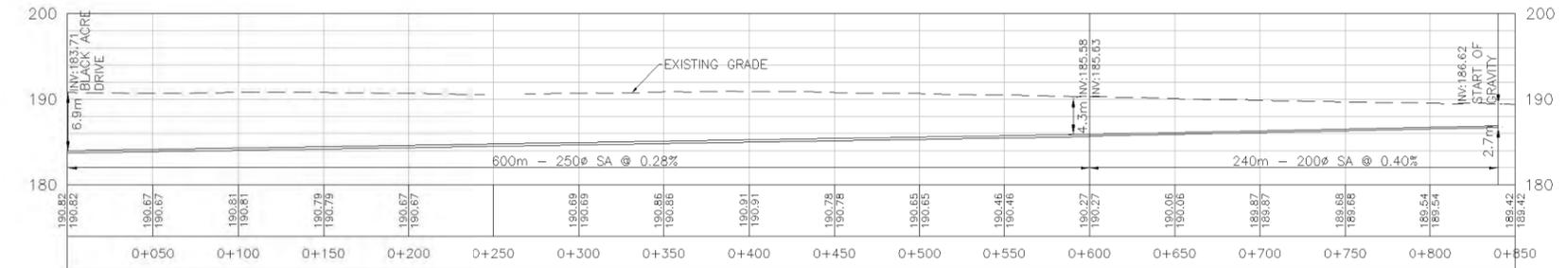
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OLDCASTLE HAMLET SANITARY SERVICING
8TH CONCESSION SANITARY OUTLET

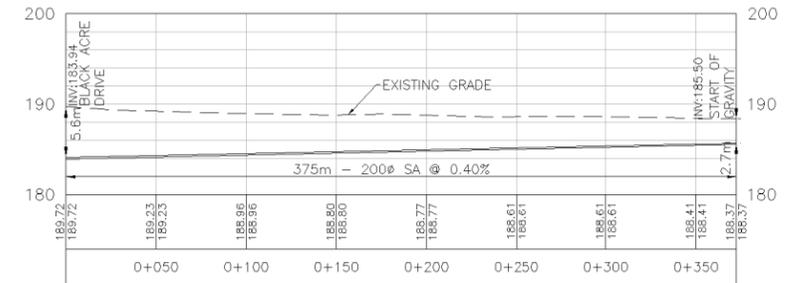
PROFILES
FIGURE 9.0



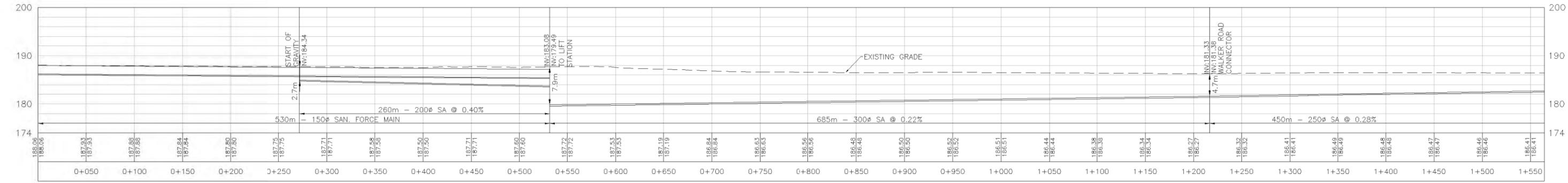
OUTER DRIVE TO LIFT STATION PROFILE
1:2000 (HOR.)/1:400(VERT.)



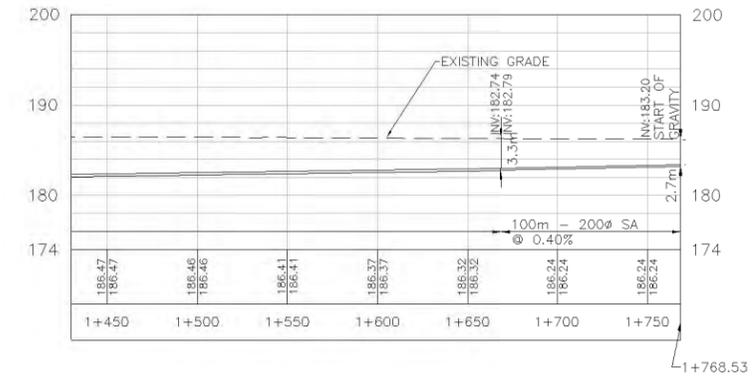
FASAN DRIVE TO BLACK ACRE DRIVE PROFILE
1:2000 (HOR.)/1:400(VERT.)



ROSCON INDUSTRIAL DRIVE TO BLACK ACRE DRIVE PROFILE
1:2000 (HOR.)/1:400(VERT.)



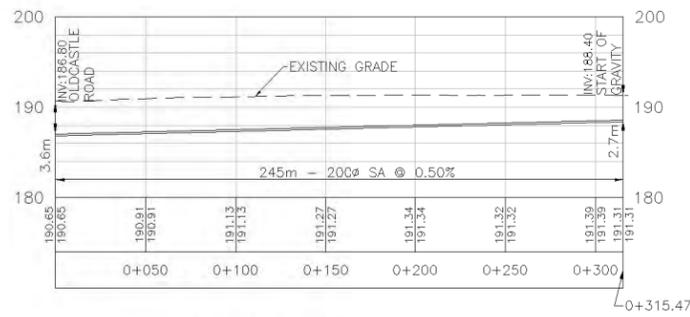
HOWARD AVENUE TO OUTER DRIVE PROFILE
1:2000 (HOR.)/1:400(VERT.)



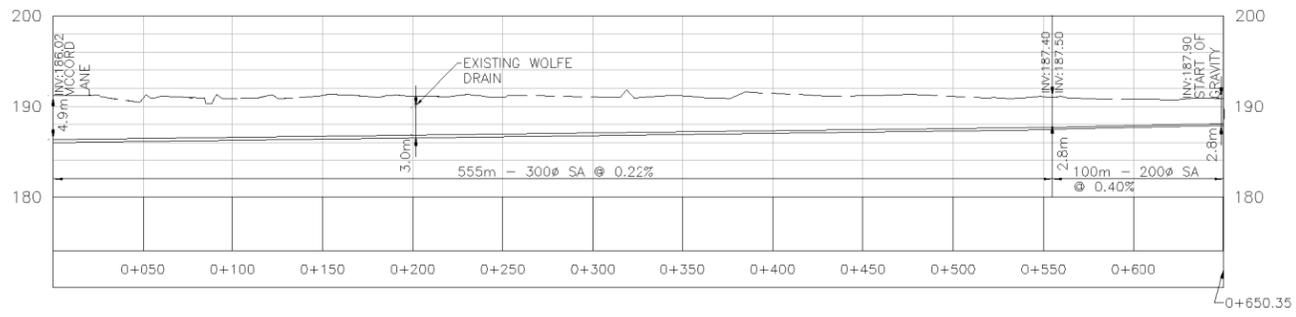
OLDCASTLE HAMLET SANITARY SERVICING
8TH CONCESSION SANITARY OUTLET

PROFILES
FIGURE 10.0

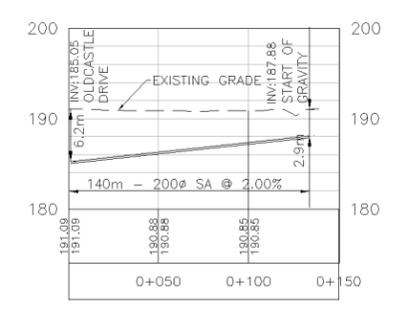
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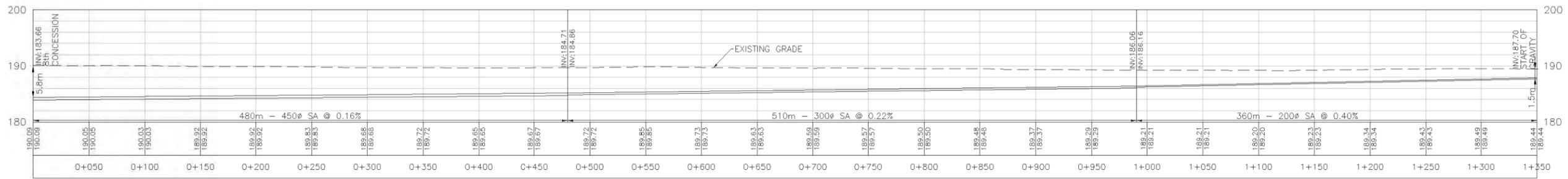
CASTLEWOOD DRIVE PROFILE
1:2000 (HOR.) 1:400 (VERT.)



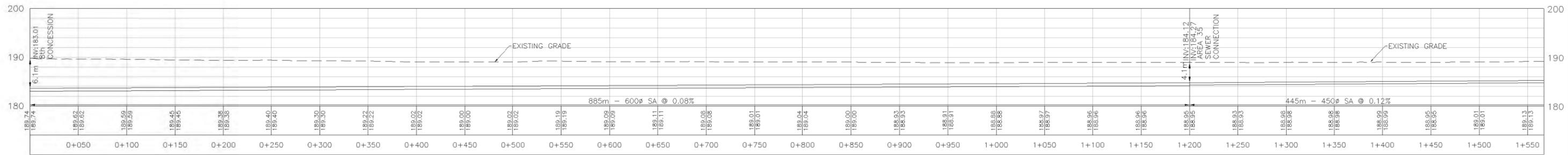
HIGHWAY 3/WALKER ROAD TO MCCORD LANE PROFILE
1:2000 (HOR.) 1:400 (VERT.)



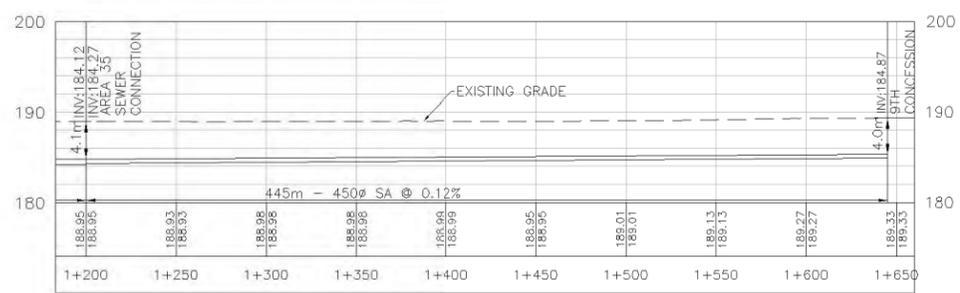
OLDCASTLE COURT PROFILE
1:2000 (HOR.) 1:400 (VERT.)



NORTH TALBOT ROAD PROFILE
1:2000 (HOR.) 1:400 (VERT.)



COUNTY ROAD 46 EAST PROFILE
1:2000 (HOR.) 1:400 (VERT.)



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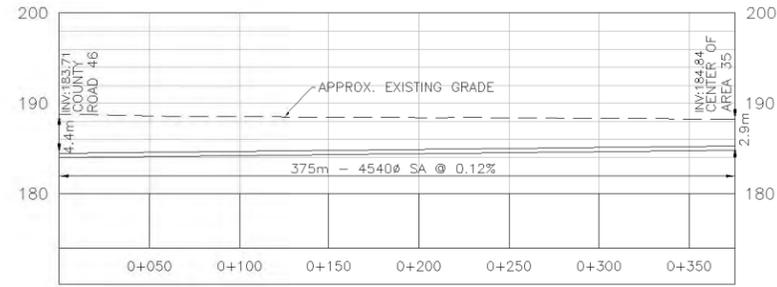


Dillon Project No. 15-2973

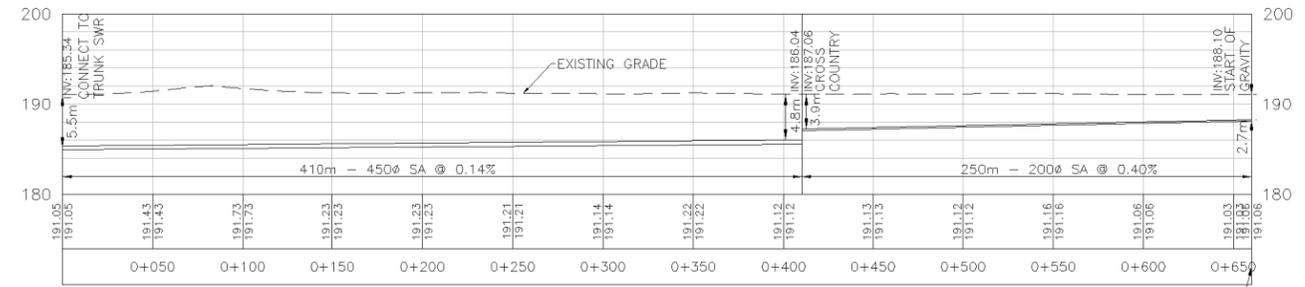
Date: March 2018

OLDCASTLE HAMLET SANITARY
SERVICING
8TH CONCESSION SANITARY OUTLET

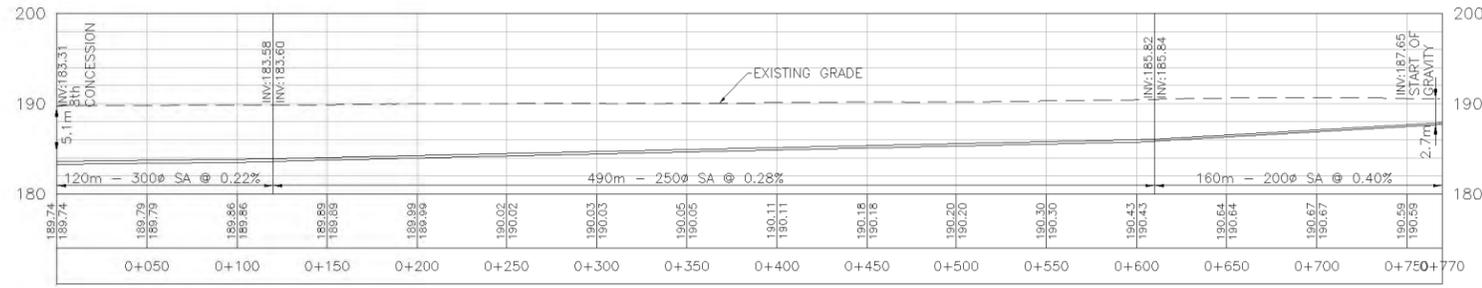
PROFILES
FIGURE 11.0



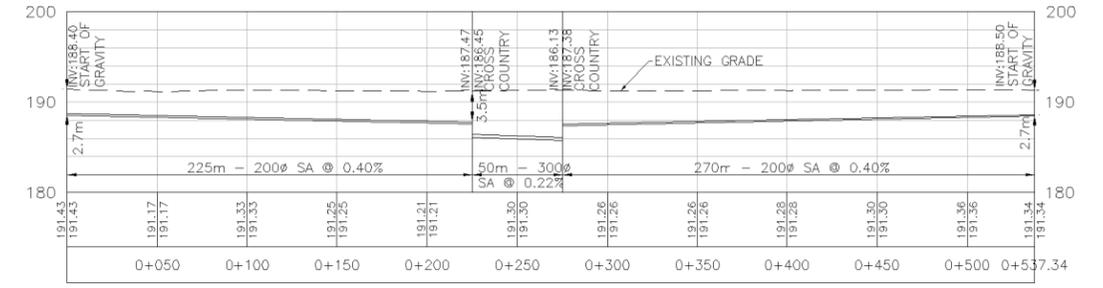
AREA 35 TO COUNTRY ROAD 46 PROFILE
1:2000 (HOR.)/1:400(VERT.)



OLDCASTLE DRIVE SOUTH OF HWY 3 PROFILE
1:2000 (HOR.)/1:400(VERT.)



COUNTY ROAD 46 WEST PROFILE
1:2000 (HOR.)/1:400(VERT.)



WALKER ROAD SOUTH OF HWY 3 PROFILE
1:2000 (HOR.)/1:400(VERT.)

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Town of Tecumseh
Ontario, Canada

Dillon Project No. 15-2973

Date: March 2018

OLDCASTLE HAMLET SANITARY
SERVICING
8TH CONCESSION SANITARY OUTLET

PROFILES
FIGURE 12.0

Appendix A

Sanitary Sewer Design Sheets

OLDCASTLE HAMLET SANITARY SEWER LAYOUT SHEET

Project No: 15-2973

Section	Start Invert	Length (m)	Dia. (mm)	Slope %	Grade Change(m)	# Straight MH	#45 MH	#90 MH	MH Drop(m)	Dia. Adj(m)	Total Grade Change(m)	Calculated Invert(m)	Top of Pipe(m)	Ground EI(m)	Cover(m)
Trunk Sewer															
From Exist to Railway	182.70	120	900	0.05	0.060	1	0	0	0.015	0.000	0.075	182.78	183.68	190.1	6.4
Railway Crossing	182.78	53	900	0.50	0.265	1	0	0	0.015	0.000	0.280	183.06	183.96	190.1	6.1
Railway Crossing to North Talbot	183.06	572	900	0.05	0.286	5	0	0	0.075	0.000	0.361	183.43	184.33	190.1	5.8
From 8th Concession to Oldcastle on North Talbot	183.43	70	750	0.06	0.042	0	0	1	0.060	0.150	0.252	183.69	184.44	190.2	5.8
Along Oldcastle to Castlewood	183.69	565	750	0.06	0.339	5	0	0	0.075	0.000	0.414	184.11	184.86	190.6	5.7
From Castlewood to End of Trunk	184.11	700	600	0.08	0.560	5	1	0	0.105	0.150	0.815	184.93	185.53	191.0	5.5
Sub Trunk to West															
To Greenway	184.93	25	600	0.08	0.020	0	0	1	0.060	0.000	0.080	185.01	185.61	191.0	5.4
Greenway to McCord	185.01	230	600	0.08	0.184	2	0	1	0.090	0.000	0.274	185.29	185.89	191.0	5.1
McCord	185.29	385	600	0.08	0.308	4	0	1	0.120	0.000	0.428	185.72	186.32	191.3	5.0
On Walker to Black Acre (B.A.)	185.72	235	375	0.50	1.175	2	0	1	0.090	0.000	1.265	186.99	187.37	190.8	3.4
On Walker from North to Black Acre (B.A.)	186.99	85	200	0.50	0.425	1	0	0	0.015	0.175	0.615	187.61	187.81	190.8	3.0
Local Sewers Western Side															
B.A. - Walker to Fasan (200)	187.80	220	200	0.40	0.880	2	1	0	0.060	0.000	0.940	186.86	187.06	190.8	3.7
Cross Country run Hwy 3 to Fasan	187.17	150	200	0.40	0.600	2	0	0	0.030	0.000	0.630	186.54	186.74	189.5	2.8
Fasan Drive to B.A. (200)	186.62	240	200	0.40	0.960	2	0	0	0.030	0.000	0.990	185.63	185.83	190.3	4.5
Fasan Drive to B.A. (250)	185.63	600	250	0.28	1.680	5	4	0	0.195	0.050	1.925	183.71	183.96	190.8	6.8
On B.A. From Fasan to LS	183.71	415	300	0.22	0.913	4	0	1	0.120	0.050	1.083	182.63	182.93	190.2	7.3
Roscon Drive to B.A.	185.50	375	200	0.4	1.500	4	0	0	0.060	0.000	1.560	183.94	184.14	189.6	5.5
Outer Drive	184.93	740	375	0.22	1.628	7	0	0	0.105	0.000	1.733	183.20	183.58	189.8	6.2
On B.A. From Outer to Roscon	183.20	330	375	0.22	0.726	2	1	1	0.120	0.000	0.846	182.36	182.74	189.6	6.9
B.A. Roscon to LS	182.36	340	375	0.15	0.510	3	0	1	0.105	0.175	0.790	181.57	181.95	190.2	8.3
Sub Trunk to South															
Oldcastle to cross country run Area 28	184.93	415	450	0.12	0.498	4	0	0	0.060	0.150	0.708	185.64	186.09	191.0	4.9
cross country run Area 28 to Walker Road	185.64	290	450	0.12	0.348	3	0	1	0.105	0.000	0.453	186.10	186.55	191.3	4.8
Local Sewers South Side															
On Walker to cross country run to Area 30	186.10	50	300	0.22	0.110	0	0	1	0.060	0.150	0.320	186.42	186.72	191.3	4.6
cross country run Area 30	186.42	240	300	0.22	0.528	2	0	1	0.090	0.000	0.618	187.04	187.34	190.0	2.7
Walker from Hwy 3 to cross country run Area 30	188.40	225	200	0.40	0.900	2	0	0	0.030	0.000	0.930	187.47	187.67	191.3	3.6
Walker from South to cross country run Area 28	188.50	270	200	0.40	1.080	3	0	0	0.045	0.000	1.125	187.38	187.58	191.3	3.7
Oldcastle from South to cross country run Area 28	188.10	250	200	0.40	1.000	3	0	0	0.045	0.000	1.045	187.06	187.26	191.0	3.7
Local Sewers Central															
Walker - McCord to Hwy 3	185.72	535	300	0.22	1.177	2	2	1	0.150	0.300	1.627	187.35	187.65	191.0	3.3
Hwy 3 to Walker Road	187.35	120	200	0.40	0.480	1	0	0	0.000	0.100	0.580	187.93	188.13	190.8	2.7
Provincial Road (300)	183.31	120	300	0.22	0.264	1	0	0	0.000	0.000	0.264	183.58	183.88	189.8	5.9
Provincial Road (250)	183.58	490	250	0.28	1.372	5	0	0	0.810	0.050	2.232	185.82	186.07	190.5	4.4
Provincial Road (200)	185.82	160	200	1.10	1.760	2	0	0	0.015	0.050	1.825	187.65	187.85	190.5	2.7
Webster	185.82	300	200	0.40	1.200	2	0	2	0.135	0.000	1.335	187.16	187.36	190.1	2.7
Castlewood	188.40	320	200	0.40	1.280	0	4	0	0.105	0.000	1.385	187.02	187.22	190.7	3.5
Area 14 to Oldcastle Drive	187.80	255	200	0.40	1.020	3	0	0	0.030	0.000	1.050	186.75	186.95	191.4	4.5
Oldcastle Court	187.88	330	200	0.85	2.805	3	1	0	0.060	0.000	2.865	185.02	185.22	191.4	6.2
Local Sewers East															
North Talbot A22	183.75	475	450	0.16	0.760	4	0	0	0.060	0.000	0.820	184.57	185.02	190.0	5.0
North Talbot A22	184.57	600	300	0.22	1.320	5	0	0	0.075	0.150	1.545	186.12	186.42	189.5	3.1
North Talbot A22	186.12	250	200	0.40	1.000	3	0	0	0.045	0.150	1.195	187.32	187.52	189.4	1.9

OLDCASTLE HAMLET SANITARY SEWER LAYOUT SHEET
 Project No: 15-2973

Section	Start Invert	Length (m)	Dia. (mm)	Slope %	Grade Change(m)	# Straight MH	#45 MH	#90 MH	MH Drop(m)	Dia. Adj(m)	Total Grade Change(m)	Calculated Invert(m)	Top of Pipe(m)	Ground EI(m)	Cover(m)
Local Sewers Howard Ave															
Howard Ave North	183.20	100	200	0.40	0.400	1	0	0	0.015	0.000	0.415	182.79	182.99	186.1	3.1
Howard Ave North	182.79	350	250	0.28	0.980	3	0	0	0.045	0.050	1.075	181.72	181.97	186.4	4.4
Howard Ave North	181.72	100	250	0.28	0.280	1	0	0	0.015	0.050	0.345	181.38	181.63	186.4	4.8
Howard Ave South	183.10	180	200	0.80	1.440	2	0	0	0.030	0.000	1.470	181.63	181.83	186.4	4.6
Howard Ave Connector to Area 34	181.38	685	300	0.22	1.507	6	1	2	0.240	0.075	1.822	179.56	179.86	187.0	7.1
Area 34 to LS	184.10	260	250	0.28	0.728	3	0	0	0.045	0.000	0.773	183.33	183.58	187.0	3.4
Local Sewers East															
Provincial Road to A35 Sewer	183.01	1200	600	0.08	0.960	10	0	0	0.150	0.000	1.110	184.12	184.72	188.9	4.2
Provincial Road From A35 to 9th Concession	184.12	445	450	0.12	0.534	4	0	0	0.060	0.150	0.744	184.87	185.32	189.3	4.0
9th Concession to Provincial (200)	184.87	120	200	0.40	0.480	1	0	1	0.075	0.250	0.805	185.68	185.88	188.6	2.7
9th Concession to 300 cross country sewer (from South)	185.70	500	200	0.40	2.000	5	0	0	0.075	0.100	2.175	183.53	183.73	188.2	4.5
9th Concession to 300 cross country sewer (from North)	185.40	140	200	0.40	0.560	2	0	1	0.090	0.000	0.650	184.75	184.95	188.2	3.3
Area 35 Midpoint Sewer North to Center of Area	184.12	375	450	0.12	0.450	4	0	1	0.120	0.150	0.720	184.84	185.29	187.8	2.5
Area 35 Midpoint Sewer from East	182.93	370	300	0.22	0.814	4	0	1	0.120	0.100	1.034	181.89	182.19	187.8	5.6
Area 35 Midpoint Sewer from West	184.70	100	200	0.40	0.400	1	0	1	0.075	0.100	0.575	184.13	184.33	187.8	3.5
Area 35 Midpoint Sewer from North	185.30	225	200	0.40	0.900	2	0	1	0.090	0.000	0.990	184.31	184.51	187.8	3.3

OLDCASTLE HAMLET
Project No: 15-2973

The Peaking Factor was derived:
 Using Harmon Formula= **Y** (Y or N)
 From a Table= **N**
 Value from table=

Residential Average Daily Flow= **300** L/Cap.D

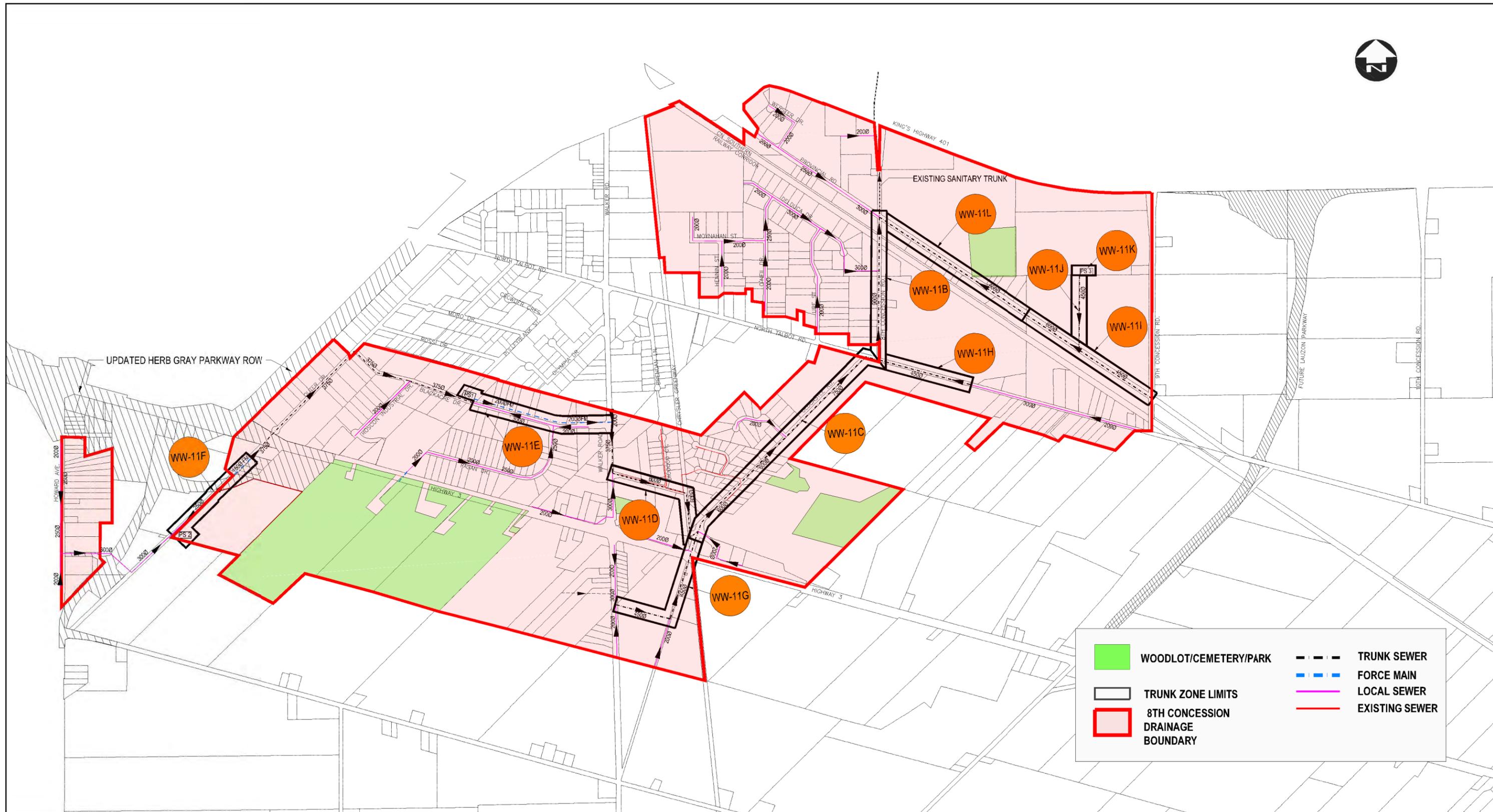
Peak Extraneous Flow= **0.120** L/Ha.S

Town of Tecumseh

Location			Flow Characteristics													
ROAD/STN	LOCATION		INDIVIDUAL		CUMULATIVE		PEAKING FACTOR M	POP FLOW Q(p) (L/s)	PEAK EXTR. FLOW Q(i) (L/s)	PEAK DESIGN FLOW Q(d) (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE DIA. (mm)	Wall Thickness (mm)	SLOPE (%)	
	FROM MH	TO MH	POP	AREA (ha.)	POP	AREA (ha.)										
A1 Outer	1	2	624	19.22	1935	48.91	3.597	24.167	5.869	30.04	67.91	375	15	0.15		
A2 Blackacre	2	4	158	4.50	2093	53.41	3.570	25.947	6.409	32.36	67.91	375	15	0.15		
A3 Roscon	3	4	486	13.87	486	13.87	3.981	6.717	1.664	8.38	21.76	200	15	0.44		
A4 Blackacre	4	6	222	6.33	2801	73.61	3.468	33.724	8.833	42.56	67.91	375	15	0.15		
A5 PulleyBlank	5	4	76	2.16	76	2.16	4.274	1.128	0.259	1.39	67.91	375	15	0.15		
A6 Blackacre	6	7	278	7.93	1740	58.12	3.632	21.944	6.974	28.92	45.36	300	15	0.22		
A7 Blackacre	7	9	148	4.20	1462	50.19	3.688	18.720	6.023	24.74	45.36	300	15	0.22		
A8 Fasan	8	9	1050	38.12	1050	38.12	3.786	13.804	4.574	18.38	31.47	250	15	0.28		
A9 Blackacre	9	11	264	7.87	264	7.87	4.102	3.760	0.944	4.70	20.74	200	15	0.40		
A11 Walker	11	12	252	7.66	4869	141.55	3.256	55.041	16.986	72.03	123.98	375	15	0.50		
A12 Walker	12	14	218	6.16	538	19.03	3.958	7.393	2.284	9.68	45.36	300	15	0.22		
A13 Highway 3	13	12	320	12.87	320	12.87	4.066	4.518	1.544	6.06	20.74	200	15	0.40		
A14 Highway 3	14	18	133	3.78	133	3.78	4.208	1.943	0.454	2.40	20.74	200	15	0.40		
A15 Dicocco	15	14	439	12.54	5923	178.87	3.176	65.318	21.464	86.78	173.67	600	15	0.08		
A16 Trafalgar	16	17	48	3.62	48	3.62	4.318	0.720	0.434	1.15	20.74	200	15	0.40		
A17 Picadilly	17	15	29	2.13	77	5.75	4.273	1.142	0.690	1.83	20.74	200	15	0.40		
A18 Oldcastle	18	19	1382	27.33	10348	266.32	2.940	105.633	31.958	137.59	173.67	600	15	0.08		
A19 Oldcastle	19	21	422	12.92	10770	279.24	2.923	109.293	33.509	142.80	173.67	600	15	0.08		
A20 Castlewood	20	21	446	13.79	446	13.79	3.999	6.193	1.655	7.85	40.17	200	15	1.50		
A21 Oldcastle	21	23	359	5.81	11575	298.84	2.891	116.205	35.861	152.07	268.11	750	15	0.06		
A22 N. Talbot	22	23	1046	35.64	1046	35.64	3.787	13.755	4.277	18.03	45.36	300	15	0.22		
A23 8th Conc.	23	24	1545	27.32	16697	434.07	2.731	158.352	52.088	210.44	404.80	900	15	0.05		
A24 8th Conc.	24	25	602	15.07	20341	536.03	2.645	186.820	64.324	251.14	404.80	900	15	0.05		
A25 8th Conc.	25	26	853	24.36	21194	560.39	2.627	193.337	67.247	260.58	404.80	900	15	0.05		
A26 8th Conc.	26	Exist	188	5.35	21540	570.25	2.620	195.966	68.430	264.40	404.80	900	15	0.05		
A27 Provincial R	27	24	830	23.69	830	23.69	3.851	11.098	2.843	13.94	20.74	200	15	0.40		
A28 Highway 3	28	18	1093	18.23	2910	56.34	3.454	34.896	6.761	41.66	98.76	450	15	0.12		
A29 Walker	29	12	858	22.58	1817	38.11	3.618	22.825	4.573	27.40	45.36	300	15	0.22		
A30 Highway 3	30	12	959	15.53	959	15.53	3.812	12.692	1.864	14.56	45.36	300	15	0.22		
Howard Ave Sewer:																
A31 Howard	31	32	54	2.28	54	2.28	4.308	0.808	0.274	1.08	20.74	200	15	0.40		
A32 Howard	32	33	209	11.45	263	13.73	4.102	3.746	1.648	5.39	31.47	250	15	0.28		
A33 Howard	33	1	260	3.19	523	16.92	3.964	7.199	2.030	9.23	45.36	300	15	0.22		
A34 Howard Con.	34	1	788	12.77	788	12.77	3.864	10.573	1.532	12.11	31.47	250	15	0.28		
From Oldcastle Hamlet Wastewater Servicing Pre-Design:																
Area A	A	23	2531	72.27	2531	72.27	3.504	30.794	8.672	39.47	45.36	300	15	0.22		
Area B	B	26	158	4.51	158	4.51	4.184	2.295	0.541	2.84	20.74	200	15	0.40		
Area 35 9th Con	35	36	2212	63.2	2212	63.20	3.551	27.276	7.584	34.86	173.67	600	15	0.08		

Appendix B

Detailed Cost Estimate Sheets



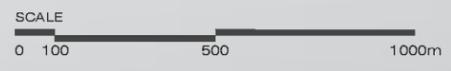
	WOODLOT/CEMETERY/PARK		TRUNK SEWER
	TRUNK ZONE LIMITS		FORCE MAIN
	8TH CONCESSION DRAINAGE BOUNDARY		LOCAL SEWER
			EXISTING SEWER



Town of Tecumseh
Ontario, Canada

Dillon Project No. 15-2973

Date: May 2018



OLDCASTLE HAMLET SANITARY SERVICING
8TH CONCESSION SANITARY OUTLET

TRUNK SEWER COST ESTIMATE ZONES

FIGURE 13.0

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ESTIMATE OF PROBABLE PROJECT COSTS

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	AMOUNT
SECTION 'A' - REMOVALS					
1	Full Depth Asphalt Pavement Removal and Disposal	m ²	5,200	\$4.00	\$20,800.00
2	Sawcutting Existing Pavement (sawcut along sanitary sewer trench)	m	40	\$5.00	\$200.00
3	Driveway Removal	L.S.	---	---	\$11,250.00
4	Hydrant Removal	Each	3	\$1,500.00	\$4,500.00
TOTAL SECTION 'A' - REMOVALS					\$36,750.00
SECTION 'B' - ROAD WORK - Restore Roadway					
5	Excavation of Existing Road Base (Allowance)	L.S.	---	---	\$55,000.00
6	Granular "A" (600 mm Thickness) including Shoulder Restoration	Tonnes	10,000	\$20.00	\$200,000.00
7	Driveway Reinstatement	L.S.	---	---	\$13,000.00
8	Full Depth Asphalt Pavement Restoration along Trench				
	a) 150 mm Base and Surface	Tonnes	2,100	\$110.00	\$231,000.00
9	Shoulder Gravel	Tonnes	500	\$25.00	\$12,500.00
10	Dust Control Allowance	L.S.	---	---	\$6,500.00
TOTAL SECTION 'B' - ROAD WORK					\$518,000.00
SECTION 'C' - SANITARY SEWERS					
11	Supply and Install Sanitary Sewers, open cut including full granular backfill: a) 900 mm dia. Concrete (100-D) (inc. 20 m stub at N. Talbot)	m	700	\$1,200.00	\$840,000.00
12	Rail/Gas Corridor Crossing a) Jack and Bore 900 mm dia. (CAN/CSA A257.2) 140-D Concrete Pipe including cost for launch and receiving pits.	m	65	\$5,100.00	\$331,500.00
13	Supply and Install Sanitary Manholes: a) 1800 mm dia.	Each	7	\$10,000.00	\$70,000.00
14	Internal Drop Structures	Each	1	\$5,000.00	\$5,000.00
15	Sewer Video Inspection Allowance	m	765	\$10.00	\$7,650.00
TOTAL SECTION 'C' - SANITARY SEWERS					\$1,254,150.00
SECTION 'D' - MISCELLANEOUS					
16	Support of Hydro Poles	Each	8	\$4,000.00	\$32,000.00
17	Hydro Excavation of High Pressure Gas Lines	L.S.	---	---	\$4,000.00
18	Imported Screened Topsoil (100 mm thick) and Hydroseed	m ²	1,500	\$9.00	\$13,500.00
19	Maintenance of Flow in Ditches	L.S.	---	---	\$20,000.00
20	Traffic Control, Dust Control, Erosion and Sediment (Allowance)	L.S.	---	---	\$20,000.00
21	Pavement Markings	L.S.	---	---	\$11,000.00
22	Site Office	L.S.	---	---	\$5,000.00
23	Utility Coordination	L.S.	---	---	\$10,000.00
24	Asphalt Cement Price Adjustment	L.S.	---	---	\$10,000.00
25	Contingency Allowance (Approx. 10%)	L.S.	---	---	\$193,440.00
TOTAL SECTION 'D' - MISCELLANEOUS					\$318,940.00

SUMMARY OF ESTIMATED PROBABLE COSTS	
SECTION 'A' - REMOVALS	\$36,750.00
SECTION 'B' - ROAD WORK	\$518,000.00
SECTION 'C' - SANITARY SEWERS	\$1,254,150.00
SECTION 'D' - MISCELLANEOUS	\$318,940.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$2,127,840.00

SUMMARY OF ESTIMATE PROBABLE PROJECT COSTS	
CONSTRUCTION (including restoration, sewer works)	\$2,127,840.00
ENGINEERING ALLOWANCE	
ENGINEERING (15% of construction costs)	\$319,200.00
GEOTECHNICAL (2% of construction costs)	\$42,600.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$2,489,640.00

Notes: Estimate is for approximately 765 m of 900 mm dia. sanitary sewer between County Road 46 and North Talbot Road, including a segment on North Talbot Road between 8th Concession and Oldcastle Rd.
Assume that Jack and Bore trenchless installation method for the sewer within the Rail and Gas Corridor.
Assume the sanitary sewer will be installed under the east lane to avoid conflict with the existing watermain on the west side of the road.
This estimate assumes that reconstruction of full width roadway will be required to accommodate the sanitary trunk sewer installation.
No costs for watermain improvements have been included.
Road Restoration - Assume CL of 900 mm dia. sewer is 1.0 m from EP,
Assume Restore 7.3 m width of Roadway.

ESTIMATE OF PROBABLE PROJECT COSTS

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	AMOUNT
SECTION 'A' - REMOVALS					
1	Full Depth Asphalt Pavement Removal and Disposal	m ²	10,000	\$4.00	\$40,000.00
2	Sawcutting Existing Pavement (sawcut along sanitary sewer trench)	m	35	\$5.00	\$175.00
3	Driveway Removal	L.S.	---	---	\$11,250.00
4	Hydrant Removal	Each	2	\$1,500.00	\$3,000.00
TOTAL SECTION 'A' - REMOVALS					\$54,425.00
SECTION 'B' - ROAD WORK - Restore Roadway					
5	Excavation of Existing Road Base (Allowance)	L.S.	---	---	\$150,000.00
6	Granular "A" (600 mm Thickness) including Shoulder Restoration	Tonnes	25,000	\$20.00	\$500,000.00
7	Driveway Reinstatement	L.S.	---	---	\$35,000.00
8	Full Depth Asphalt Pavement Restoration along Trench				
	a) 150 mm Base and Surface	Tonnes	4,000	\$110.00	\$440,000.00
9	Shoulder Gravel	Tonnes	1,000	\$25.00	\$25,000.00
10	Dust Control Allowance	L.S.	---	---	\$8,000.00
TOTAL SECTION 'B' - ROAD WORK					\$1,158,000.00
SECTION 'C' - SANITARY SEWERS					
11	Supply and Install Sanitary Sewers, open cut including full granular backfill:				
	a) 750 mm dia. Concrete (100-D)	m	650	\$1,000.00	\$650,000.00
	b) 600 mm dia. Concrete (100-D)	m	750	\$800.00	\$600,000.00
13	Supply and Install Sanitary Manholes:				
	a) 1800 mm dia.	Each	3	\$10,000.00	\$30,000.00
	b) 1500 mm dia.	Each	6	\$7,500.00	\$45,000.00
16	Sewer Video Inspection Allowance	m	1400	\$10.00	\$14,000.00
TOTAL SECTION 'C' - SANITARY SEWERS					\$1,339,000.00
SECTION 'D' - MISCELLANEOUS					
25	Support of Hydro Poles	Each	10	\$4,000.00	\$40,000.00
26	Imported Screened Topsoil (100 mm thick) and Hydroseed	m ²	3,000	\$9.00	\$27,000.00
27	Hydro Excavation of High Pressure Gas Lines	L.S.	---	---	\$4,000.00
28	Maintenance of Flow in Ditches	L.S.	---	---	\$30,000.00
29	Traffic Control, Dust Control, Erosion and Sediment (Allowance)	L.S.	---	---	\$40,000.00
30	Pavement Markings	L.S.	---	---	\$12,000.00
31	Site Office	L.S.	---	---	\$5,000.00
32	Utility Coordination	L.S.	---	---	\$10,000.00
33	Asphalt Cement Price Adjustment	L.S.	---	---	\$15,000.00
34	Contingency Allowance (Approx. 10%)	L.S.	---	---	\$273,443.00
TOTAL SECTION 'D' - MISCELLANEOUS					\$456,443.00

SUMMARY OF ESTIMATED PROBABLE COSTS	
SECTION 'A' - REMOVALS	\$54,425.00
SECTION 'B' - ROAD WORK	\$1,158,000.00
SECTION 'C' - SANITARY SEWERS	\$1,339,000.00
SECTION 'D' - MISCELLANEOUS	\$456,443.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$3,007,868.00

SUMMARY OF ESTIMATE PROBABLE PROJECT COSTS	
CONSTRUCTION (including restoration, sewer works)	\$3,007,868.00
ENGINEERING ALLOWANCE	
ENGINEERING (15% of construction costs)	\$451,200.00
GEOTECHNICAL (2% of construction costs)	\$60,200.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$3,519,268.00

Notes: Estimate is for approximately 1400 m of Sanitary trunk sewer between North Talbot Road and the Chrysler Greenway
Assume the sanitary sewer will be installed under the east lane to avoid conflict with the existing watermain on the west side of the road.
This estimate assumes that reconstruction of one lane of roadway will be required to accommodate the sanitary trunk sewer installation.
No costs for watermain improvements have been included.
Road Restoration - Assume CL of sewer is 1.0 m from EP,
Assume Restore 3.65 m width of Roadway. (half of roadway)

ESTIMATE OF PROBABLE PROJECT COSTS

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	AMOUNT
SECTION 'A' - REMOVALS					
1	Full Depth Asphalt Pavement Removal and Disposal	m ²	1,610	\$4.00	\$6,440.00
2	Clearing, Grubbing, Stripping of Topsoil	L.S.	---	---	\$8,000.00
3	Sawcutting Existing Pavement (sawcut along sanitary sewer trench)	m	460	\$10.00	\$4,600.00
TOTAL SECTION 'A' - REMOVALS					\$19,040.00
SECTION 'B' - ROAD WORK - Restore Roadway					
4	Excavation of Existing Road Base (Allowance)	L.S.	---	---	\$15,000.00
5	Granular "A" (600 mm Thickness) including Shoulder Restoration	Tonnes	3,374	\$20.00	\$67,480.00
6	Full Depth Asphalt Pavement Restoration along Trench				
	a) 150 mm Base and Surface	Tonnes	642	\$110.00	\$70,620.00
TOTAL SECTION 'B' - ROAD WORK					\$153,100.00
SECTION 'C' - SANITARY SEWERS					
7	Supply and Install Sanitary Sewers, open cut including full granular backfill:				
	a) 600 mm dia. Concrete (100-D)	m	640	\$800.00	\$512,000.00
8	Supply and Install Sanitary Manholes:				
	a) 1200 mm dia.	Each	4	\$9,000.00	\$36,000.00
	b) 1500 mm dia.	Each	2	\$7,500.00	\$15,000.00
9	Sewer Video Inspection Allowance	m	640	\$10.00	\$6,400.00
TOTAL SECTION 'C' - SANITARY SEWERS					\$569,400.00
SECTION 'D' - MISCELLANEOUS					
10	Support of Hydro Poles	Each	---	---	\$0.00
11	Imported Screened Topsoil (100 mm thick) and Hydroseed	m ²	640	\$9.00	\$5,760.00
12	Hydro Excavation of High Pressure Gas Lines	L.S.	---	---	\$0.00
13	Maintenance of Flow in Ditches	L.S.	---	---	\$3,000.00
14	Traffic Control, Dust Control, Erosion and Sediment (Allowance)	L.S.	---	---	\$4,000.00
15	Pavement Markings	L.S.	---	---	\$2,000.00
16	Site Office	L.S.	---	---	\$5,000.00
17	Utility Coordination	L.S.	---	---	\$2,500.00
18	Contingency Allowance (Approx. 10%)	L.S.	---	---	\$76,380.00
TOTAL SECTION 'D' - MISCELLANEOUS					\$98,640.00

SUMMARY OF ESTIMATED PROBABLE COSTS	
SECTION 'A' - REMOVALS	\$19,040.00
SECTION 'B' - ROAD WORK	\$153,100.00
SECTION 'C' - SANITARY SEWERS	\$569,400.00
SECTION 'D' - MISCELLANEOUS	\$98,640.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$840,180.00

SUMMARY OF ESTIMATE PROBABLE PROJECT COSTS	
CONSTRUCTION (including restoration, sewer works)	\$840,180.00
ENGINEERING ALLOWANCE	
ENGINEERING (15% of construction costs)	\$126,100.00
GEOTECHNICAL (2% of construction costs)	\$16,900.00
EASEMENT ALLOWANCE	\$130,000.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$1,113,200.00

Notes: Estimate is for trunk sanitary sewer between Oldcastle Road and Blackacre Dr. including Greenway and McCord
 This estimate assumes that reconstruction of one lane of roadway will be required to accommodate the sanitary trunk sewer installation
 The estimate for cross country sanitary sewers estimate one lane of roadway gravel to be installed at this time but the area to be finished with Topsoil and Hydroseed.
 This estimate assumes that reconstruction of one lane of roadway will be required to accommodate the sanitary trunk sewer installation.
 No costs for watermain improvements have been included.
 Road Restoration - Assume CL of sewer is 1.0 m from EP,
 Assume Restore 3.65 m width of Roadway. (half of roadway)

WW-1E Cost Estimate

Blackacre Lift Station 1 and Forcemain between Roscon Dr. and Walker Rd.
Town of Tecumseh

5/7/2018

ESTIMATE OF PROBABLE PROJECT COSTS

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	AMOUNT
SECTION 'A' - REMOVALS					
1	Full Depth Asphalt Pavement Removal and Disposal	m ²	2,630	\$4.00	\$10,520.00
2	Clearing, Grubbing, Stripping of Topsoil	L.S	---	---	\$8,000.00
3	Sawcutting Existing Pavement (sawcut along sanitary sewer trench)	m	720	\$10.00	\$7,200.00
TOTAL SECTION 'A' - REMOVALS					\$25,720.00
SECTION 'B' - ROAD WORK - Restore Roadway					
4	Excavation of Existing Road Base (Allowance)	L.S.	---	---	\$26,250.00
5	Granular "A" (600 mm Thickness) including Shoulder Restoration	Tonnes	3,800	\$20.00	\$76,000.00
6	Full Depth Asphalt Pavement Restoration along Trench				
	a) 150 mm Base and Surface	Tonnes	1,100	\$110.00	\$121,000.00
TOTAL SECTION 'B' - ROAD WORK					\$223,250.00
SECTION 'C' - SANITARY SEWERS					
7	Supply and Install Sanitary Sewers, open cut including full granular backfill: a) 200 mm dia. Forcemain HDPE	m	720	\$250.00	\$180,000.00
10	Lift Station	L.S	---	---	\$420,000.00
	Meter Chamber	L.S	---	---	\$50,000.00
11	Sewer Video Inspection Allowance	m	720	\$10.00	\$7,200.00
TOTAL SECTION 'C' - SANITARY SEWERS					\$657,200.00
SECTION 'D' - MISCELLANEOUS					
12	Imported Screened Topsoil (100 mm thick) and Hydroseed	m ²	250	\$9.00	\$2,250.00
13	Hydro Excavation of High Pressure Gas Lines	L.S	---	---	\$0.00
14	Maintenance of Flow in Ditches	L.S.	---	---	\$2,500.00
15	Traffic Control, Dust Control, Erosion and Sediment (Allowance)	L.S.	---	---	\$6,500.00
16	Pavement Markings	L.S.	---	---	\$5,500.00
17	Site Office	L.S.	---	---	\$5,000.00
18	Utility Coordination	L.S.	---	---	\$6,000.00
19	Contingency Allowance (Approx. 10%)	L.S.	---	---	\$93,392.00
TOTAL SECTION 'D' - MISCELLANEOUS					\$121,142.00

SUMMARY OF ESTIMATED PROBABLE COSTS	
SECTION 'A' - REMOVALS	\$25,720.00
SECTION 'B' - ROAD WORK	\$223,250.00
SECTION 'C' - SANITARY SEWERS	\$657,200.00
SECTION 'D' - MISCELLANEOUS	\$121,142.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$1,027,312.00

SUMMARY OF ESTIMATE PROBABLE PROJECT COSTS	
CONSTRUCTION (including restoration, sewer works)	\$1,027,312.00
ENGINEERING ALLOWANCE	
ENGINEERING (15% of construction costs)	\$154,100.00
GEOTECHNICAL (2% of construction costs)	\$20,600.00
EASEMENT/ACQUISITION ALLOWANCE	\$100,000.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$1,302,012.00

Notes: Estimate is for the lift station and forcemain located between Roscon Dr. and Walker Rd.
This estimate assumes that reconstruction of one lane of roadway will be required to accommodate the sanitary forcemain installation.
No costs for watermain improvements have been included.
Road Restoration - Assume CL of sewer is 1.0 m from EP,
Assume Restore 3.65 m width of Roadway. (half of roadway)

ESTIMATE OF PROBABLE PROJECT COSTS

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	AMOUNT
SECTION 'A' - REMOVALS					
1	Full Depth Asphalt Pavement Removal and Disposal	m ²	1,370	\$4.00	\$5,480.00
2	Clearing, Grubbing, Stripping of Topsoil	L.S	---	---	\$2,500.00
3	Sawcutting Existing Pavement (sawcut along sanitary sewer trench)	m	50	\$10.00	\$500.00
TOTAL SECTION 'A' - REMOVALS					\$8,480.00
SECTION 'B' - ROAD WORK - Restore Roadway					
4	Excavation of Existing Road Base (Allowance)	L.S.	---	---	\$13,500.00
5	Granular "A" (600 mm Thickness) including Shoulder Restoration	Tonnes	2,200	\$20.00	\$44,000.00
6	Full Depth Asphalt Pavement Restoration along Trench				
	a) 150 mm Base and Surface	Tonnes	600	\$110.00	\$66,000.00
TOTAL SECTION 'B' - ROAD WORK					\$123,500.00
SECTION 'C' - SANITARY SEWERS					
7	Supply and Install Sanitary Sewers, open cut including full granular backfill: a) 150mm dia. Forcemain HDPE	m	525	\$200.00	\$105,000.00
8	Highway 3 Crossing a) Jack and Bore 150 mm dia. Forcemain including cost for launch and receiving pits.	m	150	\$3,000.00	\$450,000.00
9	Lift Station	L.S	---	---	\$375,000.00
	Meter Chamber	L.S	---	---	\$50,000.00
10	Sewer Video Inspection Allowance	m	150	\$10.00	\$1,500.00
TOTAL SECTION 'C' - SANITARY SEWERS					\$981,500.00
SECTION 'D' - MISCELLANEOUS					
11	Imported Screened Topsoil (100 mm thick) and Hydroseed	m ²	150	\$9.00	\$1,350.00
12	Hydro Excavation of High Pressure Gas Lines	L.S	---	---	\$0.00
13	Maintenance of Flow in Ditches	L.S.	---	---	\$0.00
14	Traffic Control, Dust Control, Erosion and Sediment (Allowance)	L.S.	---	---	\$5,000.00
15	Pavement Markings	L.S.	---	---	\$3,500.00
16	Site Office	L.S.	---	---	\$5,000.00
17	Utility Coordination	L.S.	---	---	\$5,500.00
18	Contingency Allowance (Approx. 10%)	L.S.	---	---	\$113,383.00
TOTAL SECTION 'D' - MISCELLANEOUS					\$133,733.00

SUMMARY OF ESTIMATED PROBABLE COSTS	
SECTION 'A' - REMOVALS	\$8,480.00
SECTION 'B' - ROAD WORK	\$123,500.00
SECTION 'C' - SANITARY SEWERS	\$981,500.00
SECTION 'D' - MISCELLANEOUS	\$133,733.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$1,247,213.00

SUMMARY OF ESTIMATE PROBABLE PROJECT COSTS	
CONSTRUCTION (including restoration, sewer works)	\$1,247,213.00
ENGINEERING ALLOWANCE	
ENGINEERING (15% of construction costs)	\$187,100.00
GEOTECHNICAL (2% of construction costs)	\$25,000.00
EASEMENT/ACQUISITION ALLOWANCE	\$150,000.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$1,609,313.00

Notes: Estimate is for the lift station 2 and forcemain located on Outer Drive south of Highway 3
 This estimate assumes that reconstruction of one lane of roadway will be required to accommodate the sanitary trunk sewer installation.
 No costs for watermain improvements have been included.
 Road Restoration - Assume CL of sewer is 1.0 m from EP,
 Assume Restore 3.65 m width of Roadway. (half of roadway)

ESTIMATE OF PROBABLE PROJECT COSTS

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	AMOUNT
SECTION 'A' - REMOVALS					
1	Full Depth Asphalt Pavement Removal and Disposal	m ²	1,250	\$4.00	\$5,000.00
2	Clearing, Grubbing, Stripping of Topsoil	L.S.	---	---	\$4,000.00
3	Sawcutting Existing Pavement (sawcut along sanitary sewer trench)	m	725	\$10.00	\$7,250.00
TOTAL SECTION 'A' - REMOVALS					\$16,250.00
SECTION 'B' - ROAD WORK - Restore Roadway					
4	Excavation of Existing Road Base (Allowance)	L.S.	---	---	\$12,500.00
5	Granular "A" (600 mm Thickness) including Shoulder Restoration	Tonnes	2,300	\$20.00	\$46,000.00
6	Full Depth Asphalt Pavement Restoration along Trench				
	a) 150 mm Base and Surface	Tonnes	500	\$110.00	\$55,000.00
TOTAL SECTION 'B' - ROAD WORK					\$113,500.00
SECTION 'C' - SANITARY SEWERS					
7	Supply and Install Sanitary Sewers, open cut including full granular backfill: a) 450 mm dia. Concrete (100-D)	m	705	\$500.00	\$352,500.00
8	Highway 3 Crossing a) Jack and Bore 450 mm dia. (CAN/CSA A257.2) 140-D Concrete Pipe including cost for launch and receiving pits.	m	80	\$3,500.00	\$280,000.00
8	Supply and Install Sanitary Manholes: a) 1200 mm dia.	Each	7	\$9,000.00	\$63,000.00
9	Sewer Video Inspection Allowance	m	705	\$10.00	\$7,050.00
TOTAL SECTION 'C' - SANITARY SEWERS					\$702,550.00
SECTION 'D' - MISCELLANEOUS					
10	Support of Hydro Poles	Each	---	---	\$0.00
11	Imported Screened Topsoil (100 mm thick) and Hydroseed	m ²	3,000	\$9.00	\$27,000.00
12	Hydro Excavation of High Pressure Gas Lines	L.S.	---	---	\$5,000.00
13	Maintenance of Flow in Ditches	L.S.	---	---	\$4,700.00
14	Traffic Control, Dust Control, Erosion and Sediment (Allowance)	L.S.	---	---	\$9,400.00
15	Pavement Markings	L.S.	---	---	\$4,700.00
16	Site Office	L.S.	---	---	\$5,000.00
17	Utility Coordination	L.S.	---	---	\$4,700.00
18	Contingency Allowance (Approx. 10%)	L.S.	---	---	\$89,300.00
TOTAL SECTION 'D' - MISCELLANEOUS					\$149,800.00

SUMMARY OF ESTIMATED PROBABLE COSTS	
SECTION 'A' - REMOVALS	\$16,250.00
SECTION 'B' - ROAD WORK	\$113,500.00
SECTION 'C' - SANITARY SEWERS	\$702,550.00
SECTION 'D' - MISCELLANEOUS	\$149,800.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$982,100.00

SUMMARY OF ESTIMATE PROBABLE PROJECT COSTS	
CONSTRUCTION (including restoration, sewer works)	\$982,100.00
ENGINEERING ALLOWANCE	
ENGINEERING (15% of construction costs)	\$147,400.00
GEOTECHNICAL (2% of construction costs)	\$19,700.00
EASEMENT ALLOWANCE	\$60,000.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$1,209,200.00

Notes: Estimate is for a section of trunk sanitary sewer South from Oldcastle Rd. (Greenway) to Walker Rd. including a cross country run.
 This estimate assumes that reconstruction of one lane of roadway will be required to accommodate the sanitary trunk sewer installation where appropriate.
 The estimate for cross country sanitary sewers assume a width of 10.0m to re-vegetated with topsoil and hydroseed
 No costs for watermain improvements have been included.
 Road Restoration - Assume CL of sewer is 1.0 m from EP,
 Assume restoration of 3.65 m width of Roadway. (half of roadway)

ESTIMATE OF PROBABLE PROJECT COSTS

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	AMOUNT
SECTION 'A' - REMOVALS					
1	Full Depth Asphalt Pavement Removal and Disposal	m ²	1,750	\$4.00	\$7,000.00
2	Clearing, Grubbing, Stripping of Topsoil	L.S.	---	---	\$1,000.00
3	Sawcutting Existing Pavement (sawcut along sanitary sewer trench)	m	475	\$10.00	\$4,750.00
TOTAL SECTION 'A' - REMOVALS					\$12,750.00
SECTION 'B' - ROAD WORK - Restore Roadway					
4	Excavation of Existing Road Base (Allowance)	L.S.	---	---	\$17,400.00
5	Granular "A" (600 mm Thickness) including Shoulder Restoration	Tonnes	2,500	\$20.00	\$50,000.00
6	Full Depth Asphalt Pavement Restoration along Trench a) 150 mm Base and Surface	Tonnes	680	\$110.00	\$74,800.00
TOTAL SECTION 'B' - ROAD WORK					\$142,200.00
SECTION 'C' - SANITARY SEWERS					
7	Supply and Install Sanitary Sewers, open cut including full granular backfill: a) 450 mm dia. Concrete (100-D)	m	475	\$500.00	\$237,500.00
8	Supply and Install Sanitary Manholes: a) 1200 mm dia.	Each	5	\$9,000.00	\$45,000.00
9	Sewer Video Inspection Allowance	m	475	\$10.00	\$4,750.00
TOTAL SECTION 'C' - SANITARY SEWERS					\$287,250.00
SECTION 'D' - MISCELLANEOUS					
10	Support of Hydro Poles	Each	---	---	\$0.00
11	Imported Screened Topsoil (100 mm thick) and Hydroseed	m ²	0	\$9.00	\$0.00
12	Hydro Excavation of High Pressure Gas Lines	L.S.	---	---	\$0.00
13	Maintenance of Flow in Ditches	L.S.	---	---	\$1,400.00
14	Traffic Control, Dust Control, Erosion and Sediment (Allowance)	L.S.	---	---	\$2,800.00
15	Pavement Markings	L.S.	---	---	\$1,400.00
16	Site Office	L.S.	---	---	\$5,000.00
17	Utility Coordination	L.S.	---	---	\$2,000.00
18	Contingency Allowance (Approx. 10%)	L.S.	---	---	\$45,480.00
TOTAL SECTION 'D' - MISCELLANEOUS					\$58,080.00

SUMMARY OF ESTIMATED PROBABLE COSTS	
SECTION 'A' - REMOVALS	\$12,750.00
SECTION 'B' - ROAD WORK	\$142,200.00
SECTION 'C' - SANITARY SEWERS	\$287,250.00
SECTION 'D' - MISCELLANEOUS	\$58,080.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$500,280.00

SUMMARY OF ESTIMATE PROBABLE PROJECT COSTS	
CONSTRUCTION (including restoration, sewer works)	\$500,280.00
ENGINEERING ALLOWANCE	
ENGINEERING (15% of construction costs)	\$75,100.00
GEOTECHNICAL (2% of construction costs)	\$10,100.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$585,480.00

Notes: Estimate is for a section of trunk sanitary sewer East on North Talbot Rd. from 8th Concession.
 This estimate assumes that reconstruction of one lane of roadway will be required to accommodate the sanitary trunk sewer installation
 No costs for watermain improvements have been included.
 Road Restoration - Assume CL of sewer is 1.0 m from EP,
 Assume Restore 3.65 m width of Roadway. (half of roadway)

ESTIMATE OF PROBABLE PROJECT COSTS

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	AMOUNT
SECTION 'A' - REMOVALS					
1	Full Depth Asphalt Pavement Removal and Disposal	m ²	2,900	\$4.00	\$11,600.00
2	Clearing, Grubbing, Stripping of Topsoil	L.S.	---	---	\$3,500.00
3	Sawcutting Existing Pavement (sawcut along sanitary sewer trench)	m	785	\$10.00	\$7,850.00
TOTAL SECTION 'A' - REMOVALS					\$22,950.00
SECTION 'B' - ROAD WORK - Restore Roadway					
4	Excavation of Existing Road Base (Allowance)	L.S.	---	---	\$28,800.00
5	Granular "A" (600 mm Thickness) including Shoulder Restoration	Tonnes	5,300	\$20.00	\$106,000.00
6	Full Depth Asphalt Pavement Restoration along Trench				
	a) 150 mm Base and Surface	Tonnes	1,200	\$110.00	\$132,000.00
TOTAL SECTION 'B' - ROAD WORK					\$266,800.00
SECTION 'C' - SANITARY SEWERS					
7	Supply and Install Sanitary Sewers, open cut including full granular backfill:				
	a) 600 mm dia. Concrete (100-D)	m	325	\$800.00	\$260,000.00
	b) 450 mm dia. Concrete	m	450	\$500.00	\$225,000.00
8	Supply and Install Sanitary Manholes: 1200 mm dia.	Each	9	\$9,000.00	\$81,000.00
9	Sewer Video Inspection Allowance	m	775	\$10.00	\$7,750.00
TOTAL SECTION 'C' - SANITARY SEWERS					\$573,750.00
SECTION 'D' - MISCELLANEOUS					
10	Support of Hydro Poles	Each	---	---	\$0.00
11	Imported Screened Topsoil (100 mm thick) and Hydroseed	m ²	500	\$9.00	\$4,500.00
12	Hydro Excavation of High Pressure Gas Lines	L.S.	---	---	\$0.00
13	Maintenance of Flow in Ditches	L.S.	---	---	\$2,500.00
14	Traffic Control, Dust Control, Erosion and Sediment (Allowance)	L.S.	---	---	\$5,000.00
15	Pavement Markings	L.S.	---	---	\$2,500.00
16	Site Office	L.S.	---	---	\$5,000.00
17	Utility Coordination	L.S.	---	---	\$3,000.00
18	Contingency Allowance (Approx. 10%)	L.S.	---	---	\$88,600.00
TOTAL SECTION 'D' - MISCELLANEOUS					\$111,100.00

SUMMARY OF ESTIMATED PROBABLE COSTS	
SECTION 'A' - REMOVALS	\$22,950.00
SECTION 'B' - ROAD WORK	\$266,800.00
SECTION 'C' - SANITARY SEWERS	\$573,750.00
SECTION 'D' - MISCELLANEOUS	\$111,100.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$974,600.00

SUMMARY OF ESTIMATE PROBABLE PROJECT COSTS	
CONSTRUCTION (including restoration, sewer works)	\$974,600.00
ENGINEERING ALLOWANCE	
ENGINEERING (15% of construction costs)	\$146,200.00
GEOTECHNICAL (2% of construction costs)	\$19,500.00
EASEMENT ALLOWANCE	\$170,000.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$1,310,300.00

Notes: Estimate is for a section of trunk sanitary sewer East on Provincial Rd. from the boundary of Area 35 to the 9th Concession
 This sewer is meant to accommodate future development in area 35 and 36
 This estimate assumes that reconstruction of one lane of roadway will be required to accommodate the sanitary trunk sewer installation
 No costs for watermain improvements have been included.
 Road Restoration - Assume CL of sewer is 1.0 m from EP,
 Assume Restore 3.65 m width of Roadway. (half of roadway)

ESTIMATE OF PROBABLE PROJECT COSTS

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	AMOUNT
SECTION 'A' - REMOVALS					
1	Full Depth Asphalt Pavement Removal and Disposal	m ²	---	---	\$0.00
2	Clearing, Grubbing, Stripping of Topsoil	L.S	---	---	\$3,000.00
3	Sawcutting Existing Pavement (sawcut along sanitary sewer trench)	m	---	---	\$0.00
TOTAL SECTION 'A' - REMOVALS					\$3,000.00
SECTION 'B' - ROAD WORK - Restore Roadway					
4	Excavation of Existing Road Base (Allowance)	L.S.	---	---	\$0.00
5	Granular "A" (600 mm Thickness) including Shoulder Restoration	Tonnes	---	---	\$0.00
6	Full Depth Asphalt Pavement Restoration along Trench				
	a) 150 mm Base and Surface	Tonnes	---	---	\$0.00
TOTAL SECTION 'B' - ROAD WORK					\$0.00
SECTION 'C' - SANITARY SEWERS					
7	Supply and Install Sanitary Sewers, open cut including full granular backfill: a) 450 mm dia. Concrete	m	375	\$500.00	\$187,500.00
8	Supply and Install Sanitary Manholes: 1200 mm dia.	Each	5	\$9,000.00	\$45,000.00
9	Sewer Video Inspection Allowance	m	375	\$10.00	\$3,750.00
TOTAL SECTION 'C' - SANITARY SEWERS					\$236,250.00
SECTION 'D' - MISCELLANEOUS					
10	Support of Hydro Poles	Each	---	---	\$0.00
11	Imported Screened Topsoil (100 mm thick) and Hydroseed	m ²	3,750	\$9.00	\$33,750.00
12	Hydro Excavation of High Pressure Gas Lines	L.S	---	---	\$0.00
13	Maintenance of Flow in Ditches	L.S.	---	---	\$0.00
14	Traffic Control, Dust Control, Erosion and Sediment (Allowance)	L.S.	---	---	\$5,000.00
15	Pavement Markings	L.S.	---	---	\$0.00
16	Site Office	L.S.	---	---	\$5,000.00
17	Utility Coordination	L.S.	---	---	\$1,500.00
18	Contingency Allowance (Approx. 10%)	L.S.	---	---	\$28,450.00
TOTAL SECTION 'D' - MISCELLANEOUS					\$73,700.00

SUMMARY OF ESTIMATED PROBABLE COSTS	
SECTION 'A' - REMOVALS	\$3,000.00
SECTION 'B' - ROAD WORK	\$0.00
SECTION 'C' - SANITARY SEWERS	\$236,250.00
SECTION 'D' - MISCELLANEOUS	\$73,700.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$312,950.00

SUMMARY OF ESTIMATE PROBABLE PROJECT COSTS	
CONSTRUCTION (including restoration, sewer works)	\$312,950.00
ENGINEERING ALLOWANCE	
ENGINEERING (15% of construction costs)	\$47,000.00
GEOTECHNICAL (2% of construction costs)	\$6,300.00
EASEMENT ALLOWANCE	\$170,000.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$536,250.00

Notes: Estimate is for a section of trunk sanitary sewer cross country to lift station 3
 This sewer is meant to accommodate future development
 The estimate for cross country sanitary sewers assume a width of 10.0m to re-vegetated with topsoil and hydroseed
 No costs for watermain improvements have been included.

ESTIMATE OF PROBABLE PROJECT COSTS

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	AMOUNT
SECTION 'A' - REMOVALS					
1	Full Depth Asphalt Pavement Removal and Disposal	m ²	0	\$4.00	\$0.00
2	Clearing, Grubbing, Stripping of Topsoil	L.S	---	---	\$1,000.00
3	Sawcutting Existing Pavement (sawcut along sanitary sewer trench)	m	0	\$10.00	\$0.00
TOTAL SECTION 'A' - REMOVALS					\$1,000.00
SECTION 'B' - ROAD WORK - Restore Roadway					
4	Excavation of Existing Road Base (Allowance)	L.S.	---	---	\$0.00
5	Granular "A" (600 mm Thickness) including Shoulder Restoration	Tonnes	0	\$20.00	\$0.00
6	Full Depth Asphalt Pavement Restoration along Trench				
	a) 150 mm Base and Surface	Tonnes	0	\$110.00	\$0.00
TOTAL SECTION 'B' - ROAD WORK					\$0.00
SECTION 'C' - SANITARY SEWERS					
7	Supply and Install Sanitary Sewers, open cut including full granular backfill: a) 200mm dia. Forcemain HDPE	m	20	\$250.00	\$5,000.00
8	Lift Station	L.S	---	---	\$350,000.00
9	Meter Chamber	L.S	---	---	\$50,000.00
10	Sewer Video Inspection Allowance	m	20	\$10.00	\$200.00
TOTAL SECTION 'C' - SANITARY SEWERS					\$405,200.00
SECTION 'D' - MISCELLANEOUS					
11	Support of Hydro Poles	Each	---	---	\$0.00
12	Imported Screened Topsoil (100 mm thick) and Hydroseed	m ²	450	\$9.00	\$4,050.00
13	Hydro Excavation of High Pressure Gas Lines	L.S	---	---	\$0.00
14	Maintenance of Flow in Ditches	L.S.	---	---	\$0.00
15	Traffic Control, Dust Control, Erosion and Sediment (Allowance)	L.S.	---	---	\$1,500.00
16	Pavement Markings	L.S.	---	---	\$0.00
17	Site Office	L.S.	---	---	\$5,000.00
18	Utility Coordination	L.S.	---	---	\$1,500.00
19	Contingency Allowance (Approx. 10%)	L.S.	---	---	\$41,825.00
TOTAL SECTION 'D' - MISCELLANEOUS					\$53,875.00

SUMMARY OF ESTIMATED PROBABLE COSTS	
SECTION 'A' - REMOVALS	\$1,000.00
SECTION 'B' - ROAD WORK	\$0.00
SECTION 'C' - SANITARY SEWERS	\$405,200.00
SECTION 'D' - MISCELLANEOUS	\$53,875.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$460,075.00

SUMMARY OF ESTIMATE PROBABLE PROJECT COSTS	
CONSTRUCTION (including restoration, sewer works)	\$460,075.00
ENGINEERING ALLOWANCE	
ENGINEERING (15% of construction costs)	\$69,100.00
GEOTECHNICAL (2% of construction costs)	\$9,300.00
EASEMENT/ACQUISITION ALLOWANCE	\$170,000.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$708,475.00

Notes: Estimate is for Lift Station 3
 No costs for watermain improvements have been included.

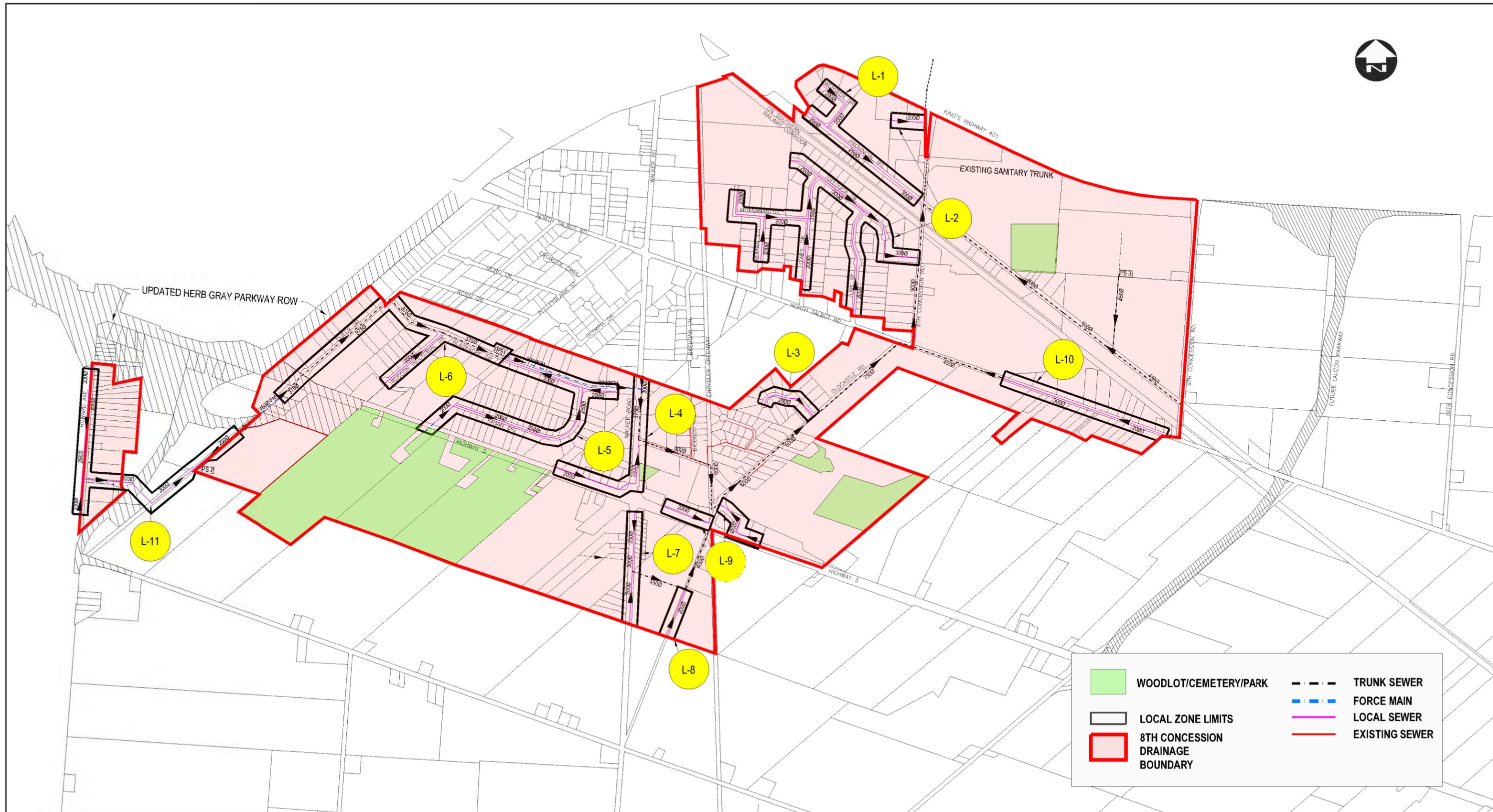
ESTIMATE OF PROBABLE PROJECT COSTS

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	AMOUNT
SECTION 'A' - REMOVALS					
1	Full Depth Asphalt Pavement Removal and Disposal	m ²	3,200	\$4.00	\$12,800.00
2	Clearing, Grubbing, Stripping of Topsoil	L.S.	---	---	\$2,000.00
3	Sawcutting Existing Pavement (sawcut along sanitary sewer trench)	m	900	\$10.00	\$9,000.00
TOTAL SECTION 'A' - REMOVALS					\$23,800.00
SECTION 'B' - ROAD WORK - Restore Roadway					
4	Excavation of Existing Road Base (Allowance)	L.S.	---	---	\$32,000.00
5	Granular "A" (600 mm Thickness) including Shoulder Restoration	Tonnes	4,613	\$20.00	\$92,260.00
6	Full Depth Asphalt Pavement Restoration along Trench				
	a) 150 mm Base and Surface	Tonnes	1,272	\$110.00	\$139,920.00
TOTAL SECTION 'B' - ROAD WORK					\$264,180.00
SECTION 'C' - SANITARY SEWERS					
7	Supply and Install Sanitary Sewers, open cut including full granular backfill: a) 600 mm dia. Concrete (100-D)	m	875	\$800.00	\$700,000.00
8	Supply and Install Sanitary Manholes: a) 1200 mm dia.	Each	9	\$9,000.00	\$81,000.00
9	Sewer Video Inspection Allowance	m	875	\$10.00	\$8,750.00
TOTAL SECTION 'C' - SANITARY SEWERS					\$789,750.00
SECTION 'D' - MISCELLANEOUS					
10	Support of Hydro Poles	Each	---	---	\$0.00
11	Imported Screened Topsoil (100 mm thick) and Hydroseed	m ²	400	\$9.00	\$3,600.00
12	Hydro Excavation of High Pressure Gas Lines	L.S.	---	---	\$0.00
13	Maintenance of Flow in Ditches	L.S.	---	---	\$2,500.00
14	Traffic Control, Dust Control, Erosion and Sediment (Allowance)	L.S.	---	---	\$5,000.00
15	Pavement Markings	L.S.	---	---	\$2,500.00
16	Site Office	L.S.	---	---	\$5,000.00
17	Utility Coordination	L.S.	---	---	\$3,000.00
18	Contingency Allowance (Approx. 10%)	L.S.	---	---	\$109,933.00
TOTAL SECTION 'D' - MISCELLANEOUS					\$131,533.00

SUMMARY OF ESTIMATED PROBABLE COSTS	
SECTION 'A' - REMOVALS	\$23,800.00
SECTION 'B' - ROAD WORK	\$264,180.00
SECTION 'C' - SANITARY SEWERS	\$789,750.00
SECTION 'D' - MISCELLANEOUS	\$131,533.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$1,209,263.00

SUMMARY OF ESTIMATE PROBABLE PROJECT COSTS	
CONSTRUCTION (including restoration, sewer works)	\$1,209,263.00
ENGINEERING ALLOWANCE	
ENGINEERING (15% of construction costs)	\$181,400.00
GEOTECHNICAL (2% of construction costs)	\$24,200.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$1,414,863.00

Notes: Estimate is for a section of trunk sanitary sewer East on Provincial Rd. from 8th Concession to the boundary of Area 35
 This estimate assumes that reconstruction of one lane of roadway will be required to accommodate the sanitary trunk sewer installation where appropriate.
 No costs for watermain improvements have been included.
 Road Restoration - Assume CL of sewer is 1.0 m from EP,
 Assume Restore 3.65 m width of Roadway. (half of roadway)



	WOODLOT/CEMETERY/PARK		TRUNK SEWER
	LOCAL ZONE LIMITS		FORCE MAIN
	8TH CONCESSION DRAINAGE BOUNDARY		LOCAL SEWER
			EXISTING SEWER



Town of Tecumseh
Ontario, Canada

Dillon Project No. 15-2973

Date: May 2018



OLDCASTLE HAMLET SANITARY SERVICING
8TH CONCESSION SANITARY OUTLET

LOCAL SEWER COST ESTIMATE ZONES

FIGURE 14.0

File Location: c:\project\sewer\working directory\active\32dc\06831872\15-2973-02-preliminary design report figures april 2018.dwg May 07 2018 2:38 PM

L-1 Cost Estimate

Provincial Road West of 8th Concession Including Webster Dr.
Town of Tecumseh

5/7/2018

ESTIMATE OF PROBABLE PROJECT COSTS

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	AMOUNT
SECTION 'A' - REMOVALS					
1	Full Depth Asphalt Pavement Removal and Disposal	m ²	2,560	\$4.00	\$10,240.00
2	Clearing, Grubbing, Stripping of Topsoil	L.S.	---	---	\$1,500.00
3	Sawcutting Existing Pavement (sawcut along sanitary sewer trench)	m	1,080	\$10.00	\$10,800.00
TOTAL SECTION 'A' - REMOVALS					\$22,540.00
SECTION 'B' - ROAD WORK - Restore Roadway					
4	Excavation of Existing Road Base (Allowance)	L.S.	---	---	\$25,400.00
5	Granular "A" (600 mm Thickness) including Shoulder Restoration	Tonnes	4,700	\$20.00	\$94,000.00
6	Full Depth Asphalt Pavement Restoration along Trench				
	a) 150 mm Base and Surface	Tonnes	1,020	\$110.00	\$112,200.00
TOTAL SECTION 'B' - ROAD WORK					\$231,600.00
SECTION 'C' - SANITARY SEWERS					
7	Supply and Install Sanitary Sewers, open cut including full granular backfill:				
	a) 200mm dia. PVC DR 35	m	460	\$300.00	\$138,000.00
	b) 250mm dia. PVC DR 35	m	490	\$350.00	\$171,500.00
	c) 300mm dia. PVC DR 35	m	120	\$400.00	\$48,000.00
8	Supply and Install Sanitary Manholes:				
	a) 1200 mm dia.	Each	10	\$9,000.00	\$90,000.00
9	Sewer Video Inspection Allowance	m	1070	\$10.00	\$10,700.00
TOTAL SECTION 'C' - SANITARY SEWERS					\$458,200.00
SECTION 'D' - MISCELLANEOUS					
10	Support of Hydro Poles	Each	---	---	\$0.00
11	Imported Screened Topsoil (100 mm thick) and Hydroseed	m ²	0	\$9.00	\$0.00
12	Hydro Excavation of High Pressure Gas Lines	L.S.	---	---	\$0.00
13	Maintenance of Flow in Ditches	L.S.	---	---	\$3,000.00
14	Traffic Control, Dust Control, Erosion and Sediment (Allowance)	L.S.	---	---	\$6,000.00
15	Pavement Markings	L.S.	---	---	\$3,000.00
16	Site Office	L.S.	---	---	\$5,000.00
17	Utility Coordination	L.S.	---	---	\$3,000.00
18	Contingency Allowance (Approx. 10%)	L.S.	---	---	\$73,234.00
TOTAL SECTION 'D' - MISCELLANEOUS					\$93,234.00

SUMMARY OF ESTIMATED PROBABLE COSTS	
SECTION 'A' - REMOVALS	\$22,540.00
SECTION 'B' - ROAD WORK	\$231,600.00
SECTION 'C' - SANITARY SEWERS	\$458,200.00
SECTION 'D' - MISCELLANEOUS	\$93,234.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$805,574.00

SUMMARY OF ESTIMATE PROBABLE PROJECT COSTS	
CONSTRUCTION (including restoration, sewer works)	\$805,574.00
ENGINEERING ALLOWANCE	
ENGINEERING (15% of construction costs)	\$120,900.00
GEOTECHNICAL (2% of construction costs)	\$16,200.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$942,674.00

Notes: Estimate is for a section of sanitary sewer West on Provincial Rd.8th Concession Including Webster Dr
This estimate assumes that reconstruction of one lane of roadway will be required to accommodate the sanitary sewer installation where appropriate.
No costs for watermain improvements have been included.
Road Restoration - Assume CL of sewer is 1.0 m from EP,
Assume Restore 3.65 m width of Roadway. (half of roadway)

ESTIMATE OF PROBABLE PROJECT COSTS

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	AMOUNT
SECTION 'A' - REMOVALS					
1	Clearing, Grubbing, Stripping of Topsoil	L.S.	---	---	\$8,500.00
2	Full Depth Asphalt Pavement Removal and Disposal	m ²	10,600	\$4.00	\$42,400.00
3	Sawcutting Existing Pavement (sawcut along sanitary sewer trench)	m	2,920	\$10.00	\$29,200.00
TOTAL SECTION 'A' - REMOVALS					\$80,100.00
SECTION 'B' - ROAD WORK - Restore Roadway					
4	Excavation of Existing Road Base (Allowance)	L.S.	---	---	\$90,000.00
5	Granular "A" (600 mm Thickness) including Shoulder Restoration	Tonnes	19,000	\$24.00	\$456,000.00
6	Full Depth Asphalt Pavement Restoration along Trench a) 100 mm Base and Surface	Tonnes	2,810	\$110.00	\$309,100.00
TOTAL SECTION 'B' - ROAD WORK					\$855,100.00
SECTION 'C' - SANITARY SEWERS					
7	Supply and Install Sanitary Sewers, open cut including full granular backfill:				
	a) 200 mm dia. PVC DR 35	m	2,030	\$300.00	\$609,000.00
	b) 250 mm dia. PVC DR 35	m	230	\$350.00	\$80,500.00
	c) 300 mm dia. PVC DR 35	m	650	\$400.00	\$260,000.00
8	Supply and Install Sanitary Manholes: a) 1200 mm dia.	Each	30	\$9,000.00	\$270,000.00
9	Sewer Video Inspection Allowance	m	2910	\$10.00	\$29,100.00
TOTAL SECTION 'C' - SANITARY SEWERS					\$1,248,600.00
SECTION 'D' - MISCELLANEOUS					
10	Support of Hydro Poles	Each	---	---	\$0.00
11	Removal and reinstatement of pole anchors	Each	---	---	\$0.00
12	Imported Screened Topsoil (100 mm thick) and Hydroseed	m ²	250	\$9.00	\$2,250.00
13	Hydro Excavation of High Pressure Gas Lines	L.S.	---	---	\$5,000.00
14	Maintenance of Flow in Ditches	L.S.	---	---	\$10,000.00
15	Traffic Control, Dust Control, Erosion and Sediment (Allowance)	L.S.	---	---	\$20,000.00
16	Pavement Markings	L.S.	---	---	\$15,000.00
17	Site Office	L.S.	---	---	\$5,000.00
18	Utility Coordination	L.S.	---	---	\$10,000.00
19	Contingency Allowance (Approx. 10%)	L.S.	---	---	\$225,105.00
TOTAL SECTION 'E' - MISCELLANEOUS					\$292,355.00

SUMMARY OF ESTIMATED PROBABLE COSTS	
SECTION 'A' - REMOVALS	\$80,100.00
SECTION 'B' - ROAD WORK	\$855,100.00
SECTION 'C' - SANITARY SEWERS	\$1,248,600.00
SECTION 'D' - MISCELLANEOUS	\$292,355.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$2,476,155.00

SUMMARY OF ESTIMATE PROBABLE PROJECT COSTS	
CONSTRUCTION (including restoration, sewer works)	\$2,476,155.00
ENGINEERING ALLOWANCE	
ENGINEERING (15% of construction costs)	\$371,500.00
GEOTECHNICAL (2% of construction costs)	\$49,600.00
EASEMENT ALLOWANCE	\$45,000.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$2,897,255.00

Notes: Estimate is for a section of sanitary sewer servicing Area A and Area B
 This estimate assumes that reconstruction of one lane of roadway will be required to accommodate the sanitary sewer installation where appropriate.
 No costs for watermain improvements have been included.
 Road Restoration - Assume CL of sewer is 1.0 m from EP,
 Assume Restore 3.65 m width of Roadway. (half of roadway)

ESTIMATE OF PROBABLE PROJECT COSTS

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	AMOUNT
SECTION 'A' - REMOVALS					
1	Full Depth Asphalt Pavement Removal and Disposal	m ²	1,170	\$4.00	\$4,680.00
2	Clearing, Grubbing, Stripping of Topsoil	L.S.	---	---	\$500.00
3	Sawcutting Existing Pavement (sawcut along sanitary sewer trench)	m	330	\$10.00	\$3,300.00
TOTAL SECTION 'A' - REMOVALS					\$8,480.00
SECTION 'B' - ROAD WORK - Restore Roadway					
4	Excavation of Existing Road Base (Allowance)	L.S.	---	---	\$11,600.00
5	Granular "A" (600 mm Thickness) including Shoulder Restoration	Tonnes	1,990	\$20.00	\$39,800.00
6	Full Depth Asphalt Pavement Restoration along Trench				
	a) 150 mm Base and Surface	Tonnes	470	\$110.00	\$51,700.00
TOTAL SECTION 'B' - ROAD WORK					\$103,100.00
SECTION 'C' - SANITARY SEWERS					
7	Supply and Install Sanitary Sewers, open cut including full granular backfill:				
	a) 200mm dia. PVC DR 35	m	320	\$300.00	\$96,000.00
8	Supply and Install Sanitary Manholes:				
	a) 1200 mm dia.	Each	4	\$9,000.00	\$36,000.00
9	Internal Drop Structures	Each	1	\$5,000.00	\$5,000.00
10	Sewer Video Inspection Allowance	m	320	\$10.00	\$3,200.00
TOTAL SECTION 'C' - SANITARY SEWERS					\$140,200.00
SECTION 'D' - MISCELLANEOUS					
11	Support of Hydro Poles	Each	---	---	\$0.00
12	Imported Screened Topsoil (100 mm thick) and Hydroseed	m ²	0	\$9.00	\$0.00
13	Hydro Excavation of High Pressure Gas Lines	L.S.	---	---	\$0.00
14	Maintenance of Flow in Ditches	L.S.	---	---	\$900.00
15	Traffic Control, Dust Control, Erosion and Sediment (Allowance)	L.S.	---	---	\$1,800.00
16	Pavement Markings	L.S.	---	---	\$900.00
17	Site Office	L.S.	---	---	\$5,000.00
18	Utility Coordination	L.S.	---	---	\$900.00
19	Contingency Allowance (Approx. 10%)	L.S.	---	---	\$26,128.00
TOTAL SECTION 'D' - MISCELLANEOUS					\$35,628.00

SUMMARY OF ESTIMATED PROBABLE COSTS	
SECTION 'A' - REMOVALS	\$8,480.00
SECTION 'B' - ROAD WORK	\$103,100.00
SECTION 'C' - SANITARY SEWERS	\$140,200.00
SECTION 'D' - MISCELLANEOUS	\$35,628.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$287,408.00

SUMMARY OF ESTIMATE PROBABLE PROJECT COSTS -	
CONSTRUCTION (including restoration, sewer works)	\$287,408.00
ENGINEERING ALLOWANCE	
ENGINEERING (15% of construction costs)	\$43,200.00
GEOTECHNICAL (2% of construction costs)	\$5,800.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$336,408.00

Notes: Estimate is for a section of sanitary sewer on Castlewood Ct.
 This estimate assumes that reconstruction of one lane of roadway will be required to accommodate the sanitary sewer installation where appropriate.
 No costs for watermain improvements have been included.
 Road Restoration - Assume CL of sewer is 1.0 m from EP,
 Assume Restore 3.65 m width of Roadway. (half of roadway)

ESTIMATE OF PROBABLE PROJECT COSTS

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	AMOUNT
SECTION 'A' - REMOVALS					
1	Full Depth Asphalt Pavement Removal and Disposal	m ²	3,130	\$4.00	\$12,520.00
2	Clearing, Grubbing, Stripping of Topsoil	L.S.	---	---	\$4,000.00
3	Sawcutting Existing Pavement (sawcut along sanitary sewer trench)	m	985	\$10.00	\$9,850.00
TOTAL SECTION 'A' - REMOVALS					\$26,370.00
SECTION 'B' - ROAD WORK - Restore Roadway					
4	Excavation of Existing Road Base (Allowance)	L.S.	---	---	\$24,400.00
5	Granular "A" (600 mm Thickness) including Shoulder Restoration	Tonnes	4,725	\$20.00	\$94,500.00
6	Full Depth Asphalt Pavement Restoration along Trench				
	a) 150 mm Base and Surface	Tonnes	1,250	\$110.00	\$137,500.00
TOTAL SECTION 'B' - ROAD WORK					\$256,400.00
SECTION 'C' - SANITARY SEWERS					
7	Supply and Install Sanitary Sewers, open cut including full granular backfill:				
	a) 200mm dia. PVC DR 35	m	205	\$300.00	\$61,500.00
	b) 300mm dia. PVC DR 35	m	535	\$400.00	\$214,000.00
	c) 375mm dia. PVC DR 35	m	235	\$450.00	\$105,750.00
8	Supply and Install Sanitary Manholes:				
	a) 1200 mm dia.	Each	10	\$9,000.00	\$90,000.00
9	Internal Drop Structures	Each	1	\$5,000.00	\$5,000.00
10	Sewer Video Inspection Allowance	m	975	\$10.00	\$9,750.00
TOTAL SECTION 'C' - SANITARY SEWERS					\$486,000.00
SECTION 'D' - MISCELLANEOUS					
11	Support of Hydro Poles	Each	---	---	\$0.00
12	Imported Screened Topsoil (100 mm thick) and Hydroseed	m ²	975	\$9.00	\$8,775.00
13	Hydro Excavation of High Pressure Gas Lines	L.S.	---	---	\$0.00
14	Maintenance of Flow in Ditches	L.S.	---	---	\$1,000.00
15	Traffic Control, Dust Control, Erosion and Sediment (Allowance)	L.S.	---	---	\$2,150.00
16	Pavement Markings	L.S.	---	---	\$2,000.00
17	Site Office	L.S.	---	---	\$5,000.00
18	Utility Coordination	L.S.	---	---	\$2,000.00
19	Contingency Allowance (Approx. 10%)	L.S.	---	---	\$78,970.00
TOTAL SECTION 'D' - MISCELLANEOUS					\$99,895.00

SUMMARY OF ESTIMATED PROBABLE COSTS	
SECTION 'A' - REMOVALS	\$26,370.00
SECTION 'B' - ROAD WORK	\$256,400.00
SECTION 'C' - SANITARY SEWERS	\$486,000.00
SECTION 'D' - MISCELLANEOUS	\$99,895.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$868,665.00

SUMMARY OF ESTIMATE PROBABLE PROJECT COSTS	
CONSTRUCTION (including restoration, sewer works)	\$868,665.00
ENGINEERING ALLOWANCE	
ENGINEERING (15% of construction costs)	\$130,300.00
GEOTECHNICAL (2% of construction costs)	\$17,400.00
EASEMENT ALLOWANCE	\$100,000.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$1,116,365.00

- Notes: Estimate is for a section of sanitary sewer on Walker Rd North of HWY 3 including a cross country run West on HWY 3
This estimate assumes that reconstruction of one lane of roadway will be required to accommodate the sanitary sewer installation where appropriate.
The estimate for cross country sanitary sewers assume one lane of roadway gravel to be installed and the area to be finished with hydroseed and topsoil.
No costs for watermain improvements have been included.
Road Restoration - Assume CL of sewer is 1.0 m from EP,
Assume Restore 3.65 m width of Roadway. (half of roadway)

ESTIMATE OF PROBABLE PROJECT COSTS

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	AMOUNT
SECTION 'A' - REMOVALS					
1	Full Depth Asphalt Pavement Removal and Disposal	m ²	5,390	\$4.00	\$21,560.00
2	Clearing, Grubbing, Stripping of Topsoil	L.S.	---	---	\$8,000.00
3	Sawcutting Existing Pavement (sawcut along sanitary sewer trench)	m	875	\$10.00	\$8,750.00
TOTAL SECTION 'A' - REMOVALS					\$38,310.00
SECTION 'B' - ROAD WORK - Restore Roadway					
4	Excavation of Existing Road Base (Allowance)	L.S.	---	---	\$53,400.00
5	Granular "A" (600 mm Thickness) including Shoulder Restoration	Tonnes	8,330	\$20.00	\$166,600.00
6	Full Depth Asphalt Pavement Restoration along Trench				
	a) 150 mm Base and Surface	Tonnes	2,150	\$110.00	\$236,500.00
TOTAL SECTION 'B' - ROAD WORK					\$456,500.00
SECTION 'C' - SANITARY SEWERS					
7	Supply and Install Sanitary Sewers, open cut including full granular backfill:				
	a) 200mm dia. PVC DR 35	m	610	\$300.00	\$183,000.00
	b) 250 mm dia. PVC DR 35	m	600	\$350.00	\$210,000.00
	c) 300mm dia. PVC DR 35	m	415	\$400.00	\$166,000.00
8	Highway 3 Crossing				
	a) Directional Drilling of 50 mm dia. Forcemain including restoration of launch and receiving pits.	m	70	\$275.00	\$19,250.00
9	Supply and Install Sanitary Manholes:				
	a) 1200 mm dia.	Each	15	\$9,000.00	\$135,000.00
10	Sewer Video Inspection Allowance	m	1625	\$10.00	\$16,250.00
TOTAL SECTION 'C' - SANITARY SEWERS					\$729,500.00
SECTION 'D' - MISCELLANEOUS					
11	Support of Hydro Poles	Each	---	---	\$0.00
12	Imported Screened Topsoil (100 mm thick) and Hydroseed	m ²	800	\$9.00	\$7,200.00
13	Hydro Excavation of High Pressure Gas Lines	L.S.	---	---	\$0.00
14	Maintenance of Flow in Ditches	L.S.	---	---	\$6,000.00
15	Traffic Control, Dust Control, Erosion and Sediment (Allowance)	L.S.	---	---	\$12,000.00
16	Pavement Markings	L.S.	---	---	\$9,000.00
17	Site Office	L.S.	---	---	\$5,000.00
18	Utility Coordination	L.S.	---	---	\$9,000.00
19	Contingency Allowance (Approx. 10%)	L.S.	---	---	\$127,251.00
TOTAL SECTION 'D' - MISCELLANEOUS					\$175,451.00

SUMMARY OF ESTIMATED PROBABLE COSTS	
SECTION 'A' - REMOVALS	\$38,310.00
SECTION 'B' - ROAD WORK	\$456,500.00
SECTION 'C' - SANITARY SEWERS	\$729,500.00
SECTION 'D' - MISCELLANEOUS	\$175,451.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$1,399,761.00

SUMMARY OF ESTIMATE PROBABLE PROJECT COSTS	
CONSTRUCTION (including restoration, sewer works)	\$1,399,761.00
ENGINEERING ALLOWANCE	
ENGINEERING (15% of construction costs)	\$210,000.00
GEOTECHNICAL (2% of construction costs)	\$28,000.00
EASEMENT ALLOWANCE	\$60,000.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$1,697,761.00

- Notes: Estimate is for a section of sanitary sewer on Blackacre Dr between Walker Rd and Lift Station 1 including Fasan Dr
This estimate assumes that reconstruction of one lane of roadway will be required to accommodate the sanitary sewer installation where appropriate.
The estimate for cross country sanitary sewers assume one lane of roadway gravel to be installed and the area to be finished with hydroseed and topsoil.
No costs for watermain improvements have been included.
Road Restoration - Assume CL of sewer is 1.0 m from EP,
Assume Restore 3.65 m width of Roadway. (half of roadway)

L-6 Cost Estimate

Outer Drive / Blackacre Trunk sewer between Hwy 3 and Lift Station 1
Town of Tecumseh

5/7/2018

ESTIMATE OF PROBABLE PROJECT COSTS

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	AMOUNT
SECTION 'A' - REMOVALS					
1	Full Depth Asphalt Pavement Removal and Disposal	m ²	6,470	\$4.00	\$25,880.00
2	Clearing, Grubbing, Stripping of Topsoil	L.S.	---	---	\$15,891.00
3	Sawcutting Existing Pavement (sawcut along sanitary sewer trench)	m	1,780	\$10.00	\$17,800.00
TOTAL SECTION 'A' - REMOVALS					\$59,571.00
SECTION 'B' - ROAD WORK - Restore Roadway					
4	Excavation of Existing Road Base (Allowance)	L.S.	---	---	\$39,850.00
5	Granular "A" (600 mm Thickness) including Shoulder Restoration	Tonnes	11,750	\$20.00	\$235,000.00
6	Full Depth Asphalt Pavement Restoration along Trench				
	a) 150 mm Base and Surface	Tonnes	2,650	\$110.00	\$291,500.00
TOTAL SECTION 'B' - ROAD WORK					\$566,350.00
SECTION 'C' - SANITARY SEWERS					
7	Supply and Install Sanitary Sewers, open cut including full granular backfill:				
	a) 200mm dia. PVC DR 35	m	375	\$300.00	\$112,500.00
	b) 375mm dia. PVC DR 35	m	1,395	\$450.00	\$627,750.00
8	Supply and Install Sanitary Manholes:				
	a) 1200 mm dia.	Each	18	\$7,000.00	\$126,000.00
9	Sewer Video Inspection Allowance	m	1770	\$10.00	\$17,700.00
TOTAL SECTION 'C' - SANITARY SEWERS					\$883,950.00
SECTION 'D' - MISCELLANEOUS					
10	Support of Hydro Poles	Each	---	---	\$0.00
11	Imported Screened Topsoil (100 mm thick) and Hydroseed	m ²	475	\$9.00	\$4,275.00
12	Hydro Excavation of High Pressure Gas Lines	L.S.	---	---	\$0.00
13	Maintenance of Flow in Ditches	L.S.	---	---	\$9,000.00
14	Traffic Control, Dust Control, Erosion and Sediment (Allowance)	L.S.	---	---	\$17,500.00
15	Pavement Markings	L.S.	---	---	\$11,000.00
16	Site Office	L.S.	---	---	\$7,000.00
17	Utility Coordination	L.S.	---	---	\$11,000.00
18	Contingency Allowance (Approx. 10%)	L.S.	---	---	\$156,965.00
TOTAL SECTION 'D' - MISCELLANEOUS					\$216,740.00

SUMMARY OF ESTIMATED PROBABLE COSTS	
SECTION 'A' - REMOVALS	\$59,571.00
SECTION 'B' - ROAD WORK	\$566,350.00
SECTION 'C' - SANITARY SEWERS	\$883,950.00
SECTION 'D' - MISCELLANEOUS	\$216,740.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$1,726,611.00

SUMMARY OF ESTIMATE PROBABLE PROJECT COSTS	
CONSTRUCTION (including restoration, sewer works)	\$1,726,611.00
ENGINEERING ALLOWANCE	
ENGINEERING (15% of construction costs)	\$259,000.00
GEOTECHNICAL (2% of construction costs)	\$34,600.00
EASEMENT ALLOWANCE	\$150,000.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$2,170,211.00

Notes: Estimate is for a section of sanitary sewer located on Outer Dr./Blackacre Dr. between Hwy. 3 and Lift Station 1 including Roscon Dr. to Blackacre Dr.
This estimate assumes that reconstruction of one lane of roadway will be required to accommodate the sanitary sewer installation where appropriate.
The estimate for cross country sanitary sewers assume one lane of roadway gravel to be installed and the area to be finished with hydroseed and topsoil.
No costs for watermain improvements have been included.
Road Restoration - Assume CL of sewer is 1.0 m from EP,
Assume Restore 7.3 m width of Roadway. (full roadway)

ESTIMATE OF PROBABLE PROJECT COSTS

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	AMOUNT
SECTION 'A' - REMOVALS					
1	Full Depth Asphalt Pavement Removal and Disposal	m ²	1,990	\$4.00	\$7,960.00
2	Clearing, Grubbing, Stripping of Topsoil	L.S.	---	---	\$3,000.00
3	Sawcutting Existing Pavement (sawcut along sanitary sewer trench)	m	545	\$10.00	\$5,450.00
TOTAL SECTION 'A' - REMOVALS					\$16,410.00
SECTION 'B' - ROAD WORK - Restore Roadway					
4	Excavation of Existing Road Base (Allowance)	L.S.	---	---	\$19,800.00
5	Granular "A" (600 mm Thickness) including Shoulder Restoration	Tonnes	2,870	\$20.00	\$57,400.00
6	Full Depth Asphalt Pavement Restoration along Trench				
	a) 150 mm Base and Surface	Tonnes	800	\$110.00	\$88,000.00
TOTAL SECTION 'B' - ROAD WORK					\$165,200.00
SECTION 'C' - SANITARY SEWERS					
7	Supply and Install Sanitary Sewers, open cut including full granular backfill:				
	a) 200mm dia. PVC DR 35	m	495	\$300.00	\$148,500.00
	b) 300mm dia. PVC DR 35	m	50	\$400.00	\$20,000.00
8	Supply and Install Sanitary Manholes:				
	a) 1200 mm dia.	Each	6	\$9,000.00	\$54,000.00
9	Sewer Video Inspection Allowance	m	545	\$10.00	\$5,450.00
TOTAL SECTION 'C' - SANITARY SEWERS					\$227,950.00
SECTION 'D' - MISCELLANEOUS					
10	Support of Hydro Poles	Each	---	---	\$0.00
11	Imported Screened Topsoil (100 mm thick) and Hydroseed	m ²	200	\$9.00	\$1,800.00
12	Hydro Excavation of High Pressure Gas Lines	L.S.	---	---	\$0.00
13	Maintenance of Flow in Ditches	L.S.	---	---	\$3,500.00
14	Traffic Control, Dust Control, Erosion and Sediment (Allowance)	L.S.	---	---	\$7,000.00
15	Pavement Markings	L.S.	---	---	\$3,500.00
16	Site Office	L.S.	---	---	\$5,000.00
17	Utility Coordination	L.S.	---	---	\$3,500.00
18	Contingency Allowance (Approx. 10%)	L.S.	---	---	\$43,386.00
TOTAL SECTION 'D' - MISCELLANEOUS					\$67,686.00

SUMMARY OF ESTIMATED PROBABLE COSTS	
SECTION 'A' - REMOVALS	\$16,410.00
SECTION 'B' - ROAD WORK	\$165,200.00
SECTION 'C' - SANITARY SEWERS	\$227,950.00
SECTION 'D' - MISCELLANEOUS	\$67,686.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$477,246.00

SUMMARY OF ESTIMATE PROBABLE PROJECT COSTS	
CONSTRUCTION (including restoration, sewer works)	\$477,246.00
ENGINEERING ALLOWANCE	
ENGINEERING (15% of construction costs)	\$71,600.00
GEOTECHNICAL (2% of construction costs)	\$9,600.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$558,446.00

- Notes: Estimate is for a section of sanitary sewer on Walker Rd South of HWY 3 to the Southern drainage boundary.
This estimate assumes that reconstruction of one lane of roadway will be required to accommodate the sanitary sewer installation where appropriate.
The estimate for cross country sanitary sewers assume one lane of roadway gravel to be installed and the area to be finished with hydroseed and topsoil.
No costs for watermain improvements have been included.
Road Restoration - Assume CL of sewer is 1.0 m from EP,
Assume Restore 3.65 m width of Roadway. (half of roadway)

ESTIMATE OF PROBABLE PROJECT COSTS

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	AMOUNT
SECTION 'A' - REMOVALS					
1	Full Depth Asphalt Pavement Removal and Disposal	m ²	920	\$4.00	\$3,680.00
2	Clearing, Grubbing, Stripping of Topsoil	L.S.	---	---	\$1,275.00
3	Sawcutting Existing Pavement (sawcut along sanitary sewer trench)	m	260	\$10.00	\$2,600.00
TOTAL SECTION 'A' - REMOVALS					\$7,555.00
SECTION 'B' - ROAD WORK - Restore Roadway					
4	Excavation of Existing Road Base (Allowance)	L.S.	---	---	\$9,200.00
5	Granular "A" (600 mm Thickness) including Shoulder Restoration	Tonnes	1,330	\$20.00	\$26,600.00
6	Full Depth Asphalt Pavement Restoration along Trench a) 150 mm Base and Surface	Tonnes	370	\$110.00	\$40,700.00
TOTAL SECTION 'B' - ROAD WORK					\$76,500.00
SECTION 'C' - SANITARY SEWERS					
7	Supply and Install Sanitary Sewers, open cut including full granular backfill: a) 200mm dia. PVC DR 35	m	250	\$300.00	\$75,000.00
8	Supply and Install Sanitary Manholes: a) 1200 mm dia.	Each	3	\$9,000.00	\$27,000.00
9	Sewer Video Inspection Allowance	m	250	\$10.00	\$2,500.00
TOTAL SECTION 'C' - SANITARY SEWERS					\$104,500.00
SECTION 'D' - MISCELLANEOUS					
10	Support of Hydro Poles	Each	---	---	\$0.00
11	Imported Screened Topsoil (100 mm thick) and Hydroseed	m ²	150	\$9.00	\$1,350.00
12	Hydro Excavation of High Pressure Gas Lines	L.S.	---	---	\$0.00
13	Maintenance of Flow in Ditches	L.S.	---	---	\$3,500.00
14	Traffic Control, Dust Control, Erosion and Sediment (Allowance)	L.S.	---	---	\$7,000.00
15	Pavement Markings	L.S.	---	---	\$3,500.00
16	Site Office	L.S.	---	---	\$5,000.00
17	Utility Coordination	L.S.	---	---	\$3,500.00
18	Contingency Allowance (Approx. 10%)	L.S.	---	---	\$21,300.00
TOTAL SECTION 'D' - MISCELLANEOUS					\$45,150.00

SUMMARY OF ESTIMATED PROBABLE COSTS	
SECTION 'A' - REMOVALS	\$7,555.00
SECTION 'B' - ROAD WORK	\$76,500.00
SECTION 'C' - SANITARY SEWERS	\$104,500.00
SECTION 'D' - MISCELLANEOUS	\$45,150.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$233,705.00

SUMMARY OF ESTIMATE PROBABLE PROJECT COSTS	
CONSTRUCTION (including restoration, sewer works)	\$233,705.00
ENGINEERING ALLOWANCE	
ENGINEERING (15% of construction costs)	\$35,100.00
GEOTECHNICAL (2% of construction costs)	\$4,700.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$273,505.00

Notes: Estimate is for a section of sanitary sewer on Oldcastle Rd South of HWY 3 to the Southern drainage boundary.
 This estimate assumes that reconstruction of one lane of roadway will be required to accommodate the sanitary sewer installation where appropriate.
 The estimate for cross country sanitary sewers assume one lane of roadway gravel to be installed and the area to be finished with hydroseed and topsoil.
 No costs for watermain improvements have been included.
 Road Restoration - Assume CL of sewer is 1.0 m from EP,
 Assume Restore 3.65 m width of Roadway. (half of roadway)

ESTIMATE OF PROBABLE PROJECT COSTS

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	AMOUNT
SECTION 'A' - REMOVALS					
1	Full Depth Asphalt Pavement Removal and Disposal	m ²	700	\$4.00	\$2,800.00
2	Clearing, Grubbing, Stripping of Topsoil	L.S.	---	---	\$2,500.00
3	Sawcutting Existing Pavement (sawcut along sanitary sewer trench)	m	200	\$10.00	\$2,000.00
TOTAL SECTION 'A' - REMOVALS					\$7,300.00
SECTION 'B' - ROAD WORK - Restore Roadway					
4	Excavation of Existing Road Base (Allowance)	L.S.	---	---	\$7,000.00
5	Granular "A" (600 mm Thickness) including Shoulder Restoration	Tonnes	1,010	\$20.00	\$20,200.00
6	Full Depth Asphalt Pavement Restoration along Trench				
	a) 150 mm Base and Surface	Tonnes	280	\$110.00	\$30,800.00
TOTAL SECTION 'B' - ROAD WORK					\$58,000.00
SECTION 'C' - SANITARY SEWERS					
7	Supply and Install Sanitary Sewers, open cut including full granular backfill:				
	a) 200mm dia. PVC DR 35	m	585	\$300.00	\$175,500.00
8	Supply and Install Sanitary Manholes:				
	a) 1200 mm dia.	Each	6	\$9,000.00	\$54,000.00
9	Sewer Video Inspection Allowance	m	585	\$10.00	\$5,850.00
TOTAL SECTION 'C' - SANITARY SEWERS					\$235,350.00
SECTION 'D' - MISCELLANEOUS					
10	Support of Hydro Poles	Each	---	---	\$0.00
11	Imported Screened Topsoil (100 mm thick) and Hydroseed	m ²	2,000	\$9.00	\$18,000.00
12	Hydro Excavation of High Pressure Gas Lines	L.S.	---	---	\$5,000.00
13	Maintenance of Flow in Ditches	L.S.	---	---	\$1,500.00
14	Traffic Control, Dust Control, Erosion and Sediment (Allowance)	L.S.	---	---	\$3,000.00
15	Pavement Markings	L.S.	---	---	\$1,500.00
16	Site Office	L.S.	---	---	\$5,000.00
17	Utility Coordination	L.S.	---	---	\$1,500.00
18	Contingency Allowance (Approx. 10%)	L.S.	---	---	\$33,615.00
TOTAL SECTION 'D' - MISCELLANEOUS					\$69,115.00

SUMMARY OF ESTIMATED PROBABLE COSTS	
SECTION 'A' - REMOVALS	\$7,300.00
SECTION 'B' - ROAD WORK	\$58,000.00
SECTION 'C' - SANITARY SEWERS	\$235,350.00
SECTION 'D' - MISCELLANEOUS	\$69,115.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$369,765.00

SUMMARY OF ESTIMATE PROBABLE PROJECT COSTS	
CONSTRUCTION (including restoration, sewer works)	\$369,765.00
ENGINEERING ALLOWANCE	
ENGINEERING (15% of construction costs)	\$55,500.00
GEOTECHNICAL (2% of construction costs)	\$7,400.00
EASEMENT ALLOWANCE	\$115,000.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$547,665.00

- Notes: Estimate is for a section of sanitary sewer Cross Country West along HWY 3 to area 14 and Oldcastle Court
This estimate assumes that reconstruction of one lane of roadway will be required to accommodate the sanitary sewer installation where appropriate.
The estimate for cross country sanitary sewers assume one lane of roadway gravel to be installed and the area to be finished with hydroseed and topsoil with a width of 10m.
No costs for watermain improvements have been included.
Road Restoration - Assume CL of sewer is 1.0 m from EP,
Assume Restore 3.65 m width of Roadway. (half of roadway)

ESTIMATE OF PROBABLE PROJECT COSTS

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	AMOUNT
SECTION 'A' - REMOVALS					
1	Full Depth Asphalt Pavement Removal and Disposal	m ²	3,110	\$4.00	\$12,440.00
2	Clearing, Grubbing, Stripping of Topsoil	L.S.	---	---	\$1,250.00
3	Sawcutting Existing Pavement (sawcut along sanitary sewer trench)	m	860	\$10.00	\$8,600.00
TOTAL SECTION 'A' - REMOVALS					\$22,290.00
SECTION 'B' - ROAD WORK - Restore Roadway					
4	Excavation of Existing Road Base (Allowance)	L.S.	---	---	\$30,800.00
5	Granular "A" (600 mm Thickness) including Shoulder Restoration	Tonnes	4,480	\$20.00	\$89,600.00
6	Full Depth Asphalt Pavement Restoration along Trench				
	a) 150 mm Base and Surface	Tonnes	1,240	\$110.00	\$136,400.00
TOTAL SECTION 'B' - ROAD WORK					\$256,800.00
SECTION 'C' - SANITARY SEWERS					
7	Supply and Install Sanitary Sewers, open cut including full granular backfill:				
	a) 200mm dia. PVC DR 35	m	250	\$300.00	\$75,000.00
	b) 300mm dia. PVC DR 35	m	600	\$400.00	\$240,000.00
8	Supply and Install Sanitary Manholes:				
	a) 1200 mm dia.	Each	8	\$9,000.00	\$72,000.00
9	Sewer Video Inspection Allowance	m	850	\$10.00	\$8,500.00
TOTAL SECTION 'C' - SANITARY SEWERS					\$395,500.00
SECTION 'D' - MISCELLANEOUS					
10	Support of Hydro Poles	Each	---	---	\$0.00
11	Imported Screened Topsoil (100 mm thick) and Hydroseed	m ²	200	\$9.00	\$1,800.00
12	Hydro Excavation of High Pressure Gas Lines	L.S.	---	---	\$0.00
13	Maintenance of Flow in Ditches	L.S.	---	---	\$2,500.00
14	Traffic Control, Dust Control, Erosion and Sediment (Allowance)	L.S.	---	---	\$5,000.00
15	Pavement Markings	L.S.	---	---	\$2,500.00
16	Site Office	L.S.	---	---	\$5,000.00
17	Utility Coordination	L.S.	---	---	\$2,500.00
18	Contingency Allowance (Approx. 10%)	L.S.	---	---	\$69,389.00
TOTAL SECTION 'D' - MISCELLANEOUS					\$88,689.00

SUMMARY OF ESTIMATED PROBABLE COSTS	
SECTION 'A' - REMOVALS	\$22,290.00
SECTION 'B' - ROAD WORK	\$256,800.00
SECTION 'C' - SANITARY SEWERS	\$395,500.00
SECTION 'D' - MISCELLANEOUS	\$88,689.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$763,279.00

SUMMARY OF ESTIMATE PROBABLE PROJECT COSTS	
CONSTRUCTION (including restoration, sewer works)	\$763,279.00
ENGINEERING ALLOWANCE	
ENGINEERING (15% of construction costs)	\$114,500.00
GEOTECHNICAL (2% of construction costs)	\$15,300.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$893,079.00

Notes: Estimate is for a section of sanitary sewer on East North Talbot from mid area 22 to 9th Concession
 This estimate assumes that reconstruction of one lane of roadway will be required to accommodate the sanitary sewer installation where appropriate.
 The estimate for cross country sanitary sewers assume one lane of roadway gravel to be installed and the area to be finished with hydroseed and topsoil with a width of 10m.
 No costs for watermain improvements have been included.
 Road Restoration - Assume CL of sewer is 1.0 m from EP,
 Assume Restore 3.65 m width of Roadway. (half of roadway)

ESTIMATE OF PROBABLE PROJECT COSTS

ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	UNIT PRICE	AMOUNT
SECTION 'A' - REMOVALS					
1	Clearing, Grubbing, Stripping of Topsoil	L.S.	---	---	\$4,000.00
2	Full Depth Asphalt Pavement Removal and Disposal	m ²	4,160	\$4.00	\$16,640.00
3	Sawcutting Existing Pavement (sawcut along sanitary sewer trench)	m	1,030	\$10.00	\$10,300.00
TOTAL SECTION 'A' - REMOVALS					\$30,940.00
SECTION 'B' - ROAD WORK - Restore Roadway					
4	Excavation of Existing Road Base (Allowance)	L.S.	---	---	\$37,500.00
5	Granular "A" (600 mm Thickness) including Shoulder Restoration	Tonnes	9,000	\$20.00	\$180,000.00
6	Full Depth Asphalt Pavement Restoration along Trench a) 100 mm Base and Surface	Tonnes	1,050	\$110.00	\$115,500.00
TOTAL SECTION 'B' - ROAD WORK					\$333,000.00
SECTION 'C' - SANITARY SEWERS					
7	Supply and Install Sanitary Sewers, open cut including full granular backfill: a) 200mm dia. PVC DR 35 b) 250mm dia. PVC DR 35 c) 300mm dia. PVC DR 35	m	360	\$300.00	\$108,000.00
		m	450	\$350.00	\$157,500.00
		m	685	\$400.00	\$274,000.00
8	Supply and Install Sanitary Manholes: a) 1200 mm dia.	Each	19	\$9,000.00	\$171,000.00
9	Internal Drop Structures	Each	1	\$5,000.00	\$5,000.00
10	Sewer Video Inspection Allowance	m	1495	\$10.00	\$14,950.00
TOTAL SECTION 'C' - SANITARY SEWERS					\$730,450.00
SECTION 'D' - MISCELLANEOUS					
11	Support of Hydro Poles	Each	---	---	\$0.00
12	Removal and reinstatement of pole anchors	Each	---	---	\$0.00
13	Imported Screened Topsoil (100 mm thick) and Hydroseed	m ²	200	\$7.00	\$1,400.00
14	Hydro Excavation of High Pressure Gas Lines	L.S.	---	---	\$5,000.00
15	Maintenance of Flow in Ditches	L.S.	---	---	\$10,000.00
16	Traffic Control, Dust Control, Erosion and Sediment (Allowance)	L.S.	---	---	\$40,000.00
17	Pavement Markings	L.S.	---	---	\$10,000.00
18	Site Office	L.S.	---	---	\$5,000.00
19	Utility Coordination	L.S.	---	---	\$10,000.00
20	Contingency Allowance (Approx. 10%)	L.S.	---	---	\$117,579.00
TOTAL SECTION 'E' - MISCELLANEOUS					\$198,979.00

SUMMARY OF ESTIMATED PROBABLE COSTS	
SECTION 'A' - REMOVALS	\$30,940.00
SECTION 'B' - ROAD WORK	\$333,000.00
SECTION 'C' - SANITARY SEWERS	\$730,450.00
SECTION 'D' - MISCELLANEOUS	\$198,979.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$1,293,369.00

SUMMARY OF ESTIMATE PROBABLE PROJECT COSTS	
CONSTRUCTION (including restoration, sewer works)	\$1,293,369.00
ENGINEERING ALLOWANCE	
ENGINEERING (15% of construction costs)	\$194,100.00
GEOTECHNICAL (2% of construction costs)	\$25,900.00
EASEMENT ALLOWANCE	\$250,000.00
TOTAL CONSTRUCTION COST (excluding H.S.T.)	\$1,763,369.00

Notes: Estimate is for sanitary sewer for Howard Ave and Outer Drive including Areas 31-34
 This estimate assumes that reconstruction of one lane of roadway will be required to accommodate the sanitary trunk sewer installation where appropriate.
 The estimate for cross country sanitary sewers estimate one lane of roadway gravel to be installed at this time but the area to be

finished with Topsoil and Hydroseed.
No costs for watermain improvements have been included.
Road Restoration - Assume CL of sewer is 1.0 m from EP,
Assume Restore 3.65 m width of Roadway. (half of roadway)