david schaeffer engineering ltd

FUNCTIONAL SERVICING

&

STORMWATER MANAGEMENT REPORT

FOR

MAYFIELD WEST PHASE 1 – STAGE 2 EXPANSION LANDS

TOWN OF CALEDON
REGION OF PEEL

PROJECT NO. 21-1257

August 2021

**FUNCTIONAL SERVICING & STORMWATER MANAGEMENT REPORT
FOR THE
MAYFIELD WEST PHASE 1 – STAGE 2 EXPANSION LANDS**

TOWN OF CALEDON

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

DRAWINGS

FUNCTIONAL SERVICING & STORMWATER MANAGEMENT REPORT FOR THE MAYFIELD WEST PHASE 1 – STAGE 2 EXPANSION LANDS

TOWN OF CALEDON

1.0 INTRODUCTION

David Schaeffer Engineering Limited (DSEL) has been retained by Argo Kennedy Limited to prepare a Community Functional Servicing and Stormwater Management Report (FSR) in support of a Local Official Plan Amendment (LOPA) for the Mayfield West Phase 1 – Stage 2 (MW1-2) lands in the Town of Caledon. The lands are generally bounded by Highway 10 to the west, Old School Road to the north and the Greenbelt to the east and legally described as Parts of Lot 22, Concession 1 and 2 East of Centre Road Chinguacousy in the Town of Caledon, Regional Municipality of Peel. The subject lands are located immediately to the north of the existing Mayfield West Phase 1 Community and are within the Mayfield West Community Development Plan Area. The purpose of the LOPA is to bring the subject lands into the Settlement Area and designate it for urban land uses.

This FSR is intended to integrate the environmental objectives described in the Comprehensive Environmental Impact Study and Management Plan (CEISMP) with the grading and servicing requirements for the study area. This report will address the functional servicing and stormwater management requirements for the MW1-2 lands. This FSR will confirm that adequate services are available to support the proposed development in accordance with the standards of Town of Caledon, Region of Peel, Toronto Region Conservation Authority (TRCA), and general industry practice. The report will also demonstrate general conformance with the CEISMP and other framework documents that have been prepared for the community, including the Preliminary Hydrogeological Investigation for the subject lands prepared by DS Consultants, 2021.

This community-scale FSR is a higher-level document intended to identify the development constraints, SWM targets, and site serviceability of the overall LOPA area. It is to provide guidance to future draft plans and not intended to be continuously revised to address potential minor revisions to the local road networks that may arise from the advancement of individual draft plans within the community. It will be the responsibility of the individual landowners to comply with the grading and servicing intent of the overall FSR should their draft plans deviate considerably from the road and servicing concepts presented herein. Individual FSR reports will be required for the individual draft plans. The scope of site-specific FSRs will vary depending on the extent of deviation from the overall FSR. For only minor deviations, a conformance letter FSR may be sufficient.

The subject lands are comprised of three main parcels known as the Newhouse, Hicks (also known as Argo Kennedy), and Russell properties as shown on ***Figure 1***. These lands were previously identified as Future Potential Growth Area in the CEISMP for the Mayfield West Community Development Plan Area.

2.0 PREVIOUS STUDIES AND REPORTS

The following material has been reviewed in order to identify the constraints, which govern development within the subject site shown in ***Table 2-1*** below.

Table 2-1: Background Studies and Guidelines

RESOURCES
Etobicoke Creek Hydrology Update TRCA, 2013 *(**Etobicoke Hydrology)***
Humber River Hydrology Update Civica Infrastructure, 2018 ***(Humber Hydrology)***
Comprehensive Environmental Impact Study & Management Plan for the Mayfield West Community Development Plan Area Mayfield West Community, November 2007 ***(MW1 CEISMP)***
Region of Peel Public Works Design, Specifications & Procedures Manual, Linear Infrastructure, Sanitary Sewer Design Criteria Region of Peel, July 2009, revised March 2017 ***(Sanitary Design Criteria)***
Region of Peel Public Works Design, Specifications & Procedures Manual, Linear Infrastructure, Watermain Design Criteria Region of Peel, June 2010 ***(Watermain Design Criteria)***
Erosion & Sediment Control Guidelines for Urban Construction, TRCA et al., 2006 ***(ESC Guidelines)***
Stormwater Management Planning and Design Manual Ministry of Environment, March 2003 ***(SWMP Manual)***
Low Impact Development Stormwater Management Planning and Design Guide Credit Valley Conservation and Toronto and Region Conservation Authority, 2011 ***(LID Design Manual)***
Region of Peel Water & Wastewater Master Plan for the Lake-Based System Region of Peel, 2020

(Peel Master Plan)
Region of Peel Water & Wastewater Master Plan for the Lake-Based System Region of Peel, 2020 ***(Peel Master Plan)***

The above documents form the basis for this report.

3.0 PROPOSED LAND USE

The subject lands are currently under agricultural use and include several natural heritage features associated with tributaries of Etobicoke Creek and the West Humber River. The West Humber tributary (identified officially as Kilmanagh Creek by MECP; or locally by TRCA as Campbell's Cross Creek) is designated as Greenbelt Protected Countryside. Both tributaries are recognized as an 'Environmentally Sensitive Area' and represent 'Core Areas' that are part of the Region of Peel 'Greenlands System'. The portion of Kilmanagh Creek that traverses the Russell parcel is identified as part of the Greenbelt Plan Area as per the Town's OP. Portions of the Etobicoke Creek Headwater Provincially Significant Wetland (PSW) Complex are located to the north and south of the subject lands.

The subject lands are approximately 100 ha and proposed to be developed for residential and related purposes. The plan includes single detached houses, conventional, lane-based, street, and back-to-back townhouses, medium density, parks, natural heritage features, stormwater management ponds, and municipal right-of-way. The development concept, illustrated in ***Figure 2***, includes the following land uses listed in **Table 3-1** separated between proposed land uses.

Table 3-1: Summary of Proposed Land Uses

LAND USE	AREA (HA)	UNITS
Residential	34.41	1282
Future Development	1.08	
Medium Density Block	1.08	
Parks	3.36	
Pump Station	0.11	
SWM Pond	7.05	
Walkway / Vista	1.05	
Municipal Right of Way	15.77	
Greenbelt	11.00	
Natural Heritage System	24.76	
Road Widening	0.70	
TOTAL	**100.37**	**1282**

4.0 STORM DRAINAGE

The subject property will be developed using a treatment-train approach for addressing stormwater runoff generated by the proposed development, consisting of:

- the application of source control and LID techniques as appropriate, preferentially located in public areas with appropriate soil conditions to provide stormwater quality control and enhance the water balance;

- conveyance techniques as appropriate; and

- end of pipe facilities such as wetlands, wet ponds, and hybrids for additional quantity, quality, and erosion control.

The pre-development drainage areas for the subject property are shown in ***Figure 3***. External post-development drainage areas are shown in ***Figure 4.***

4.1 Existing Features and Drainage Patterns

The majority of the subject lands are situated in the Etobicoke Creek Watershed, with a relatively small easterly portion of the Russell property within the Humber River Watershed. The lands in the Humber watershed drain to Campbell's Cross Creek, which is also within the Natural Heritage System (NHS) of the Protected Countryside of the Greenbelt Plan.

The lands west of Kennedy Road are traversed by Etobicoke Creek and one of its tributaries. These natural heritage features segment the development area into three distinct areas. Topography of the areas is undulating with the general slope towards the Etobicoke Creek valley. Existing grades can be described as rolling to steep, with the steeper grades associated with the valley slope of Etobicoke Creek. The valley is generally wooded with a number of wetland features extending along the meandering low flow channel. A beaver dam is currently disturbing the natural water levels in the low flow creek corridor. Immediately south of the Hicks parcel is a Provincially Significant Wetland (PSW).

The Russel lands east of Kennedy Road are traversed by the drainage divide between Etobicoke Creek and Humber River watersheds. Approximately 9.6 ha of the developable lands drain to the Humber River with the remainder to Etobicoke Creek. Of the drainage to Etobicoke Creek, approximately 2.4 ha is conveyed directly to the natural heritage system through a culvert at the intersection of Old School Road and Kennedy Road. An additional 2.6 ha is conveyed through a culvert in Kennedy Road to the Hicks parcel where it disperses overland and ultimately enters Etobicoke Creek within the MW1-2 lands. The remaining 11.7 ha drains southerly to existing residential lands at Bonnieglen Farm Boulevard.

The existing drainage entering along Bonnieglen Farm Boulevard is conveyed via storm pipes to an existing stormwater management facility known as MW1 Pond E2. The facility is located at the southwest corner of Dougall Avenue and Old Kennedy Road where it discharges to Etobicoke Creek.

The easternmost limit of the development lands is defined by the Greenbelt associated with the West Humber River (aka Campbell's Cross Creek). A cemetery is located on the east side of Kennedy Road adjacent to the Russel property and is not part of this LOPA application.

Beyond the natural heritage features, the lands are currently generally used for active row-crop agricultural activities and consist of managed fields and farmed-through minor drainage swales.

The existing drainage regime is shown on ***Figure 3***.

4.2 Etobicoke Creek Floodplain Assessment

The floodplain model and mapping for Etobicoke Creek completed to date by the TRCA was intended for use only as a screening tool to determine whether properties or structures are potentially susceptible to flooding. The TRCA confirmed this information is not appropriate for use in determining the development limit for the subject lands since the model didn't include crossing structures, doesn't have refined Manning's n values, and crossing geometry is not detailed. As such, the TRCA recommended the model be refined with more detailed information in support of this LOPA application.

The TRCA provided the HEC-RAS 6.0.0 model and a refined hydraulic assessment has been undertaken. Reaches of the model through the subject lands were updated based on site-specific survey information and LiDAR data. Reaches were modified from their confluence on the subject lands to the upstream crossings of Old School Road. An additional reach was added to the model to define flood levels between the confluence of the two reaches and the downstream crossing of Highway 10 / Hurontario Street. Culvert details of the crossings of Old School Road were added based on survey information or culvert replacement details shown on the 90% design drawings of the imminent reconstruction of Old School Road, as appropriate. Manning's roughness coefficients were reviewed and refined. The existing beaver dam was included in the model as an inline structure based on survey data.

Based on the above, design water levels and velocities under existing conditions for Etobicoke Creek were determined and incorporated into the development limit constraint mapping and overall design of the site. Details of the floodplain assessment including the refined digital HEC-RAS model is provided in ***Appendix C***.

4.3 Proposed Drainage Patterns

Post-development drainage areas have been regularized to reflect the concept plan and with due consideration for property ownership and community phasing. A conventional storm sewer system and major system conveyance network is designed to direct storm flows safely through the catchment to designated stormwater management facilities for treatment. The proposed drainage scheme is illustrated in ***Figure 4.*** The 100-year capture areas where major overland flow route to the ponds is not possible due to grading constraints have been illustrated on ***Drawing 2***.

The number and location of ponds and the associated drainage areas presented in this report are generally established on technical merits and environmental consideration. The number of stormwater management ponds have been minimized without compromising the benefits of stormwater management.

Pond 1 services the south portion of the Hicks parcel. Pond 2 services the majority of the Newhouse property, while Pond 3 treats drainage from the north portion of the Hicks parcel. The

Russell lands are generally serviced by Pond 4. Ponds 1, 2, and 3 are tributary to Etobicoke Creek while Pond 4 outlets to the West Humber River.

Given the undulating topography and the segmented development areas caused by the existing natural heritage systems that traverse the lands, there are two locations where conveyance of flows to the proposed ponds is not feasible. In these localized areas, as highlighted on ***Figure 4***, it is proposed to utilize oil/grit separator (OGS) units to achieve stormwater quality controls with major system flow conveyed to the adjacent valley. The locations are in the northeast corner of the Newhouse property (1.05 ha) and the northeast area of the Hicks parcel (1.27 ha). Sizing details of the OGS units will be completed at detailed design.

The grading and drainage boundaries may be further refined at the detailed design stage. The locations and number of stormwater management ponds may change to meet the individual owners timing and servicing needs through detailed design. Preliminary plan and profiles are shown on ***Drawing 4*** through ***Drawing 6***.

4.3.1 Etobicoke Creek / Humber River Watershed Drainage Divide

The watershed divide between Etobicoke Creek and the Humber River traverses the non-participating Russell property east of Kennedy Road as described in ***Section 4.1***. For the area within the Russell lands draining to Etobicoke Creek, the majority is conveyed to existing residential development to the south (11.7 ha) where it is captured in the storm sewer system of Bonnieglen Farm Boulevard as pre-development drainage. No accommodation was made in the existing downstream storm pipes and stormwater management facility for post-development flows from the Russell lands.

The proposed grading and stormwater drainage concept has minimized the area draining to Bonnieglen Farm Boulevard. A 3.06 ha area of post development (including the existing cemetery) in the southwest corner will continue to drain to the existing Etobicoke Creek system and utilize the capacity provided in the downstream system for the pre-development drainage area. The remaining area of the Russell property is proposed to be conveyed to Pond 4. However, this concept results in a diversion of flows from the Etobicoke Creek watershed to the Humber River. A summary of the proposed drainage area changes is shown in ***Table 4-1***.

Table 4-1: Summary of Drainage Changes for Non-Participating Russell Property

Tributary	Pre-Development Drainage Area (ha)	Post-Development Drainage Area (ha)	Difference (ha)
Etobicoke Creek			
- Within MW1-2 Lands	4.21	0.16	(4.05)
- via Bonnieglen Farm Blvd to Existing MW1 Pond E2	10.82	2.44	(8.38)
- Total Etobicoke	15.03	2.60	(12.43)
West Humber River	9.61	22.44	12.43
Total	**24.64**	**24.64**	**-**

This concept reduces the number of SWM facilities, which subsequently eliminates the condition where the SWM facility would discharge flows to an existing storm sewer, and thus avoids mixing clean flows with untreated drainage.

When the Russell property proceeds to development, this concept can be further refined. Potential alternatives can be investigated including the ability for the existing downstream storm system and stormwater management facility to accommodate additional post-development drainage.

It is noted that topographical constraints do not allow this southerly area of the Russell property to be conveyed north through the Hicks lands to Etobicoke Creek.

4.3.2 Boundary Road Drainage

The boundary roads have been reviewed to identify areas that could potentially drain to ponds within the study area for treatment. The drainage areas for the boundary roads which are proposed to drain to the subject site ponds are illustrated in ***Drawing 2***.

Old School Road is a rural cross section. Reconstruction of the road between Highway 10 and Kennedy Road is expected to take place in 2021, but it will maintain a rural cross section. Within the frontage of the subject lands, the road crosses several watercourses and the undulating topography does not allow for a significant amount of drainage to be physically conveyed to the development ponds. As shown on ***Drawing 2***, approximately mid-way between Highway 10 and Kennedy Road, a segment of approximately 200m in length is able to be captured (0.55 ha) and conveyed to Pond 3. The area has been accommodated at a runoff coefficient of 0.90 based on the existing ROW limits.

The western segment of Old School Road to Highway 10 has not been accommodated in the SWM pond. However, the segment has been accounted for in the sizing of the clean flow pipe that captures external drainage from north of Old School Road from the existing ditch. Refer to ***Section 4.6*** for further details.

The remaining segments of Old School currently outlet directly to the intersecting watercourses and will require their own stormwater management design as part of future road reconstruction designs by others.

Kennedy Road is a rural cross section. An EA has been completed and preliminary design is underway for reconstruction from Bonnieglen Farm Boulevard to Old School Road. It is proposed to be reconstructed to a rural cross section with the addition of a 3.0m multi-use trail. Ultimately, it is anticipated the road will be reconstructed to an urban cross section at a later date. Ultimate post development drainage from Kennedy Road has been accommodated in the development pond where possible. This extends from the southernmost intersection of the Hicks parcel to approximately 250m north (0.64 ha) as shown on ***Drawing 2***. For this segment, the minor system has been accommodated in Pond 1 along with the major system from the west side of the ROW. Major system flows on the east side of the segment has been accounted for in Pond 4 on the Russell parcel. North of this segment, Kennedy Road drainage cannot be physically directed to a development pond. This segment will require its own stormwater management concept to be developed as part of the ultimate road design by others.

4.4 Conveyance of Minor System Flows

The subject property will generally be serviced by a conventional storm sewer system designed in accordance with Town of Caledon standards:

- Storm sewers will be sized using a 10-year return frequency without surcharging where foundation drains will be connected to the storm sewer.
- Storm sewers will be sized using a 5-year return frequency where foundation drains will not be connected to the minor system (i.e. sump pumps are utilized).

Sump pumps will be required in areas of shallow storm sewers or where 0.3 m of freeboard is not achieved from the 100 year / Regional hydraulic grade line to the underside of footing elevation. The sump pump outlet locations will be established through detailed design and will require back flow preventers or gooseneck connections to discharge to the storm sewer.

Given grading constraints associated with boundary roads and natural heritage systems, combined with the requirement for Regional control ponds and the resulting pond water levels and hydraulic grade line, sump pumps will be required for the subject lands. As such, in accordance with Town standards, the storm sewers are to be sized using a 5 year return frequency.

Storm flows will be directed to one of the four proposed stormwater management facilities in the study area, where the runoff will be treated for water quality, erosion, and quantity control. Localized areas that cannot be conveyed to the stormwater management facilities will be treated using oil-grit separators.

The conceptual storm servicing plan is provided in ***Drawing 2*** and the overall drainage plan identifying catchment areas to the respective ponds is provided in ***Figure 4***. Preliminary plan and profiles are shown on ***Drawing 4*** through ***Drawing 6***.

4.5 Conveyance of Major Storm Flows

A continuous overland flow route will be provided through the study area in order to safely convey major system flows in excess of the minor system and up to the 100-year event. Overland flow routes will be directed to one of four stormwater management ponds located within the study area. The major system flow will not exceed the width of the road allowance, and in no case will the depth of flow exceed 0.30 meters above the gutter of the road during a 100 year event, in accordance with the Town of Caledon criteria.

Should the major system flow exceed the conveyance capacity of any given road, the storm sewer will be sized to accommodate the flows in excess of the road capacity.

The major system flows will be attenuated in the stormwater management ponds to achieve the allowable release rates as defined in ***Section 5.0***.

In order to reduce the fill requirements and to minimize grade differences at boundary roads and the natural heritage system, an area of 100-year capture is proposed at the northeast corner of the Hicks parcel as shown on ***Drawing 2***. Details of capture inlets will be completed at detailed design.

The conceptual major storm system is illustrated on ***Drawings 1 and 2***. Preliminary plan and profiles are shown on ***Drawing 4*** through ***Drawing 6***.

4.5.1 Uncontrolled Areas

Driven primarily by grading constraints, there are two circumstances that result in major system flows that are unable to be attenuated in the stormwater management facilities. These scenarios include:

- Rear yards backing onto the natural heritage system (2.51 ha). Drainage from these areas is considered clean water.
- Two localized areas serviced by oil/grit separator (OGS) units for quality control (2.32ha).

An assessment has been completed to demonstrate these uncontrolled areas can discharge to Etobicoke Creek without increasing the total peak flows from the subject lands. The areas are shown on ***Figure 4*** and the detailed assessment is included in ***Appendix D***.

A SYMHYMO model was developed based on the Visual OTTHYMO model from the April 2013 Etobicoke Creek Hydrology Update by MMM Group Limited, as provided by the TRCA. A node located downstream of the subject lands (Node C) was identified as the key point of comparison. The assessment also included three additional nodes within the proposed development area for comparison purposes. A summary of the peak flow comparison downstream at Node C is provided in ***Table 4-2***.

Table 4-2: Summary of Peak Flow Comparison (at Node C)

Scenario	Peak Flow (m^3/s)						
	2-yr	**5-yr**	**10-yr**	**25-yr**	**50-yr**	**100-yr**	**Regional**
Existing Conditions	8.52	15.56	21.35	29.42	35.97	42.91	181.90
Post Development	8.46	15.47	21.20	29.20	35.68	42.56	180.30
Difference	*(0.06)*	*(0.09)*	*(0.15)*	*(0.22)*	*(0.29)*	*(0.35)*	*(0.60)*

The assessment concludes that peak flows on Etobicoke Creek are lower than existing with the proposed development in place, when compared to existing conditions for the 2-year to 100-year or Regional storm events. As such, overcontrol in the development ponds is not required for these areas within the development.

Note that Old School Road drainage areas that discharge directly to the watercourses have not been considered in this analysis since they drain directly to the creek under existing conditions and are not part of the subject lands.

4.6 External Drainage

External drainage generally enters the subject lands from north of Old School Road and west of Highway 10. The majority of external drainage is conveyed within the natural valley systems located and to be maintained within the subject lands. There are, however, a few locations where external flows currently enter the proposed development tablelands and will need to be captured and conveyed. A summary of these are as follows, with reference to drainage areas identified on ***Figure 3***:

Northwest (59 ha)

This area is located at the northwest corner of the subject lands. Drainage enters the site through a 600mm diameter CSP culvert on Old School Road that is approximately 100m east of Highway 10. There may also be an additional culvert on Highway 10 approximately 200m south of Old School Road that is to be confirmed. It is proposed to capture and convey this drainage within a dedicated clear flow storm pipe to be located within ROW's, buffer/greenway blocks, and the SWM block and discharged to Etobicoke Creek as shown on ***Drawing 2***.

Old School Central 1 (1.5 ha)

This area is located north of Old School Road, approximately mid-way between Highway 10 and Kennedy Road. Minor re-grading of the south ditch of Old School Road is proposed to convey this flow directly to the tributary of Etobicoke Creek.

Old School Central 2 (16.4 ha)

This area is located north of Old School Road, approximately mid-way between Highway 10 and Kennedy Road. Drainage enters the subject lands through a 600mm diameter CSP culvert crossing Old School Road. It is proposed to capture and convey this external drainage through a dedicated clean flow pipe within the proposed ROWs and outlet to Etobicoke Creek as shown on ***Drawing 2***.

Kennedy Road

Drainage from a portion of Kennedy Road is conveyed through the subject lands. The northernmost segment enters Etobicoke Creek directly in the vicinity of the Old School Road intersection. Conveyance of external road drainage is further discussed in ***Section 4.3.2***.

Cemetery

There is an existing cemetery fronting Kennedy Road adjacent to the Russell property. Conveyance of pre-development drainage from these lands has been considered in the design of the lands but no accommodation for the future development is necessary.

5.0 STORMWATER MANAGEMENT

Stormwater management for the subject lands will be accommodated in four (4) stormwater management ponds, with localized use of OGS units in two locations as described in ***Section 4.3***. Each pond services a distinct development area and all facilities are proposed as wet ponds as further described below. Details for OGS units will be provided at detailed design.

Pond 1 is located on the Hicks south lands and discharges to Etobicoke Creek. The peninsula pond is situated at the low point of the area and is bounded on three sides by the natural heritage system. Groundwater constraints may limit the depth of the facility and a clay liner is anticipated to be required.

Pond 2 is located on the Newhouse parcel immediately adjacent to Highway 10. The current concept identifies the outfall location to be at the headwater drainage feature (HDF) to the east of the pond. Alternatively the pond could potentially discharge directly to Etobicoke Creek, subject to erosion and feature-based water balance assessments for the HDF.

Pond 3 is located on the Hicks north parcel and outlets to Etobicoke Creek.

Pond 4 is located on the non-participating Russel property and conveys drainage to the West Humber River (Campbell's Cross Creek). Currently the pond concept is demonstrated to be outside the Greenbelt limit. However, when the Russell lands proceed actively, further assessment is encouraged to utilize Greenbelt lands for open space uses, including SWM blocks. Should the pond be relocated within the Greenbelt, it must be located outside of the buffers and features associated with Campbell's Cross Creek such as the long-term stable slope, meander belt, floodplain, as determined in consultation with the TRCA.

The following sections outline the preliminary details for Ponds 1 through 4 within the subject lands.

5.1 Design Criteria

Stormwater management within the subject lands must be practiced as follows:

Water Quality Control

- Provide **Enhanced (Level 1)** water quality treatment, sized in accordance with the ***SWMP Manual.***

Erosion Control

- Provide adequate drawdown time / erosion control to protect the form and function of watercourses downstream of the SWM facilities as per TRCA requirements of a 48-hour drawdown time for the 25 mm storm runoff volume

Quantity Control

- Volume required to meet unitary rates from the TRCA's ***Etobicoke Hydrology*** and ***Humber River Hydrology*** reports based on post-development drainage area to SWM facility.
- As per discussion with TRCA, ponds tributary to Etobicoke Creek are to use unit flow rates pro-rated between existing catchments 13 and 34.
- Quantity Controls are required for 2- to 100-year and Regional storm events.

All facilities will be designed accordingly to meet the criteria in Section 4.2.1 of the TRCA's Approaches to Manage Regulatory Event Flow Increases resulting from Urban Development (TRCA, 2016), where applicable.

Pond 4 outlets to a tributary that is considered occupied habitat for the endangered Redside Dace. Redside Dace is listed both federally and provincially as endangered and is regulated by DFO under the *Species at Risk Act* and by MECP under the *Endangered Species Act*. As such, a deeper permanent pool (average 3.0m) is required for additional thermal mitigation as per MECP.

Through discussion with TRCA, it has been confirmed that since the lands tributary to Etobicoke Creek are located in close proximity to Catchments 13 and 34 as identified in the ***Etobicoke Hydrology Study***, the average unitary rates from these catchments can be used for the subject lands for the 2-year to Regional events. As per the ***Etobicoke Hydrology Study***, the 2- to 100-year unitary rates control flows to 60% of pre-development levels.

Control for the 2- to 100-year events for lands tributary to the Humber River are based on the unit flow equations in the ***Humber River Hydrology*** report for sub-basin 36. The Regional unitary rate is calculated using existing Regional flow of the sub-catchment area where the subject site is located within Humber River Watershed and the result is 0.061 m^3/ha as provided by the TRCA.

A summary of the unitary release rate criteria is provided in ***Table 5-1***.

Table 5-1: Quantity Control - Unit Release Rate Criteria

Storm Event	Unit Release Criteria	
	Etobicoke Creek (Pond 1, 2, 3)	Humber River (Pond 4)
	Unit Release Rate (m^3/s/ha)	Unit Flow Equation Q (L/s)
2-yr	0.00349	9.506A – 0.719lnA
5-yr	0.00618	14.652A – 1.136lnA
10-yr	0.00827	17.957A – 1.373lnA
25-yr	0.01112	22.639A – 1.741lnA
50-yr	0.01340	26.566A – 2.082lnA
100-yr	0.01579	29.912A – 2.082lnA
Regional	0.05717	0.061 m^3/s/ha

5.2 Operating Characteristics

The stormwater management ponds have been designed in accordance with the requirements of the Town of Caledon ***Design Standards***, ***TRCA Hydrology Updates,*** and the ***SWMP Manual***, and include the following features:

Sediment Forebay to improve sediment removal prior to entering the pond

Permanent Pool to provide water quality and trap pollutants

Extended Detention Storage to provide erosion control

Quantity Control Storage to attenuate post development flows to the allowable release rates as per the ***Hydrology Updates***

The conceptual designs of the stormwater management ponds including typical cross sections are presented in ***Figure 7*** through ***Figure 10.*** All ponds are designed as a wet pond. A summary of the pond operating characteristics is presented in ***Table 5-2***:

Table 5-2: Summary of Required Pond Storage Characteristics

Pond I.D.	Drainage Area (ha)	Imp. Coverage (%)	Permanent Pool Volume [1] (m^3)	Erosion Control Volume [2] (m^3)	100 Year Flood Control Volume [3] (m^3)	Regional Flood Control Volume [3] (m^3)
Pond 1	10.05	70	1,859	1,672	4,998	10,980
Pond 2	14.31	71	2,671	2,413	7,186	15,800
Pond 3	10.25	69	1,879	1,681	5,049	11,070
Pond 4	22.30	70	4,126	3,710	10,980	21,520

1 Permanent pool and quality control provided for MOE Enhanced project as per MOE SWMP Manual
2 Erosion control to provide 48-hour drawdown time for the 25mm storm runoff volume
3 Proposed conditions as modelled in SWMHYMO. Post- to pre-development quantity control required for the 2- to 100-year and Regional events in accordance with the pro-rated unit flow rates of existing catchments 13 and 34, as provided by TRCA (60% of base condition) for Pond 1, 2, and 3 and the unit flow equations for Sub-Basin 36 of Humber for Pond 4, as provided by TRCA.

The impervious coverage has been estimated based on the various land uses and their respective sizes in the current plan. The final impervious coverage will be updated at the detailed design stage based on the characteristics of the actual plan.

5.3 Pond Components

5.3.1 Sediment Forebay

A sediment forebay is provided in each pond to improve the pollutant removal by trapping larger particles near the inlet of the pond. The forebays are designed with a length to width ratio of approximately 3:1 and do not exceed one third of the permanent pool surface area, as required in the ***SWMP Manual***. The forebays have a depth of 1.5 m to minimize the potential for re-suspension. Detailed sediment forebay sizing calculations will be provided at detailed design.

5.3.2 Permanent Pool

The permanent pools have been sized to provide Enhanced level of protection in accordance with the ***SWMP Manual.*** The average permanent pool depths are proposed as 1.5 m for Ponds 1, 2, and 3. For Pond 4, an average permanent pool depth of 3.0m has been provided to provide additional thermal mitigation required by MECP for areas subject to redside dace requirements. The storage characteristics are summarized in ***Table 5-3***.

Table 5-3: Permanent Pool Storage

Pond I.D.	Drainage Area (ha)	Imp. Coverage (%)	Volume[1] Required (m^3)	Volume Provided (m^3)
Pond 1	10.05	70	1,859	2,322
Pond 2	14.31	71	2,671	3784
Pond 3	10.25	69	1,879	3,872
Pond 4	22.30	70	4,126	9,432

1 SWMP Design Manual, Table 3.2

The slopes in the permanent pools will be graded with side slopes of 4:1 and 7:1, with minor localized variations.

5.3.3 Extended Detention

Stormwater erosion criteria for proposed SWM facilities were established based on the TRCA SWM Criteria (2012) and MOE (2003) requirement for extended detention volume based on detention of the 25mm storm event over a period of 48 hours. This level of design was sufficient to develop preliminary sizing of stormwater facilities in support of the land use plan. Through subsequent stages of study, consultation will be undertaken with TRCA to confirm additional erosion analysis scope requirements for stormwater management, such as determination of an appropriate erosion threshold and exceedance analysis, in coordination with the geomorphic assessment.

The resulting pond characteristics are summarized in ***Table 5-4.***

Table 5-4: Extended Detention / Erosion Control

Pond I.D.	Drainage Area (ha)	Imp. Coverage (%)	Release Rate Required[1] (m^3/s)	Volume Required[1] (m^3)	Volume Provided (m^3)
Pond 1	10.05	70	0.010	1,672	1,728
Pond 2	14.31	71	0.014	2,413	2,614
Pond 3	10.25	69	0.010	1,681	1,703
Pond 4	22.30	70	0.021	3,710	3,790

[1] Based on 48-hour drawdown time for the 25 mm storm runoff volume

The extended detention component has been provided with side slopes of 7:1 with minor localized variations. Side slopes of 7:1 have been applied to the pond area 1 m on either side of the permanent pool water levels.

The extended detention volumes within the ponds will outlet through a reverse graded pipe. An orifice will be provided to discharge the extended detention volume at the allowable release rate. When used in connection with a perforated pipe outlet configuration, the minimum orifice size as per the ***SWMP Manual*** is 50mm. If this is not possible, an alternative option such as using a custom inlet control device (e.g. Hydrovex) may be reviewed at the detailed design stage.

5.3.4 Quantity Control

Flood control for the subject lands is to be provided for 2-to-100 year and Regional Storm events based on the target release rates outlined in ***Section 5.1***. The details of the outlet structures for each pond will be determined at the Functional Servicing Report stage or detailed design stage.

The required quantity control release rates are summarized in ***Table 5-5*** below and have been incorporated into the pond designs.

Table 5-5: Quantity Control - Target Release Rates

Component	Target Release Rate (m^3/s)			
	Pond 1[1]	Pond 2[1]	Pond 3[1]	Pond 4[2]
2-yr	0.035	0.050	0.036	0.162
5-yr	0.062	0.088	0.063	0.248
10-yr	0.083	0.118	0.085	0.305
25-yr	0.112	0.159	0.114	0.384
50-yr	0.135	0.192	0.137	0.448
100-yr	0.159	0.226	0.162	0.507
Regional	0.575	0.818	0.586	1.360

1 Post- to pre-development quantity control required for the 2- to 100-year and Regional events in accordance with the pro-rated unit flow rates of existing catchments 13 and 34, as provided by TRCA (60% of base condition).

2 Post- to pre-development quantity control required for the 2- to 100-year and Regional events in accordance with the unit flow equations for Sub-Basin 36 of Humber, as provided by TRCA.

The ponds have been modelled in SWMHYMO to determine the storage volumes required to achieve the target peak outflow rates for each storm event. A summary of the required volume is presented in ***Table 5-6***, with further details provided in ***Appendix E***.

Table 5-6: Quantity Control - Target Storage Volumes

Component	Target Storage (m^3)			
	Pond 1	Pond 2	Pond 3	Pond 4
2-yr	2,284	3,308	2,291	4,481
5-yr	2,997	4,331	3,012	6,058
10-yr	3,478	5,030	3,499	7,240
25-yr	4,122	5,933	4,157	8,765
50-yr	4,561	6,560	4,607	9,879
100-yr	4,998	7,186	5,049	10,980
Regional	10,980	15,800	11,070	21,520

A drop inlet structure will be provided at the pond outlets, which restricts flows to the required rates for 2- to 100-year and Regional storm events by a combination of orifices and/or weirs. The outlet pipe will be sized such that the full flow capacity of the pipe exceeds the maximum regional pond outflow for each pond.

Regional active storage will be provided up to a maximum 3.5 m depth. A 0.10m freeboard from the Regional water level to the emergency spillway elevation is to be provided.

Pond block sizes provided are approximate. It is expected the preliminary ponds will be refined through Functional Servicing Reports for individual properties.

5.3.5 Emergency Overflows

In the event of a blockage or a storm greater than the Regional Event, an emergency overflow weir has been provided. The emergency overflow weir will be sized to convey the greater of the unattenuated 100 year or Regional inflow to the pond.

5.3.6 Access Road

A 5.0 m wide access road will be provided on at least two sides of the pond blocks to facilitate routine inspection and maintenance activities within the pond. The access road will be graded with a maximum slope of 2% cross slope, and 10:1 longitudinal slope for the access road into the pond forebay and main cell.

The pond access roads will connect to municipal right-of-ways, and will allow for access to the outlet structure, inlet structures, forebay and main cell. The maintenance access road will be configured such that two points of entry are provided where possible. The access road shall be situated in a manner that allows trucks to drive around the pond without having to turn around; alternatively, the access road may incorporate a turning circle (minimum radius 12.0m) where two access points are not provided.

Trails will be combined with the maintenance access roads in locations where the trail alignment passes through the SWM pond block.

5.3.7 Sediment Drying Area

The Town has varied criteria depending on whether sediment removal operations will occur in dry conditions or wet conditions. The MW1-2 facilities are designed to be cleaned in the wet condition. According to the Town criteria for cleaning in wet conditions, sediment drying areas are to be provided above the high water level to dewater the excavated sediment. However, these have not been provided. Many neighbouring jurisdictions do not use sediment drying areas and their ponds have been cleaned out successfully prior to assumption. In municipalities that do require sediment drying areas, it has been observed that contractors do not use the sediment drying areas when cleaning ponds prior to assumption. Instead, it has been observed that contractors will use long-boom excavators to recover sediment from the forebays and load directly into dump trucks. The dump trucks are prepped by placing a layer of clay on the truck bed, and the wet sediment is immediately hauled off site. The dump trucks are not fully loaded to mitigate spillage.

Furthermore, there will be a treatment train approach to providing stormwater management as described in ***Section 6.0***. The LIDs proposed for the subject lands will contribute to reducing post-development runoff for frequent storm events and potential sediment loading to the ponds. This approach may extend the lifespan of the ponds before clean-out is required.

Alternative methods for dredging the SWM facilities can also be explored at detailed design, including:

- winter sediment removal in which the sediment is frozen and easier to haul off site with less dewatering
- on-site filtering methods which involve pumping / pressing with minimal disturbance to the pond.

5.4 Thermal Mitigation

Effluent from ponds can experience increased temperatures due to solar exposure prior to discharging from the facilities. The stormwater management concept is to consider opportunities to reduce thermal inputs to the receiving watercourses. General guidance on opportunities and implementation of thermal mitigation practices can be found in the Thermal Impacts of Urbanization including Practices and Mitigation Techniques (CVC, January 2011). The following acceptable techniques in order of implementation priority should be considered when developing detailed subdivision designs:

- LID infiltration BMPs;
- Deep pool and bottom-draw from SWM facility;
- Urban terrestrial canopy;
- Facility shading, orientation and length to width ratio; and,
- Concrete sewer system.

The CVC Thermal Impacts report identified five zones where thermal mitigation measures can be implemented. These include:

- Zone 1 - Pond catchment area
- Zone 2 - Stormwater Management Facility Inlet
- Zone 3 - Stormwater Management Facility
- Zone 4 - Stormwater Management Facility Outlet
- Zone 5 - Riparian Corridor

The typical outlet structure for all SWM facilities will consist of a deep outlet pool, reverse-slope extended detention pipe, and a sub-surface outlet pipe. The thermal mitigation strategy including planting/landscaping details will be further refined during the detailed SWM facility design stage. The potential thermal mitigation measures that can be considered for each facility is summarized in ***Table 5-7***.

Table 5-7: Potential Thermal Mitigation Measures

Thermal Mitigation Techniques per Development "Zone"						
Thermal Mitigation Techniques	**Zone**	**Pond**				**Notes**
		1	**2**	**3**	**4**	
Energy transfer between warm storm runoff and cool sub-surface storm sewers	1	Yes	Yes	Yes	Yes	
LID measures	1	Yes	Yes	Yes	Yes	See ***Section 6.0*** of this report
Roof Colour	1	TBD	TBD	TBD	TBD	Development characteristics not yet known
Downspout Disconnection	1	Yes	Yes	Yes	Yes	
Up-Gradient Plantings	1	Yes	Yes	Yes	Yes	
Buried Inlet Pipe	2	Yes	Yes	Yes	Yes	
Inlet Cooling Trench	2	No	No	No	No	Not recommended due to additional infrastructure/ maintenance
Inlet Plantings	2	Yes	Yes	Yes	Yes	
Shading of open water areas by maximizing canopy	3	Yes	Yes	Yes	Yes	
Artificial shade system	3	No	No	No	No	Not recommended due to additional infrastructure/ maintenance
Floating island	3	No	No	No	No	Not recommended due to additional infrastructure/ maintenance
Reduce Open water area	3	Yes	Yes	Yes	Yes	
Increased L:W Ratio	3	No	No	No	Yes	Not recommended due to location constraints
Pond orientation to increase exposure to prevailing wind	3	No	No	No	No	The orientation of the ponds are based on topographic and boundary constraints and to meet other development objectives.
Landscaped jetties for shading	3	Yes	Yes	Yes	Yes	
Sub-surface SWM Facility	3	No	No	No	No	Not practical for large drainage areas
Outlet sub-surface cooling trench and shading	4	No	No	No	No	Not recommended – historically MECP has indicated cooling trenches have marginal effect on effluent water temperatures
Concrete outlet pipe	4	Yes	Yes	Yes	Yes	
Introduce cool water at SWM Pond outlets such as foundation drain collectors, where feasible	4	No	No	No	No	Not recommended due to additional infrastructure/ maintenance
Reversed slope submerged pond outlet and extra permanent pool depth at outlet	4	Yes	Yes	Yes	Yes	
Distributed outlets along the NHS to take advantage of the NHS shading	4	Yes	Yes	Yes	Yes	
Night time release of discharge	4	No	No	No	No	Not recommended due to additional infrastructure/ maintenance of resulting complex system
Watercourse shading	5	Yes	Yes	Yes	Yes	

6.0 LOW IMPACT DEVELOPMENT STRATEGIES

Low Impact Development Techniques (LIDs) can help mitigate the effects of development on the water budget, promote at-source retention, and maintain groundwater infiltration volume in the post-development condition. The use of LIDs forms part of a "treatment-train" approach to achieve overall stormwater management benefits, such as reducing thermal impacts, achieving water balance targets, promoting retention on the up-gradient pond catchment to minimize runoff and more closely match pre-development watershed characteristics along with other benefits.

Techniques aimed at directing runoff towards high pervious areas such as parks, swales and backyards, and increased topsoil thickness can increase groundwater infiltration in development areas. Other LID measures may include bioswales, rain gardens, perforated pipe systems, infiltration trenches and facilities, permeable pavements, tree boxes and rainwater harvesting techniques. The implementation of LIDs will be refined at the detailed design stage. It is noted that a general lack of permeable soils in the MW1-2 area may preclude certain LID measures or the ability to meet recharge targets/

6.1.1 LID Locations and Ownership

To promote infiltration across the subject lands, preliminary LID measures are suggested:

- Increased topsoil depths on all detached product and conventional townhouse product (private property);
- Increased topsoil depths in the boulevard (public property);
- Increased topsoil depth in channel/parks/pond (public property); and
- Disconnected roof leaders to discharge to rear yards in low and medium density blocks (private property)
- Swales where feasible in NHS areas, parks, downstream of stormwater management outfalls, adjacent to rear lots located within buffers, overland flow easements, and private side yard / rear yard swales
- Sub-Surface Infiltration LIDs
    - Infiltration trenches or galleries in parks and parkettes (public property); and
    - Infiltration trenches in rear yards (private property)

The list above is based on a combination of LIDs that are applicable in private property and public property. It is possible to provide additional LIDs in open space area or buffers subject to approval. The list above is not meant to be exhaustive or preclude other LID measures. Further LID considerations can be reviewed for individual draft plans as part of the Functional Servicing Reports prepared in support of draft plans.

6.2 Community Water Balance Assessment Recommendations

Overall site water balance requirements have been assessed by DS Consultants in the Preliminary Hydrogeological Investigation for the subject lands dated August 2021. The assessment established recharge targets for catchment areas based on varying soil types, land cover and flow characteristics. The report identified that without mitigation, the MW1-2 lands will experience a decrease in infiltration and increase in total runoff under a post-development scenario. The effects are mainly the result of increased impervious area and decreased pervious areas of the subject lands.

Based on results of the pre-development and post-development water balance completed by DS Consultants, the proposed impervious areas will produce a reduction in annual Actual Evapotranspiration (AET) at the Hicks, Newhouse and Russell properties of 72,042 m^3/year, 62,829 m^3/year and 87,526 m^3/year, respectively. A reduction in annual infiltration is estimated of 8,991 m^3/year, 13,107 m^3/year and 15,424 m^3/year, respectively. An increase of annual runoff is estimated for the Hicks, Newhouse and Russell properties of 45,251 m^3/year, 44,347 m^3/year and 59,472 m^3/year, respectively.

The assessment noted that passive measures of downspout disconnection and directing of rooftop drainage to increased topsoil depth in pervious grassed areas assist with water retention and provide a longer duration for infiltration to occur. Additional Low Impact Development strategies (LIDs) are recommended to promote infiltration and more closely represent pre-development conditions within the MW1-2 lands. Following passive measures, the remaining annual infiltration volume targets, discretized by landowner, as provided by DS Consultants is summarized in ***Table 6-1***.

Table 6-1: Target Additional LID Infiltration Volumes

Property	Pre-Development Annual Infiltration Volume (m^3/year)	Post-Development Annual Infiltration Volume Without Mitigation (m^3/year)	Target Annual Infiltration Volume (m^3/year)
Newhouse	58,830	45,723	13,107
Hicks	56,181	47,190	8,991
Russell	65,721	50,298	15,424

Refer to Table 4.5 of the Preliminary Hydrogeological Investigation, DS Consultants, 2021 for further details

As noted above, at functional and/or detailed design a number of LID measures can be considered. This preliminary assessment reviewed the feasibility of providing rear lot infiltration trenches to meet the infiltration volume targets. Detailed calculations are included in ***Appendix F*** and potential locations are shown on ***Figure 15***.

Based on preliminary groundwater information, there are limited opportunities for LIDs within the Hicks parcel due to clearance required between the groundwater and LID trench. For the non-participating Russell property, the results in ***Appendix F*** for the Russell property demonstrate the potential extend of LIDs assuming separation to groundwater is not a constraint. The feasibility of the extent of LIDs within the Russell property will need to be verified once groundwater information becomes available.

The results in ***Appendix F*** indicate that the required annual infiltration volume can be achieved for the subject lands, as summarized below in

Table 6-2: Infiltration Volumes Provided

Property	Target Annual Infiltration Volume (m^3/year)	LID Infiltration Volume Provided (m^3/year)
Newhouse	13,107	16,613
Hicks	8,991	9,309
Russell	15,424	21,617

6.3 Feature Based Water Balance

In addition to the overall site water balance, within MW1-2 there are individual natural features that will require water balance considerations.

The preliminary hydrogeological investigation prepared by DS Consultants for the subject lands included a wetland water balance risk evaluation. The results indicate that wetland catchments identified as W2 to W5 have a low risk, and catchment W1 is a low to medium risk based on proposed land use types. Changes to catchment size as a result of proposed changes to drainage score a risk level of low for catchment W2 to W5 and medium for catchment W1.

Stormwater management and LID techniques to maintain the pre-to-post development water balance (volume, timing and duration of water) to existing features will be provided to the extent practical. As part of the functional servicing design of individual draft plans, a detailed assessment of these features will be provided.

7.0 WATER SUPPLY SERVICING

7.1 Water Supply Servicing Design Criteria

The water supply servicing the MW1-2 lands will be designed according to the Region of Peel design criteria, by taking into consideration watermain sizing, depth, crossings, valves, hydrants, and service connections such that adequate pressures and fire flows can be achieved. Water design flows will be designed with the following criteria shown in ***Table 7-1*** and ***Table 7-2*** below.

Table 7-1: Water Design Criteria

DEMAND TYPE	CRITERIA
Average Daily Demand - Residential (L/c/d)	280
Maximum Daily Demand - Residential (L/c/d)	2.0 x avg. day
Peak Hour Demand - Residential (L/c/d)	3.0 x avg. day

Table 7-2: Region of Peel Linear Design Manual Population Densities

DEVELOPMENT TYPE	EQUIVALENT POPULATION DENSITY (PERSON / HA)
Single Family	50
Single family (Less than 10 m frontage)	70
Semi-detached	70
Townhouse / Row Dwellings	175
Commercial	50

7.2 Existing Water Services

Within the vicinity of the development area, the Region currently provides supply to Pressure Zone 7 through a 400 mm main along the east side of Kennedy Road. A 300mm watermain is located within Old School east of Kennedy Road. In addition, a 600 mm feedermain main is located within Kennedy Road and connects to the Mayfield West Elevated Tank located south of King Street.

The existing watermains are illustrated in ***Figure 6.***

7.3 External Water Supply Requirements

The development will be connected to Pressure Zone 7 via three (3) connections to the existing 400 mm Kennedy Road watermain and one (1) connection at the intersection of Kennedy Road at Old School Road. The Russell lands east of Kennedy Road will also connect to the existing 300mm watermain within Old School Road.

An external watermain within Old School Road west of Kennedy Road will be required to service the Hicks North and Newhouse parcels. This watermain is identified in the ***Peel Region Master Plan*** (Project ID W-D-229) and the ***Peel 2021 Capital Budget Water DC Map*** (Project ID 26-1199, 51587) however we note in the former it is identified as a 400mm watermain and the latter as a 600mm. Further discussion with the Region is required to confirm the ultimate size and to advance the currently identified in-service date of 2035. The hydraulic capacity and model analysis included in ***Appendix G*** confirms the MW1-2 lands can be adequate serviced by either the 400mm or 600mm size.

The primary water source for the development is anticipated to be the Alloa Reservoir and Pump Station which has recently been constructed. This infrastructure supports Pressure Zone 7 for the MW1-2 lands.

7.4 Proposed Water Supply

The proposed development is within Pressure Zone 7 of the Peel Region water distribution network. The site will be serviced by connection to the existing 400 mm watermain within Kennedy Road.

A preliminary Hydraulic Capacity and Modeling Analysis has been completed by GeoAdvice for the subject lands and is included in ***Appendix G***. The analysis encompasses the entirety of the subject lands, but includes additional details for the participating Hicks and Newhouse parcels. The non-participating Russell lands have been considered as a point load allocation. However the site-specific watermain network has not been modeled as part of the scope of this report.

The modeling analysis confirms that the Average Day Demand (ADD) and Peak Hourly Demand (PHD) service pressures are expected to be within the Region of Peel guidelines for water distribution systems. All fire flows are achievable with residual pressures exceeding 20 psi and no watermain will reach a velocity in excess of 3.0 m/s. External trunk watermains including a new 400mm or 600mm watermain within Old School Road will adequately service the development. No watermain crossings of the natural heritage system within the Hicks and Newhouse properties are required.

The water distribution system within the development will be sized to meet the pressures and flows in accordance with the Region of Peel criteria. The system will be looped internally in order to provide system security.

If necessary, the internal infrastructure may be further evaluated through individual Draft Plan applications using the Region's current water distribution model and associated water demand / fire flow criteria.

The proposed watermain network is illustrated in ***Figure 6.***

8.0 WASTEWATER SERVICING

8.1 Region of Peel Wastewater Design Criteria

The wastewater mains will be designed with the following Region of Peel design criteria:

Table 8-1: Wastewater Design Criteria

DEMAND TYPE	CRITERIA
Average Dry Weather Flow	302.8
Infiltration	0.0002 m^3 per second per hectare
Peaking Factor	Peak Flow Factor – Harmon Formula

Table 8-2: Region of Peel Linear Design Manual Population Densities

DEVELOPMENT TYPE	EQUIVALENT POPULATION DENSITY (PERSON / HA)
Single Family	50
Single family (Less than 10 m frontage)	70
Semi-detached	70
Townhouse / Row Dwellings	175
Commercial	50

8.2 Existing Wastewater Services

A 300mm diameter sanitary trunk sewer was constructed in Kennedy Road as part of the Mayfield West Phase 1 – Stage 1 development. A 300mm diameter stub is located approximately 45m north of Bonnieglen Farm Boulevard. This trunk sewer was sized to accommodate portions of the Hicks and Russell properties as demonstrated by the external sanitary drainage plan from the Kennedy Trails Development Ltd. subdivision (21T-12003C) included in ***Appendix H***. The north portion of the Hicks parcel and the Newhouse property were not accommodated in the original design of this trunk sewer.

8.3 External Wastewater Supply Requirements

8.3.1 Kennedy Road Trunk System

The existing 300mm-525mm trunk sewer within Kennedy Road extends through the Mayfield West Phase 1 - Stage 1 lands and crosses Highway 410. At Mayfield Road, the trunk currently heads westerly to Inder Heights Drive where it continues south to Conservation Drive. The trunk then connects to the main trunk system within the Etobicoke Creek valley known as the West Brampton 2 trunk.

The Region has identified capacity constraints within the downstream trunk between Mayfield Road and Conservation Drive. This constraint is being mitigated through the installation of a new 1200mm diameter trunk sewer to be installed within Kennedy Road and Conservation Drive. In the ***2021 Wastewater DC Map*** updated as part of the Region's capital budget process, the new trunk (Project ID 15-2153, Component 53475) is scheduled to be constructed in 2021 and will eliminate capacity constraints downstream of Mayfield Road.

The Kennedy Road trunk sewer was designed to accommodate flow from the southerly portion of the Hicks property and westerly portion of the Russell parcel. It was not originally designed to accommodate the north portion of Hicks nor the Newhouse properties. As such, a preliminary downstream capacity analysis has been undertaken to determine the feasibility of conveying this additional flow. The analysis extends from the existing stub at Bonnieglen Farm Boulevard to Mayfield Road. As noted above, downstream of Mayfield Road a new 1200mm trunk sewer is currently being undertaken and therefore no further constraints immediately downstream are anticipated.

Design sheets were obtained for the existing Kennedy Road trunk. Based on a review of the historical drainage plans and design sheets, ***Table 8-3*** summarizes the parameters accommodated in the Kennedy Road trunk sewer for the MW1-2 lands.

Table 8-3: MW1-2 Flows Accommodated in Design of Kennedy Road Trunk Sewer

AREA (ha)	POPULATION	FLOW (L/s)
26.5 ha	1,325	22.56

The historical design sheets were modified with the updated drainage and populations from the MW1-2 lands and are included in ***Appendix J***. The analysis determined that from the stub at Bonnieglen Farm Boulevard downstream to Abbotside Way the existing system has sufficient capacity to accommodate the additional flows without surcharging. There are several legs of sewer within that segment that would be 95-99% full based on design flows.

South of Abbotside Way (MH 112) to Mayfield Road there are no houses directly connected to the trunk sewer and therefore no basements would be affected by surcharging in the sewer. The analysis determined this segment of 525mm diameter sewer would experience surcharging with flows of 98-110% based on theoretical design flows.

In addition to the analysis of the historical design, a review of historical as-constructed information was also undertaken. There are three legs of sewer most negatively impacted by the available as-constructed information. Two of the segments are located downstream of Abbotside Way where no basements are connected to the trunk sewer (MH113A-MH115A and MH117A-118A). The third segment is located at Kearney Avenue (MH108A-109A) where the design slope was 0.25% and the as-constructed information indicates a slope 0.14%.

A detailed hydraulic grade line analysis has been undertaken to confirm the extent of surcharging resulting from the additional flows from the subject lands. The results detailed in ***Appendix J*** confirm that minimal surcharge will occur, with the worst-case locations demonstrating surcharge of only 0.35m above pipe obvert. Based on a review of grading plans for the adjacent existing developments, there is generally greater than 3.0m freeboard between the HGL and adjacent basements. External sanitary drainage areas and reference manhole locations are demonstrated on ***Figure 5***.

8.3.2 Dixie Road Trunk System

The Kennedy Trails external drainage plan indicates most of the Russell property is to be directed to the Dixie Road trunk sewer. This trunk sewer within Dixie Road currently extends to approximately 475m north of Mayfield Road. The ***Peel Master Plan*** and the ***2021 Wastewater DC Map*** confirm this trunk sewer will be extended further north on Dixie Road, westerly through future development lands to Heart Lake Road where it will extend northly to service lands north of Campbell's Cross Creek.

The series of projects to extend the Dixie Road trunk to Heart Lake Road are currently estimated for implementation between 2029-2031. Should the Russell property desire to proceed in advance of that timing, further discussion with the Region will be required.

Connecting to the trunk sewer on Heart Lake Road from the Russell property will require an easement through external private lands. It is anticipated the sewer would generally follow an alignment adjacent to the Greenbelt limit but could be incorporated within future external ROW's if adjacent lands proceed to development in a similar timeframe as the Russell property.

8.4 Proposed Wastewater Servicing

8.4.1 General Overview

The subject site will be serviced by a network of local gravity sewers designed in accordance with Region of Peel criteria. A proposed pump station will accept flows from the Hicks and Newhouse parcels and convey wastewater through a forcemain to the existing 300mm sanitary trunk sewer within Kennedy Road, north of Bonnieglen Farm Boulevard.

The southwest corner of the Russell property will be conveyed to Bonnieglen Farm Boulevard through extension of a sanitary sewer within an unopened ROW near the intersection of Kennedy Road. The remaining portions of the Russell lands will be conveyed easterly to the Dixie Road trunk system.

The conceptual wastewater servicing concept is illustrated in ***Drawing 3***. An overall sanitary drainage plan is provided on ***Figure 5*** and preliminary plan and profiles are shown on ***Drawing 4*** through ***Drawing 6.***

8.4.2 Pump Station & Forcemain

The existing topography at the tributary crossings force the sanitary sewers to be too deep to drain the subject lands by gravity to the existing sewer on Kennedy Road. A sanitary pumping station will be required in the southern parcel of the Hicks Property to service the southern and northern portions of the Hicks Property, and the Newhouse Property. The municipal pump station is proposed to be in the vicinity of Pond 1 with the forcemain aligned within proposed municipal ROWs conveying flows to the Kennedy Road trunk sewer.

The total peak flow to the pump station is estimated to be 47.2 l/s. The preliminary pump station depth is estimated to be 13m as demonstrated on profile 108 (MH 132A) on ***Drawing 4***. The concept plan provides a 0.11 ha block for the pump station. Further details of the pump station and forcemain will be provided at detailed design.

8.4.3 Deep Trunk Sewer

A deep trunk sewer is required through the Newhouse and Hicks parcels to convey wastewater flows to the pump station. The depth is driven by the servicing and grading requirements of the Newhouse parcel and to provide sufficient clearance at the watercourse crossings.

The preliminary profile of the deep trunk is provided on ***Drawing 4*** through ***Drawing 6***. The alignment schematic is demonstrated on ***Drawing 3***. Specifically, the crossing of the tributary within the Newhouse property is shown on profile alignment 206 (***Drawing 5***) and the crossing of Etobicoke Creek is shown on profile alignment 108 (***Drawing 4***).

Where the deep trunk sewer is located within municipal ROWs, an additional local sewer may be required to provide service connections for individual lots and adhere to the maximum service connection depth per Region of Peel criteria. Typical ROW sections showing the placement of the deep and local trunk sewers are shown on ***Figure 11*** through ***Figure 14***.

Crossings of the natural heritage system are proposed to be constructed by trenchless technology. Further discussion on the NHS crossings is provided in ***Section 11.2***.

9.0 ROADS

The community will include a series of municipal roads and laneways in accordance with Town of Caledon standards. Sidewalks will be constructed in accordance with the standard municipal cross sections.

10.0 GRADING

A preliminary grading plan has been prepared for the study area based on the environmental and engineering constraints identified.

Retaining walls are provided adjacent to boundary features as required. Measures have been implemented to minimize their height including 100-year capture points and saw-toothing of roads to achieve an average road grade of 0.3%. The average road grade of 0.3% should be supported through Functional Servicing Studies for individual properties, as required.

The conceptual grading is illustrated in ***Drawing 1***.

10.1 Grading in Natural Heritage System

Grading in the NHS and the associated buffers is minimized but required at the following locations:

- Pond and clean water pipe outfalls
- 3:1 grade transition within maximum 50% of buffer width
- Grading may be required to provide emergency spillways for the ponds adjacent to the NHS.
- Grading required to facilitate trails within the buffers or pedestrian crossings of the NHS

The anticipated grading within the NHS buffers is illustrated on ***Drawing 1***.

11.0 CREEK AND UTILITY CROSSINGS

Creek crossings are required to accommodate servicing and active transportation (trail) requirements within the community.

11.1 Internal Road Crossings

There are no internal crossings of the NHS for the purposes of a municipal ROW within the MW1-2 lands.

11.2 Sanitary and Watermain Crossings

The water model assessment confirms there are no crossings of the NHS required for watermains. Each development area can be adequately serviced by connection to trunks within the boundary roads and internal NHS crossings are not required.

There are two sanitary trunk crossings of the NHS within the subject lands. These crossings are necessary to connect the fragmented development areas to the proposed pump station proposed within the Hicks south area. These crossings are proposed to be constructed by trenchless technology. A minimum 1.5 m of cover will be provided from the obvert of the sanitary sewer to the bottom of the low flow channel. Preliminary plan and profile drawings are shown on ***Drawing 4*** through ***Drawing 6***, with the conceptual layout illustrated on ***Drawing 3***.

In addition, sanitary connection of the Russell property easterly to the Dixie Road sanitary trunk system will require routing the NHS lands external to the MW12 lands. Further details will be provided at the functional design stage of the Russell parcel.

11.3 Pedestrian Crossings

It is anticipated that pedestrian crossings of Etobicoke Creek will be recommended through the active transportation plan for the study area. Location and further details of the crossing will be provided separately from this report.

12.0 POND MAINTENANCE

The following section provides general guidance on pond maintenance for the MW1-2 community. Further refinement and details can be provided at functional and/or detailed design of the individual draft plans.

12.1 Inspections

As recommended in the ***SWMP Manual***, inspections should be made after every significant storm (e.g., >10 mm) during the first two years of operation to ensure that the facility is functioning properly. It is anticipated that four inspections will be required per year. After the initial period, and proper operation has been confirmed, an inspection schedule can be established based on the observed operation of the ponds. Although four inspections per year are recommended, the ponds should be inspected annually as a minimum requirement.

12.2 Regular Operation and Maintenance Activities

Grass Cutting

Grass cutting is not recommended for the ponds. Allowing grass to grow enhances the water quality and provides other benefits. It is understood though, that grass cutting enhances the aesthetics of the facility for nearby residents and therefore, should be done as infrequently as possible.

Grass should not be cut to the edge of the permanent pool and should be done parallel to the shoreline. Grass clippings should be ejected away from the pond.

Weed Control

If weed control is required to remove a specific species, the weeds should be removed by hand.

Plantings

Different parts of the SWM ponds will require different vegetative treatments for upland, flood, shoreline and aquatic conditions. Planting methods and any replanting should be carried out in accordance with an approved Landscape Design and the recommendations of the ***SWMP Manual***, or as modified by the operating authority.

Trash Removal

Trash and debris should be removed by hand, and performed as required based on inspections.

Sediment Removal

In accordance with the ***SWMP Manual,*** it is recommended that the frequency of sediment removal be determined based on a 5% reduction in the total suspended solids (TSS) removal efficiency. The frequency of pond maintenance will be determined at the detailed design stage. It should be noted that routine cleaning of the sediment forebay should allow for less frequent cleaning of the main cell than indicated in the ***SWMP Manual.*** However, the extension of service life prior to cleaning cannot be quantified.

Safety

The ponds should be provided with appropriate signage which warns the public of the presence of deep water and slopes. Landscape drawings are to be prepared with strategic plantings around the perimeter of the pond to discourage direct access to the facility. All inlets, outlets, structures, and headwalls will be provided with the appropriate grates, covers, and safety features to prevent public entry or tampering.

13.0 EROSION AND SEDIMENT CONTROL

An erosion and sediment control strategy should be implemented prior to construction of site services. The following measures are recommended:

- environmental fencing where required;
- stone mud mat at the construction entrance;

- use of the permanent ponds as a temporary silt basin during site construction activities
- regular inspection and monitoring of the erosion and sediment control devices;
- removal and disposal of the erosion and sediment control devices after the site has been stabilized.

14.0 CONCLUSIONS

This Functional Servicing and Stormwater Management Report provides an overview of the servicing plan for the Mayfield West Stage 1 – Phase 2 expansion lands located within the Town of Caledon. This report demonstrates the availability of water, wastewater, and storm services for the proposed development in accordance with Town of Caledon, Region of Peel, and TRCA criteria and in consideration of applicable guideline documents.

We trust you will find the contents of this report satisfactory.

Prepared by,
David Schaeffer Engineering Ltd.

LICENSED PROFESSIONAL ENGINEER
J. P. TJEERDSMA
100083453
Aug 2021
PROVINCE OF ONTARIO

Per: John Tjeerdsma, P.Eng.

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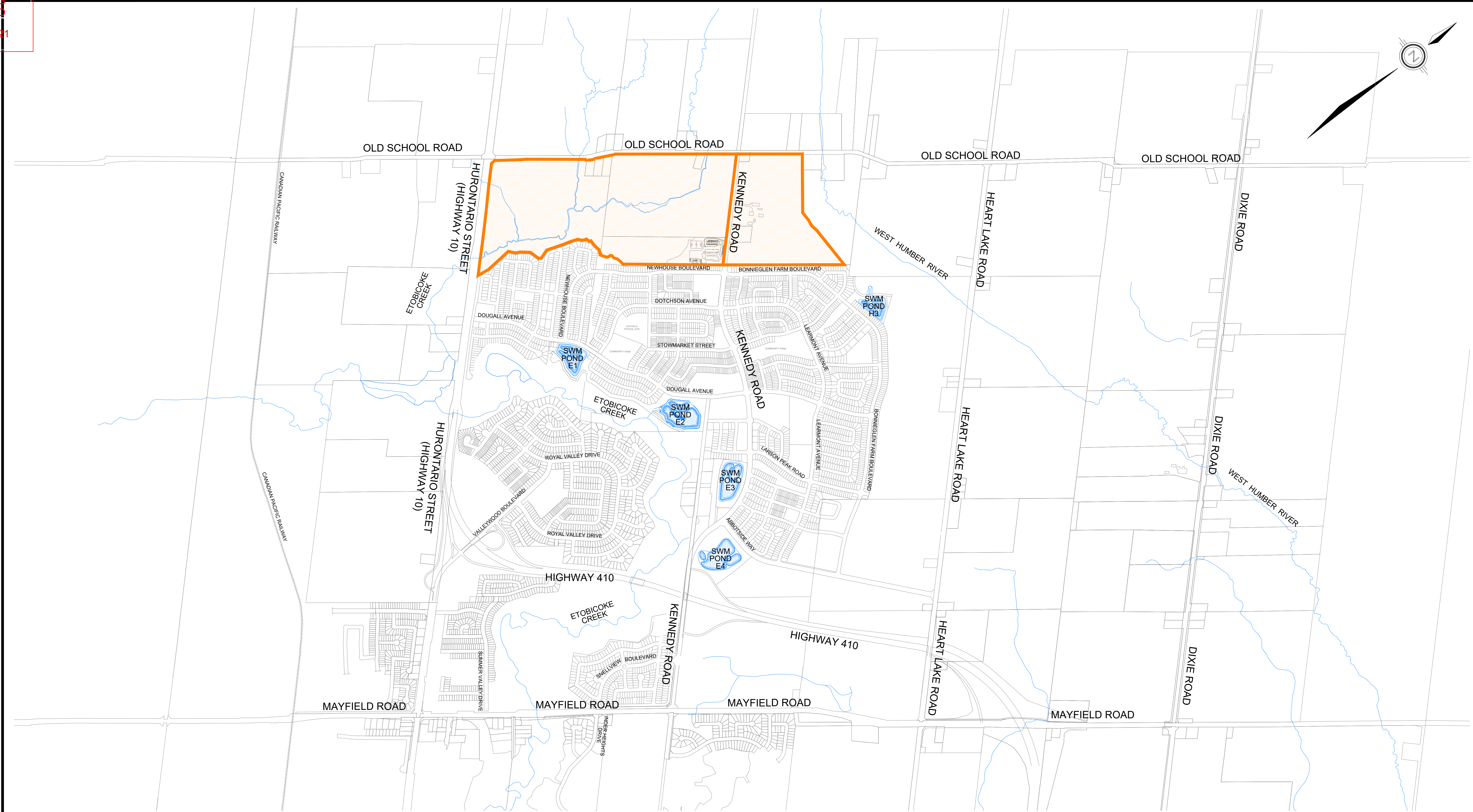
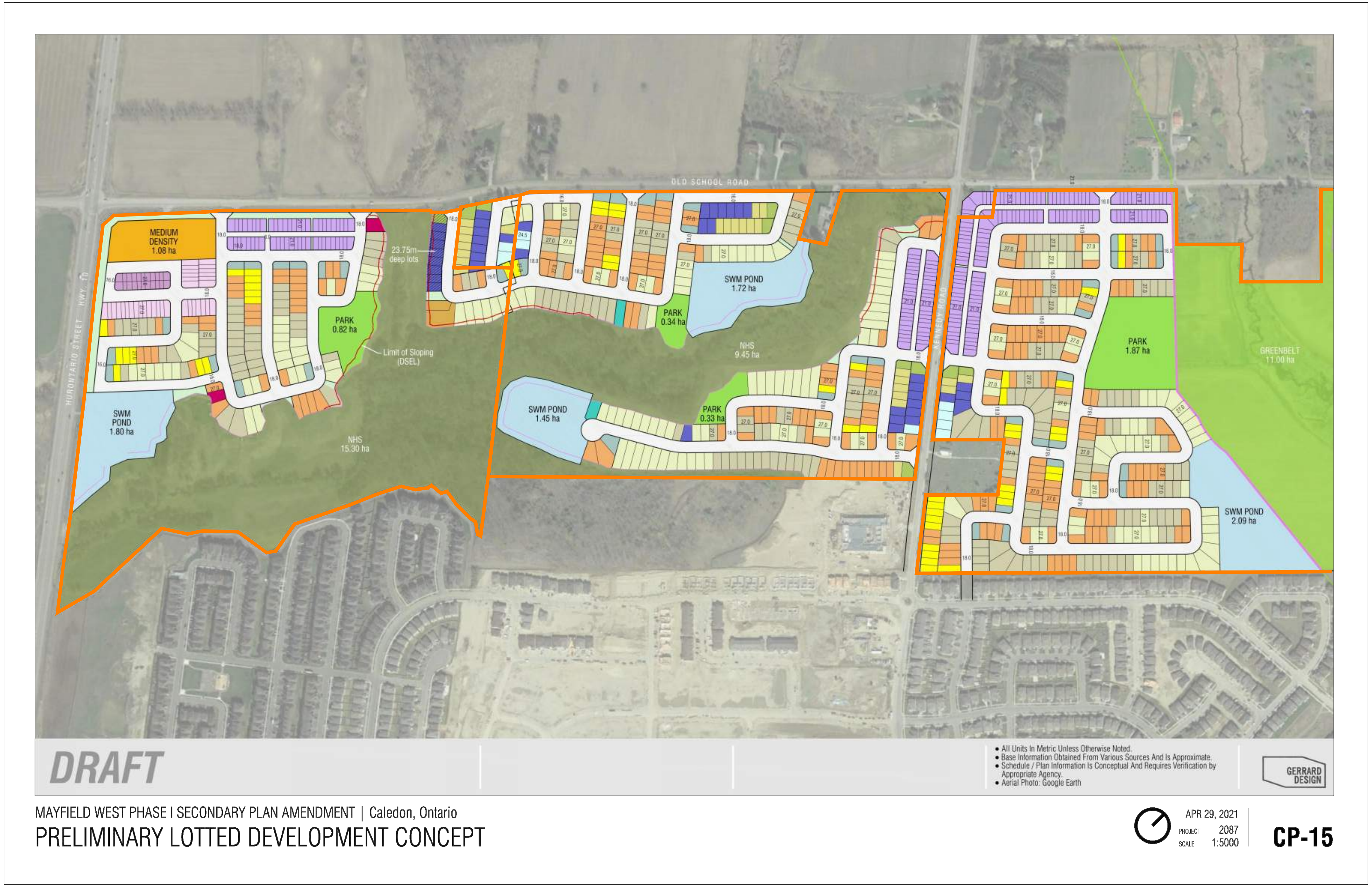
1151 FSR (Sub1).docx



LEGEND

SITE BOUNDARY

DAVID SCHAEFFER ENGINEERING LTD.	MAYFIELD WEST PHASE 1 STAGE 2 COMMUNITY FUNCTIONAL SERVICING REPORT	SITE LOCATION PLAN	
BEACON ENVIRONMENTAL			
GLENN SCHNARR & ASSOCIATES INC.			
DS CONSULTANTS LTD.	TOWN OF CALEDON	SCALE: 1:20000	PROJECT No.: 21-1257
		DATE: JULY 2021	FIGURE: 1



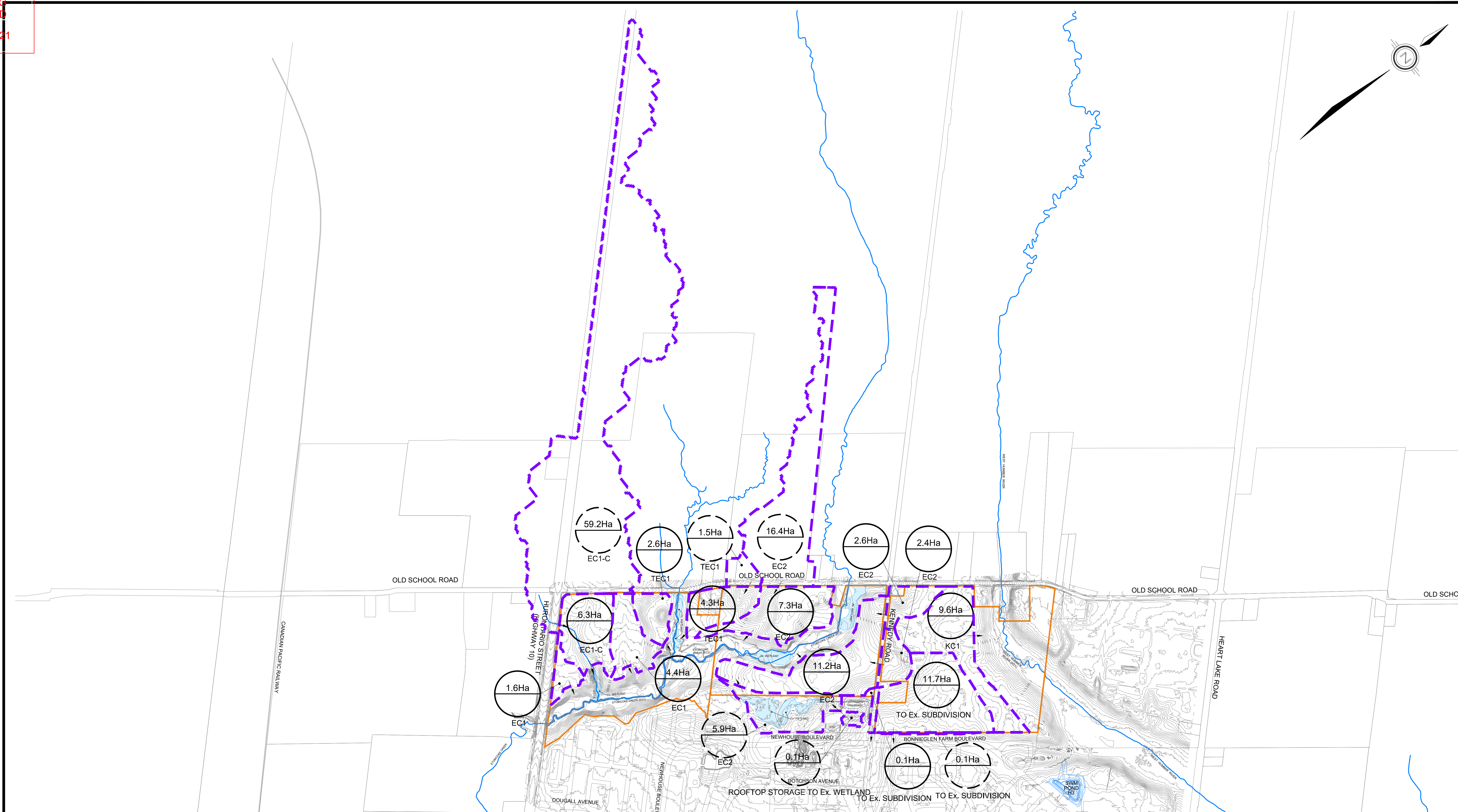
LEGEND

SITE BOUNDARY

DAVID SCHAEFFER ENGINEERING LTD.	MAYFIELD WEST PHASE 1 STAGE 2 COMMUNITY FUNCTIONAL SERVICING REPORT
BEACON ENVIRONMENTAL	
GLENN SCHNARR & ASSOCIATES INC.	
DS CONSULTANTS LTD.	TOWN OF CALEDON

CONCEPT PLAN

SCALE:	AS SHOWN	PROJECT No.:	21-1257
DATE:	JULY 2021	FIGURE:	2



LEGEND

SITE BOUNDARY
STORM TRIBUTARY AREA
EXISTING WATERCOURSE

16.4Ha — TOTAL EXTERNAL DRAINAGE AREA

7.3Ha — TOTAL DRAINAGE AREA

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GLENN SCHNARR & ASSOCIATES INC.

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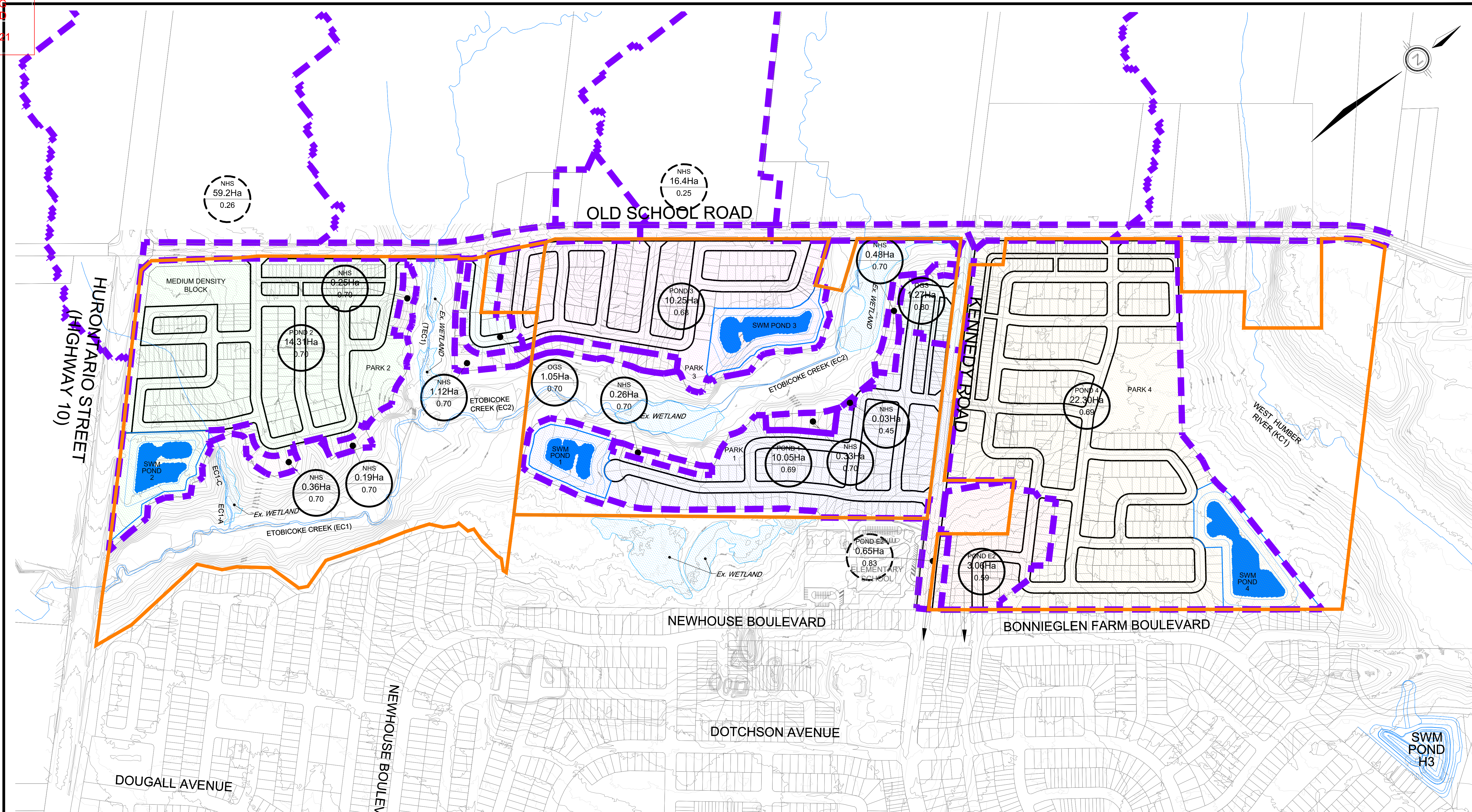
MAYFIELD WEST PHASE 1 STAGE 2 COMMUNITY FUNCTIONAL SERVICING REPORT

TOWN OF CALEDON

PRE-DEVELOPMENT STORM DRAINAGE AREAS

SCALE:	1:15000	PROJECT No.:	21-1257
DATE:	JULY 2021	FIGURE:	3

TOWN OF CALEDON
PLANNING
RECEIVED
Sep 14, 2021



LEGEND

- SITE BOUNDARY
- STORM TRIBUTARY AREA
- EXISTING WATERCOURSE
- OGS DELINEATION
- NHS DELINEATION
- POND 1 DELINEATION
- POND 2 DELINEATION
- POND 3 DELINEATION
- POND 4 DELINEATION
- POND E2 DELINEATION
- NHS 1.81Ha 0.90 — DRAINAGE DESTINATION, TOTAL AREA, RUN-OFF COEFFICIENT
- POND E2 0.57Ha 0.70 — DRAINAGE DESTINATION, EXTERNAL DRAINAGE ARE, RUN-OFF COEFFICIENT

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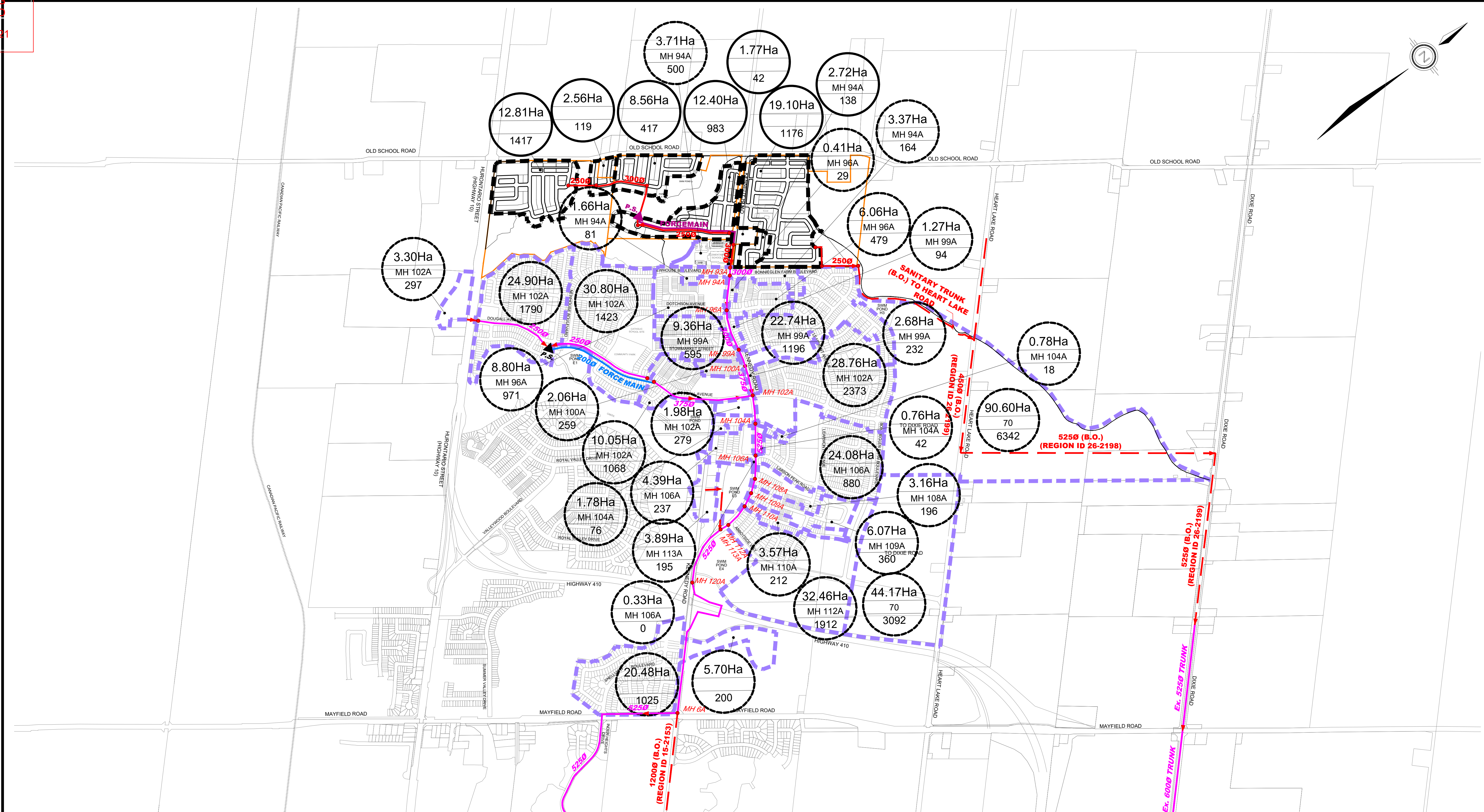
MAYFIELD WEST PHASE 1 STAGE 2 COMMUNITY FUNCTIONAL SERVICING REPORT

TOWN OF CALEDON

POST-DEVELOPMENT STORM DRAINAGE AREAS

SCALE:	1:6000	PROJECT No.:	21-1257
DATE:	JULY 2021	FIGURE:	4



LEGEND

- SITE BOUNDARY
- EXISTING SANITARY TRUNK
- PROPOSED SANITARY TRUNK
- PROPOSED SANITARY TRUNK (B.O.)
- PROPOSED FORCEMAIN
- EXISTING FORCEMAIN
- PROPOSED SANITARY TRIBUTARY AREA
- EXTERNAL SANITARY TRIBUTARY AREA

12.66Ha / 50 / 1085 — DRAINAGE AREA / POPULATION DENSITY / POPULATION

0.79Ha / 175 / 139 — EXTERNAL DRAINAGE AREA / POPULATION DENSITY / POPULATION

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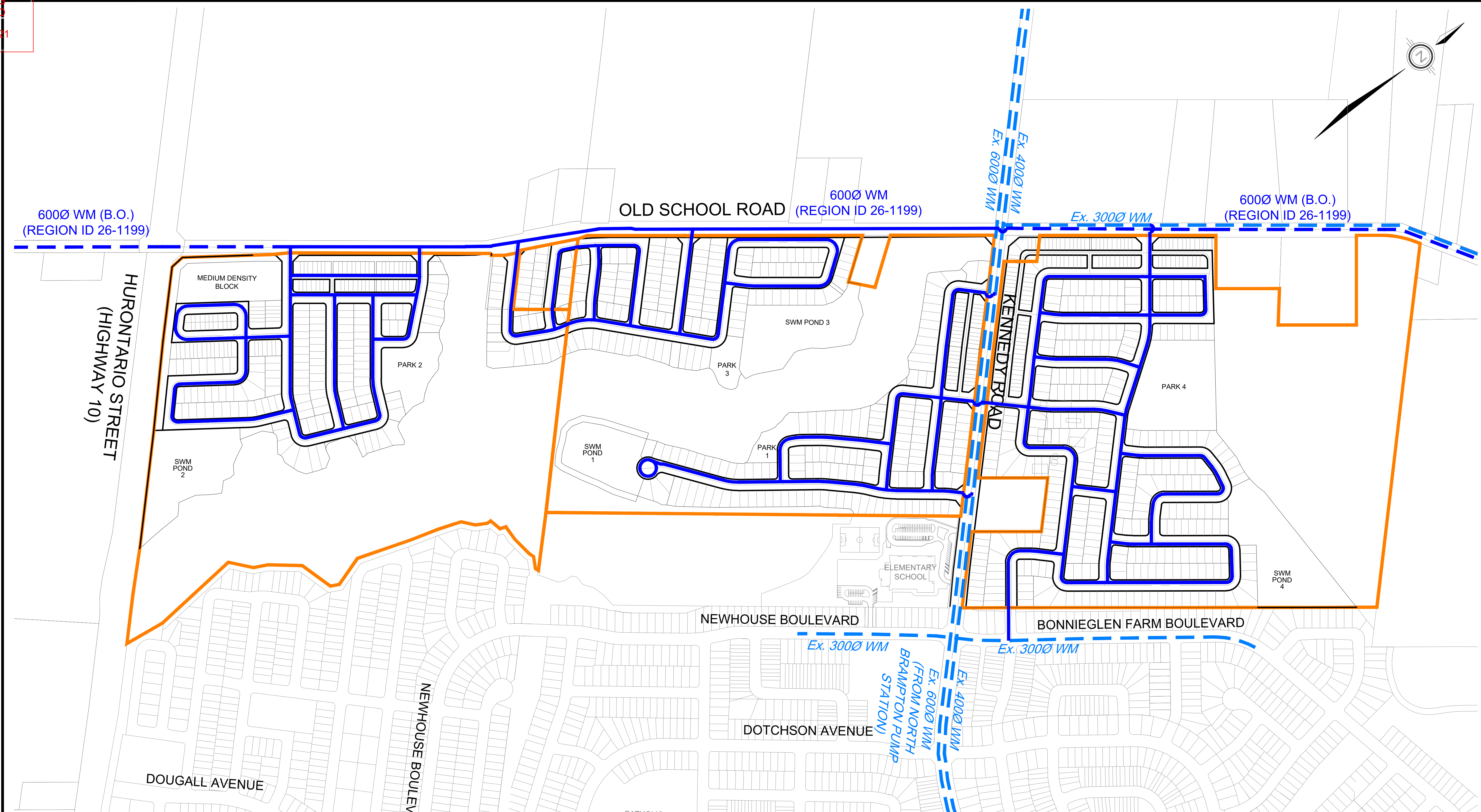
TOWN OF CALEDON

EXTERNAL SANITARY DRAINAGE AREAS

SCALE:	1:20000	PROJECT No.:	21-1257
DATE:	JULY 2021	FIGURE:	5



LEGEND

- SITE BOUNDARY
- PROPOSED WATERMAIN
- PROPOSED WATERMAIN (B.O.)
- EXISTING WATERMAIN

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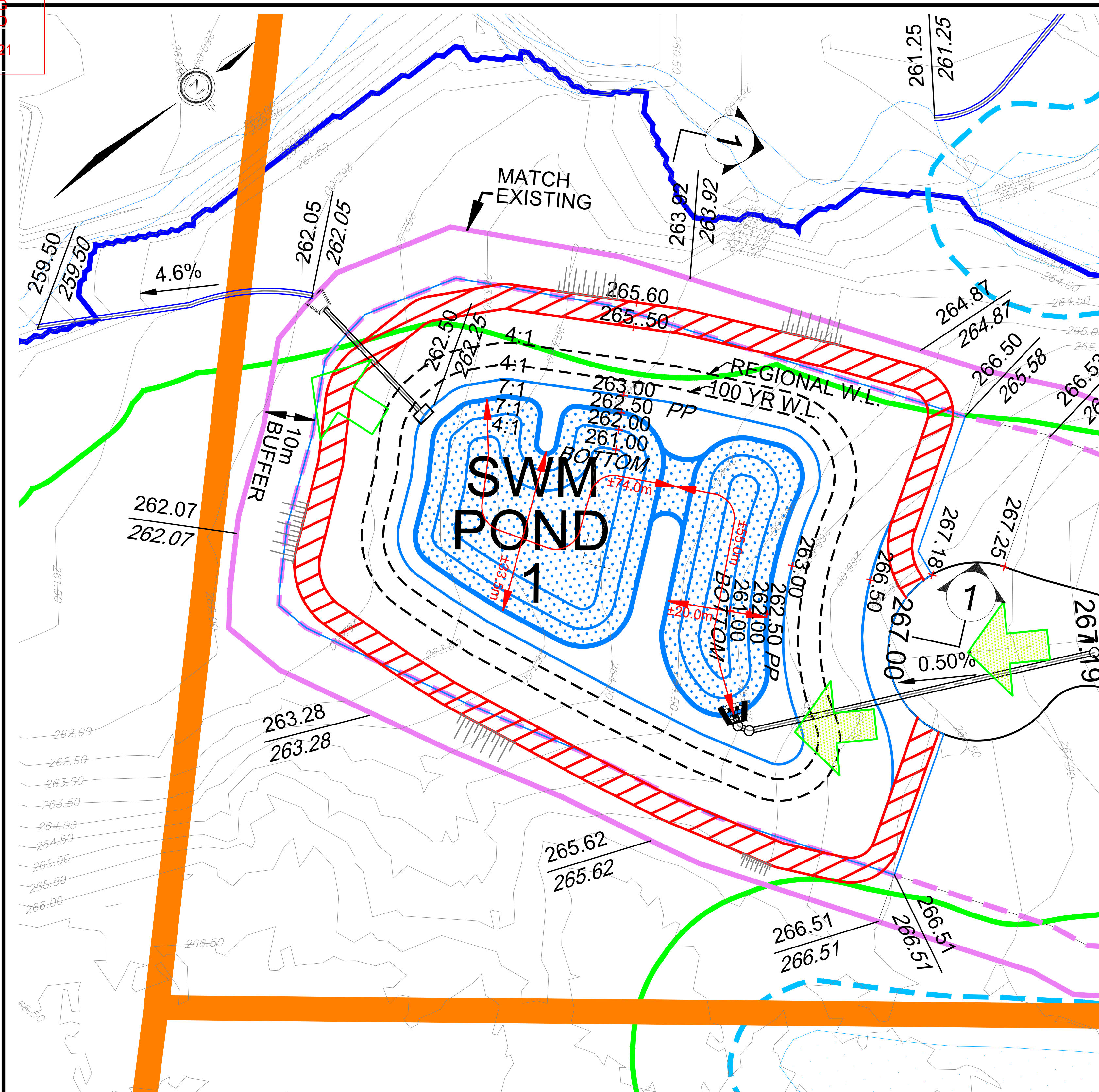
BEACON ENVIRONMENTAL
GLENN SCHNARR & ASSOCIATES INC.
DS CONSULTANTS LTD.

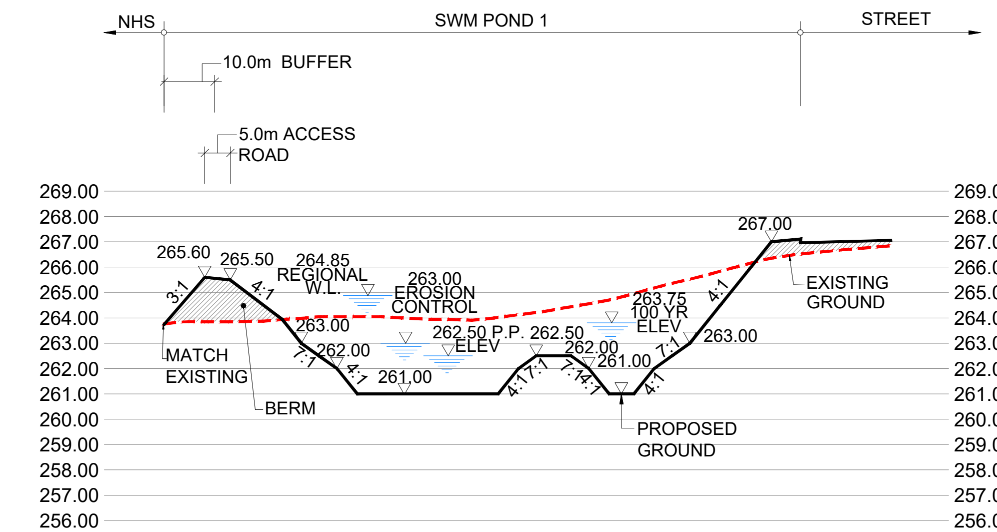
MAYFIELD WEST PHASE 1 STAGE 2 COMMUNITY FUNCTIONAL SERVICING REPORT

TOWN OF CALEDON

CONCEPTUAL WATERMAIN SERVICING PLAN

SCALE:	1:6000	PROJECT No.:	21-1257
DATE:	JULY 2021	FIGURE:	6





POND 1
SECTION 1-1
SCALE HOR. 1:1500
VER. 1:300

POND CHARACTERISTICS - POND 1				
	LOWER ELEVATION (m)	UPPER ELEVATION (m)	VOLUME REQUIRED (m³)	VOLUME PROVIDED (m³)
PERMANENT POOL	261.00	262.50	1859	2322
EXTENDED DETENTION	262.50	262.65	402	462
EROSION CONTROL	262.50	263.00	1672	1728
100 YEAR	262.50	263.75	4998	5030
REGIONAL	262.50	264.85	10980	11033

POND 1 DATA	
DRAINAGE AREA (Ha)	10.05
IMPERVIOUSNESS	70%
POND BLOCK AREA (Ha)	1.10

LEGEND

- SITE BOUNDARY
- WATERCOURSE
- TRCA REGULATION LIMIT
- LONGTERM STABLE TOP OF SLOPE
- 10m LONGTERM STABLE TOS BUFFER
- REGIONAL FLOODLINE
- 10m REGIONAL FLOODLINE BUFFER
- WETLANDS
- 10m WETLANDS BUFFER
- MEANDER BELT
- 10m MEANDER BELT BUFFER
- ACCESS ROAD
- PERMANENT POOL
- 264.50 PROPOSED GRADE
- 264.00 EXISTING CONTOUR
- ELEVATION
- POND INLET
- POND OUTLET
- OVERLAND FLOW DIRECTION
- EMERGENCY OVERFLOW DIRECTION

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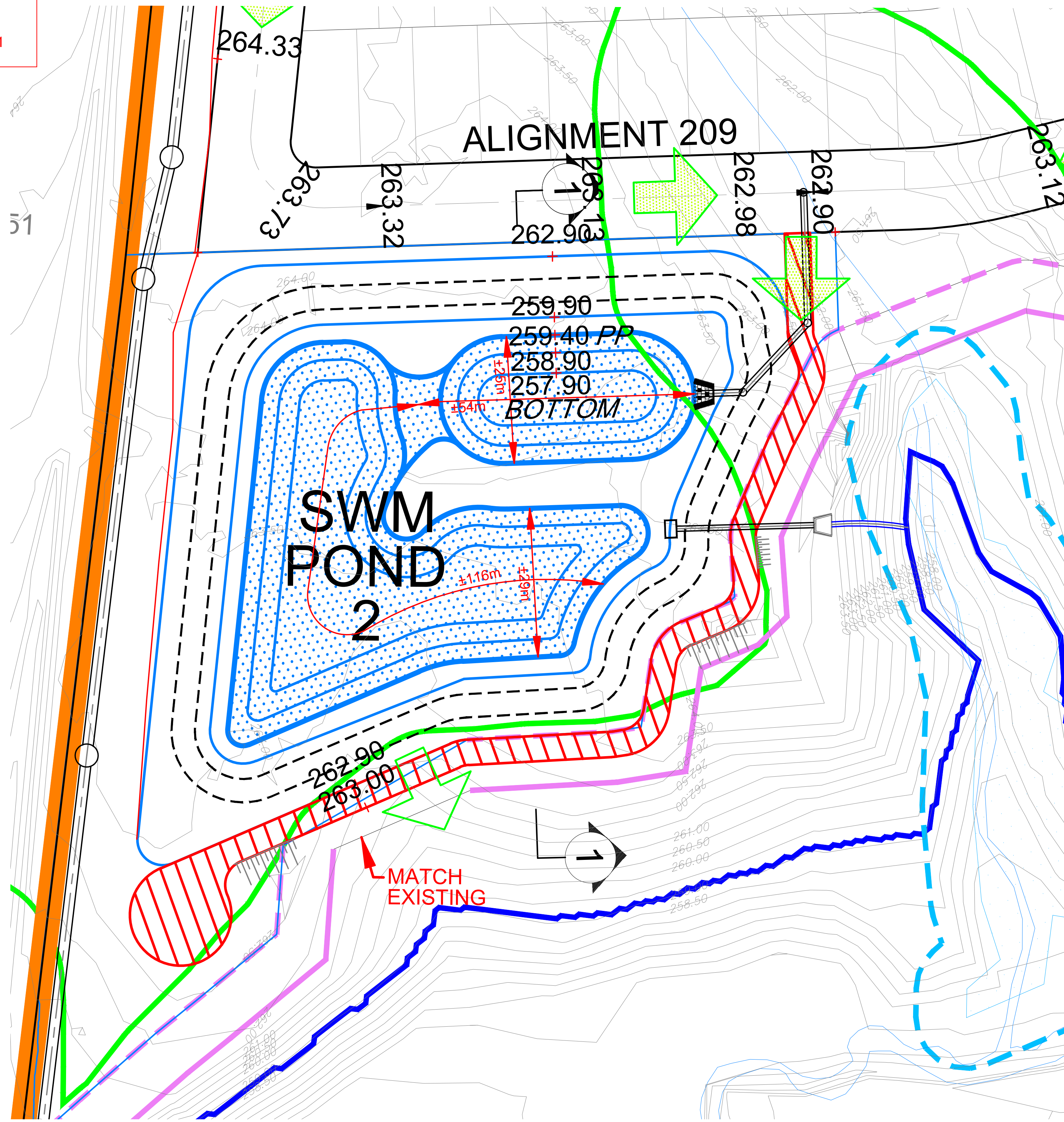
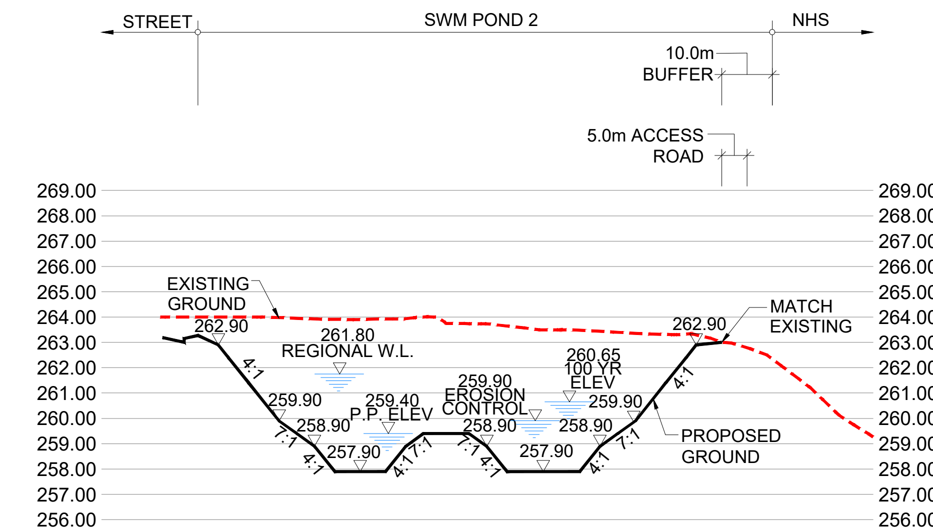
MAYFIELD WEST PHASE 1 STAGE 2 COMMUNITY FUNCTIONAL SERVICING REPORT

TOWN OF CALEDON

SWM POND 1

SCALE:	0.039370	PROJECT No.:	21-1257
DATE:	JULY 2021	FIGURE:	7





POND 2
SECTION 1-1
SCALE HOR. 1:1500
VER. 1:300

POND CHARACTERISTICS - POND 2				
	LOWER ELEVATION (m)	UPPER ELEVATION (m)	VOLUME REQUIRED (m³)	VOLUME PROVIDED (m³)
PERMANENT POOL	257.90	259.40	2671	3784
EXTENDED DETENTION	259.40	259.55	572	718
EROSION CONTROL	259.40	259.90	2413	2614
100 YEAR	259.40	260.65	7186	7358
REGIONAL	259.40	261.80	15800	16076

POND 2 DATA	
DRAINAGE AREA (Ha)	14.31
IMPERVIOUSNESS	71%
POND BLOCK AREA (Ha)	1.55

LEGEND

- SITE BOUNDARY
- WATERCOURSE
- TRCA REGULATION LIMIT
- LONGTERM STABLE TOP OF SLOPE
- 10m LONGTERM STABLE TOS BUFFER
- REGIONAL FLOODLINE
- 10m REGIONAL FLOODLINE BUFFER
- WETLANDS
- 10m WETLANDS BUFFER
- MEANDER BELT
- 10m MEANDER BELT BUFFER
- ACCESS ROAD
- PERMANENT POOL
- 264.50 PROPOSED GRADE
- 264.00 EXISTING CONTOUR
- ELEVATION
- POND INLET
- POND OUTLET
- OVERLAND FLOW DIRECTION
- EMERGENCY OVERFLOW DIRECTION

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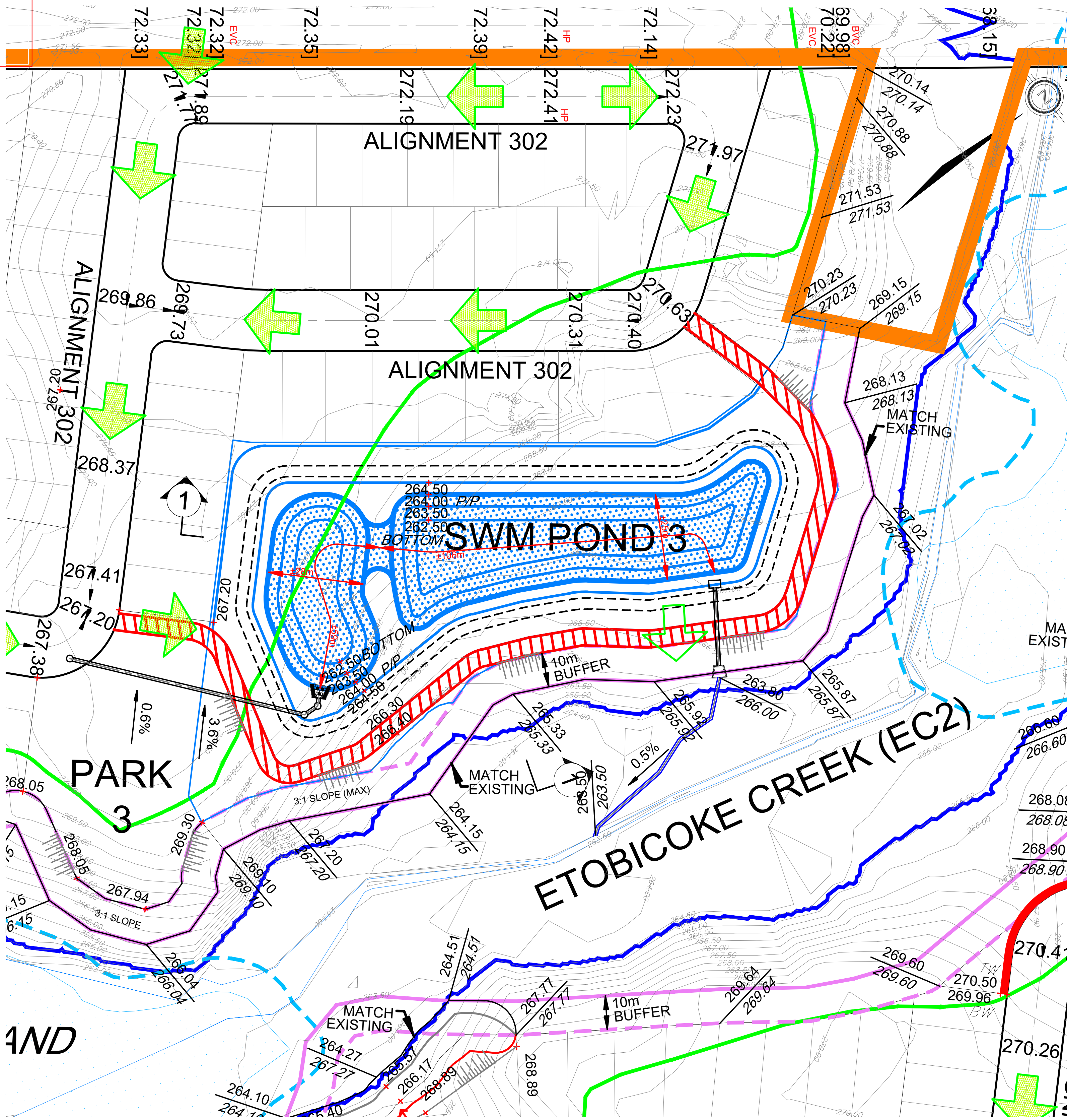
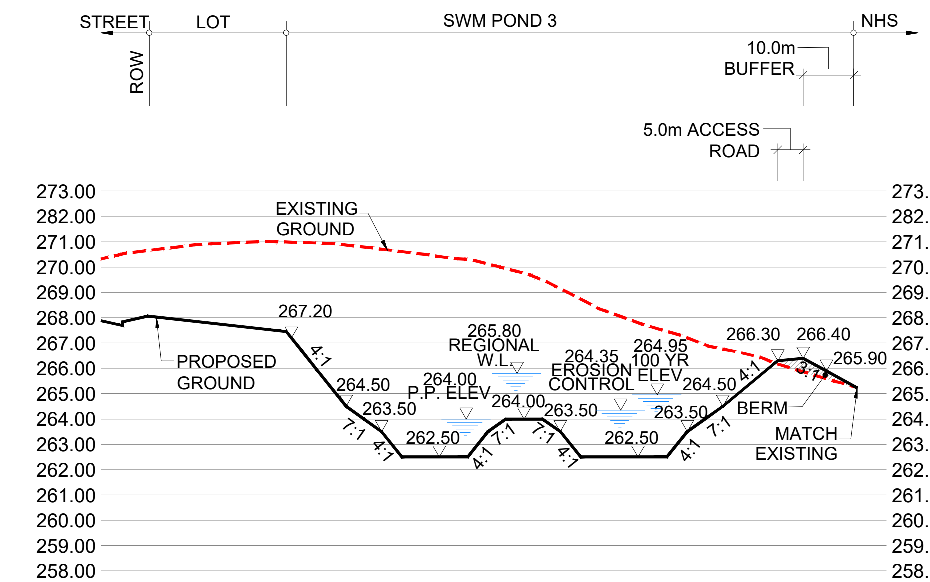
MAYFIELD WEST PHASE 1 STAGE 2 COMMUNITY FUNCTIONAL SERVICING REPORT

TOWN OF CALEDON

SWM POND 2

SCALE:	1:1000	PROJECT No.:	21-1257
DATE:	JULY 2021	FIGURE:	8





POND 3
SECTION 1-1
SCALE HOR. 1:1500
VER. 1:300

POND CHARACTERISTICS - POND 3				
	LOWER ELEVATION (m)	UPPER ELEVATION (m)	VOLUME REQUIRED (m³)	VOLUME PROVIDED (m³)
PERMANENT POOL	262.50	264.00	1879	3872
EXTENDED DETENTION	264.00	264.10	410	450
EROSION CONTROL	264.00	264.35	1681	1703
100 YEAR	264.00	264.95	5049	5323
REGIONAL	264.00	265.80	11070	11426

POND 3 DATA	
DRAINAGE AREA (Ha)	10.25
IMPERVIOUSNESS	69%
POND BLOCK AREA (Ha)	1.41

LEGEND

- SITE BOUNDARY
- WATERCOURSE
- TRCA REGULATION LIMIT
- LONGTERM STABLE TOP OF SLOPE
- 10m LONGTERM STABLE TOS BUFFER
- REGIONAL FLOODLINE
- 10m REGIONAL FLOODLINE BUFFER
- WETLANDS
- 10m WETLANDS BUFFER
- MEANDER BELT
- 10m MEANDER BELT BUFFER
- ACCESS ROAD
- PERMANENT POOL
- 264.50 PROPOSED GRADE
- 264.00 EXISTING CONTOUR ELEVATION
- POND INLET
- POND OUTLET
- OVERLAND FLOW DIRECTION
- EMERGENCY OVERFLOW DIRECTION

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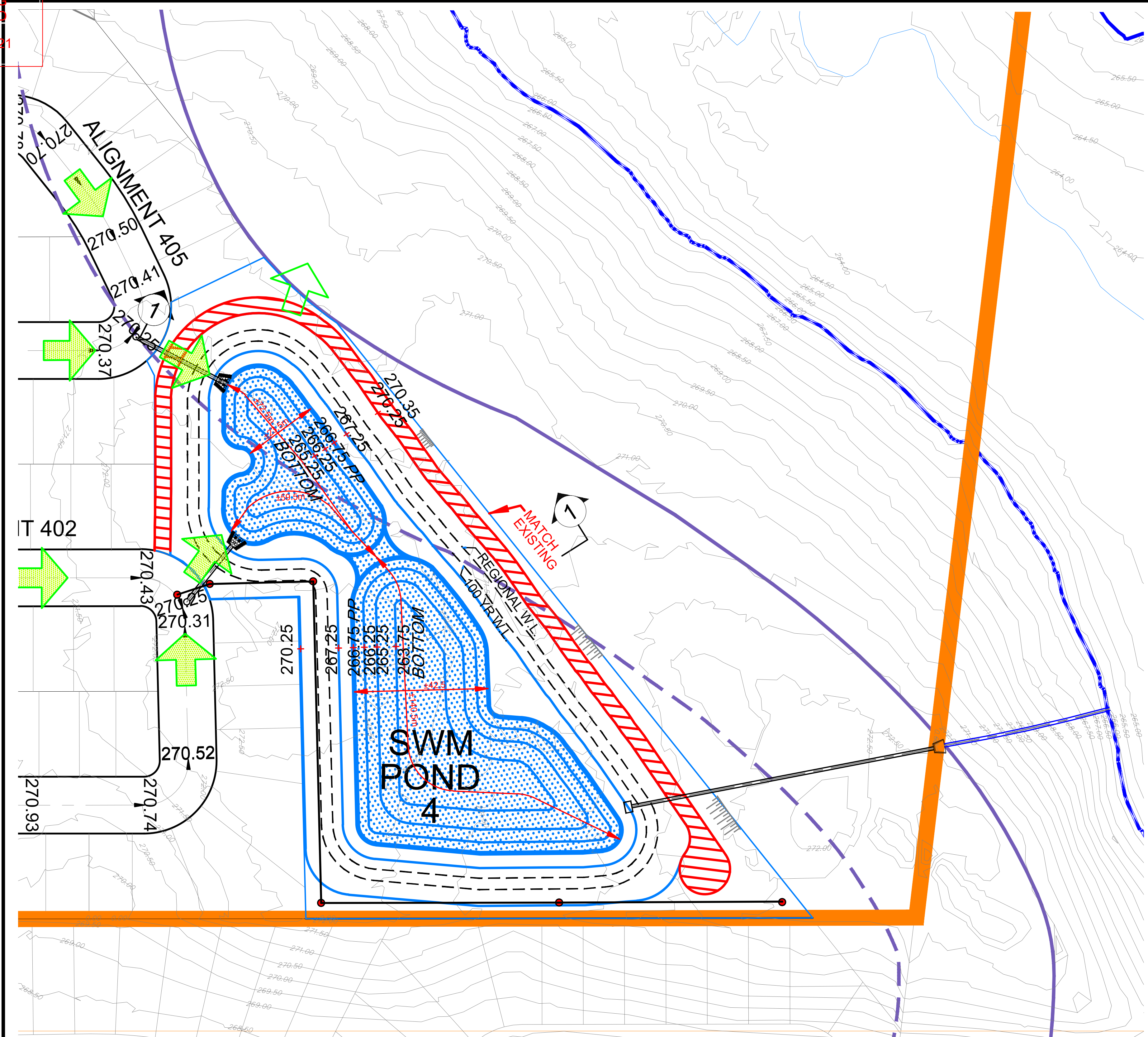
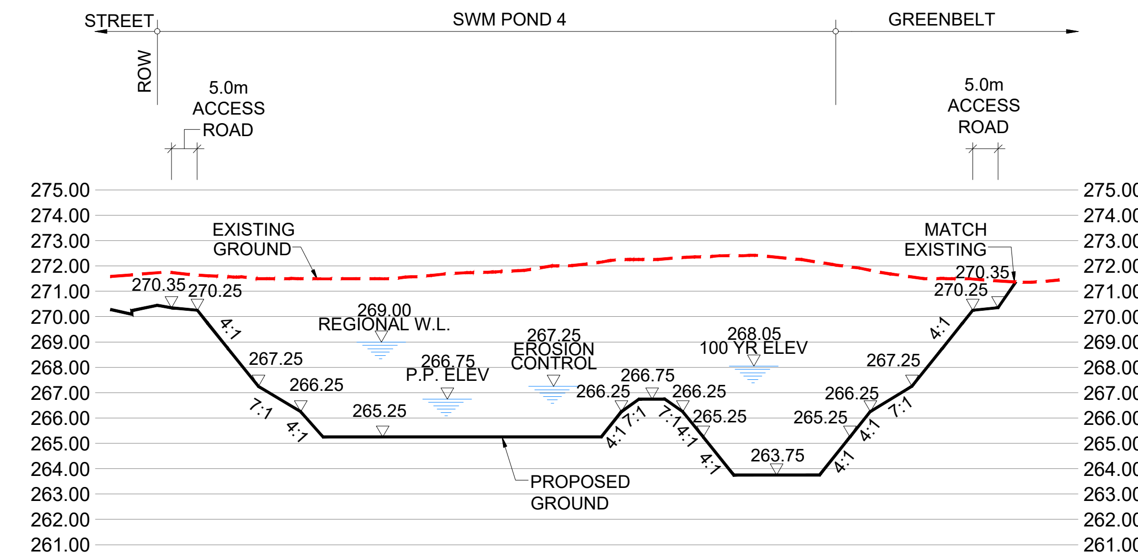
MAYFIELD WEST PHASE 1 STAGE 2 COMMUNITY FUNCTIONAL SERVICING REPORT

TOWN OF CALEDON

SWM POND 3

SCALE:	1:1500	PROJECT No.:	21-1257
DATE:	JULY 2021	FIGURE:	9





POND 4
SECTION 1-1
SCALE HOR. 1:1500
VER. 1:300

POND CHARACTERISTICS - POND 4				
	LOWER ELEVATION (m)	UPPER ELEVATION (m)	VOLUME REQUIRED (m^3)	VOLUME PROVIDED (m^3)
PERMANENT POOL	263.75	266.75	4126	9432
EXTENDED DETENTION	266.75	266.90	892	1012
EROSION CONTROL	266.75	267.25	3710	3790
100 YEAR	266.75	268.05	10980	11360
REGIONAL	266.75	269.00	21520	21880

POND 4 DATA	
DRAINAGE AREA (Ha)	22.30
IMPERVIOUSNESS	70%
POND BLOCK AREA (Ha)	2.08

LEGEND

- SITE BOUNDARY
- WATERCOURSE
- TRCA REGULATION LIMIT
- LONGTERM STABLE TOP OF SLOPE
- 10m LONGTERM STABLE TOS BUFFER
- REGIONAL FLOODLINE
- 10m REGIONAL FLOODLINE BUFFER
- WETLANDS
- 10m WETLANDS BUFFER
- MEANDER BELT
- 10m MEANDER BELT BUFFER
- ACCESS ROAD
- PERMANENT POOL
- 264.50 PROPOSED GRADE
- 264.00 EXISTING CONTOUR ELEVATION
- POND INLET
- POND OUTLET
- OVERLAND FLOW DIRECTION
- EMERGENCY OVERFLOW DIRECTION

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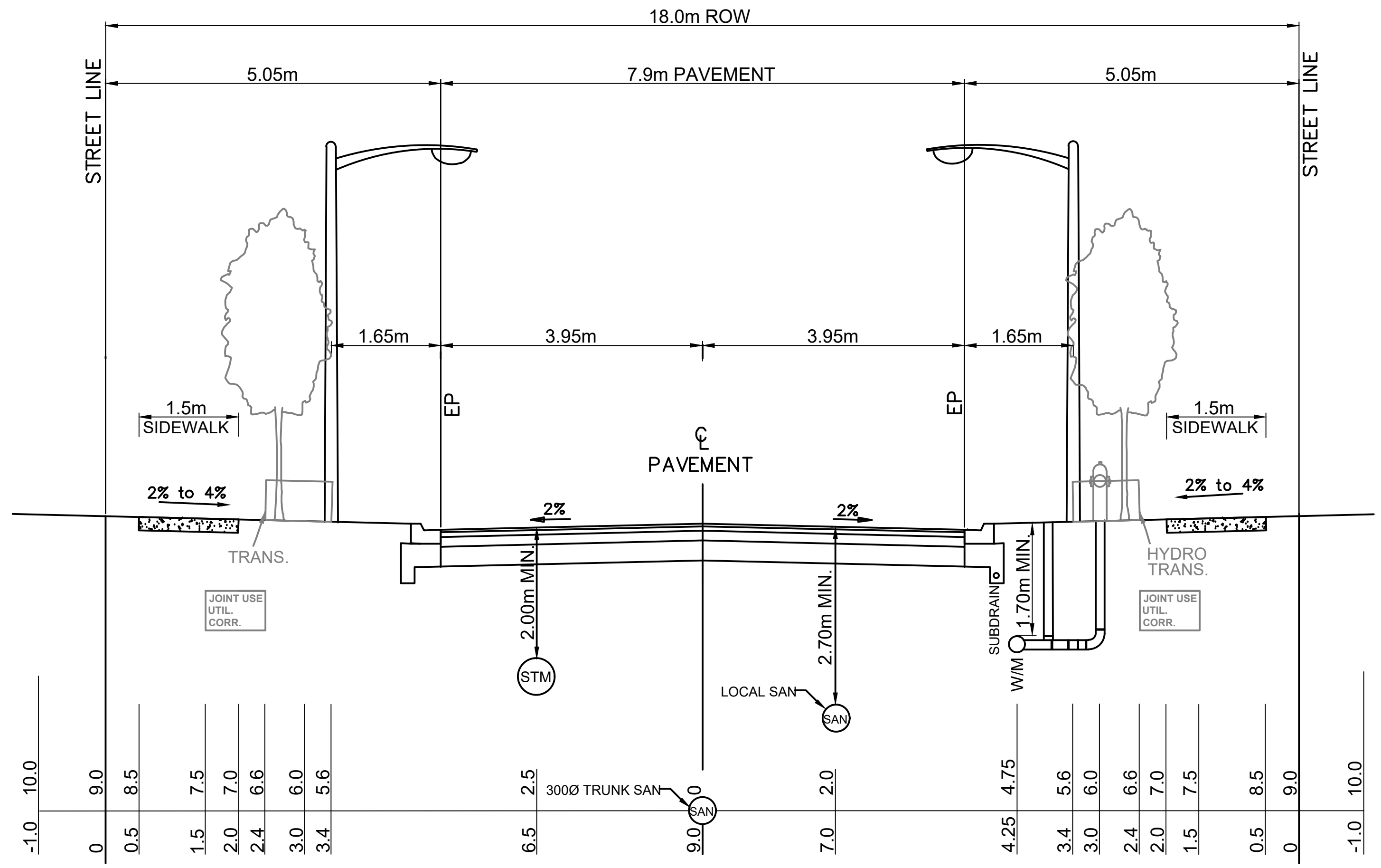
MAYFIELD WEST PHASE 1 STAGE 2 COMMUNITY FUNCTIONAL SERVICING REPORT

TOWN OF CALEDON

SWM POND 4

SCALE:	1:1500	PROJECT No.:	21-1257
DATE:	JULY 2021	FIGURE:	10



NOTES:

1. WATERMAIN TO HAVE MINIMUM COVER OF 1.7m.
2. UTILITY CORRIDOR TO HAVE A MINIMUM COVER OF 0.9m.
3. TREES TO BE PLACED IN LOCATIONS PER APPROVED LANDSCAPE PLAN.
4. STREETLIGHT FIXTURE PER APPROVED TOWN STANDARD.
5. THE FOLLOWING IS A MINIMUM ROAD BASE AND WILL REQUIRE A SOILS REPORT VERIFICATION
   - 40 mm HL3
   - 65 mm HL8
   - 150 mm GRANULAR "A"
   - 300 mm GRANULAR "B"
6. THE BOULEVARDS REQUIRE A MINIMUM OF 300mm OF TOPSOIL AND NURSERY SOD.
7. ON A CRESCENT THE WATERMAIN SHALL BE PLACED ON THE OUTSIDE.
8. FULL LENGTH MINIMUM 100 MM DIA.SUB-DRAINS C/W FILTERCLOTH SHALL BE INSTALLED, AS PER APPROVED TOWN OF CALEDON STANDARD NO. 219.
9. SUB-GRADE SHALL BE COMPACTED TO A MINIMUM 95% OF S.P.D. AT OPTIMUM MOISTURE CONTENT.
10. WHERE POSSIBLE MANHOLE LIDS TO BE LOCATED OUT OF TIRE LANE OF TRAFFIC.
11. LONG DIMENSION OF TRANSFORMER TO BE PARALLEL TO STREETLINE.

TOWN OF CALEDON

18.0m LOCAL ROAD
8.5m ROADWAY (7.9m PAVEMENT)

NO.	REVISION	APR'D	DATE
4	TEXT AND SLOPE REVISIONS		MAY 19
3	DIMENSION AND TEXT REVISION		JAN. 09
2	DIMENSION AND LAYOUT REVISION		JULY 08
1	DIMENSION EDIT		JUNE 08

APR'D: C.C.	DATE: JUNE 08
DRAWN:	SCALE: N.T.S.

STANDARD No. 202 (MOD)
(ALIGNMENT 207)

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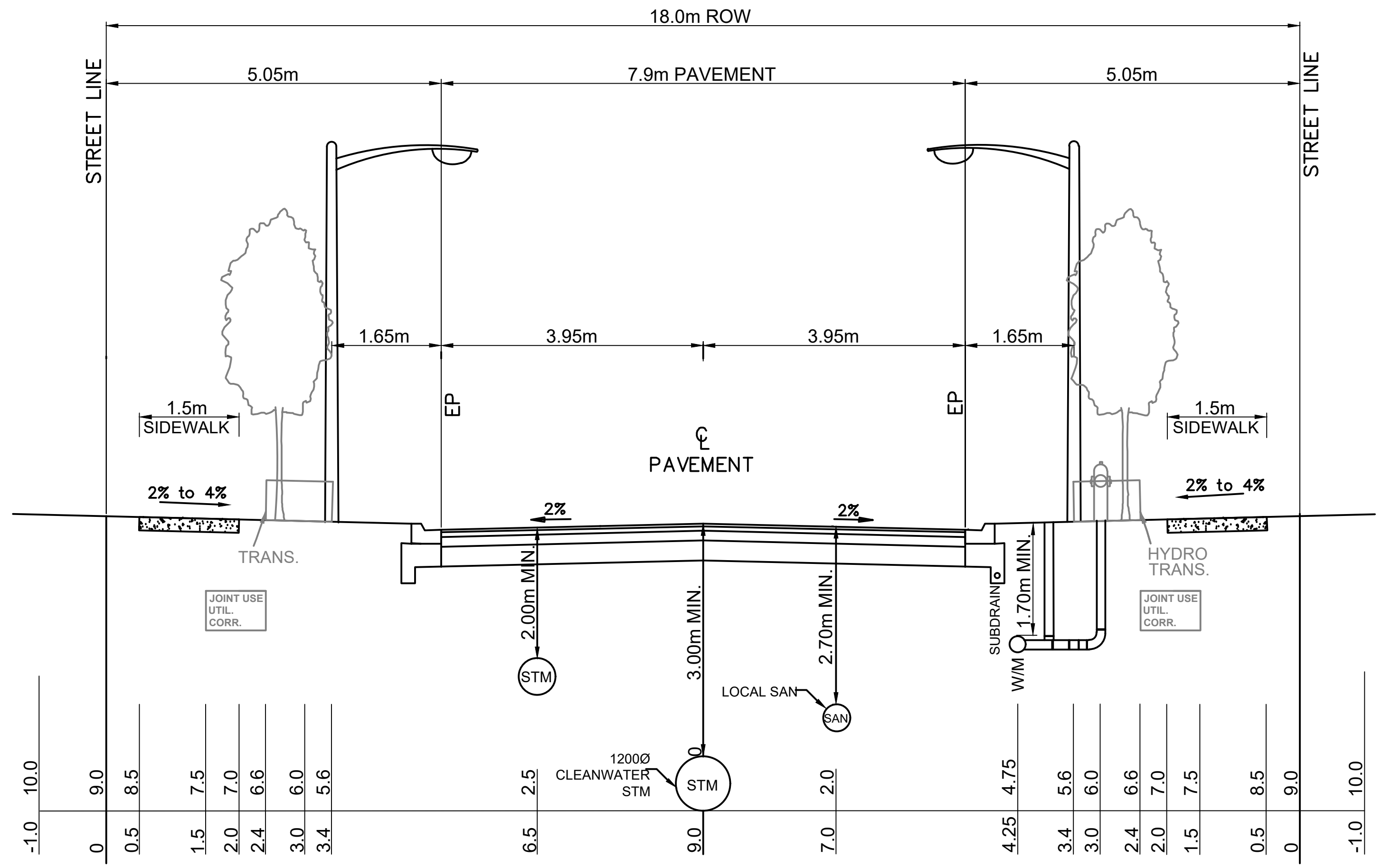
DS CONSULTANTS LTD.

MAYFIELD WEST PHASE 1 STAGE 2 COMMUNITY FUNCTIONAL SERVICING REPORT

TOWN OF CALEDON

TYPICAL ROAD SECTIONS - ALIGNMENT 207

SCALE:	AS SHOWN	PROJECT No.:	21-1257
DATE:	JULY 2021	FIGURE:	11



NOTES:
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TOWN OF CALEDON

18.0m LOCAL ROAD
8.5m ROADWAY (7.9m PAVEMENT)

NO.	REVISION	APR'D	DATE
4	TEXT AND SLOPE REVISIONS		MAY 19
3	DIMENSION AND TEXT REVISION		JAN. 09
2	DIMENSION AND LAYOUT REVISION		JULY 08
1	DIMENSION EDIT		JUNE 08

APR'D: C.C. DATE: JUNE 08
DRAWN: SCALE: N.T.S.

STANDARD No. 202 (MOD)
(ALIGNMENT 301)

DAVID SCHAEFFER ENGINEERING LTD.
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GLENN SCHNARR & ASSOCIATES INC.
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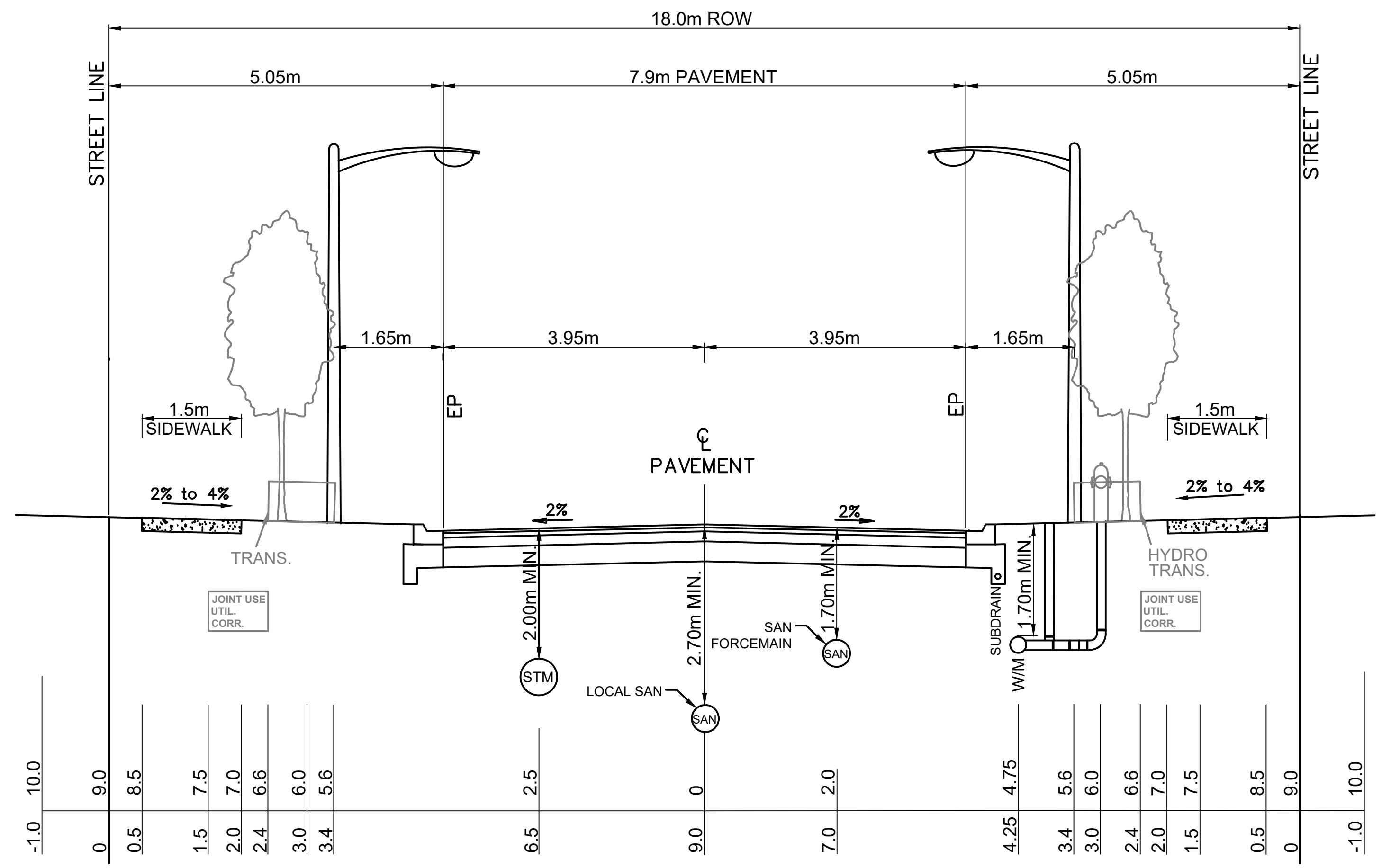
MAYFIELD WEST PHASE 1 STAGE 2 COMMUNITY FUNCTIONAL SERVICING REPORT

TOWN OF CALEDON

TYPICAL ROAD SECTIONS - ALIGNMENT 301

SCALE:	AS SHOWN	PROJECT No.:	21-1257
DATE:	JULY 2021	FIGURE:	12



NOTES:

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TOWN OF CALEDON

18.0m LOCAL ROAD
8.5m ROADWAY (7.9m PAVEMENT)

NO.	REVISION	APR'D	DATE
4	TEXT AND SLOPE REVISIONS		MAY 19
3	DIMENSION AND TEXT REVISION		JAN. 09
2	DIMENSION AND LAYOUT REVISION		JULY 08
1	DIMENSION EDIT		JUNE 08

APR'D: C.C.	DATE: JUNE 08
DRAWN:	SCALE: N.T.S.

STANDARD No. 202 (MOD)
(ALIGNMENT 101)

DAVID SCHAEFFER ENGINEERING LTD.

BEACON ENVIRONMENTAL

GLENN SCHNARR & ASSOCIATES INC.

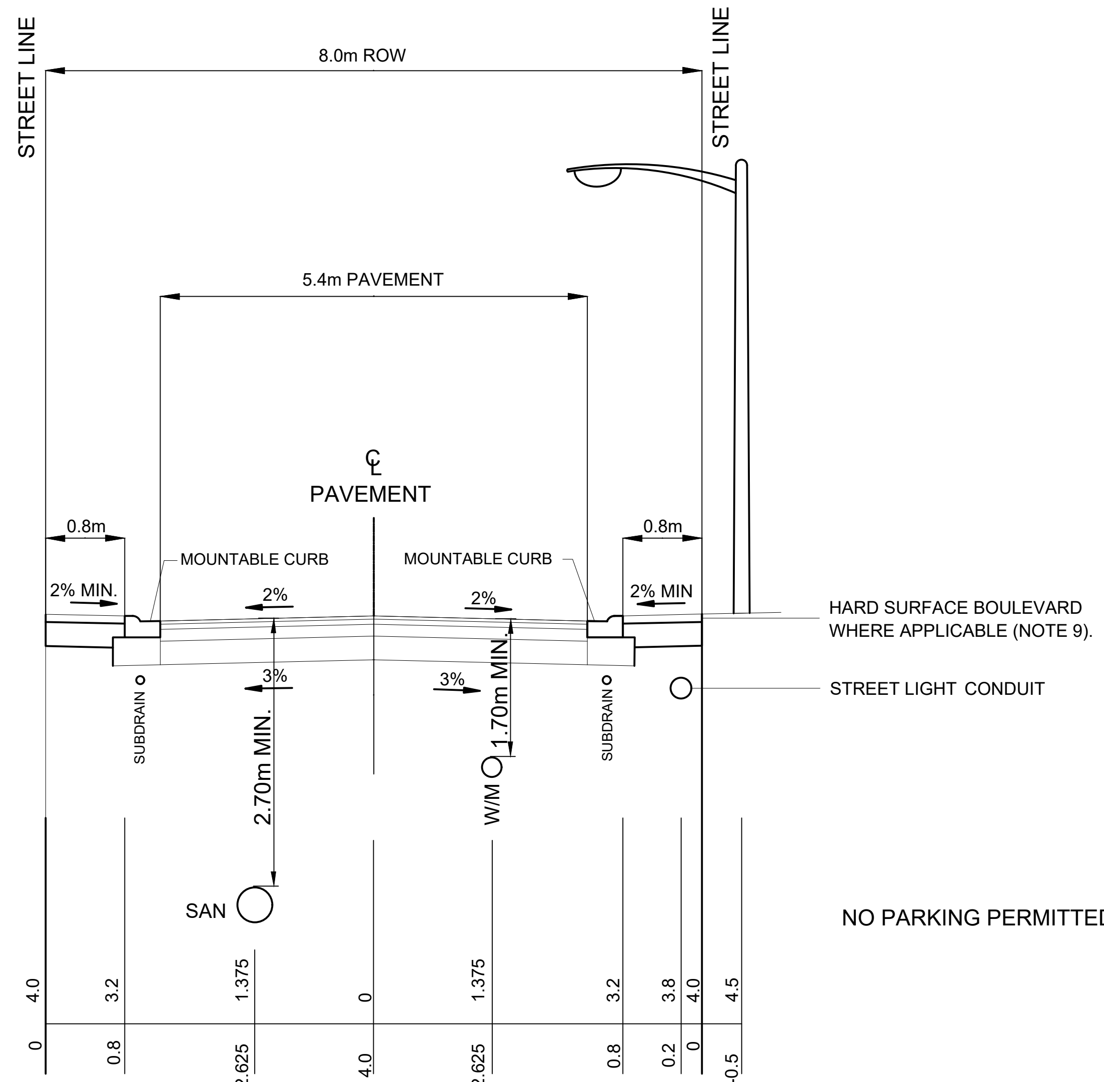
DS CONSULTANTS LTD.

MAYFIELD WEST PHASE 1 STAGE 2 COMMUNITY FUNCTIONAL SERVICING REPORT

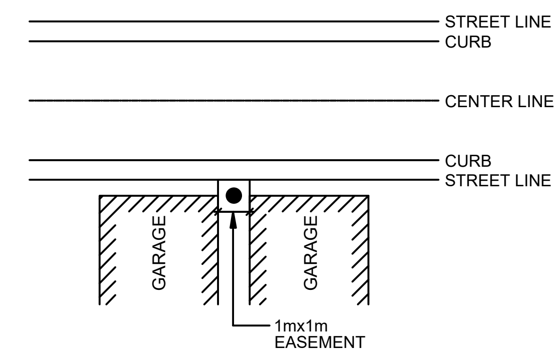
TOWN OF CALEDON

TYPICAL ROAD SECTIONS - ALIGNMENT 101

SCALE:	AS SHOWN	PROJECT No.:	21-1257
DATE:	JULY 2021	FIGURE:	13



PLAN:



NOTES

1. THE FOLLOWING IS A MINIMUM ROAD BASE AND WILL REQUIRE A SOILS REPORT VERIFICATION
   40 mm HL3
   65 mm HL8
   150 mm GRANULAR "A"
   300 mm GRANULAR "B"
2. STREETLIGHT FIXTURE PER APPROVED TOWN STANDARD.
3. FULL LENGTH MINIMUM 100 MM DIA.SUB-DRAINS C/W FILTERCLOTH SHALL BE INSTALLED, AS PER APPROVED TOWN OF CALEDON STANDARD NO. 218.
4. SUB-GRADE SHALL BE COMPACTED TO A MINIMUM 95% OF S.P.D. AT OPTIMUM MOISTURE CONTENT.
5. WHERE POSSIBLE MANHOLE LIDS TO BE LOCATED OUT OF TIRE LANE OF TRAFFIC.
6. TRANSFORMERS TO BE LOCATED ON SIDE STREETS WHERE POSSIBLE OR ALTERNATIVELY ON EASEMENT ADJACENT TO LANEWAY.
7. STREET LIGHT POLE IN 1mx1m EASEMENT.
8. 50m MAXIMUM POLE SPACING AND THEREFORE MAXIMUM LANEWAY LENGTH IS 50m WITHOUT LANEWAY ILLUMINATION.
9. WHERE LANEWAYS ARE PROPOSED ADJACENT RESIDENTIAL REAR LYARDS, HARD SURFACING IS TO BE INSTALLED FROM THE BACK OF CURB TO THE STREET LINE. HARD SURFACE TYPE IS AT THE DISCRETION OF THE TOWN.

TOWN OF CALEDON

8.0m LANEWAY 6.0m ROADWAY (5.40m PAVEMENT)

NO.	REVISION	APR'D	DATE
4	TEXT AND SLOPE REVISIONS		JULY 19
3	DIMENSION AND TEXT REVISION		JAN. 09
2	DIMENSION AND LAYOUT REVISION		JULY 08
1	NOTES EDIT, STANDARD No. 225 NOW 200		JUNE 08

APR'D: C.C.	DATE: JUNE 08
DRAWN:	SCALE: N.T.S.

STANDARD No. 200 (MOD) (ALIGNMENT 202)

DAVID SCHAEFFER ENGINEERING LTD.
BEACON ENVIRONMENTAL
GLENN SCHNARR & ASSOCIATES INC.
DS CONSULTANTS LTD.

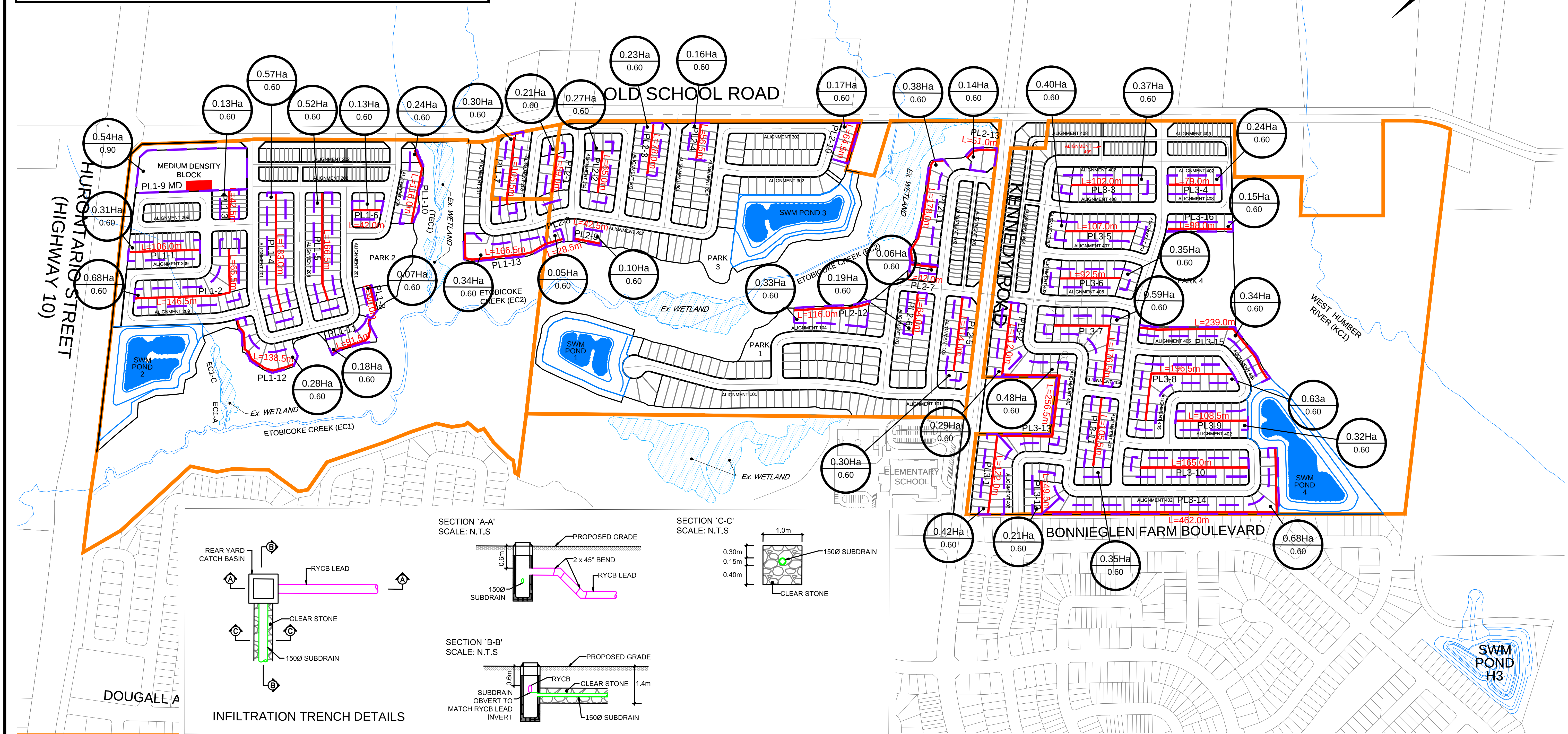
MAYFIELD WEST PHASE 1 STAGE 2 COMMUNITY FUNCTIONAL SERVICING REPORT

TOWN OF CALEDON

TYPICAL ROAD SECTIONS - ALIGNMENT 202

SCALE:	AS SHOWN	PROJECT No.:	21-1257
DATE:	JULY 2021	FIGURE:	14

NOTE:
GROUNDWATER ELEVATIONS PROVIDED BY DS CONSULTANTS LTD., DATED JUNE 14, 2021 FOR THE NEWHOUSE AND HICKS PARCELS. GROUNDWATER MONITORING TO BE COMPLETED FOR THE RUSSEL PARCEL TO VERIFY SUFFICIENT SEPARATION FROM LIDS. ONGOING GROUNDWATER MONITORING ACROSS OVERALL SITE MAY IMPACT LID RECOMMENDATIONS.



LEGEND

SITE BOUNDARY	
LID TRIBUTARY BOUNDARY	
LID TRENCH	
0.10Ha / 0.60	TOTAL AREA / RUN-OFF COEFFICIENT

NOTE: ASSUME ROOFS COVER 50% OF MEDIUM DENSITY BLOCK AREA

DAVID SCHAEFFER ENGINEERING LTD.
BEACON ENVIRONMENTAL
GLENN SCHNARR & ASSOCIATES INC.
DS CONSULTANTS LTD.

MAYFIELD WEST PHASE 1 STAGE 2 COMMUNITY FUNCTIONAL SERVICING REPORT

TOWN OF CALEDON

POTENTIAL LID PLAN

SCALE:	1:6000	PROJECT No.:	21-1257
DATE:	JULY 2021	FIGURE:	15

LEGEND

SITE BOUNDARY

PROPOSED CENTERLINE ELEVATION

PROPOSED ELEVATION
EXISTING ELEVATION

STORM OVERLAND FLOW ARROW

EXISTING CONTOUR ELEVATION

EXISTING WATERCOURSE
TRCA REGULATION LIMIT
LONGTERM STABLE TOP OF SLOPE
10m LONGTERM STABLE TOS BUFFER

REGIONAL FLOODLINE
10m REGIONAL FLOODLINE BUFFER
WETLANDS
10m WETLANDS BUFFER
MEANDER BELT
10m MEANDER BELT BUFFER

CUT-FILL DEPTH ALONG CENTER LINE:

CUT DEPTH (m)	FILL DEPTH (m)
0 - 1	0 - 1
1 - 2	1 - 2
2 - 3	2 - 3
> 3	> 3

DAVID SCHAEFFER ENGINEERING LTD.
BEACON ENVIRONMENTAL
GLENN SCHNARR & ASSOCIATES INC.
DS CONSULTANTS LTD.

MAYFIELD WEST PHASE 1 STAGE 2 COMMUNITY FUNCTIONAL SERVICING REPORT

TOWN OF CALEDON

CONCEPTUAL GRADING PLAN

SCALE:	1:2000_1	PROJECT No.:	21-1257
DATE:	JULY 2021	DRAWING:	1

LEGEND

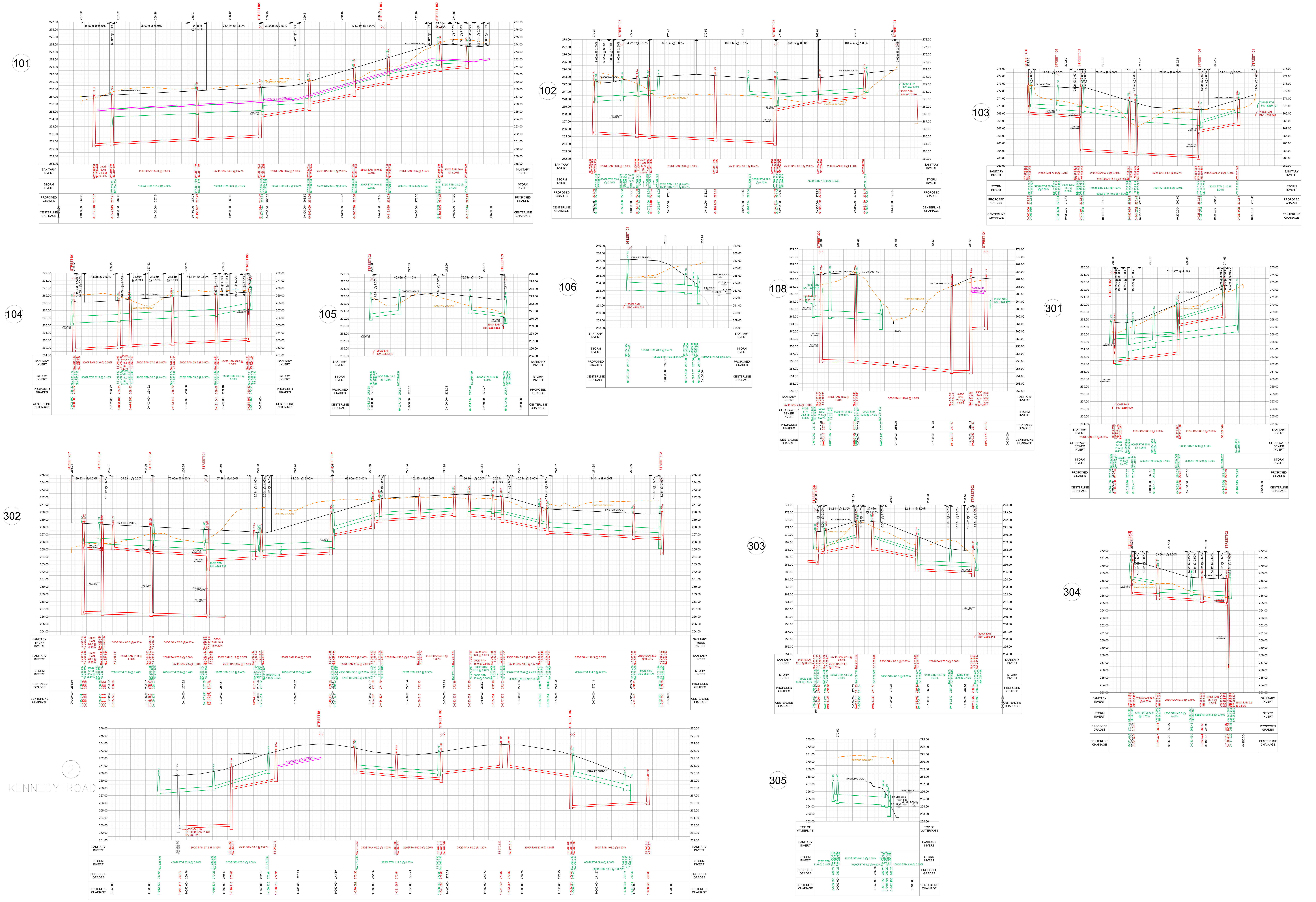
SITE BOUNDARY	100 YEAR STM CAPTURE AREAS
PROPOSED STORM MANHOLE	STORM TRIBUTARY AREA
PROPOSED STORM SEWER	EXISTING WATERCOURSE
DRAINAGE DESTINATION TOTAL AREA RUN-OFF COEFFICIENT UPSTREAM MANHOLE DOWNSTREAM MANHOLE	DRAINAGE DESTINATION TOTAL EXTERNAL AREA RUN-OFF COEFFICIENT UPSTREAM MANHOLE DOWNSTREAM MANHOLE

DAVID SCHAEFFER ENGINEERING LTD.	MAYFIELD WEST PHASE 1 STAGE 2 COMMUNITY FUNCTIONAL SERVICING REPORT	CONCEPTUAL STORM SERVICING PLAN	
BEACON ENVIRONMENTAL			
GLENN SCHNARR & ASSOCIATES INC.		SCALE: 1:20000	PROJECT No.: 21-1257
DS CONSULTANTS LTD.	TOWN OF CALEDON	DATE: JULY 2021	DRAWING: 2

LEGEND

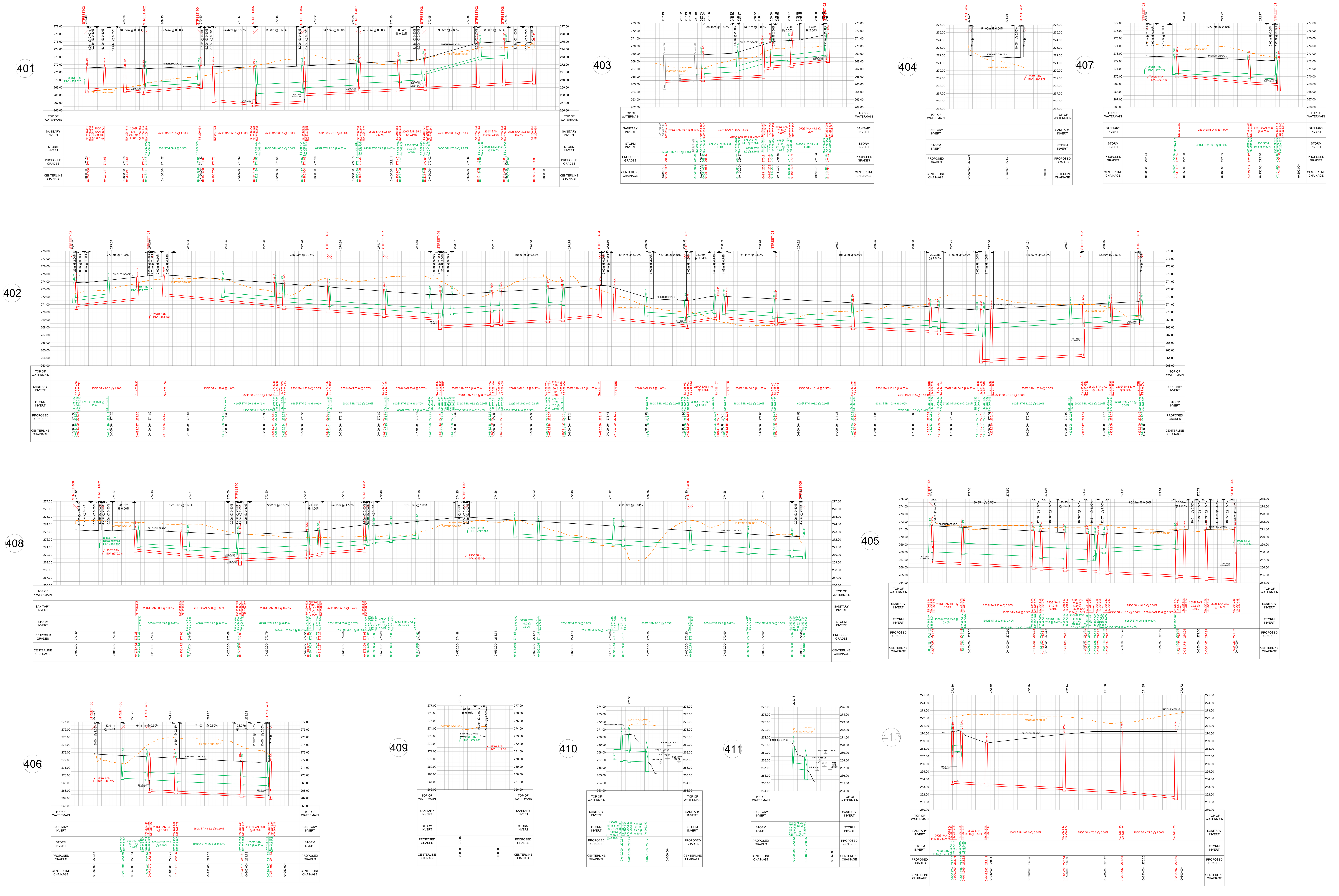
	SITE BOUNDARY
	EXISTING SANITARY TRUNK
	PROPOSED SANITARY FORCEMAIN
	PROPOSED SANITARY SEWER
	SANITARY TRIBUTARY AREA
	EXISTING SANITARY MANHOLE
	PROPOSED SANITARY MANHOLE
	EXISTING WATERCOURSE
	DRAINAGE AREA
	POPULATION DENSITY
	POPULATION

DAVID SCHAEFFER ENGINEERING LTD.	MAYFIELD WEST PHASE 1 STAGE 2 COMMUNITY FUNCTIONAL SERVICING REPORT	CONCEPTUAL SANITARY SERVICING PLAN
BEACON ENVIRONMENTAL		
GLENN SCHNARR & ASSOCIATES INC.		
DS CONSULTANTS LTD.	TOWN OF CALEDON	SCALE: 1:2000_1 PROJECT No.: 21-1257
		DATE: JULY 2021 DRAWING: 3



DAVID SCHAEFFER ENGINEERING LTD.	MAYFIELD WEST PHASE 1 STAGE 2 COMMUNITY FUNCTIONAL SERVICING REPORT	PLAN AND PROFILE
BEACON ENVIRONMENTAL		
GLENN SCHNARR & ASSOCIATES INC.		SCALE: H 1:1500 V 150 — PROJECT No.: 21-1257
DS CONSULTANTS LTD.	TOWN OF CALEDON	DATE: JULY 2021 — DRAWING: 4

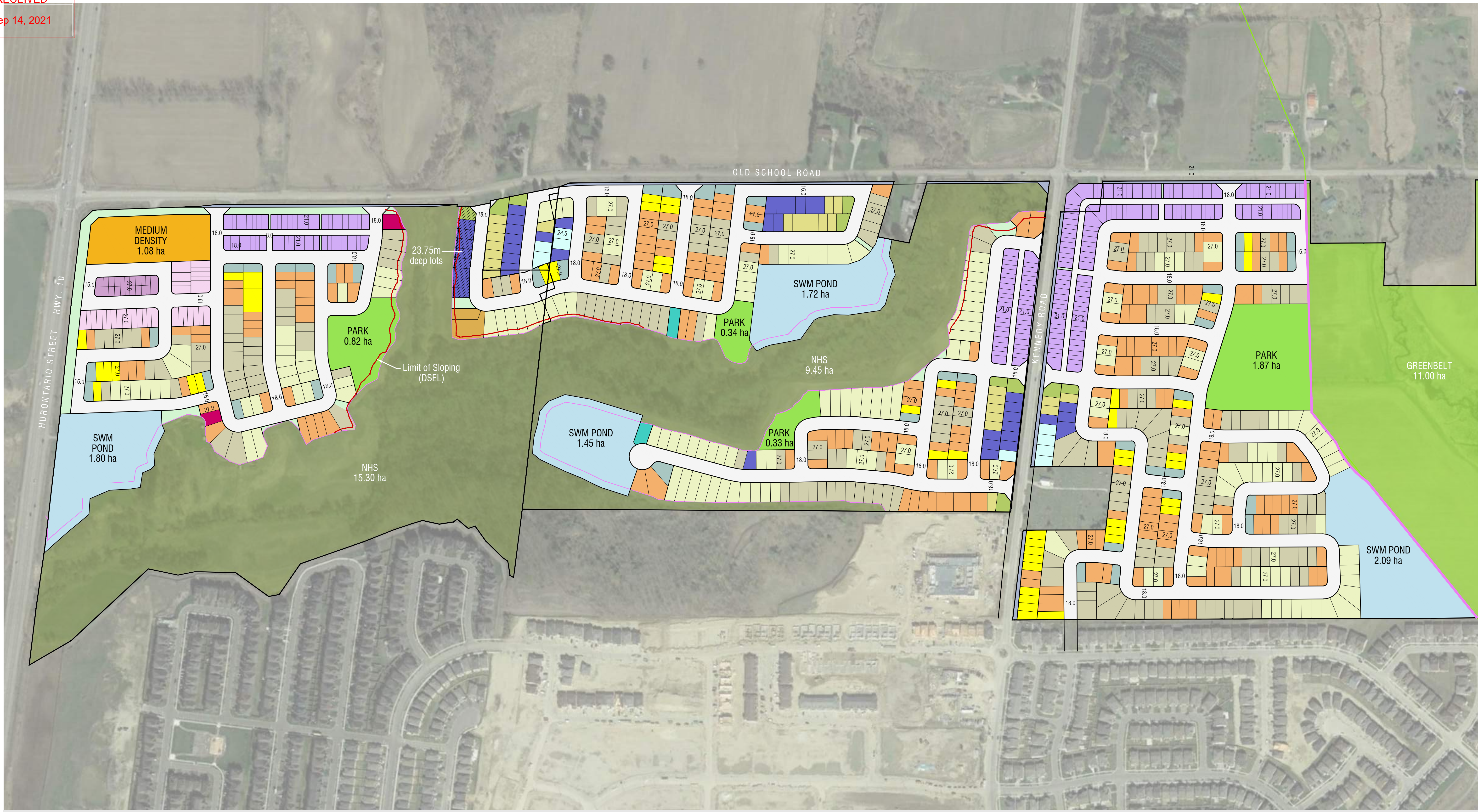
DAVID SCHAEFFER ENGINEERING LTD.	MAYFIELD WEST PHASE 1 STAGE 2 COMMUNITY FUNCTIONAL SERVICING REPORT	PLAN AND PROFILE
BEACON ENVIRONMENTAL		
GLENN SCHNARR & ASSOCIATES INC.		SCALE: H 1:1500 V1:150 / PROJECT No.: 21-1257
DS CONSULTANTS LTD.	TOWN OF CALEDON	DATE: JULY 2021 / DRAWING: 5



DAVID SCHAEFFER ENGINEERING LTD. BEACON ENVIRONMENTAL GLENN SCHNARR & ASSOCIATES INC. DS CONSULTANTS LTD.	MAYFIELD WEST PHASE 1 STAGE 2 COMMUNITY FUNCTIONAL SERVICING REPORT TOWN OF CALEDON	PLAN AND PROFILE SCALE: H 1:1500 V 1:150 — PROJECT No.: 21-1257 DATE: JULY 2021 — DRAWING: 6

APPENDIX A

PROPOSED CONCEPT PLAN



DRAFT

- All Units In Metric Unless Otherwise Noted.
- Base Information Obtained From Various Sources And Is Approximate.
- Schedule / Plan Information Is Conceptual And Requires Verification by Appropriate Agency.
- Aerial Photo: Google Earth

GERRARD DESIGN

MAYFIELD WEST PHASE I SECONDARY PLAN AMENDMENT | Caledon, Ontario

PRELIMINARY LOTTED DEVELOPMENT CONCEPT

APR 29, 2021
PROJECT 2087
SCALE 1:5000

CP-15

APPENDIX B

PRELIMINARY STORM DESIGN SHEETS

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

TOWN OF CALEDON

Manning 0.013

Sump Pump Site = 5 Year Return Frequency
Gravity Site = 10 Year Return Frequency

LOCATION			AREA (Ha)																FLOW						SEWER DATA									
			2 YEAR				5 YEAR				10 YEAR				100 YEAR				Time of Conc.	Intensity 2 Year	Intensity 5 Year	Intensity 10 Year	Intensity 100 Year	Peak Flow	DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF FLOW	RATIO
			AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC															
Location	From Node	To Node																	(min)	(mm/h)	(mm/h)	(mm/h)	(mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	(min)	Q/Q full
ALIGNMENT 105																																	
	102	103			0.00	0.00	0.33	0.85	0.78	0.78			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	85	375	375	PVC	1.20	47.5	192	1.74	0.46	0.45
To ALIGNMENT 103, Pipe 103 - 106						0.00				0.78				0.00				0.00	10.46														
	153	154			0.00	0.00			0.00	0.00			0.00	0.00	0.35	0.85	0.83	0.83	10.00	0.00	109.64	134.16	196.80	163	450	450	CONC	1.25	38.5	319	2.00	0.32	0.51
To ALIGNMENT 102, Pipe 154 - 155						0.00				0.00				0.00				0.83	10.32														
ALIGNMENT 102																																	
	104	106			0.00	0.00	0.55	0.65	0.99	0.99			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	109	450	450	CONC	0.65	120.0	230	1.45	1.38	0.47
To ALIGNMENT 103, Pipe 106 - 107						0.00				0.99				0.00				0.00	11.38														
					0.00	0.00	0.19	0.85	0.45	0.45			0.00	0.00			0.00	0.00															
	105	106			0.00	0.00	0.21	0.65	0.38	0.83			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	91	375	375	PVC	0.70	39.0	147	1.33	0.49	0.62
To ALIGNMENT 103, Pipe 106 - 107						0.00				0.83				0.00				0.00	10.49														
					0.00	0.00			0.00	0.00			0.00	0.00	0.11	0.85	0.26	0.26															
	150	151			0.00	0.00			0.00	0.00			0.00	0.00	0.18	0.65	0.33	0.59	10.00	0.00	109.64	134.16	196.80	115	375	375	PVC	0.80	15.0	157	1.42	0.18	0.73
	151	152			0.00	0.00			0.00	0.00			0.00	0.00	0.03	0.65	0.05	0.64	10.18	0.00	108.84	133.19	195.57	125	450	450	CONC	0.50	15.0	202	1.27	0.20	0.62
	152	154			0.00	0.00			0.00	0.00			0.00	0.00	0.05	0.45	0.06	0.70	10.37	0.00	107.96	132.13	194.21	136	450	450	CONC	0.85	22.5	263	1.65	0.23	0.52
Contribution From ALIGNMENT 105, Pipe 153 - 154						0.00				0.00				0.00				0.83	10.32														
	154	155			0.00	0.00			0.00	0.00			0.00	0.00	0.11	0.65	0.20	1.73	10.60	0.00	106.96	130.92	192.68	333	600	600	CONC	0.55	35.0	455	1.61	0.36	0.73
To KENNEDY ROAD, Pipe 155 - 156						0.00				0.00				0.00				1.73	10.96														
KENNEDY ROAD																																	
					0.00	0.00	0.09	0.30	0.08	0.08			0.00	0.00			0.00	0.00															
	100	101			0.00	0.00	0.28	0.65	0.51	0.58			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	64	375	375	PVC	0.75	112.0	152	1.37	1.36	0.42
To ALIGNMENT 103, Pipe 101 - 103						0.00				0.58				0.00				0.00	11.36														
	507	506			0.00	0.00	0.64	0.90	1.60	1.60			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	176	375	375	PVC	3.00	73.5	304	2.75	0.45	0.58
	506	505			0.00	0.00			0.00	1.60			0.00	0.00			0.00	0.00	10.45	0.00	107.64	131.74	193.72	172	450	450	CONC	0.70	73.5	239	1.50	0.82	0.72
Contribution From ALIGNMENT 102, Pipe 154 - 155						0.00				0.00				0.00				1.73	10.96														
	155	156			0.00	0.00	0.50	0.90	1.25	1.25			0.00	0.00			0.00	1.73	10.96	0.00	105.41	129.05	190.28	461	600	600	CONC	2.50	69.0	971	3.43	0.33	0.47
	156	157			0.00	0.00			0.00	1.25			0.00	0.00			0.00	1.73	11.30	0.00	104.02	127.36	188.11	455	600	600	CONC	1.00	13.0	614	2.17	0.10	0.74
ALIGNMENT 103																																	
	109	110			0.00	0.00	0.22	0.65	0.40	0.40			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	44	300	300	PVC	3.00	51.0	167	2.37	0.36	0.26
To ALIGNMENT 104, Pipe 110 - 111						0.00				0.40				0.00				0.00	10.36														
Contribution From KENNEDY ROAD, Pipe 100 - 101						0.00				0.58				0.00				0.00	11.36														
	101	103			0.00	0.00	0.64	0.90	1.60	2.18			0.00	0.00			0.00	0.00	11.36	0.00	103.77	127.06	187.72	226	525	525	CONC	0.50	36.5	304	1.40	0.43	0.74
Contribution From ALIGNMENT 105, Pipe 102 - 103						0.00				0.78				0.00				0.00	10.46														
	103	106			0.00	0.00	0.11	0.65	0.20	3.16			0.00	0.00			0.00	0.00	11.79	0.00	102.03	124.96	185.01	323	600	600	CONC	0.50	33.5	434	1.54	0.36	0.74
Contribution From ALIGNMENT 102, Pipe 104 - 106						0.00				0.99				0.00				0.00	11.38														
Contribution From ALIGNMENT 102, Pipe 105 - 106						0.00				0.83				0.00				0.00	10.49														
	106	107			0.00	0.00	0.22	0.65	0.40	5.38			0.00	0.00			0.00	0.00	12.15	0.00	100.62	123.25	182.79	541	600	600	CONC	1.60	61.0	777	2.75	0.37	0.70
	107	108			0.00	0.00	0.02	0.65	0.04	5.42			0.00	0.00			0.00	0.00	12.52	0.00	99.23	121.56	180.58	538	600	600	CONC	1.60	10.0	777	2.75	0.06	0.69
	108	110			0.00	0.00	0.53	0.65	0.96	6.37			0.00	0.00			0.00	0.00	12.59	0.00	99.01	121.29	180.22	631	750	750	CONC	0.60	85.5	862	1.95	0.73	0.73
To ALIGNMENT 104, Pipe 110 - 111						0.00				6.37				0.00				0.00	13.32														
ALIGNMENT 104																																	
Contribution From ALIGNMENT 103, Pipe 108 - 110						0.00				6.37				0.00				0.00	13.32														
Contribution From ALIGNMENT 103, Pipe 109 - 110						0.00				0.40				0.00				0.00	10.36														
	110	111			0.00	0.00	0.11	0.65	0.20	6.97			0.00	0.00			0.00	0.00	13.32	0.00	96.39	118.11	176.05	672	750	750	CONC	1.90	46.0	1535	3.47	0.22	0.44
	111	112			0.00	0.00	0.37	0.65	0.67	7.64			0.00	0.00			0.00	0.00	13.54	0.00	95.63	117.18	174.82	731	825	825	CONC	0.50	58.5	1015	1.90	0.51	0.72
	112	113			0.00	0.00	0.26	0.65	0.47	8.11			0.00	0.00			0.00	0.00	14.05	0.00	93.90	115.08	172.04	761	900	900	CONC	0.40	56.5	1145	1.80	0.52	0.67
	113	114			0.00	0.00	0.03	0.65	0.05	8.16			0.00	0.00			0.00	0.00	14.57	0.00	92.21	113.02	169.30	753	900	900	CONC	0.40	14.0	1145	1.80	0.13	0.66

Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Designed: V.C.		PROJECT:	Mayfield West Phase 1 Stage 2 Community		
Checked: D.A.		LOCATION:	Town of Caledon		
Dwg. Reference: 2		File Ref: 21-1257	Date: Jul 2021	Sheet No. SHEET 1 OF 8	

TOWN OF CALEDON
PLANNING
RECEIVED
Sep 14, 2021

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

TOWN OF CALEDON

Manning 0.013

Sump Pump Site = 5 Year Return Frequency
Gravity Site = 10 Year Return Frequency

LOCATION			AREA (Ha) 2 YEAR				5 YEAR				10 YEAR				100 YEAR				FLOW						SEWER DATA								
Location	From Node	To Node	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	Time of Conc. (min)	Intensity 2 Year (mm/h)	Intensity 5 Year (mm/h)	Intensity 10 Year (mm/h)	Intensity 100 Year (mm/h)	Peak Flow Q (l/s)	DIA. (mm) (actual)	DIA. (mm) (nominal)	TYPE	SLOPE (%)	LENGTH (m)	CAPACITY (l/s)	VELOCITY (m/s)	TIME OF FLOW (min)	RATIO Q/Q full
					0.00	0.00	0.25	0.65	0.45	8.62			0.00	0.00			0.00	0.00															
	114	120			0.00	0.00	0.33	0.45	0.41	9.03			0.00	0.00			0.00	0.00	14.70	0.00	91.80	112.52	168.63	829	900	900	CONC	0.40	62.5	1145	1.80	0.58	0.72
To ALIGNMENT 101, Pipe 120 - 121						0.00				9.03				0.00				0.00	15.28														
ALIGNMENT 101																																	
	115	116			0.00	0.00	0.36	0.65	0.65	0.65			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	71	375	375	PVC	0.40	39.0	111	1.00	0.65	0.64
	116	117			0.00	0.00	0.45	0.65	0.81	1.46			0.00	0.00			0.00	0.00	10.65	0.00	106.76	130.67	192.36	156	375	375	PVC	1.95	66.5	245	2.22	0.50	0.64
	117	118			0.00	0.00	0.22	0.65	0.40	1.86			0.00	0.00			0.00	0.00	11.15	0.00	104.64	128.11	189.07	195	375	375	PVC	2.85	46.0	296	2.68	0.29	0.66
	118	119			0.00	0.00	0.44	0.65	0.80	2.66			0.00	0.00			0.00	0.00	11.43	0.00	103.46	126.69	187.24	275	450	450	CONC	3.00	60.0	494	3.10	0.32	0.56
	119	120			0.00	0.00	0.36	0.65	0.65	3.31			0.00	0.00			0.00	0.00	11.76	0.00	102.17	125.13	185.22	338	600	600	CONC	0.55	63.0	455	1.61	0.65	0.74
Contribution From ALIGNMENT 104, Pipe 114 - 120						0.00				9.03				0.00				0.00	15.28														
	120	121			0.00	0.00	0.57	0.65	1.03	13.36			0.00	0.00			0.00	0.00	15.28	0.00	90.02	110.35	165.72	1203	1050	1050	CONC	0.40	88.0	1727	1.99	0.74	0.70
	121	122			0.00	0.00	0.73	0.65	1.32	14.68			0.00	0.00			0.00	0.00	16.02	0.00	87.86	107.72	162.17	1290	1050	1050	CONC	0.40	114.0	1727	1.99	0.95	0.75
To SWM POND 1, Pipe 122 - 123						0.00				14.68				0.00				0.00	16.97														
SWM POND 1																																	
Contribution From ALIGNMENT 101, Pipe 121 - 122						0.00				14.68				0.00				0.00	16.97														
					0.00	0.00	0.05	0.90	0.13	14.81			0.00	0.00			0.00	0.00															
	122	123			0.00	0.00	0.35	0.65	0.63	15.44			0.00	0.00			0.00	0.00	16.97	0.00	85.23	104.50	157.79	1316	1050	1050	CONC	0.45	78.0	1832	2.12	0.61	0.72
	123	124			0.00	0.00			0.00	15.44			0.00	0.00			0.00	0.00	17.58	0.00	83.62	102.53	155.09	1291	1050	1050	CONC	0.40	10.0	1727	1.99	0.08	0.75
	124	125			0.00	0.00			0.00	15.44			0.00	0.00			0.00	0.00	17.67	0.00	83.40	102.26	154.73	1288	1050	1050	CONC	0.40	7.5	1727	1.99	0.06	0.75
OLD SCHOOL ROAD																																	
	350	351			0.00	0.00			0.00	0.00			0.00	0.00	16.40	0.25	11.40	11.40	52.21	0.00	41.62	50.73	79.57	907	900	900	CONC	0.45	48.0	1214	1.91	0.42	0.75
To ALIGNMENT 301, Pipe 351 - 352						0.00				0.00				0.00				11.40	52.63														
ALIGNMENT 301																																	
	316	317			0.00	0.00	0.54	0.65	0.98	0.98			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	107	300	300	PVC	3.00	62.0	167	2.37	0.44	0.64
	317	3170			0.00	0.00	0.37	0.65	0.67	1.64			0.00	0.00			0.00	0.00	10.44	0.00	107.68	131.79	193.79	177	525	525	CONC	0.40	59.5	272	1.26	0.79	0.65
	3170	318			0.00	0.00	0.05	0.65	0.09	1.73			0.00	0.00			0.00	0.00	11.23	0.00	104.31	127.72	188.57	181	525	525	CONC	0.40	30.0	272	1.26	0.40	0.67
To ALIGNMENT 302, Pipe 318 - 330						0.00				1.73				0.00				0.00	11.62														
Contribution From OLD SCHOOL ROAD, Pipe 350 - 351						0.00				0.00				0.00				11.40	52.63														
	351	352			0.00	0.00			0.00	0.00			0.00	0.00			0.00	11.40	52.63	0.00	41.38	50.43	79.11	902	900	900	CONC	1.30	112.0	2064	3.24	0.58	0.44
	352	3520			0.00	0.00			0.00	0.00			0.00	0.00			0.00	11.40	53.20	0.00	41.06	50.02	78.48	895	900	900	CONC	1.95	35.5	2528	3.97	0.15	0.35
To SERVICING EASEMENT - CLEANWATER, Pipe 3520 - 3						0.00				0.00				0.00				11.40	53.35														
SERVICING EASEMENT - CLEANWATER																																	
Contribution From ALIGNMENT 301, Pipe 352 - 3520						0.00				0.00				0.00				11.40	53.35														
	3520	3521			0.00	0.00			0.00	0.00			0.00	0.00			0.00	11.40	53.35	0.00	40.97	49.92	78.32	893	900	900	CONC	0.45	31.5	1214	1.91	0.28	0.74
	3521	353			0.00	0.00			0.00	0.00			0.00	0.00			0.00	11.40	53.63	0.00	40.82	49.73	78.03	889	900	900	CONC	0.45	36.0	1214	1.91	0.31	0.73
	353	354			0.00	0.00			0.00	0.00			0.00	0.00			0.00	11.40	53.94	0.00	40.64	49.52	77.70	886	900	900	CONC	0.45	33.5	1214	1.91	0.29	0.73
ALIGNMENT 303																																	
	305	306			0.00	0.00	0.24	0.65	0.43	0.43			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	48	300	300	PVC	2.90	43.5	165	2.33	0.31	0.29
	306	309			0.00	0.00	0.02	0.65	0.04	0.47			0.00	0.00			0.00	0.00	10.31	0.00	108.24	132.46	194.64	51	300	300	PVC	0.55	14.0	72	1.01	0.23	0.71
To ALIGNMENT 304, Pipe 309 - 310						0.00				0.47				0.00				0.00	10.54														
	313	314			0.00	0.00	0.43	0.65	0.78	0.78			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	85	300	300	PVC	3.00	65.5	167	2.37	0.46	0.51
	314	3150			0.00	0.00	0.29	0.65	0.52	1.30			0.00	0.00			0.00	0.00	10.46	0.00	107.57	131.66	193.62	140	525	525	CONC	0.40	43.0	272	1.26	0.57	0.51
	3150	315			0.00	0.00	0.06	0.65	0.11	1.41			0.00	0.00			0.00	0.00	11.03	0.00	105.12	128.70	189.83	148	525	525	CONC	0.40	35.0	272	1.26	0.46	0.54
To ALIGNMENT 302, Pipe 315 - 318						0.00				1.41				0.00				0.00	11.50														
ALIGNMENT 304																																	
Contribution From ALIGNMENT 303, Pipe 306 - 309						0.00				0.47				0.00				0.00	10.54														
	309	310			0.00	0.00	0.07	0.65	0.13	0.60			0.00	0.00			0.00	0.00	10.54	0.00	107.22	131.23	193.07	64	300	300	PVC	1.70	37.0	126	1.78	0.35	0.51
	310	311			0.00	0.00	0.42	0.65	0.76	1.36			0.00	0.00			0.00	0.00	10.89	0.00	105.73	129.43	190.77	143	450	450	CONC	0.45	45.0	191	1.20	0.62	0.75

Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Designed: V.C.	PROJECT: Mayfield West Phase 1 Stage 2 Community		
Checked: D.A.	LOCATION: Town of Caledon		
Dwg. Reference: 2	File Ref: 21-1257	Date: Jul 2021	Sheet No. SHEET 2 OF 8

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

TOWN OF CALEDON

Manning 0.013

Sump Pump Site = 5 Year Return Frequency
Gravity Site = 10 Year Return Frequency

LOCATION			AREA (Ha) 2 YEAR				5 YEAR				10 YEAR				100 YEAR				FLOW						SEWER DATA								
Location	From Node	To Node	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	Time of Conc. (min)	Intensity 2 Year (mm/h)	Intensity 5 Year (mm/h)	Intensity 10 Year (mm/h)	Intensity 100 Year (mm/h)	Peak Flow Q (l/s)	DIA. (mm) (actual)	DIA. (mm) (nominal)	TYPE	SLOPE (%)	LENGTH (m)	CAPACITY (l/s)	VELOCITY (m/s)	TIME OF FLOW (min)	RATIO Q/Q full
	311	312			0.00	0.00	0.06	0.65	0.11	1.46			0.00	0.00			0.00	0.00	11.51	0.00	103.15	126.31	186.75	151	525	525	CONC	0.40	51.5	272	1.26	0.68	0.56
To ALIGNMENT 302, Pipe 312 - 315						0.00				1.46				0.00				0.00	12.19														
ALIGNMENT 302																																	
	325	326			0.00	0.00	0.38	0.65	0.69	0.69			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	75	375	375	PVC	0.55	99.0	130	1.18	1.40	0.58
					0.00	0.00	0.06	0.65	0.11	0.80			0.00	0.00			0.00	0.00															
	326	327			0.00	0.00	0.55	0.90	1.38	2.17			0.00	0.00			0.00	0.00	11.40	0.00	103.59	126.85	187.44	225	375	375	PVC	2.95	9.5	301	2.73	0.06	0.75
	327	328			0.00	0.00	0.36	0.65	0.65	2.82			0.00	0.00			0.00	0.00	11.46	0.00	103.36	126.56	187.08	292	450	450	CONC	2.95	53.0	490	3.08	0.29	0.60
	319	320			0.00	0.00	0.16	0.65	0.29	0.29			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	32	300	300	PVC	0.60	31.5	75	1.06	0.50	0.42
	320	321			0.00	0.00	0.12	0.65	0.22	0.51			0.00	0.00			0.00	0.00	10.50	0.00	107.42	131.48	193.38	54	300	300	PVC	0.60	12.0	75	1.06	0.19	0.73
	321	322			0.00	0.00	0.24	0.65	0.43	0.94			0.00	0.00			0.00	0.00	10.68	0.00	106.60	130.48	192.11	100	300	300	PVC	2.45	50.0	151	2.14	0.39	0.66
	322	323			0.00	0.00	0.09	0.65	0.16	1.10			0.00	0.00			0.00	0.00	11.07	0.00	104.94	128.48	189.55	116	300	300	PVC	2.55	9.5	154	2.18	0.07	0.75
	323	324			0.00	0.00	0.83	0.65	1.50	2.60			0.00	0.00			0.00	0.00	11.15	0.00	104.64	128.12	189.08	272	600	600	CONC	0.50	114.5	434	1.54	1.24	0.63
	324	328			0.00	0.00	0.06	0.65	0.11	2.71			0.00	0.00			0.00	0.00	12.39	0.00	99.74	122.18	181.38	270	600	600	CONC	0.40	35.0	388	1.37	0.42	0.70
	328	329			0.00	0.00	0.57	0.65	1.03	6.56			0.00	0.00			0.00	0.00	12.81	0.00	98.17	120.27	178.90	644	825	825	CONC	0.40	98.5	908	1.70	0.97	0.71
To SWM POND 3, Pipe 329 - 330						0.00				6.56				0.00				0.00	13.78														
Contribution From ALIGNMENT 207, Pipe 303 - 304						0.00				1.97				0.00				0.00	12.18														
	304	312			0.00	0.00	0.12	0.65	0.22	2.19			0.00	0.00			0.00	0.00	12.18	0.00	100.54	123.15	182.65	220	600	600	CONC	0.40	22.5	388	1.37	0.27	0.57
Contribution From ALIGNMENT 304, Pipe 311 - 312						0.00				1.46				0.00				0.00	12.19														
	312	315			0.00	0.00	0.37	0.65	0.67	4.32			0.00	0.00			0.00	0.00	12.45	0.00	99.51	121.90	181.02	430	750	750	CONC	0.40	71.0	704	1.59	0.74	0.61
Contribution From ALIGNMENT 303, Pipe 3150 - 315						0.00				1.41				0.00				0.00	11.50														
	315	318			0.00	0.00	0.36	0.65	0.65	6.38			0.00	0.00			0.00	0.00	13.19	0.00	96.82	118.63	176.74	618	825	825	CONC	0.40	68.0	908	1.70	0.67	0.68
Contribution From ALIGNMENT 301, Pipe 3170 - 318						0.00				1.73				0.00				0.00	11.62														
	318	330			0.00	0.00	0.38	0.65	0.69	8.80			0.00	0.00			0.00	0.00	13.86	0.00	94.53	115.85	173.06	832	900	900	CONC	0.40	81.0	1145	1.80	0.75	0.73
To SWM POND 3, Pipe 330 - 331						0.00				8.80				0.00				0.00	14.61														
SWM POND 3																																	
Contribution From ALIGNMENT 302, Pipe 328 - 329						0.00				6.56				0.00				0.00	13.78														
	329	330			0.00	0.00			0.00	6.56			0.00	0.00			0.00	0.00	13.78	0.00	94.80	116.17	173.49	622	825	825	CONC	0.40	11.0	908	1.70	0.11	0.69
Contribution From ALIGNMENT 302, Pipe 318 - 330						0.00				8.80				0.00				0.00	14.61														
	330	331			0.00	0.00	0.34	0.45	0.43	15.79			0.00	0.00			0.00	0.00	14.61	0.00	92.09	112.88	169.10	1454	1050	1050	CONC	0.55	61.0	2025	2.34	0.43	0.72
	331	332			0.00	0.00			0.00	15.79			0.00	0.00			0.00	0.00	15.04	0.00	90.74	111.23	166.90	1433	1050	1050	CONC	0.50	4.5	1931	2.23	0.03	0.74
	332	333			0.00	0.00			0.00	15.79			0.00	0.00			0.00	0.00	15.08	0.00	90.64	111.10	166.73	1431	1050	1050	CONC	0.50	6.5	1931	2.23	0.05	0.74
ALIGNMENT 204																																	
					0.00	0.00	0.07	0.45	0.09	0.09			0.00	0.00			0.00	0.00															
	2120	212			0.00	0.00	0.17	0.85	0.40	0.49			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	54	300	300	PVC	1.50	32.5	118	1.68	0.32	0.45
					0.00	0.00	0.12	0.85	0.28	0.77			0.00	0.00			0.00	0.00															
	212	213			0.00	0.00	0.50	0.65	0.90	1.68			0.00	0.00			0.00	0.00	10.32	0.00	108.18	132.40	194.56	181	450	450	CONC	1.40	75.5	337	2.12	0.59	0.54
	213	214			0.00	0.00	0.53	0.65	0.96	2.63			0.00	0.00			0.00	0.00	10.92	0.00	105.60	129.28	190.58	278	525	525	CONC	1.50	74.5	527	2.43	0.51	0.53
	214	2140			0.00	0.00	0.30	0.65	0.54	3.18			0.00	0.00			0.00	0.00	11.43	0.00	103.49	126.72	187.28	329	525	525	CONC	1.35	55.5	500	2.31	0.40	0.66
	2140	215			0.00	0.00			0.00	3.18			0.00	0.00			0.00	0.00	11.83	0.00	101.89	124.78	184.78	324	600	600	CONC	0.50	15.5	434	1.54	0.17	0.75
To ALIGNMENT 201, Pipe 215 - 216						0.00				3.18				0.00				0.00	12.00														
ALIGNMENT 205																																	
					0.00	0.00	0.04	0.65	0.07	0.07			0.00	0.00			0.00	0.00															
					0.00	0.00	0.06	0.45	0.08	0.15			0.00	0.00			0.00	0.00															
					0.00	0.00	0.11	0.65	0.20	0.35			0.00	0.00			0.00	0.00															
	202	203			0.00	0.00	0.27	0.85	0.64	0.98			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	108	375	375	PVC	0.70	6.5	147	1.33	0.08	0.74
	203	204			0.00	0.00	0.29	0.65	0.52	1.51			0.00	0.00			0.00	0.00	10.08	0.00	109.27	133.71	196.23	165	450	450	CONC	0.60	96.0	221	1.39	1.15	0.75
	204	205			0.00	0.00	0.02	0.65	0.04	1.54			0.00	0.00			0.00	0.00	11.23	0.00	104.28	127.68	188.52	161	450	450	CONC	0.60	10.0	221	1.39	0.12	0.73
	205	208			0.00	0.00	0.19	0.65	0.34	1.89			0.00	0.00			0.00	0.00	11.35	0.00	103.79	127.08	187.75	196	525	525	CONC	0.40	49.0	272	1.26	0.65	0.72
To ALIGNMENT 201, Pipe 208 - 209						0.00				1.89				0.00				0.00	12.00														

Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Designed: V.C.	PROJECT: Mayfield West Phase 1 Stage 2 Community			
Checked: D.A.	LOCATION: Town of Caledon			
Dwg. Reference: 2	File Ref: 21-1257	Date: Jul 2021	Sheet No. SHEET 3 OF 8	

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

TOWN OF CALEDON

Manning 0.013

Sump Pump Site = 5 Year Return Frequency
Gravity Site = 10 Year Return Frequency

LOCATION			AREA (Ha)																FLOW						SEWER DATA								
			2 YEAR				5 YEAR				10 YEAR				100 YEAR				Time of	Intensity	Intensity	Intensity	Intensity	Peak Flow	DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF	RATIO
			AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	Conc.	2 Year	5 Year	10 Year	100 Year										
Location	From Node	To Node	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(min)	(mm/h)	(mm/h)	(mm/h)	(mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	LOW (min	Q/Q full
ALIGNMENT 203																																	
					0.00	0.00	0.13	0.85	0.31	0.31			0.00	0.00			0.00	0.00															
	206	207			0.00	0.00	0.18	0.65	0.33	0.63			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	69	375	375	PVC	0.40	46.5	111	1.00	0.77	0.63
To ALIGNMENT 201, Pipe 207 - 208						0.00				0.63				0.00				0.00	10.77														
SERVICING EASEMENT																																	
					0.00	0.00	0.08	0.45	0.10	0.10			0.00	0.00			0.00	0.00															
	200	207			0.00	0.00	0.27	0.85	0.64	0.74			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	81	300	300	PVC	1.25	34.0	108	1.53	0.37	0.75
To ALIGNMENT 201, Pipe 207 - 208						0.00				0.74				0.00				0.00	10.37														
ALIGNMENT 201																																	
					0.00	0.00	0.08	0.65	0.14	0.14			0.00	0.00			0.00	0.00															
					0.00	0.00	0.10	0.85	0.24	0.38			0.00	0.00			0.00	0.00															
					0.00	0.00	0.17	0.65	0.31	0.69			0.00	0.00			0.00	0.00															
	218	219			0.00	0.00	0.30	0.85	0.71	1.40			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	153	375	375	PVC	1.45	120.0	211	1.91	1.05	0.73
Contribution From ALIGNMENT 209, Pipe 228 - 219						0.00				0.61				0.00				0.00	10.30														
	219	220			0.00	0.00	0.63	0.65	1.14	3.15			0.00	0.00			0.00	0.00	11.05	0.00	105.06	128.62	189.73	331	600	600	CONC	1.05	103.5	629	2.23	0.78	0.53
	220	221			0.00	0.00	0.16	0.65	0.29	3.44			0.00	0.00			0.00	0.00	11.82	0.00	101.91	124.81	184.82	350	675	675	CONC	0.40	30.5	532	1.49	0.34	0.66
To ALIGNMENT 209, Pipe 221 - 222						0.00				3.44				0.00				0.00	12.16														
Contribution From SERVICING EASEMENT, Pipe 200 - 207						0.00				0.74				0.00				0.00	10.37														
Contribution From ALIGNMENT 203, Pipe 206 - 207						0.00				0.63				0.00				0.00	10.77														
					0.00	0.00	0.19	0.85	0.45	1.82			0.00	0.00			0.00	0.00															
	207	208			0.00	0.00	0.29	0.65	0.52	2.34			0.00	0.00			0.00	0.00	10.77	0.00	106.22	130.03	191.53	249	600	600	CONC	0.40	72.0	388	1.37	0.87	0.64
Contribution From ALIGNMENT 205, Pipe 205 - 208						0.00				1.89				0.00				0.00	12.00														
	208	209			0.00	0.00	0.32	0.65	0.58	4.81			0.00	0.00			0.00	0.00	12.00	0.00	101.20	123.95	183.70	487	750	750	CONC	0.40	69.0	704	1.59	0.72	0.69
					0.00	0.00	0.29	0.65	0.52	5.33			0.00	0.00			0.00	0.00															
	209	210			0.00	0.00	0.82	0.45	1.03	6.36			0.00	0.00			0.00	0.00	12.73	0.00	98.49	120.66	179.41	626	825	825	CONC	0.40	53.0	908	1.70	0.52	0.69
	210	211			0.00	0.00	0.05	0.65	0.09	6.45			0.00	0.00			0.00	0.00	13.25	0.00	96.63	118.40	176.44	623	825	825	CONC	0.40	12.5	908	1.70	0.12	0.69
	211	215			0.00	0.00	0.31	0.65	0.56	7.01			0.00	0.00			0.00	0.00	13.37	0.00	96.21	117.88	175.75	674	825	825	CONC	0.40	66.0	908	1.70	0.65	0.74
Contribution From ALIGNMENT 204, Pipe 2140 - 215						0.00				3.18				0.00				0.00	12.00														
	215	216			0.00	0.00	0.30	0.65	0.54	10.73			0.00	0.00			0.00	0.00	14.02	0.00	94.01	115.22	172.22	1009	975	975	CONC	0.40	63.0	1417	1.90	0.55	0.71
	216	217			0.00	0.00	0.05	0.65	0.09	10.82			0.00	0.00			0.00	0.00	14.57	0.00	92.22	113.04	169.32	998	975	975	CONC	0.40	13.0	1417	1.90	0.11	0.70
	217	221			0.00	0.00	0.11	0.65	0.20	11.02			0.00	0.00			0.00	0.00	14.68	0.00	91.86	112.60	168.73	1012	975	975	CONC	0.40	40.0	1417	1.90	0.35	0.71
To ALIGNMENT 209, Pipe 221 - 222						0.00				11.02				0.00				0.00	15.03														
ALIGNMENT 209																																	
					0.00	0.00	0.10	0.45	0.13	0.13			0.00	0.00			0.00	0.00															
	227	229			0.00	0.00	0.65	0.85	1.54	1.66			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	182	525	525	CONC	0.50	95.0	304	1.40	1.13	0.60
	228	219			0.00	0.00	0.26	0.85	0.61	0.61			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	67	375	375	PVC	0.45	19.0	118	1.06	0.30	0.57
To ALIGNMENT 201, Pipe 219 - 220						0.00				0.61				0.00				0.00	10.30														
					0.00	0.00	0.03	0.45	0.04	0.04			0.00	0.00			0.00	0.00															
	224	225			0.00	0.00	0.31	0.85	0.73	0.77			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	84	450	450	CONC	0.55	80.5	211	1.33	1.01	0.40
	225	226			0.00	0.00	0.09	0.85	0.21	0.98			0.00	0.00			0.00	0.00	11.01	0.00	105.21	128.81	189.97	103	450	450	CONC	0.50	10.5	202	1.27	0.14	0.51
					0.00	0.00	0.12	0.85	0.28	1.27			0.00	0.00			0.00	0.00															
	226	229			0.00	0.00	1.08	0.85	2.55	3.82			0.00	0.00			0.00	0.00	11.15	0.00	104.64	128.11	189.07	400	675	675	CONC	0.50	34.5	594	1.66	0.35	0.67
	229	230			0.00	0.00	0.18	0.65	0.33	5.80			0.00	0.00			0.00	0.00	11.49	0.00	103.22	126.39	186.86	599	825	825	CONC	0.40	65.0	908	1.70	0.64	0.66
	230	231			0.00	0.00	0.16	0.65	0.29	6.09			0.00	0.00			0.00	0.00	12.13	0.00	100.71	123.36	182.93	614	825	825	CONC	0.40	10.0	908	1.70	0.10	0.68
	231	232			0.00	0.00	0.73	0.65	1.32	7.41			0.00	0.00			0.00	0.00	12.23	0.00	100.34	122.90	182.33	744	900	900	CONC	0.50	100.0	1280	2.01	0.83	0.58
					0.00	0.00	0.06	0.45	0.08	7.49			0.00	0.00			0.00	0.00															
	232	233			0.00	0.00	0.06	0.65	0.11	7.60			0.00	0.00			0.00	0.00	13.06	0.00	97.30	119.21	177.50	739	900	900	CONC	0.40	11.5	1145	1.80	0.11	0.65
					0.00	0.00	0.08	0.45	0.10	7.70			0.00	0.00			0.00	0.00															
	233	234			0.00	0.00	0.10	0.65	0.18	7.88			0.00	0.00			0.00	0.00	13.16	0.00	96.92	118.75	176.90	763	900	900	CONC	1.75	56.5	2395	3.76	0.25	0.32
					0.00	0.00	0.03	0.45	0.04	7.91			0.00	0.00			0.00	0.00															
	234	235			0.00	0.00	0.03	0.65	0.05	7.97			0.00	0.00			0.00	0.00	13.41	0.00	96.05	117.69	175.50	765	900	900	CONC	1.15	14.0	1941	3.05	0.08	0.39

Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Designed: V.C.	PROJECT: Mayfield West Phase 1 Stage 2 Community		
Checked: D.A.	LOCATION: Town of Caledon		
Dwg. Reference: 2	File Ref: 21-1257	Date: Jul 2021	Sheet No. SHEET 4 OF 8

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

TOWN OF CALEDON

Manning 0.013

Sump Pump Site = 5 Year Return Frequency
Gravity Site = 10 Year Return Frequency

LOCATION			AREA (Ha)																FLOW						SEWER DATA								
			2 YEAR				5 YEAR				10 YEAR				100 YEAR				Time of	Intensity	Intensity	Intensity	Intensity	Peak Flow	DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF	RATIO
			AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	AREA	R	Indiv.	Accum.	Conc.	2 Year	5 Year	10 Year	100 Year										
Location	From Node	To Node	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(Ha)		2.78 AC	2.78 AC	(min)	(mm/h)	(mm/h)	(mm/h)	(mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	FLOW (min)	Q/Q full
	235	236			0.00	0.00	0.41	0.65	0.74	8.71			0.00	0.00			0.00	0.00	13.49	0.00	95.78	117.37	175.07	834	900	900	CONC	0.50	96.0	1280	2.01	0.80	0.65
To SWM POND 2, Pipe 236 - 237						0.00				8.71				0.00				0.00	14.29														
Contribution From ALIGNMENT 201, Pipe 217 - 221						0.00				11.02				0.00				0.00	15.03														
Contribution From ALIGNMENT 201, Pipe 220 - 221						0.00				3.44				0.00				0.00	12.16														
	221	222			0.00	0.00	0.22	0.65	0.40	14.85			0.00	0.00			0.00	0.00	15.03	0.00	90.77	111.27	166.95	1348	1050	1050	CONC	0.45	60.0	1832	2.12	0.47	0.74
	222	223			0.00	0.00	0.10	0.65	0.18	15.03			0.00	0.00			0.00	0.00	15.51	0.00	89.35	109.53	164.61	1343	1050	1050	CONC	0.45	25.5	1832	2.12	0.20	0.73
To SWM POND 2, Pipe 223 - 237						0.00				15.03				0.00				0.00	15.71														
SWM POND 2																																	
Contribution From ALIGNMENT 209, Pipe 222 - 223						0.00				15.03				0.00				0.00	15.71														
	223	237			0.00	0.00	0.02	0.65	0.04	15.07			0.00	0.00			0.00	0.00	15.71	0.00	88.76	108.81	163.64	1338	1050	1050	CONC	0.45	7.5	1832	2.12	0.06	0.73
Contribution From ALIGNMENT 209, Pipe 235 - 236						0.00				8.71				0.00				0.00	14.29														
	236	237			0.00	0.00	0.02	0.65	0.04	8.75			0.00	0.00			0.00	0.00	14.29	0.00	93.13	114.14	170.79	814	900	900	CONC	0.40	7.5	1145	1.80	0.07	0.71
	237	238			0.00	0.00			0.00	23.82			0.00	0.00			0.00	0.00	15.77	0.00	88.58	108.60	163.36	2110	1200	1200	CONC	0.55	19.0	2891	2.56	0.12	0.73
	238	239			0.00	0.00			0.00	23.82			0.00	0.00			0.00	0.00	15.89	0.00	88.23	108.16	162.77	2101	1200	1200	CONC	0.55	18.5	2891	2.56	0.12	0.73
	239	HW			0.00	0.00			0.00	23.82			0.00	0.00			0.00	0.00	16.01	0.00	87.88	107.74	162.19	2093	1200	1200	CONC	0.55	9.5	2891	2.56	0.06	0.72
To SWM POND 2						0.00				23.82				0.00				0.00	16.07														
GREENWAY CORRIDOR - CLEANWATER																																	
					0.00	0.00	0.26	0.45	0.33	0.33			0.00	0.00			0.00	0.00															
	250	251			0.00	0.00			0.00	0.33			0.00	0.00	59.20	0.26	42.79	42.79	96.64	0.00	26.07	31.47	49.38	2122	1200	1200	CONC	0.55	61.0	2891	2.56	0.40	0.73
	251	252			0.00	0.00			0.00	0.33			0.00	0.00			0.00	42.79	97.04	0.00	25.98	31.36	49.22	2114	1200	1200	CONC	0.55	20.0	2891	2.56	0.13	0.73
	252	253			0.00	0.00			0.00	0.33			0.00	0.00			0.00	42.79	97.17	0.00	25.96	31.33	49.16	2112	1200	1200	CONC	0.55	55.5	2891	2.56	0.36	0.73
	253	254			0.00	0.00			0.00	0.33			0.00	0.00			0.00	42.79	97.53	0.00	25.88	31.24	49.01	2106	1350	1350	CONC	0.40	91.0	3376	2.36	0.64	0.62
	254	255			0.00	0.00			0.00	0.33			0.00	0.00			0.00	42.79	98.17	0.00	25.75	31.07	48.75	2094	1350	1350	CONC	0.40	98.0	3376	2.36	0.69	0.62
	255	256			0.00	0.00			0.00	0.33			0.00	0.00			0.00	42.79	98.87	0.00	25.60	30.89	48.47	2082	1350	1350	CONC	0.45	24.5	3580	2.50	0.16	0.58
	256	257			0.00	0.00			0.00	0.33			0.00	0.00			0.00	42.79	99.03	0.00	25.57	30.85	48.40	2079	1350	1350	CONC	1.15	94.5	5724	4.00	0.39	0.36
	257	258			0.00	0.00			0.00	0.33			0.00	0.00			0.00	42.79	99.42	0.00	25.49	30.75	48.25	2073	1350	1350	CONC	1.15	94.5	5724	4.00	0.39	0.36
	258	259			0.00	0.00			0.00	0.33			0.00	0.00			0.00	42.79	99.82	0.00	25.41	30.66	48.09	2066	1350	1350	CONC	0.40	23.5	3376	2.36	0.17	0.61
ALIGNMENT 208																																	
	300	301			0.00	0.00	0.82	0.65	1.48	1.48			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	162	525	525	CONC	0.50	93.5	304	1.40	1.11	0.53
	301	302			0.00	0.00	0.05	0.65	0.09	1.57			0.00	0.00			0.00	0.00	11.11	0.00	104.79	128.30	189.32	165	525	525	CONC	0.40	28.0	272	1.26	0.37	0.61
	302	303			0.00	0.00	0.01	0.65	0.02	1.59			0.00	0.00			0.00	0.00	11.48	0.00	103.27	126.46	186.94	164	525	525	CONC	0.40	11.5	272	1.26	0.15	0.60
To ALIGNMENT 207, Pipe 303 - 304						0.00				1.59				0.00				0.00	11.63														
ALIGNMENT 207																																	
	241	242			0.00	0.00	0.55	0.65	0.99	0.99			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	109	450	450	CONC	0.40	80.0	180	1.13	1.18	0.60
	242	245			0.00	0.00	0.17	0.65	0.31	1.30			0.00	0.00			0.00	0.00	11.18	0.00	104.52	127.97	188.89	136	450	450	CONC	0.40	47.5	180	1.13	0.70	0.75
To SERVICING EASEMENT - OGS, Pipe 245 - 246						0.00				1.30				0.00				0.00	11.87														
	243	244			0.00	0.00	0.35	0.65	0.63	0.63			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	69	300	300	PVC	2.55	55.5	154	2.18	0.42	0.45
	244	245			0.00	0.00	0.06	0.65	0.11	0.74			0.00	0.00			0.00	0.00	10.42	0.00	107.74	131.86	193.87	80	300	300	PVC	1.25	15.5	108	1.53	0.17	0.74
To SERVICING EASEMENT - OGS, Pipe 245 - 246						0.00				0.74				0.00				0.00	10.59														
Contribution From ALIGNMENT 208, Pipe 302 - 303						0.00				1.59				0.00				0.00	11.63														
	303	304			0.00	0.00	0.21	0.65	0.38	1.97			0.00	0.00			0.00	0.00	11.63	0.00	102.66	125.72	185.98	202	525	525	CONC	0.40	41.0	272	1.26	0.54	0.74
To ALIGNMENT 302, Pipe 304 - 312						0.00				1.97				0.00				0.00	12.18														
SERVICING EASEMENT - OGS																																	
Contribution From ALIGNMENT 207, Pipe 242 - 245						0.00				1.30				0.00				0.00	11.87														
Contribution From ALIGNMENT 207, Pipe 244 - 245						0.00				0.74				0.00				0.00	10.59														
	245	246			0.00	0.00			0.00	2.04			0.00	0.00			0.00	0.00	11.87	0.00	101.71	124.56	184.49	208	525	525	CONC	0.45	36.0	288	1.33	0.45	0.72

Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Designed: V.C.	PROJECT: Mayfield West Phase 1 Stage 2 Community			
Checked: D.A.	LOCATION: Town of Caledon			
Dwg. Reference: 2	File Ref: 21-1257	Date: Jul 2021	Sheet No. SHEET 5 OF 8	

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

TOWN OF CALEDON

Manning 0.013

Sump Pump Site = 5 Year Return Frequency
Gravity Site = 10 Year Return Frequency

LOCATION			AREA (Ha) 2 YEAR				5 YEAR				10 YEAR				100 YEAR				FLOW						SEWER DATA								
Location	From Node	To Node	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	Time of Conc. (min)	Intensity 2 Year (mm/h)	Intensity 5 Year (mm/h)	Intensity 10 Year (mm/h)	Intensity 100 Year (mm/h)	Peak Flow Q (l/s)	DIA. (mm) (actual)	DIA. (mm) (nominal)	TYPE	SLOPE (%)	LENGTH (m)	CAPACITY (l/s)	VELOCITY (m/s)	TIME OF FLOW (min)	RATIO Q/Q full
ALIGNMENT 403																																	
Contribution From ALIGNMENT 402, Pipe 447 - 449						0.00				1.34				0.00				0.00	10.68														
Contribution From ALIGNMENT 402, Pipe 448 - 449						0.00				0.31				0.00				0.00	10.38														
					0.00	0.00	0.23	0.65	0.42	2.06			0.00	0.00			0.00	0.00															
	449	450			0.00	0.00	0.86	0.30	0.72	2.78			0.00	0.00			0.00	0.00	10.68	0.00	106.60	130.48	192.12	296	600	600	CONC	1.20	48.0	673	2.38	0.34	0.44
	450	451			0.00	0.00	0.19	0.65	0.34	3.12			0.00	0.00			0.00	0.00	11.02	0.00	105.17	128.75	189.90	328	675	675	CONC	0.40	23.5	532	1.49	0.26	0.62
	451	452			0.00	0.00	0.20	0.65	0.36	3.48			0.00	0.00			0.00	0.00	11.28	0.00	104.07	127.43	188.20	362	675	675	CONC	2.15	13.0	1233	3.44	0.06	0.29
	452	4520			0.00	0.00	0.68	0.65	1.23	4.71			0.00	0.00			0.00	0.00	11.35	0.00	103.81	127.12	187.79	489	675	675	CONC	2.75	34.5	1394	3.90	0.15	0.35
	4520	453			0.00	0.00			0.00	4.71			0.00	0.00			0.00	0.00	11.49	0.00	103.22	126.39	186.86	486	675	675	CONC	0.50	45.5	594	1.66	0.46	0.82
	453	Ex. 165			0.00	0.00			0.00	4.71			0.00	0.00			0.00	0.00	11.95	0.00	101.41	124.20	184.02	478	675	675	CONC	0.45	10.0	564	1.58	0.11	0.85
To South Fields Phase 2, Pipe 165 - 40						0.00				4.71				0.00				0.00	12.06														
ALIGNMENT 406																																	
Contribution From ALIGNMENT 408, Pipe 4050 - 406						0.00				3.99				0.00				0.00	13.97														
	406	416			0.00	0.00	0.05	0.65	0.09	4.08			0.00	0.00			0.00	0.00	13.97	0.00	94.16	115.39	172.45	385	900	900	CONC	0.40	32.0	1145	1.80	0.30	0.34
Contribution From ALIGNMENT 402, Pipe 4110 - 416						0.00				3.83				0.00				0.00	12.87														
Contribution From ALIGNMENT 402, Pipe 4150 - 416						0.00				3.36				0.00				0.00	11.69														
	416	417			0.00	0.00	0.06	0.65	0.11	11.38			0.00	0.00			0.00	0.00	14.27	0.00	93.18	114.21	170.88	1060	975	975	CONC	0.40	37.5	1417	1.90	0.33	0.75
	417	418			0.00	0.00	0.63	0.65	1.14	12.52			0.00	0.00			0.00	0.00	14.60	0.00	92.13	112.92	169.17	1153	1050	1050	CONC	0.40	86.5	1727	1.99	0.72	0.67
	418	435			0.00	0.00	0.06	0.65	0.11	12.63			0.00	0.00			0.00	0.00	15.32	0.00	89.90	110.21	165.53	1135	1050	1050	CONC	0.40	35.0	1727	1.99	0.29	0.66
To ALIGNMENT 401, Pipe 435 - 436						0.00				12.63				0.00				0.00	15.61														
ALIGNMENT 407																																	
	432	433			0.00	0.00	0.73	0.65	1.32	1.32			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	145	450	450	CONC	0.50	99.0	202	1.27	1.30	0.72
	433	434			0.00	0.00	0.06	0.65	0.11	1.43			0.00	0.00			0.00	0.00	11.30	0.00	104.00	127.34	188.08	148	450	450	CONC	0.50	35.5	202	1.27	0.47	0.74
To ALIGNMENT 401, Pipe 434 - 435						0.00				1.43				0.00				0.00	11.77														
ALIGNMENT 408																																	
	428	429			0.00	0.00	0.51	0.65	0.92	0.92			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	101	375	375	PVC	0.60	65.0	136	1.23	0.88	0.74
	429	430			0.00	0.00	0.27	0.65	0.49	1.41			0.00	0.00			0.00	0.00	10.88	0.00	105.75	129.46	190.81	149	450	450	CONC	0.50	65.0	202	1.27	0.85	0.74
To ALIGNMENT 401, Pipe 430 - 431						0.00				1.41				0.00				0.00	11.74														
	421	422			0.00	0.00	0.37	0.85	0.87	0.87			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	96	375	375	PVC	0.90	37.5	166	1.51	0.42	0.58
	422	423			0.00	0.00	0.02	0.85	0.05	0.92			0.00	0.00			0.00	0.00	10.42	0.00	107.77	131.90	193.93	99	375	375	PVC	0.60	25.5	136	1.23	0.35	0.73
	423	425			0.00	0.00			0.00	0.92			0.00	0.00			0.00	0.00	10.76	0.00	106.27	130.08	191.61	98	375	375	PVC	0.60	8.0	136	1.23	0.11	0.72
Contribution From ALIGNMENT 402, Pipe 424 - 425						0.00				0.97				0.00				0.00	10.45														
	425	426			0.00	0.00	0.10	0.65	0.18	2.07			0.00	0.00			0.00	0.00	10.87	0.00	105.80	129.52	190.89	219	525	525	CONC	0.75	65.0	372	1.72	0.63	0.59
	426	427			0.00	0.00	0.08	0.65	0.14	2.21			0.00	0.00			0.00	0.00	11.50	0.00	103.20	126.37	186.83	229	525	525	CONC	0.55	15.0	319	1.47	0.17	0.72
	427	430			0.00	0.00	0.61	0.65	1.10	3.32			0.00	0.00			0.00	0.00	11.67	0.00	102.52	125.55	185.77	340	675	675	CONC	0.45	93.0	564	1.58	0.98	0.60
To ALIGNMENT 401, Pipe 430 - 431						0.00				3.32				0.00				0.00	12.65														
	400	401			0.00	0.00	0.33	0.85	0.78	0.78			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	85	375	375	PVC	0.60	31.0	136	1.23	0.42	0.63
	401	402			0.00	0.00	0.39	0.85	0.92	1.70			0.00	0.00			0.00	0.00	10.42	0.00	107.75	131.88	193.89	183	525	525	CONC	0.60	98.5	333	1.54	1.07	0.55
	402	403			0.00	0.00	0.10	0.85	0.24	1.94			0.00	0.00			0.00	0.00	11.49	0.00	103.24	126.43	186.90	200	525	525	CONC	0.40	12.5	272	1.26	0.17	0.74
	403	404			0.00	0.00	0.34	0.85	0.80	2.74			0.00	0.00			0.00	0.00	11.65	0.00	102.58	125.62	185.86	281	600	600	CONC	0.55	88.5	455	1.61	0.92	0.62
	404	405			0.00	0.00	0.29	0.85	0.69	3.43			0.00	0.00			0.00	0.00	12.57	0.00	99.07	121.36	180.32	339	675	675	CONC	0.60	75.5	651	1.82	0.69	0.52
	405	4050			0.00	0.00	0.24	0.85	0.57	3.99			0.00	0.00			0.00	0.00	13.26	0.00	96.58	118.34	176.36	386	675	675	CONC	0.55	57.5	623	1.74	0.55	0.62
	4050	406			0.00	0.00			0.00	3.99			0.00	0.00			0.00	0.00	13.81	0.00	94.70	116.05	173.33	378	750	750	CONC	0.40	15.5	704	1.59	0.16	0.54
To ALIGNMENT 406, Pipe 406 - 416						0.00				3.99				0.00				0.00	13.97														
ALIGNMENT 405																																	
	443	444			0.00	0.00	0.97	0.65	1.75	1.75			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	192	525	525	CONC	0.50	95.5	304	1.40	1.13	0.63
	444	445			0.00	0.00			0.00	1.75			0.00	0.00			0.00	0.00	11.13	0.00	104.69	128.18	189.17	184	525	525	CONC	0.40	18.0	272	1.26	0.24	0.67
To SWM POND 4 - NORTH, Pipe 445 - 446						0.00				1.75				0.00				0.00	11.37														
Contribution From ALIGNMENT 401, Pipe 435 - 436						0.00				23.53				0.00				0.00	16.02														
	436	437			0.00	0.00	0.59	0.65	1.07	24.59			0.00	0.00			0.00	0.00	16.02	0.00	87.84	107.70	162.14	2160	1350	1350	CONC	0.40	43.0	3376	2.36	0.30	0.64
	437	438			0.00	0.00	0.73	0.65	1.32	25.91			0.00	0.00			0.00	0.00	16.33	0.00	86.99	106.65	160.71	2254	1350	1350	CONC	0.40	92.5	3376	2.36	0.65	0.67
	438	439			0.00	0.00	0.08	0.65	0.14	26.06			0.00	0.00			0.00	0.00	16.98	0.00	85.20	104.46	157.74	2220	1350	1350	CONC	0.40	10.5	3376	2.36	0.07	0.66
	439	440			0.00	0.00	0.18	0.65	0.33	26.38			0.00	0.00			0.00	0.00	17.06	0.00	85.00	104.22	157.41	2242	1350	1350	CONC	0.40	32.0	3376	2.36	0.23	0.66
	440	441			0.00	0.00	0.17	0.65	0.31	26.69			0.00	0.00			0.00	0.00	17.28	0.00	84.40	103.49	156.41	2253	1350	1350	CONC	0.40	31.5	3376	2.36	0.22	0.67
To SWM POND 4 - NORTH, Pipe 441 - 445						0.00				26.69				0.00				0.00	17.50														

Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Designed: V.C.	PROJECT: Mayfield West Phase 1 Stage 2 Community		
Checked: D.A.	LOCATION: Town of Caledon		
Dwg. Reference: 2	File Ref: 21-1257	Date: Jul 2021	Sheet No. SHEET 6 OF 8

FT51 Stm1.xlsx

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

TOWN OF CALEDON

Manning 0.013

Sump Pump Site = 5 Year Return Frequency
Gravity Site = 10 Year Return Frequency

LOCATION			AREA (Ha) 2 YEAR				5 YEAR				10 YEAR				100 YEAR				FLOW Time of Conc.	Intensity 2 Year	Intensity 5 Year	Intensity 10 Year	Intensity 100 Year	Peak Flow	SEWER DATA DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF FLOW	RATIO
Location	From Node	To Node	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	(min)	(mm/h)	(mm/h)	(mm/h)	(mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	(min)	Q/Q full
SWM POND 4 - NORTH																																	
Contribution From ALIGNMENT 405, Pipe 440 - 441						0.00				26.69				0.00				0.00	17.50														
	441	445			0.00	0.00	0.03	0.65	0.05	26.74			0.00	0.00			0.00	0.00	17.50	0.00	83.82	102.78	155.44	2242	1350	1350	CONC	0.40	15.0	3376	2.36	0.11	0.66
Contribution From ALIGNMENT 405, Pipe 444 - 445						0.00				1.75				0.00				0.00	11.37														
	445	446			0.00	0.00			0.00	28.50			0.00	0.00			0.00	0.00	17.61	0.00	83.55	102.44	154.98	2381	1350	1350	CONC	0.40	23.5	3376	2.36	0.17	0.71
ALIGNMENT 401																																	
	462	463			0.00	0.00	0.52	0.65	0.94	0.94			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	103	450	450	CONC	0.50	69.5	202	1.27	0.91	0.51
To ALIGNMENT 402, Pipe 463 - 464						0.00				0.94				0.00				0.00	10.91														
					0.00	0.00	0.05	0.85	0.12	0.12			0.00	0.00			0.00	0.00															
	419	420			0.00	0.00	0.08	0.85	0.19	0.31			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	34	300	300	PVC	0.50	34.0	68	0.97	0.59	0.49
					0.00	0.00	0.04	0.85	0.09	0.40			0.00	0.00			0.00	0.00															
	420	430			0.00	0.00	0.28	0.65	0.51	0.91			0.00	0.00			0.00	0.00	10.59	0.00	107.02	131.00	192.77	97	300	300	PVC	2.75	75.0	160	2.27	0.55	0.61
Contribution From ALIGNMENT 408, Pipe 427 - 430						0.00				3.32				0.00				0.00	12.65														
Contribution From ALIGNMENT 408, Pipe 429 - 430						0.00				1.41				0.00				0.00	11.74														
	430	431			0.00	0.00	0.10	0.65	0.18	5.81			0.00	0.00			0.00	0.00	12.65	0.00	98.76	120.99	179.83	574	750	750	CONC	0.45	30.0	747	1.69	0.30	0.77
	431	434			0.00	0.00	0.21	0.65	0.38	6.19			0.00	0.00			0.00	0.00	12.95	0.00	97.69	119.69	178.12	605	825	825	CONC	0.40	55.5	908	1.70	0.54	0.67
Contribution From ALIGNMENT 407, Pipe 433 - 434						0.00				1.43				0.00				0.00	11.77														
	434	435			0.00	0.00	0.27	0.65	0.49	8.11			0.00	0.00			0.00	0.00	13.49	0.00	95.78	117.36	175.06	777	825	825	CONC	0.50	72.5	1015	1.90	0.64	0.77
Contribution From ALIGNMENT 406, Pipe 418 - 435						0.00				12.63				0.00				0.00	15.61														
					0.00	0.00	0.25	0.65	0.45	21.19			0.00	0.00			0.00	0.00															
	435	436			0.00	0.00	1.87	0.45	2.34	23.53			0.00	0.00			0.00	0.00	15.61	0.00	89.03	109.15	164.10	2095	1200	1200	CONC	0.50	60.0	2757	2.44	0.41	0.76
To ALIGNMENT 405, Pipe 436 - 437						0.00				23.53				0.00				0.00	16.02														
ALIGNMENT 402																																	
					0.00	0.00	0.18	0.85	0.43	0.43			0.00	0.00			0.00	0.00															
	424	425			0.00	0.00	0.30	0.65	0.54	0.97			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	106	375	375	PVC	1.10	45.0	184	1.66	0.45	0.58
To ALIGNMENT 408, Pipe 425 - 426						0.00				0.97				0.00				0.00	10.45														
	447	449			0.00	0.00	0.74	0.65	1.34	1.34			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	147	450	450	CONC	0.50	52.0	202	1.27	0.68	0.73
To ALIGNMENT 403, Pipe 449 - 450						0.00				1.34				0.00				0.00	10.68														
	448	449			0.00	0.00	0.17	0.65	0.31	0.31			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	34	300	300	PVC	1.60	39.5	122	1.73	0.38	0.28
To ALIGNMENT 403, Pipe 449 - 450						0.00				0.31				0.00				0.00	10.38														
Contribution From ALIGNMENT 401, Pipe 462 - 463						0.00				0.94				0.00				0.00	10.91														
	463	464			0.00	0.00	0.44	0.65	0.80	1.73			0.00	0.00			0.00	0.00	10.91	0.00	105.61	129.29	190.59	183	525	525	CONC	0.50	42.5	304	1.40	0.50	0.60
	464	465			0.00	0.00	0.45	0.65	0.81	2.55			0.00	0.00			0.00	0.00	11.42	0.00	103.52	126.76	187.34	264	600	600	CONC	0.50	50.5	434	1.54	0.55	0.61
	465	466			0.00	0.00			0.00	2.55			0.00	0.00			0.00	0.00	11.97	0.00	101.35	124.13	183.93	258	600	600	CONC	0.50	120.0	434	1.54	1.30	0.59
To SWM POND 4 - SOUTH, Pipe 466 - 467						0.00				2.55				0.00				0.00	13.27														
	412	413			0.00	0.00	0.60	0.65	1.08	1.08			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	119	375	375	PVC	0.85	17.5	162	1.46	0.20	0.74
	413	414			0.00	0.00	0.37	0.65	0.67	1.75			0.00	0.00			0.00	0.00	10.20	0.00	108.74	133.07	195.41	191	525	525	CONC	0.55	62.0	319	1.47	0.70	0.60
	414	415			0.00	0.00	0.34	0.65	0.61	2.37			0.00	0.00			0.00	0.00	10.90	0.00	105.67	129.36	190.68	250	600	600	CONC	0.50	14.0	434	1.54	0.15	0.58
	415	4150			0.00	0.00	0.55	0.65	0.99	3.36			0.00	0.00			0.00	0.00	11.05	0.00	105.03	128.59	189.69	353	675	675	CONC	0.60	53.5	651	1.82	0.49	0.54
	4150	416			0.00	0.00			0.00	3.36			0.00	0.00			0.00	0.00	11.54	0.00	103.02	126.15	186.55	346	675	675	CONC	0.40	13.0	532	1.49	0.15	0.65
To ALIGNMENT 406, Pipe 416 - 417						0.00				3.36				0.00				0.00	11.69														
	455	456			0.00	0.00	0.59	0.65	1.07	1.07			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	117	450	450	CONC	0.50	66.5	202	1.27	0.87	0.58
	456	457			0.00	0.00	0.74	0.65	1.34	2.40			0.00	0.00			0.00	0.00	10.87	0.00	105.78	129.50	190.85	254	600	600	CONC	0.50	103.0	434	1.54	1.12	0.59
	457	458			0.00	0.00	0.74	0.65	1.34	3.74			0.00	0.00			0.00	0.00	11.99	0.00	101.25	124.01	183.77	379	675	675	CONC	0.50	103.5	594	1.66	1.04	0.64
	458	459			0.00	0.00	0.17	0.65	0.31	4.05			0.00	0.00			0.00	0.00	13.03	0.00	97.39	119.33	177.65	394	675	675	CONC	0.40	13.0	532	1.49	0.15	0.74
	459	460			0.00	0.00	0.27	0.65	0.49	4.54			0.00	0.00			0.00	0.00	13.18	0.00	96.87	118.70	176.83	439	675	675	CONC	0.50	50.5	594	1.66	0.51	0.74
To SANITARY SERVICING EASEMENT, Pipe 460 - 466						0.00				4.54				0.00				0.00	13.68														
					0.00	0.00	0.28	0.85	0.66	0.66			0.00	0.00			0.00	0.00															
	407	408			0.00	0.00	0.39	0.65	0.70	1.37			0.00	0.00			0.00	0.00	10.00	0.00	109.64	134.16	196.80	150	450	450	CONC	0.75	69.5	247	1.55	0.75	0.61

Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Designed: V.C.	PROJECT: Mayfield West Phase 1 Stage 2 Community			
Checked: D.A.	LOCATION: Town of Caledon			
Dwg. Reference: 2	File Ref: 21-1257	Date: Jul 2021	Sheet No. SHEET 7 OF 8	

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

TOWN OF CALEDON

Manning 0.013

Sump Pump Site = 5 Year Return Frequency
Gravity Site = 10 Year Return Frequency

LOCATION			AREA (Ha)																FLOW						SEWER DATA								
			2 YEAR				5 YEAR				10 YEAR				100 YEAR				Time of Conc.	Intensity 2 Year	Intensity 5 Year	Intensity 10 Year	Intensity 100 Year	Peak Flow	DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF FLOW	RATIO
Location	From Node	To Node	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	(min)	(mm/h)	(mm/h)	(mm/h)	(mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	(min)	Q/Q full
	408	409			0.00	0.00	0.06	0.85	0.14	1.51			0.00	0.00			0.00	0.00	10.75	0.00	106.33	130.16	191.70	160	450	450	CONC	0.60	11.5	221	1.39	0.14	0.73
					0.00	0.00	0.11	0.85	0.26	1.77			0.00	0.00			0.00	0.00															
	409	410			0.00	0.00	0.19	0.65	0.34	2.11			0.00	0.00			0.00	0.00	10.88	0.00	105.74	129.45	190.79	223	525	525	CONC	0.65	61.0	347	1.60	0.63	0.64
					0.00	0.00	0.16	0.85	0.38	2.49			0.00	0.00			0.00	0.00															
	410	411			0.00	0.00	0.31	0.65	0.56	3.05			0.00	0.00			0.00	0.00	11.52	0.00	103.12	126.27	186.70	314	600	600	CONC	0.75	75.0	532	1.88	0.66	0.59
					0.00	0.00	0.26	0.65	0.47	3.52			0.00	0.00			0.00	0.00															
	411	4110			0.00	0.00	0.13	0.85	0.31	3.83			0.00	0.00			0.00	0.00	12.18	0.00	100.51	123.12	182.61	385	600	600	CONC	0.70	57.5	514	1.82	0.53	0.75
	4110	416			0.00	0.00			0.00	3.83			0.00	0.00			0.00	0.00	12.71	0.00	98.55	120.73	179.49	377	600	600	CONC	0.55	15.5	455	1.61	0.16	0.83
To ALIGNMENT 406, Pipe 416 - 417						0.00				3.83				0.00				0.00	12.87														
SANITARY SERVICING EASEMENT																																	
Contribution From ALIGNMENT 402, Pipe 459 - 460						0.00				4.54				0.00				0.00	13.68														
	460	466			0.00	0.00	0.79	0.65	1.43	5.96			0.00	0.00			0.00	0.00	13.68	0.00	95.12	116.57	174.01	567	750	750	CONC	0.45	16.0	747	1.69	0.16	0.76
To SWM POND 4 - SOUTH, Pipe 466 - 467						0.00				5.96				0.00				0.00	13.84														
SWM POND 4 - SOUTH																																	
Contribution From SANITARY SERVICING EASEMENT, Pipe						0.00				5.96				0.00				0.00	13.84														
Contribution From ALIGNMENT 402, Pipe 465 - 466						0.00				2.55				0.00				0.00	13.27														
	466	467			0.00	0.00			0.00	8.51			0.00	0.00			0.00	0.00	13.84	0.00	94.59	115.92	173.16	805	750	750	CONC	0.95	16.0	1085	2.46	0.11	0.74

Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Designed: V.C.	PROJECT: Mayfield West Phase 1 Stage 2 Community		
Checked: D.A.	LOCATION: Town of Caledon		
Dwg. Reference: 2	File Ref: 21-1257	Date: Jul 2021	Sheet No. SHEET 8 OF 8

1151_Stm1.xlsx

APPENDIX C

FLOODPLAIN ASSESSMENT

JFSA
WATER RESOURCES AND
ENVIRONMENTAL CONSULTANTS

J.F. Sabourin and Associates Inc.
52 Springbrook Drive,
Ottawa, ON K2S 1B9
T 613-836-3884 F 613-836-0332

jfsa.com

Ottawa. ON
Paris. ON
Gatineau. QC
Montréal. QC
Québec. QC

June 10, 2021 Project Number: P1408

David Schaeffer Engineering Limited
600 Alden Road, Suite 700
Markham, Ontario
L3R 0E7

Attention: John Tjeerdsma, P.Eng.

Subject: Mayfield West Phase 1 Secondary Plan Amendment / Hydraulic Analysis of Etobicoke Creek

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As requested by your office, we have evaluated, based on the available information as described below, the 2- to 100-year and Regional design water levels along Etobicoke Creek under existing conditions through the Mayfield West Phase 1 Secondary Plan Amendment area. The subject reach is located within the Town of Caledon, southeast of Old School Road and northeast of Hurontario Street (Highway 10).

In undertaking this work, the following information was considered:

1. The TRCA HEC-RAS model of upper Etobicoke Creek and its tributaries under existing conditions was forwarded by DSEL on January 13, 2021. The model includes 2- to 100-year and Regional existing conditions flow profiles, and was accompanied by the following notes from the TRCA:
   - The Estimated floodplain modeling and mapping was intended to be used as a screening tool for development applications submitted to the TRCA, to determine whether existing or proposed sites, properties, or structures are potentially susceptible to flooding. This information is the best available at this time but is not appropriate for many uses since the model doesn't include crossing structures, doesn't have refined Manning's n values, and the crossing geometry is not detailed. Thus, the TRCA water resources engineering staff recommends that the proponent use TRCA's available modeling and mapping to conduct the hydraulic analysis for their project, refine the model, and create an engineered HEC-RAS model.
   - Also, the flows in the estimated HEC-RAS model are only valid/updated for the reaches: upper_et_229.01, upper_et_229.04, upper_et_229.05, and upper_et_229.07 (within your project scope) The rest of the flows in the estimated model are outdated.
   - As the estimated model has been prepared using HEC-RAS 6.0.0, please use this version in your assessment for the most accurate results.

2. In accordance with the direction above from the TRCA, the reaches of the model through the subject site were updated based on survey and LiDAR data provided by DSEL and R-PE Surveying Limited. The modified reaches are named in the model as upper_et_229.01 and upper_et_229.07, and have been modified from their confluence on the subject site to the upstream crossings of Old School Road. Refer to Figure A-1 of Attachment A for the locations of the HEC-RAS cross-sections.

3. Additionally, a reach named upper_et_229.01’ was added to the model to define flood levels between the confluence of the two reaches and the downstream crossing of Hurontario Street / Highway 10. The 2- to 100-year and Regional flows in this added reach were estimated as the direct sum of flows at the confluence from reaches upper_et_229.01 and upper_et_229.07. Refer to Figure A-1 of Attachment A for the locations of the HEC-RAS cross-sections.

4. The crossings of Old School Road in reach upper_et_229.07 and Hurontario Street / Highway 10 in reach upper_et_229.01’ were included in the model based on the provided survey of existing conditions. The crossing of Old School Road in reach upper_et_229.01 was modelled to represent the culvert replacement proposed as part of road improvements expected to take place prior to the development of the subject lands, based on information provided by DSEL taken from the Town’s 90% drawings for the Old School Road improvement works. An existing beaver dam in reach upper_et_229.01 was also included in the model as an inline structure based on survey data.

5. Based on Google Earth satellite and street view imagery, Manning’s roughness coefficients through the subject site were set to 0.035 for the low flow channel and 0.08 for the overbanks, with the exception of wooded areas that were assigned a higher Manning’s roughness coefficient of 0.10.

Based on the above information, design water levels and velocities under existing conditions (with proposed Old School Road culvert) for Etobicoke Creek through the subject site were determined using HEC-RAS version 6.0.0 and are presented in Attachment B. Digital HEC-RAS models are attached.

The existing conditions (with proposed Old School Road culvert) Regional floodplain extents through the subject site based on the updated HEC-RAS modelling are presented in Figure A-1 of Attachment A. A summary of existing conditions Regional water levels is presented in Table 1.

Table 1: Summary of Existing Conditions Regional Flood Levels Through the Subject Site [1]

Reach	River Station	Regional Flood Level (m)
229.07	439.7198	264.33
229.07		Old School Road
229.07	394.8881	262.04
229.07	360.2077	261.05
229.07	283.8773	260.30
229.07	215.2255	259.61
229.07	160.8058	259.39

Reach	River Station	Regional Flood Level (m)
229.01	1082.504	268.15
229.01		Old School Road
229.01	1080.619	267.50
229.01	1040.967	266.85
229.01	1004.562	266.60
229.01	928.1997	266.31
229.01	842.2649	265.56
229.01	751.243	264.80
229.01	672.631	264.47
229.01	601.0356	264.25
229.01	499.7924	263.99
229.01	488.6847	263.47
229.01		Beaver Dam
229.01	452.2947	262.26
229.01	368.6675	262.18
229.01	291.7302	261.15
229.01	237.1133	260.62
229.01	144.6575	259.52
229.01	75.89621	259.37
229.01'	767.45	259.28
229.01'	706.03	259.26
229.01'	657.19	259.24
229.01'	597.31	259.24
229.01'	537.29	259.23
229.01'	477.27	259.23
229.01'	417.22	259.22
229.01'	356.64	259.21
229.01'	297.21	259.21
229.01'	237.24	259.20
229.01'	177.17	259.20
229.01'	112.28	259.20
229.01'	60.89	259.19
229.01'	51.14	259.19
229.01'		Highway 10
229.01'	0	256.16

(1) Based on existing flow profiles. Channel infrastructure included at existing crossings (with proposed Old School Road culvert).

Yours truly,
J.F Sabourin and Associates Inc.

Laura Pipkins, P.Eng.
Project Engineer in Water Resources

cc: J.F Sabourin, M.Eng, P.Eng
Director of Water Resources Projects

Attachments
Attachment A: Location of HEC-RAS Model Cross-Sections
Attachment B: Existing Conditions HEC-RAS Results for Etobicoke Creek

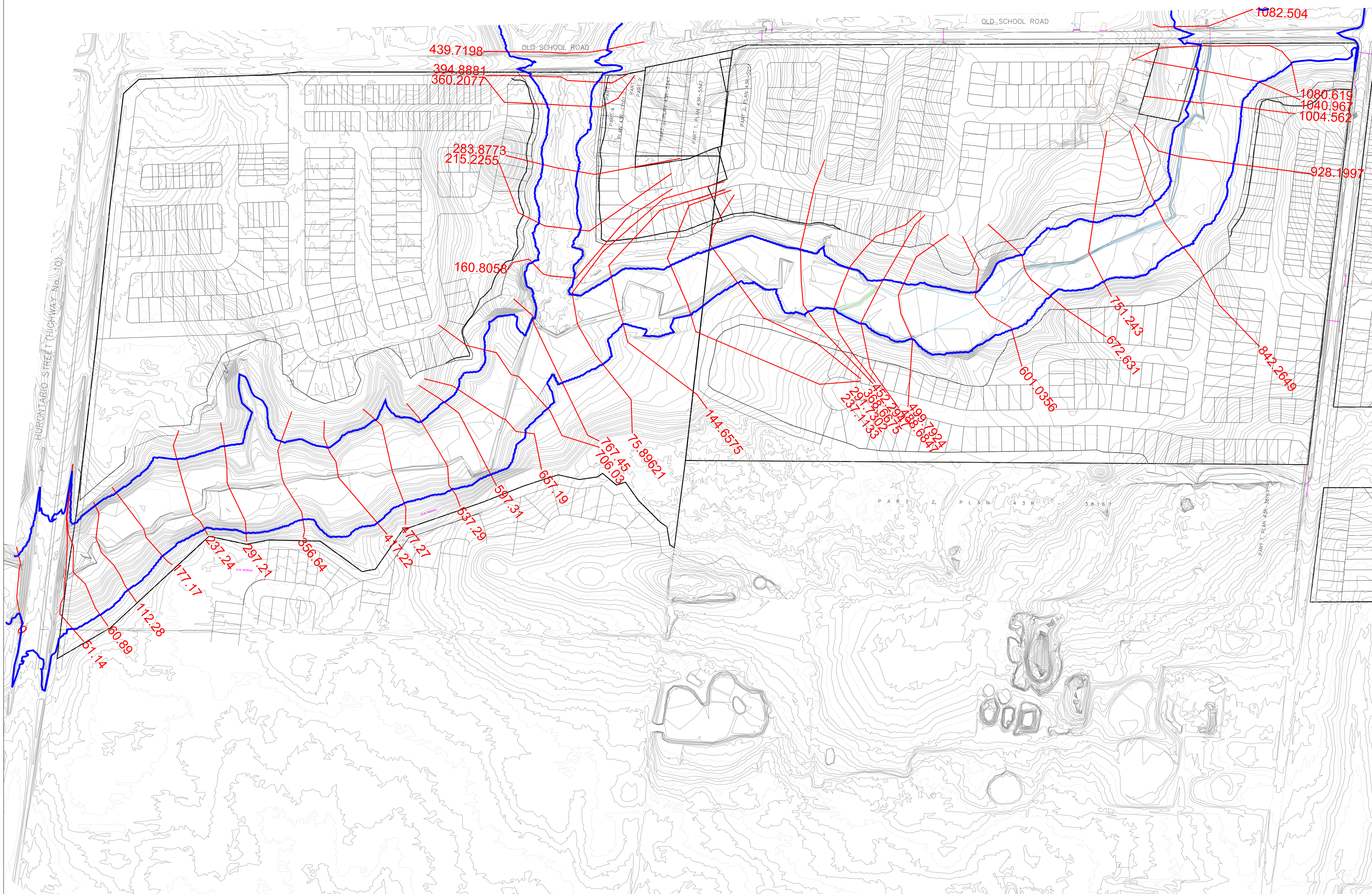
JFSA
WATER RESOURCES AND
ENVIRONMENTAL CONSULTANTS

Ottawa. ON
Paris. ON
Gatineau. QC
Montréal. QC
Québec. QC

Attachment A

Location of HEC-RAS Model Cross-Sections

TOWN OF CALEDON
PLANNING
RECEIVED
Sep 14, 2021



LEGEND :

1080.619	HEC-RAS CROSS-SECTION ID
(red line)	EXTENT OF EXISTING CROSS-SECTION
(blue line)	REGIONAL FLOODPLAIN EXTENTS

SCALE :

0 50 100 150 200 250m

J.F. Sabourin & Associates Inc.
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS
OTTAWA (613) 836-3884
GATINEAU (819) 243-6858

CLIENT :

DSEL
david schaeffer engineering ltd
600 ALDEN ROAD, SUITE 700
MARKHAM, ONTARIO,, L3R 0E7
(905) 475-3080

PROJECT :

MAYFIELD WEST PHASE 1
SECONDARY PLAN AMENDMENT

BY	DATE	DESCRIPTION	BY

LOCATION OF HEC-RAS MODEL
CROSS-SECTIONS

FIGURE A-1

DESIGNED:
DRAWN: LP
VERIFIED: JFS
APPROVED: JFS

DRAWING REF.
1408-16\202101 FSR\Design\CAD
JFSA Figures.dwg

DATE	PROJECT No.
Jun/21	1408-16

JFSA
WATER RESOURCES AND
ENVIRONMENTAL CONSULTANTS

Ottawa. ON
Paris. ON
Gatineau. QC
Montréal. QC
Québec. QC

Attachment B

Existing Conditions HEC-RAS Results for Etobicoke Creek

Table B-1: HEC-RAS Results for Etobicoke Creek Through the Subject Site Under Existing Conditions (1)

HEC-RAS Reach	HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
229.07	439.7198	2-yr	0.93	261.25	261.42	1.24	0.09
229.07	439.7198	5-yr	1.66	261.25	261.57	1.16	0.07
229.07	439.7198	10-yr	2.24	261.25	261.75	0.99	0.06
229.07	439.7198	25-yr	3.05	261.25	261.96	0.95	0.06
229.07	439.7198	50-yr	3.72	261.25	262.14	0.91	0.06
229.07	439.7198	100-yr	4.43	261.25	262.46	0.80	0.05
229.07	439.7198	Regional	18.39	261.25	264.33	0.27	0.05
229.07	417.3039		Culvert				
229.07	394.8881	2-yr	0.93	260.70	260.96	1.14	0.08
229.07	394.8881	5-yr	1.66	260.70	261.01	1.65	0.07
229.07	394.8881	10-yr	2.24	260.70	261.07	1.79	0.06
229.07	394.8881	25-yr	3.05	260.70	261.15	1.99	0.05
229.07	394.8881	50-yr	3.72	260.70	261.20	2.14	0.05
229.07	394.8881	100-yr	4.43	260.70	261.26	2.26	0.05
229.07	394.8881	Regional	18.39	260.70	262.04	3.69	0.04
229.07	360.2077	2-yr	0.93	260.24	260.50	1.21	0.07
229.07	360.2077	5-yr	1.66	260.24	260.54	1.24	0.06
229.07	360.2077	10-yr	2.24	260.24	260.61	1.11	0.05
229.07	360.2077	25-yr	3.05	260.24	260.65	1.20	0.05
229.07	360.2077	50-yr	3.72	260.24	260.64	1.54	0.05
229.07	360.2077	100-yr	4.43	260.24	260.67	1.61	0.05
229.07	360.2077	Regional	18.39	260.24	261.05	2.06	0.04
229.07	283.8773	2-yr	0.93	259.38	259.64	1.00	0.05
229.07	283.8773	5-yr	1.66	259.38	259.73	1.23	0.04
229.07	283.8773	10-yr	2.24	259.38	259.73	1.67	0.04
229.07	283.8773	25-yr	3.05	259.38	259.79	1.83	0.03
229.07	283.8773	50-yr	3.72	259.38	259.89	1.57	0.03
229.07	283.8773	100-yr	4.43	259.38	259.93	1.65	0.03
229.07	283.8773	Regional	18.39	259.38	260.30	2.64	0.03
229.07	215.2255	2-yr	0.93	258.75	259.03	0.93	0.03
229.07	215.2255	5-yr	1.66	258.75	259.09	1.17	0.03
229.07	215.2255	10-yr	2.24	258.75	259.21	1.01	0.02
229.07	215.2255	25-yr	3.05	258.75	259.31	0.98	0.02
229.07	215.2255	50-yr	3.72	258.75	259.22	1.61	0.02
229.07	215.2255	100-yr	4.43	258.75	259.26	1.71	0.02
229.07	215.2255	Regional	18.39	258.75	259.61	2.49	0.02
229.07	160.8058	2-yr	0.93	258.25	258.48	0.95	0.02
229.07	160.8058	5-yr	1.66	258.25	258.55	1.15	0.01
229.07	160.8058	10-yr	2.24	258.25	258.51	1.94	0.01
229.07	160.8058	25-yr	3.05	258.25	258.51	2.65	0.01
229.07	160.8058	50-yr	3.72	258.25	258.64	1.49	0.01
229.07	160.8058	100-yr	4.43	258.25	258.67	1.59	0.01
229.07	160.8058	Regional	18.39	258.25	259.39	1.26	0.01
229.01	1082.504	2-yr	1.77	265.37	265.91	1.77	0.29
229.01	1082.504	5-yr	3.74	265.37	266.13	2.10	0.25
229.01	1082.504	10-yr	5.15	265.37	266.38	1.85	0.23
229.01	1082.504	25-yr	7.11	265.37	266.63	1.86	0.21

Table B-1: HEC-RAS Results for Etobicoke Creek Through the Subject Site Under Existing Conditions [(1)]

HEC-RAS Reach	HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
229.01	1082.504	50-yr	8.85	265.37	266.83	1.90	0.19
229.01	1082.504	100-yr	10.78	265.37	267.03	1.96	0.18
229.01	1082.504	Regional	52.01	265.37	268.15	1.33	0.12
229.01	1081.561		Culvert				
229.01	1080.619	2-yr	1.77	265.28	265.83	1.24	0.29
229.01	1080.619	5-yr	3.74	265.28	266.02	1.65	0.24
229.01	1080.619	10-yr	5.15	265.28	266.11	1.93	0.23
229.01	1080.619	25-yr	7.11	265.28	266.21	2.27	0.20
229.01	1080.619	50-yr	8.85	265.28	266.28	2.56	0.19
229.01	1080.619	100-yr	10.78	265.28	266.37	2.81	0.18
229.01	1080.619	Regional	52.01	265.28	267.50	1.55	0.11
229.01	1040.967	2-yr	1.77	265.02	265.65	1.13	0.28
229.01	1040.967	5-yr	3.74	265.02	265.80	1.67	0.24
229.01	1040.967	10-yr	5.15	265.02	265.87	1.92	0.22
229.01	1040.967	25-yr	7.11	265.02	265.95	2.22	0.20
229.01	1040.967	50-yr	8.85	265.02	266.02	2.39	0.19
229.01	1040.967	100-yr	10.78	265.02	266.10	2.54	0.17
229.01	1040.967	Regional	52.01	265.02	266.85	3.12	0.11
229.01	1004.562	2-yr	1.77	265.06	265.52	0.82	0.27
229.01	1004.562	5-yr	3.74	265.06	265.68	0.98	0.23
229.01	1004.562	10-yr	5.15	265.06	265.73	1.18	0.22
229.01	1004.562	25-yr	7.11	265.06	265.81	1.34	0.19
229.01	1004.562	50-yr	8.85	265.06	265.88	1.45	0.18
229.01	1004.562	100-yr	10.78	265.06	265.93	1.61	0.17
229.01	1004.562	Regional	52.01	265.06	266.60	3.18	0.11
229.01	928.1997	2-yr	1.77	264.40	264.84	1.75	0.26
229.01	928.1997	5-yr	3.74	264.40	265.11	1.88	0.22
229.01	928.1997	10-yr	5.15	264.40	265.27	1.68	0.20
229.01	928.1997	25-yr	7.11	264.40	265.34	1.82	0.18
229.01	928.1997	50-yr	8.85	264.40	265.39	1.97	0.17
229.01	928.1997	100-yr	10.78	264.40	265.46	1.97	0.16
229.01	928.1997	Regional	52.01	264.40	266.31	2.34	0.10
229.01	842.2649	2-yr	1.77	263.86	264.48	0.82	0.24
229.01	842.2649	5-yr	3.74	263.86	264.60	1.29	0.20
229.01	842.2649	10-yr	5.15	263.86	264.67	1.50	0.19
229.01	842.2649	25-yr	7.11	263.86	264.76	1.69	0.17
229.01	842.2649	50-yr	8.85	263.86	264.83	1.83	0.16
229.01	842.2649	100-yr	10.78	263.86	264.89	1.98	0.15
229.01	842.2649	Regional	52.01	263.86	265.56	3.54	0.09
229.01	751.243	2-yr	1.77	263.33	263.88	1.53	0.22
229.01	751.243	5-yr	3.74	263.33	264.08	1.34	0.18
229.01	751.243	10-yr	5.15	263.33	264.12	1.47	0.17
229.01	751.243	25-yr	7.11	263.33	264.16	1.65	0.15
229.01	751.243	50-yr	8.85	263.33	264.19	1.80	0.14
229.01	751.243	100-yr	10.78	263.33	264.23	1.91	0.13
229.01	751.243	Regional	52.01	263.33	264.80	2.63	0.09

Table B-1: HEC-RAS Results for Etobicoke Creek Through the Subject Site Under Existing Conditions [(1)]

HEC-RAS Reach	HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
229.01	672.631	2-yr	1.77	262.44	263.26	0.53	0.20
229.01	672.631	5-yr	3.74	262.44	263.40	0.82	0.17
229.01	672.631	10-yr	5.15	262.44	263.47	0.95	0.15
229.01	672.631	25-yr	7.11	262.44	263.55	1.08	0.14
229.01	672.631	50-yr	8.85	262.44	263.62	1.17	0.13
229.01	672.631	100-yr	10.78	262.44	263.68	1.26	0.12
229.01	672.631	Regional	52.01	262.44	264.47	2.19	0.08
229.01	601.0356	2-yr	1.77	262.91	263.05	1.23	0.18
229.01	601.0356	5-yr	3.74	262.91	263.17	1.23	0.15
229.01	601.0356	10-yr	5.15	262.91	263.24	1.23	0.14
229.01	601.0356	25-yr	7.11	262.91	263.33	1.29	0.12
229.01	601.0356	50-yr	8.85	262.91	263.40	1.34	0.11
229.01	601.0356	100-yr	10.78	262.91	263.46	1.39	0.11
229.01	601.0356	Regional	52.01	262.91	264.25	2.20	0.07
229.01	499.7924	2-yr	1.77	262.56	263.00	0.22	0.15
229.01	499.7924	5-yr	3.74	262.56	263.06	0.40	0.12
229.01	499.7924	10-yr	5.15	262.56	263.12	0.49	0.11
229.01	499.7924	25-yr	7.11	262.56	263.19	0.59	0.10
229.01	499.7924	50-yr	8.85	262.56	263.24	0.67	0.09
229.01	499.7924	100-yr	10.78	262.56	263.29	0.75	0.08
229.01	499.7924	Regional	52.01	262.56	263.99	1.69	0.06
229.01	488.6847	2-yr	1.77	262.59	262.88	1.37	0.13
229.01	488.6847	5-yr	3.74	262.59	262.98	1.00	0.10
229.01	488.6847	10-yr	5.15	262.59	263.02	1.16	0.10
229.01	488.6847	25-yr	7.11	262.59	263.06	1.37	0.09
229.01	488.6847	50-yr	8.85	262.59	263.10	1.53	0.08
229.01	488.6847	100-yr	10.78	262.59	263.12	1.70	0.08
229.01	488.6847	Regional	52.01	262.59	263.47	3.97	0.05
229.01	470.4897		Inl Struct				
229.01	452.2947	2-yr	1.77	260.91	261.36	0.68	0.12
229.01	452.2947	5-yr	3.74	260.91	261.47	1.10	0.10
229.01	452.2947	10-yr	5.15	260.91	261.52	1.35	0.09
229.01	452.2947	25-yr	7.11	260.91	261.58	1.66	0.08
229.01	452.2947	50-yr	8.85	260.91	261.63	1.89	0.08
229.01	452.2947	100-yr	10.78	260.91	261.67	2.08	0.07
229.01	452.2947	Regional	52.01	260.91	262.26	3.39	0.05
229.01	368.6675	2-yr	1.77	261.00	261.23	0.70	0.10
229.01	368.6675	5-yr	3.74	261.00	261.32	0.84	0.08
229.01	368.6675	10-yr	5.15	261.00	261.36	0.95	0.08
229.01	368.6675	25-yr	7.11	261.00	261.41	1.07	0.07
229.01	368.6675	50-yr	8.85	261.00	261.44	1.20	0.07
229.01	368.6675	100-yr	10.78	261.00	261.49	1.28	0.06
229.01	368.6675	Regional	52.01	261.00	262.18	1.99	0.04
229.01	291.7302	2-yr	1.77	259.60	260.01	1.56	0.07
229.01	291.7302	5-yr	3.74	259.60	260.17	1.93	0.05
229.01	291.7302	10-yr	5.15	259.60	260.30	1.94	0.05
229.01	291.7302	25-yr	7.11	259.60	260.42	2.01	0.04

Table B-1: HEC-RAS Results for Etobicoke Creek Through the Subject Site Under Existing Conditions [(1)]

HEC-RAS Reach	HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
229.01	291.7302	50-yr	8.85	259.60	260.52	1.96	0.04
229.01	291.7302	100-yr	10.78	259.60	260.58	2.06	0.04
229.01	291.7302	Regional	52.01	259.60	261.15	3.71	0.03
229.01	237.1133	2-yr	1.77	259.06	259.51	0.97	0.05
229.01	237.1133	5-yr	3.74	259.06	259.70	1.29	0.04
229.01	237.1133	10-yr	5.15	259.06	259.79	1.49	0.04
229.01	237.1133	25-yr	7.11	259.06	259.83	1.92	0.04
229.01	237.1133	50-yr	8.85	259.06	259.91	2.13	0.03
229.01	237.1133	100-yr	10.78	259.06	259.98	2.34	0.03
229.01	237.1133	Regional	52.01	259.06	260.62	2.90	0.03
229.01	144.6575	2-yr	1.77	258.17	258.56	1.22	0.02
229.01	144.6575	5-yr	3.74	258.17	258.68	1.69	0.02
229.01	144.6575	10-yr	5.15	258.17	258.76	1.87	0.02
229.01	144.6575	25-yr	7.11	258.17	258.89	1.76	0.02
229.01	144.6575	50-yr	8.85	258.17	258.93	1.90	0.01
229.01	144.6575	100-yr	10.78	258.17	258.98	2.04	0.01
229.01	144.6575	Regional	52.01	258.17	259.52	3.65	0.01
229.01	75.89621	2-yr	1.77	257.56	258.05	1.34	0.01
229.01	75.89621	5-yr	3.74	257.56	258.19	1.64	0.01
229.01	75.89621	10-yr	5.15	257.56	258.25	1.58	0.01
229.01	75.89621	25-yr	7.11	257.56	258.30	1.77	0.01
229.01	75.89621	50-yr	8.85	257.56	258.33	1.92	0.01
229.01	75.89621	100-yr	10.78	257.56	258.36	2.12	0.01
229.01	75.89621	Regional	52.01	257.56	259.37	1.72	0.01
229.01'	767.45	2-yr	2.70	256.72	257.16	1.84	0.17
229.01'	767.45	5-yr	5.41	256.72	257.39	2.21	0.14
229.01'	767.45	10-yr	7.39	256.72	257.63	1.79	0.13
229.01'	767.45	25-yr	10.17	256.72	257.72	1.92	0.13
229.01'	767.45	50-yr	12.57	256.72	257.77	2.07	0.13
229.01'	767.45	100-yr	15.21	256.72	257.82	2.21	0.13
229.01'	767.45	Regional	70.41	256.72	259.28	1.74	0.27
229.01'	706.03	2-yr	2.70	256.14	256.93	0.87	0.16
229.01'	706.03	5-yr	5.41	256.14	257.08	1.29	0.13
229.01'	706.03	10-yr	7.39	256.14	257.18	1.51	0.12
229.01'	706.03	25-yr	10.17	256.14	257.24	1.85	0.12
229.01'	706.03	50-yr	12.57	256.14	257.30	2.03	0.12
229.01'	706.03	100-yr	15.21	256.14	257.36	2.19	0.13
229.01'	706.03	Regional	70.41	256.14	259.26	1.17	0.25
229.01'	657.19	2-yr	2.70	256.00	256.69	1.31	0.14
229.01'	657.19	5-yr	5.41	256.00	256.84	1.57	0.12
229.01'	657.19	10-yr	7.39	256.00	256.87	1.88	0.11
229.01'	657.19	25-yr	10.17	256.00	257.01	1.71	0.11
229.01'	657.19	50-yr	12.57	256.00	257.06	1.83	0.11
229.01'	657.19	100-yr	15.21	256.00	257.11	1.95	0.12
229.01'	657.19	Regional	70.41	256.00	259.24	1.17	0.24
229.01'	597.31	2-yr	2.70	255.63	256.38	1.19	0.13
229.01'	597.31	5-yr	5.41	255.63	256.63	1.25	0.11

Table B-1: HEC-RAS Results for Etobicoke Creek Through the Subject Site Under Existing Conditions [(1)]

HEC-RAS Reach	HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
229.01'	597.31	10-yr	7.39	255.63	256.75	1.13	0.10
229.01'	597.31	25-yr	10.17	255.63	256.70	1.84	0.10
229.01'	597.31	50-yr	12.57	255.63	256.74	1.97	0.10
229.01'	597.31	100-yr	15.21	255.63	256.78	2.11	0.11
229.01'	597.31	Regional	70.41	255.63	259.24	0.81	0.23
229.01'	537.29	2-yr	2.70	255.25	256.16	1.14	0.12
229.01'	537.29	5-yr	5.41	255.25	256.34	1.66	0.10
229.01'	537.29	10-yr	7.39	255.25	256.42	1.95	0.09
229.01'	537.29	25-yr	10.17	255.25	256.51	1.31	0.09
229.01'	537.29	50-yr	12.57	255.25	256.58	1.36	0.09
229.01'	537.29	100-yr	15.21	255.25	256.65	1.43	0.10
229.01'	537.29	Regional	70.41	255.25	259.23	0.87	0.21
229.01'	477.27	2-yr	2.70	255.12	255.87	1.37	0.10
229.01'	477.27	5-yr	5.41	255.12	256.06	1.54	0.09
229.01'	477.27	10-yr	7.39	255.12	256.15	1.68	0.08
229.01'	477.27	25-yr	10.17	255.12	256.25	1.81	0.08
229.01'	477.27	50-yr	12.57	255.12	256.32	1.91	0.08
229.01'	477.27	100-yr	15.21	255.12	256.39	2.00	0.09
229.01'	477.27	Regional	70.41	255.12	259.23	0.80	0.19
229.01'	417.22	2-yr	2.70	254.63	255.64	1.11	0.09
229.01'	417.22	5-yr	5.41	254.63	255.86	1.31	0.07
229.01'	417.22	10-yr	7.39	254.63	255.98	1.32	0.07
229.01'	417.22	25-yr	10.17	254.63	256.05	1.54	0.07
229.01'	417.22	50-yr	12.57	254.63	256.13	1.59	0.07
229.01'	417.22	100-yr	15.21	254.63	256.20	1.70	0.08
229.01'	417.22	Regional	70.41	254.63	259.22	0.72	0.16
229.01'	356.64	2-yr	2.70	254.67	255.18	1.72	0.08
229.01'	356.64	5-yr	5.41	254.67	255.39	1.99	0.06
229.01'	356.64	10-yr	7.39	254.67	255.52	2.09	0.06
229.01'	356.64	25-yr	10.17	254.67	255.70	1.83	0.06
229.01'	356.64	50-yr	12.57	254.67	255.76	1.99	0.06
229.01'	356.64	100-yr	15.21	254.67	255.87	1.89	0.07
229.01'	356.64	Regional	70.41	254.67	259.21	0.78	0.14
229.01'	297.21	2-yr	2.70	253.95	254.79	1.14	0.07
229.01'	297.21	5-yr	5.41	253.95	255.06	1.46	0.05
229.01'	297.21	10-yr	7.39	253.95	255.22	1.64	0.05
229.01'	297.21	25-yr	10.17	253.95	255.41	1.83	0.05
229.01'	297.21	50-yr	12.57	253.95	255.60	1.53	0.05
229.01'	297.21	100-yr	15.21	253.95	255.80	1.27	0.06
229.01'	297.21	Regional	70.41	253.95	259.21	0.59	0.12
229.01'	237.24	2-yr	2.70	253.78	254.50	1.32	0.05
229.01'	237.24	5-yr	5.41	253.78	254.72	1.83	0.04
229.01'	237.24	10-yr	7.39	253.78	254.85	2.11	0.04
229.01'	237.24	25-yr	10.17	253.78	254.99	2.43	0.04
229.01'	237.24	50-yr	12.57	253.78	255.01	2.98	0.05
229.01'	237.24	100-yr	15.21	253.78	255.03	3.56	0.06
229.01'	237.24	Regional	70.41	253.78	259.20	0.80	0.09

Table B-1: HEC-RAS Results for Etobicoke Creek Through the Subject Site Under Existing Conditions [(1)]

HEC-RAS Reach	HEC-RAS River Station	Profile	Flow (m^3/s)	Minimum Channel Elevation (m)	Water Surface Elevation (m)	Channel Velocity (m/s)	Channel Travel Time (h)
229.01'	177.17	2-yr	2.70	253.41	254.04	1.55	0.04
229.01'	177.17	5-yr	5.41	253.41	254.28	1.81	0.03
229.01'	177.17	10-yr	7.39	253.41	254.41	1.98	0.03
229.01'	177.17	25-yr	10.17	253.41	254.61	2.10	0.03
229.01'	177.17	50-yr	12.57	253.41	254.90	1.69	0.04
229.01'	177.17	100-yr	15.21	253.41	255.27	1.12	0.05
229.01'	177.17	Regional	70.41	253.41	259.20	0.60	0.07
229.01'	112.28	2-yr	2.70	253.04	253.84	0.82	0.03
229.01'	112.28	5-yr	5.41	253.04	254.14	1.04	0.02
229.01'	112.28	10-yr	7.39	253.04	254.32	1.10	0.02
229.01'	112.28	25-yr	10.17	253.04	254.60	1.04	0.02
229.01'	112.28	50-yr	12.57	253.04	254.91	0.86	0.02
229.01'	112.28	100-yr	15.21	253.04	255.26	0.69	0.03
229.01'	112.28	Regional	70.41	253.04	259.20	0.51	0.04
229.01'	60.89	2-yr	2.70	252.77	253.54	1.63	0.01
229.01'	60.89	5-yr	5.41	252.77	253.94	1.56	0.01
229.01'	60.89	10-yr	7.39	252.77	254.19	1.47	0.01
229.01'	60.89	25-yr	10.17	252.77	254.55	1.17	0.01
229.01'	60.89	50-yr	12.57	252.77	254.89	0.92	0.01
229.01'	60.89	100-yr	15.21	252.77	255.25	0.75	0.01
229.01'	60.89	Regional	70.41	252.77	259.20	0.53	0.01
229.01'	51.14	2-yr	2.70	252.18	253.59	0.56	0.01
229.01'	51.14	5-yr	5.41	252.18	253.97	0.84	0.01
229.01'	51.14	10-yr	7.39	252.18	254.20	1.00	0.01
229.01'	51.14	25-yr	10.17	252.18	254.51	1.18	0.01
229.01'	51.14	50-yr	12.57	252.18	254.81	1.27	0.01
229.01'	51.14	100-yr	15.21	252.18	255.15	1.35	0.01
229.01'	51.14	Regional	70.41	252.18	259.19	0.63	0.00
229.01'	25.57		Culvert				
229.01'	0	2-yr	2.70	252.64	253.35	2.00	0.00
229.01'	0	5-yr	5.41	252.64	253.60	2.42	0.00
229.01'	0	10-yr	7.39	252.64	253.74	2.69	0.00
229.01'	0	25-yr	10.17	252.64	253.92	2.97	0.00
229.01'	0	50-yr	12.57	252.64	254.06	3.17	0.00
229.01'	0	100-yr	15.21	252.64	254.21	3.34	0.00
229.01'	0	Regional	70.41	252.64	256.16	5.65	0.00

[(1)] Based on existing flow profiles. Channel infrastructure included at existing crossings (with proposed Old School Road culvert).

APPENDIX D

UNCONTROLLED AREA ASSESSMENT

JFSA
WATER RESOURCES AND
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jfsa.com

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Paris. ON
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Québec. QC

August 06, 2021 Project Number: P1408

David Schaeffer Engineering Limited
600 Alden Road, Suite 700
Markham, Ontario
L3R 0E7

Attention: John Tjeerdsma, P.Eng.

Subject: Mayfield West Phase 1 Secondary Plan Amendment / Uncontrolled Development Areas to Etobicoke Creek

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As requested by your office, we have evaluated, based on the available information as described below, the impact of proposed uncontrolled development areas in the Mayfield West Phase 1 Secondary Plan Amendment area on the 2- to 100-year and Regional peak flows on Etobicoke Creek. The proposed development is located within the Town of Caledon, southeast of Old School Road and northeast of Hurontario Street (Highway 10).

The proposed drainage area plan for the development is shown in Figure A-1 of Attachment A. The development will be serviced by three Stormwater Management (SWM) ponds discharging to Etobicoke Creek (Ponds 1, 2 and 3), and one SWM pond discharging to the Humber River (Pond 4). Pond 3 will also service drainage from 0.56 ha of Old School Road. In addition, 4.85 ha of the development area discharge to Etobicoke Creek without quantity control. The 4.85 ha include 2.51 ha of rearyards (considered clean water) backing onto the creek corridor, and 2.34 ha of development area serviced by two oil-and-grit separator (OGS) units for quality control. Note that areas on Old School Road discharging directly to the watercourse are identified on Figure A-1, but have not been considered as part of this analysis as these areas drain directly to the creek under existing conditions.

Preliminary sizing of the quality and quantity control volumes to be provided in Ponds 1, 2 and 3 to Etobicoke Creek are presented in Tables A-1 to A-4 of Attachment A. As directed by DSEL, it has been assumed that 48 hour detention of the 25 mm storm runoff volume is required for erosion control in Ponds 1, 2 and 3. The ponds have not been overcontrolled to compensate for the uncontrolled rearyard and OGS-serviced areas. To justify this approach, it must be demonstrated that the uncontrolled areas will not increase total peak flows on Etobicoke Creek. Note that this analysis does not address potential erosive impacts of the proposed SWM ponds or uncontrolled areas on Etobicoke Creek, and relates only to quantity control for the 2- to 100-year and Regional events.

A Visual OTTHYMO model of the Etobicoke Creek watershed under existing conditions was prepared by MMM Group Limited for the April 2013 *Etobicoke Creek Hydrology Update Draft Final Report*. In the course of the study, it was determined that the 12-hour AES distribution is the critical 2- to 100-year design event for establishing peak flows in Etobicoke Creek. The existing drainage plan for the Etobicoke Creek watershed is presented in Attachment B, as per Drawing J1 of the April 2013 *Etobicoke Creek Hydrology Update Draft Final Report*. A rough outline of development boundaries for the Mayfield West Phase 1 Secondary Plan Amendment area has been added in magenta.

Node C on Etobicoke Creek, located downstream of the proposed development, has been identified as a key point of comparison. The total existing conditions drainage area at Node C is 2306.81 ha, of which the portion of the proposed development tributary to Etobicoke Creek (39.46 ha) makes up approximately 1.7% of the watershed. The drainage area to Node C has been outlined roughly in red in the existing conditions drainage plan shown in Attachment B. The model also includes three nodes within the proposed development area, not shown on the attached drainage plan, that were also used as key points of comparison.

In order to make a comparison of peak flows on Etobicoke Creek under existing conditions, and with the proposed development (with uncontrolled rearyard and OGS areas) in place, the hydrologic model of Etobicoke Creek was modified to incorporate the proposed development areas and SWM Ponds 1, 2 and 3. Existing catchment areas 13, 17, 33, 34 and 37 were adjusted to remove these development areas (i.e. to avoid double counting). In lieu of making these modifications in Visual OTTHYMO, for which we don't have a license, the OTTHYMO model up to Node C was recreated in SWMHYMO, which shares the same theoretical basis as OTTHYMO and generates consistent results.

Digital SWMHYMO modelling files are attached. Summaries of peak 2- to 100-year and Regional flows at key nodes on Etobicoke Creek are presented in Table 1 for existing conditions and Table 2 with the proposed development in place. Note that the Regional event peak flows are based on the 48-hour rainfall record.

Table 1: Summary of Peak Flows at Key Nodes on Etobicoke Creek Under Existing Conditions [(1)]

Node	Location	Peak Flow (m^3/s)						
		2-Year	5-Year	10-Year	25-Year	50-Year	100-Year	Regional
1033	Reach Confluence in MW Ph1	2.830	5.448	7.488	10.298	12.651	15.264	70.323
1037	Mid-Point Between 1033 and 2037	3.121	5.949	8.197	11.295	13.869	16.707	76.576
2037	Hurontario Street	3.140	5.977	8.223	11.331	13.899	16.728	76.875
1049	Etobicoke Creek Node C	8.520	15.558	21.353	29.424	35.970	42.905	181.901

[(1)] As simulated in SWMHYMO, recreated from the existing conditions Visual OTTHYMO model Existing-2to100yr-12AES from the April 2013 *Etobicoke Creek Hydrology Update Draft Final Report* by MMM Group Limited.

Table 2: Summary of Peak Flows at Key Nodes on Etobicoke Creek With Proposed Development in Place (1)

Node	Location	Peak Flow (m^3/s)						
		2-Year	5-Year	10-Year	25-Year	50-Year	100-Year	Regional
1033	Reach Confluence in MW Ph1	2.794	5.390	7.377	10.137	12.444	15.003	68.898
1037	Mid-Point Between 1033 and 2037	3.038	5.809	7.980	10.983	13.489	16.236	74.331
2037	Hurontario Street	3.103	5.918	8.118	11.162	13.684	16.440	75.327
1049	Etobicoke Creek Node C	8.464	15.467	21.200	29.199	35.683	42.559	180.297

(1) As simulated in SWMHYMO, recreated from the existing conditions Visual OTTHYMO model Existing-2to100yr-12AES from the April 2013 *Etobicoke Creek Hydrology Update Draft Final Report* by MMM Group Limited, and modified to include the proposed development areas and SWM ponds.

As may be seen by comparison of Tables 1 and 2, peak flows on Etobicoke Creek are between 0.036 m^3/s and 2.245 m^3/s lower with the proposed development in place in comparison to existing conditions. As such, it may be concluded that the proposed 4.85 ha of uncontrolled rearyard and OGS areas do not result in an increase in 2- to 100-year or Regional peak flows on Etobicoke Creek.

Yours truly,
J.F Sabourin and Associates Inc.

Laura Pipkins, P.Eng.
Project Engineer in Water Resources

cc: J.F Sabourin, M.Eng, P.Eng
Director of Water Resources Projects

Attachments
Attachment A: Proposed Conditions Drainage Areas and SWM Pond Sizing
Attachment B: Etobicoke Creek Watershed Study Existing Catchments (MMM Group Limited, April 2013)

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ENVIRONMENTAL CONSULTANTS

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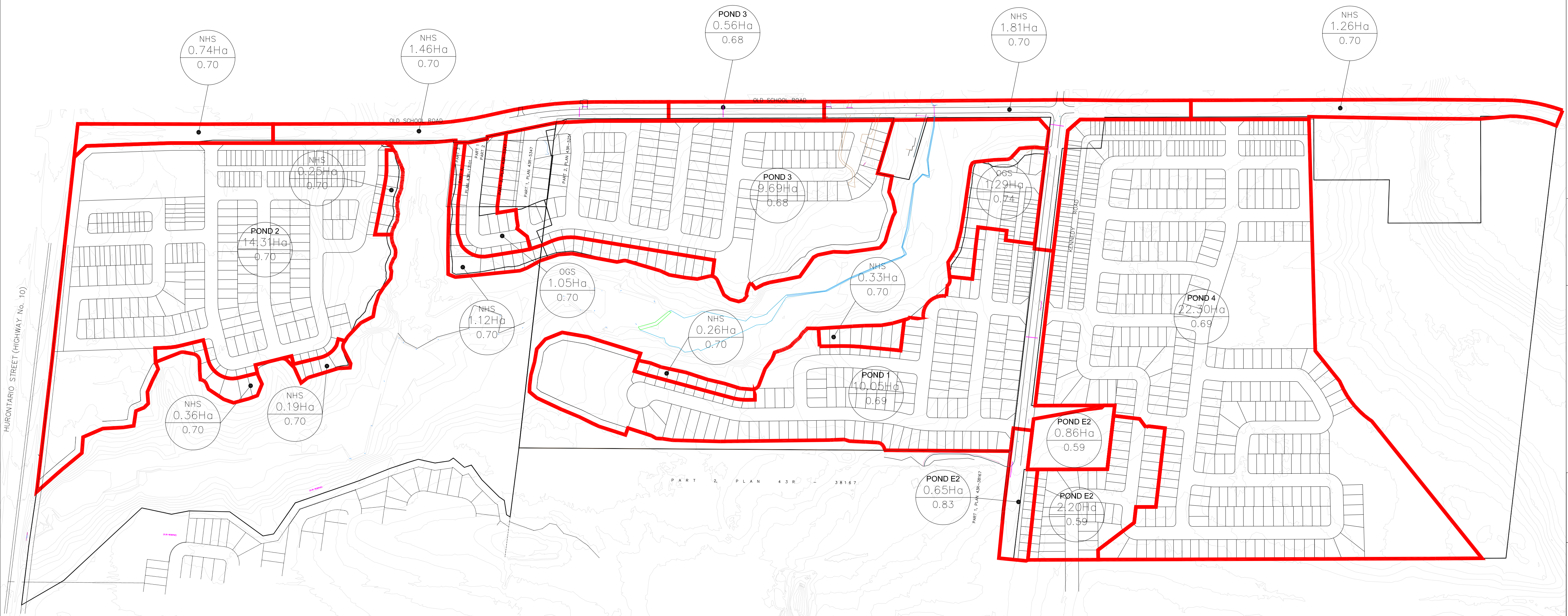
Paris. ON
Gatineau. QC
Montréal. QC
Québec. QC

Attachment A

Proposed Conditions Drainage Areas and SWM Pond Sizing

TOWN OF CALEDON
PLANNING
RECEIVED
Sep 14, 2021



LEGEND :

SUBCATCHMENT BOUNDARY

TRIBUTARY TO
SUB-CATCHMENT AREA
SUBCATCHMENT RUNOFF COEFFICIENT

SCALE : 0 75 150 225 300 375m

J.F. Sabourin & Associates Inc.
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS
OTTAWA (613) 836-3884
GATINEAU (819) 243-6858

CLIENT :
DSEL
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600 ALDEN ROAD, SUITE 700
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PROJECT :
MAYFIELD WEST PHASE 1
SECONDARY PLAN AMENDMENT

BY	DATE	DESCRIPTION	BY

PROPOSED CONDITIONS
DRAINAGE AREAS

FIGURE A-1

DESIGNED:
DRAWN: LP
VERIFIED: JFS
APPROVED: JFS

DRAWING REF.
1408-16\202101 FSR\Design\CAD
JFSA Figures.dwg

DATE: Aug/21
PROJECT No.: 1408-16

Table A-1: Summary of Total Proposed Drainage Area

To SWM Facility	Area (ha)	Imperviousness (%)	Area x Imp.
Uncontrolled (1)	4.85	73	354.05
Pond 1	10.05	70	703.5
Pond 2	14.31	71	1016.0
Pond 3	10.25	69	707.3
Total	39.46	70	2780.8

(1) Demonstrated through SWMHYMO modelling that uncontrolled areas do not negatively impact overall flows on Etobicoke Creek.

Table A-2: Simulated Release Rates and Volumes for SWM Facility 1 (1)

Component	Unit Release Rate (1) (m^3/s/ha)	Target Release Rate (m^3/s)	Storage (m^3)
Permanent Pool (2)	N/A	N/A	1859
Quality Control (2)	N/A	N/A	402
Erosion Control (3)	N/A	0.010	1672
2yr/12hr AES	0.00349	0.035	2284
5yr/12hr AES	0.00618	0.062	2997
10yr/12hr AES	0.00827	0.083	3478
25yr/12hr AES	0.01112	0.112	4122
50yr/12hr AES	0.01340	0.135	4561
100yr/12hr AES	0.01579	0.159	4998
Regional	0.05717	0.575	10980

(1) Proposed conditions as modelled in SWMHYMO. Post- to pre-development quantity control required for the 2- to 100-year and Regional events in accordance with the pro-rated unit flow rates of existing catchments 13 and 34, as provided by TRCA (60% of base condition).

(2) Permanent pool and quality control provided for MOE enhanced protection.

(2) Preliminary erosion control assumption of a 48 hour drawdown time for the 25 mm storm runoff volume.

Table A-3: Simulated Release Rates and Volumes for SWM Facility 2 (1)

Component	Unit Release Rate (1) (m^3/s/ha)	Target Release Rate (m^3/s)	Storage (m^3)
Permanent Pool (2)	N/A	N/A	2671
Quality Control (2)	N/A	N/A	572
Erosion Control (3)	N/A	0.014	2413
2yr/12hr AES	0.00349	0.050	3308
5yr/12hr AES	0.00618	0.088	4331
10yr/12hr AES	0.00827	0.118	5030
25yr/12hr AES	0.01112	0.159	5933
50yr/12hr AES	0.01340	0.192	6560
100yr/12hr AES	0.01579	0.226	7186
Regional	0.05717	0.818	15800

(1) Proposed conditions as modelled in SWMHYMO. Post- to pre-development quantity control required for the 2- to 100-year and Regional events in accordance with the pro-rated unit flow rates of existing catchments 13 and 34, as provided by TRCA (60% of base condition).

(2) Permanent pool and quality control provided for MOE enhanced protection.

(2) Preliminary erosion control assumption of a 48 hour drawdown time for the 25 mm storm runoff volume.

Table A-4: Simulated Release Rates and Volumes for SWM Facility 3 [(1)]

Component	Unit Release Rate [(1)] (m^3/s/ha)	Target Release Rate (m^3/s)	Storage (m^3)
Permanent Pool [(2)]	N/A	N/A	1879
Quality Control [(2)]	N/A	N/A	410
Erosion Control [(3)]	N/A	0.010	1681
2yr/12hr AES	0.00349	0.036	2291
5yr/12hr AES	0.00618	0.063	3012
10yr/12hr AES	0.00827	0.085	3499
25yr/12hr AES	0.01112	0.114	4157
50yr/12hr AES	0.01340	0.137	4607
100yr/12hr AES	0.01579	0.162	5049
Regional	0.05717	0.586	11070

(1) Proposed conditions as modelled in SWMHYMO. Post- to pre-development quantity control required for the 2- to 100-year and Regional events in accordance with the pro-rated unit flow rates of existing catchments 13 and 34, as provided by TRCA (60% of base condition).

(2) Permanent pool and quality control provided for MOE enhanced protection.

(2) Preliminary erosion control assumption of a 48 hour drawdown time for the 25 mm storm runoff volume.

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Attachment B

Etobicoke Creek Watershed Study Existing Catchments
(MMM Group Limited, April 2013)

Legend

- Watershed Boundary
- Municipal Boundaries
- Key Flow Nodes
- Watercourse
- Collector
- Expressway/Highway
- Freeway

0 750 1,500 3,000 4,500 6,000 Meters

CLIENT
TORONTO AND REGION CONSERVATION AUTHORITY

TITLE
ETOBICOKIE CREEK WATERSHED STUDY

EXISTING CATCHMENTS

MMM GROUP

Checked	Drawn
A.Z	S.Y
Date: March 2013	Proj. No.: 14-11605-001-WR1
Scale: As Shown	Drawing No.: J-1

APPENDIX E

PRELIMINARY POND SIZING CALCULATIONS

Table A-1: Summary of Total Proposed Drainage Area

To SWM Facility	Area (ha)	Imperviousness (%)	Area x Imp.
Uncontrolled [1]	4.85	73	354.05
Pond 1	10.05	70	703.5
Pond 2	14.31	71	1016.0
Pond 3	10.25	69	707.3
Total	39.46	70	2780.8

[1] Demonstrated through SWMHYMO modelling that uncontrolled areas do not negatively impact overall flows on Etobicoke Creek.

Table A-2: Simulated Release Rates and Volumes for SWM Facility 1 [1]

Component	Unit Release Rate [1] ($m^3/s/ha$)	Target Release Rate (m^3/s)	Storage (m^3)
Permanent Pool [2]	N/A	N/A	1859
Quality Control [2]	N/A	N/A	402
Erosion Control [3]	N/A	0.010	1672
2yr/12hr AES	0.00349	0.035	2284
5yr/12hr AES	0.00618	0.062	2997
10yr/12hr AES	0.00827	0.083	3478
25yr/12hr AES	0.01112	0.112	4122
50yr/12hr AES	0.01340	0.135	4561
100yr/12hr AES	0.01579	0.159	4998
Regional	0.05717	0.575	10980

[1] Proposed conditions as modelled in SWMHYMO. Post- to pre-development quantity control required for the 2- to 100-year and Regional events in accordance with the pro-rated unit flow rates of existing catchments 13 and 34, as provided by TRCA (60% of base condition).

[2] Permanent pool and quality control provided for MOE enhanced protection.

[3] Preliminary erosion control assumption of a 48 hour drawdown time for the 25 mm storm runoff volume.

Table A-3: Simulated Release Rates and Volumes for SWM Facility 2 [1]

Component	Unit Release Rate [1] ($m^3/s/ha$)	Target Release Rate (m^3/s)	Storage (m^3)
Permanent Pool [2]	N/A	N/A	2671
Quality Control [2]	N/A	N/A	572
Erosion Control [3]	N/A	0.014	2413
2yr/12hr AES	0.00349	0.050	3308
5yr/12hr AES	0.00618	0.088	4331
10yr/12hr AES	0.00827	0.118	5030
25yr/12hr AES	0.01112	0.159	5933
50yr/12hr AES	0.01340	0.192	6560
100yr/12hr AES	0.01579	0.226	7186
Regional	0.05717	0.818	15800

[1] Proposed conditions as modelled in SWMHYMO. Post- to pre-development quantity control required for the 2- to 100-year and Regional events in accordance with the pro-rated unit flow rates of existing catchments 13 and 34, as provided by TRCA (60% of base condition).

[2] Permanent pool and quality control provided for MOE enhanced protection.

[3] Preliminary erosion control assumption of a 48 hour drawdown time for the 25 mm storm runoff volume.

Table A-4: Simulated Release Rates and Volumes for SWM Facility 3 (1)

Component	Unit Release Rate (1) (m^3/s/ha)	Target Release Rate (m^3/s)	Storage (m^3)
Permanent Pool (2)	N/A	N/A	1879
Quality Control (2)	N/A	N/A	410
Erosion Control (3)	N/A	0.010	1681
2yr/12hr AES	0.00349	0.036	2291
5yr/12hr AES	0.00618	0.063	3012
10yr/12hr AES	0.00827	0.085	3499
25yr/12hr AES	0.01112	0.114	4157
50yr/12hr AES	0.01340	0.137	4607
100yr/12hr AES	0.01579	0.162	5049
Regional	0.05717	0.586	11070

(1) Proposed conditions as modelled in SWMHYMO. Post- to pre-development quantity control required for the 2- to 100-year and Regional events in accordance with the pro-rated unit flow rates of existing catchments 13 and 34, as provided by TRCA (60% of base condition).

(2) Permanent pool and quality control provided for MOE enhanced protection.

(3) Preliminary erosion control assumption of a 48 hour drawdown time for the 25 mm storm runoff volume.

Table 1: Summary of Total Proposed Drainage Area

To SWM Facility	Area (ha)	Imperviousness (%)	Area x Imp.
Pond 4	22.30	70	1561.0
Total	22.30	70	1561.0

Table 2: Simulated Release Rates and Volumes for SWM Facility 4 (1)

Component	Unit Flow Equation (1) (m^3/s)	Target Release Rate (m^3/s)	Storage
Permanent Pool (2)	N/A	N/A	4126
Quality Control (2)	N/A	N/A	892
Erosion Control (3)	N/A	0.021	3710
2yr/6hr AES	Q (L/s) = 9.506A - 0.719lnA	0.162	4481
5yr/6hr AES	Q (L/s) = 14.652A - 1.136lnA	0.248	6058
10yr/6hr AES	Q (L/s) = 17.957A - 1.373lnA	0.305	7240
25yr/6hr AES	Q (L/s) = 22.639A - 1.741lnA	0.384	8765
50yr/6hr AES	Q (L/s) = 26.566A - 2.082lnA	0.448	9879
100yr/6hr AES	Q (L/s) = 29.912A - 2.316lnA	0.507	10980
Regional (4)	Q (L/s) = 0.061 $m^3/s/ha$	1.360	21520

(1) Proposed conditions as modelled in SWMHYMO. Post- to pre-development quantity control required for the 2- to 100-year events in accordance with the unit flow equations for Sub-Basin 36 of Humber River, as provided by TRCA.

(2) Permanent pool and quality control provided for MOE enhanced protection.

(3) Preliminary erosion control assumption of a 48 hour drawdown time for the 25 mm storm runoff volume.

(4) Unit flow rate as provided by TRCA per the existing Regional flow of the sub-catchment Pond 4 is located in within the Humber River watershed.

APPENDIX F

PRLEIMINARY LID MEASURES

LID SUMMARY					Conceptual LID Design									Infiltration Rate						Achieved LID Water Balance		Target LID Water Balance	
LID Number	Description	Location	Type	Distance to Water Table (1)	Length	Width	Area	Depth of Water	Porosity (5)	LID Volume	Drainage Area	Runoff 'C'	Rainfall Event Storage	Storage Volume	Inf. Rate (LID Bottom)	Inf. Rate (Least Perm. Soil Horizon)	Correction Factor (4)	Corrected Infiltration Rate	Drawdown Time (6)	Annual Rainfall Based on Event Storage	Annual Infiltration Volume	Target Annual Infiltration Volume (2)	Annual Infiltration Comparison (Target vs Achieved)
				(m)	(m)	(m)	(m^2)	(m)		(m^3)	(m^2)		(mm)	(m^3)	(mm/hr)	(mm/hr)		(mm/hr)	(hr)	(mm/yr)	(m^3/yr)	(m^3/yr)	
Private LIDs - New House																							
PL1-1	Private	RLCB	Infiltration Trench	>1.0	106.0	1.0	106	0.55	0.4	23.3	3,139	0.60	10.0	18.7	12.0	12.0	2.5	4.8	45.8	560	1,047		
PL1-2	Private	RLCB	Infiltration Trench	>1.0	212.0	1.0	212	0.55	0.4	46.6	6,774	0.60	10.0	40.3	12.0	12.0	2.5	4.8	45.8	560	2,260		
PL1-3	Private	RLCB	Infiltration Trench	>1.0	42.5	1.0	43	0.55	0.4	9.4	1,283	0.60	10.0	7.6	12.0	12.0	2.5	4.8	45.8	560	428		
PL1-4	Private	RLCB	Infiltration Trench	>1.0	183.0	1.0	183	0.55	0.4	40.3	5,663	0.60	10.0	33.7	12.0	12.0	2.5	4.8	45.8	560	1,889		
PL1-5	Private	RLCB	Infiltration Trench	>1.0	166.5	1.0	167	0.55	0.4	36.6	5,167	0.60	10.0	30.8	12.0	12.0	2.5	4.8	45.8	560	1,724		
PL1-6	Private	RLCB	Infiltration Trench	>1.0	42.0	1.0	42	0.55	0.4	9.2	1,289	0.60	10.0	7.7	12.0	12.0	2.5	4.8	45.8	560	430		
PL1-7	Private	RLCB	Infiltration Trench	>1.0	105.5	1.0	106	0.55	0.4	23.2	3,004	0.60	10.0	17.9	12.0	12.0	2.5	4.8	45.8	560	1,002		
PL1-8	Private	RLCB	Infiltration Trench	>1.0	40.0	1.0	40	0.55	0.4	8.8	670	0.60	15.0	6.0	12.0	12.0	2.5	4.8	45.8	651	260		
PL1-9 MD	Private	Condo	Infiltration Pit	>1.0	40.0	15.0	600	0.55	0.4	132.0	5,400	0.90	25.0	121.5	12.0	12.0	2.5	4.8	45.8	729	3,543		
PL1-10	Private	RLCB	Infiltration Trench	>1.0	116.0	1.0	116	0.55	0.4	25.5	2,386	0.60	15.0	21.3	12.0	12.0	2.5	4.8	45.8	651	925		
PL1-11	Private	RLCB	Infiltration Trench	>1.0	91.5	1.0	92	0.55	0.4	20.1	1,753	0.60	15.0	15.7	12.0	12.0	2.5	4.8	45.8	651	680		
PL1-12	Private	RLCB	Infiltration Trench	>1.0	138.5	1.0	139	0.55	0.4	30.5	2,820	0.60	15.0	25.2	12.0	12.0	2.5	4.8	45.8	651	1,094		
PL1-13	Private	RLCB	Infiltration Trench	>1.0	166.5	1.0	167	0.55	0.4	36.6	3,436	0.60	15.0	30.7	12.0	12.0	2.5	4.8	45.8	651	1,332		
																				Total:	**16,613**	**13,107**	**127%**
Private LIDs - Hicks																							
PL2-1	Private	RLCB	Infiltration Trench	>1.0	59.0	1.0	59	0.55	0.4	13.0	2,137	0.60	10.0	12.7	12.0	12.0	2.5	4.8	45.8	560	713		
PL2-2	Private	RLCB	Infiltration Trench	>1.0	65.0	1.0	65	0.55	0.4	14.3	2,675	0.60	7.5	12.0	12.0	12.0	2.5	4.8	45.8	490	781		
PL2-3	Private	RLCB	Infiltration Trench	>1.0	78.0	1.0	78	0.55	0.4	17.2	2,300	0.60	12.5	17.1	12.0	12.0	2.5	4.8	45.8	612	838		
PL2-4	Private	RLCB	Infiltration Trench	>1.0	56.5	1.0	57	0.55	0.4	12.4	1,622	0.60	12.5	12.1	12.0	12.0	2.5	4.8	45.8	612	591		
PL2-5	Private	RLCB	Infiltration Trench	>1.0	114.0	1.0	114	0.55	0.4	25.1	3,015	0.60	12.5	22.4	12.0	12.0	2.5	4.8	45.8	612	1,099		
PL2-6	Private	RLCB	Infiltration Trench	>1.0	64.0	1.0	64	0.55	0.4	14.1	1,878	0.60	12.5	14.0	12.0	12.0	2.5	4.8	45.8	612	685		
PL2-7	Private	RLCB	Infiltration Trench	>1.0	42.0	1.0	42	0.55	0.4	9.2	609	0.60	15.0	5.4	12.0	12.0	2.5	4.8	45.8	651	236		
PL2-8	Private	RLCB	Infiltration Trench	>1.0	28.5	1.0	29	0.55	0.4	6.3	541	0.60	15.0	4.8	12.0	12.0	2.5	4.8	45.8	651	210		
PL2-9	Private	RLCB	Infiltration Trench	>1.0	42.5	1.0	43	0.55	0.4	9.4	956	0.60	15.0	8.5	12.0	12.0	2.5	4.8	45.8	651	371		
PL2-10	Private	RLCB	Infiltration Trench	>1.0	64.5	1.0	65	0.55	0.4	14.2	1,656	0.60	12.5	12.3	12.0	12.0	2.5	4.8	45.8	612	604		
PL2-11	Private	RLCB	Infiltration Trench	>1.0	178.0	1.0	178	0.55	0.4	39.2	3,835	0.60	15.0	34.3	12.0	12.0	2.5	4.8	45.8	651	1,487		
PL2-12	Private	RLCB	Infiltration Trench	>1.0	116.0	1.0	116	0.55	0.4	25.5	3,259	0.60	12.5	24.3	12.0	12.0	2.5	4.8	45.8	612	1,188		
PL2-13	Private	RLCB	Infiltration Trench	>1.0	51.0	1.0	51	0.55	0.4	11.2	1,389	0.60	12.5	10.3	12.0	12.0	2.5	4.8	45.8	612	506		
																				Total:	**9,309**	**8,991**	**104%**
Private LIDs - Russel																							
PL3-1	Private	RLCB	Infiltration Trench	TBD	122.0	1.0	122	0.55	0.4	26.8	4,169	0.60	10.0	24.8	12.0	12.0	2.5	4.8	45.8	560	1,391		
PL3-2	Private	RLCB	Infiltration Trench	TBD	112.0	1.0	112	0.55	0.4	24.6	2,878	0.60	10.0	17.1	12.0	12.0	2.5	4.8	45.8	560	960		
PL3-3	Private	RLCB	Infiltration Trench	TBD	102.0	1.0	102	0.55	0.4	22.4	3,745	0.60	10.0	22.3	12.0	12.0	2.5	4.8	45.8	560	1,249		
PL3-4	Private	RLCB	Infiltration Trench	TBD	79.0	1.0	79	0.55	0.4	17.4	2,365	0.60	10.0	14.1	12.0	12.0	2.5	4.8	45.8	560	789		
PL3-5	Private	RLCB	Infiltration Trench	TBD	107.0	1.0	107	0.55	0.4	23.5	3,985	0.60	7.5	17.8	12.0	12.0	2.5	4.8	45.8	490	1,163		
PL3-6	Private	RLCB	Infiltration Trench	TBD	92.5	1.0	93	0.55	0.4	20.4	3,522	0.60	7.5	15.7	12.0	12.0	2.5	4.8	45.8	490	1,028		
PL3-7	Private	RLCB	Infiltration Trench	TBD	176.5	1.0	177	0.55	0.4	38.8	5,912	0.60	10.0	35.2	12.0	12.0	2.5	4.8	45.8	560	1,972		
PL3-8	Private	RLCB	Infiltration Trench	TBD	196.5	1.0	197	0.55	0.4	43.2	6,260	0.60	10.0	37.3	12.0	12.0	2.5	4.8	45.8	560	2,088		
PL3-9	Private	RLCB	Infiltration Trench	TBD	108.5	1.0	109	0.55	0.4	23.9	3,193	0.60	10.0	19.0	12.0	12.0	2.5	4.8	45.8	560	1,065		
PL3-10	Private	RLCB	Infiltration Trench	TBD	165.0	1.0	165	0.55	0.4	36.3	5,161	0.60	10.0	30.7	12.0	12.0	2.5	4.8	45.8	560	1,722		
PL3-11	Private	RLCB	Infiltration Trench	TBD	105.5	1.0	106	0.55	0.4	23.2	3,519	0.60	10.0	21.0	12.0	12.0	2.5	4.8	45.8	560	1,174		
PL3-12	Private	RLCB	Infiltration Trench	TBD	49.5	1.0	50	0.55	0.4	10.9	2,112	0.60	7.5	9.4	12.0	12.0	2.5	4.8	45.8	490	616		
PL3-13	Private	RLCB	Infiltration Trench	TBD	256.5	1.0	257	0.55	0.4	56.4	4,837	0.60	15.0	43.2	12.0	12.0	2.5	4.8	45.8	651	1,876		
PL3-14	Private	RLCB	Infiltration Trench	TBD	462.0	1.0	462	0.55	0.4	101.6	6,783	0.60	15.0	60.6	12.0	12.0	2.5	4.8	45.8	651	2,630		
PL3-15	Private	RLCB	Infiltration Trench	TBD	239.0	1.0	239	0.55	0.4	52.6	3,430	0.60	15.0	30.6	12.0	12.0	2.5	4.8	45.8	651	1,330		
PL3-16	Private	RLCB	Infiltration Trench	TBD	98.0	1.0	98	0.55	0.4	21.6	1,454	0.60	15.0	13.0	12.0	12.0	2.5	4.8	45.8	651	564		
																				Total:	**21,617**	**15,424**	**140%**

Notes:
(1) Groundwater elevations provided by DS Consultants Ltd., dated June 14, 2021 for the Newhouse and Hicks Parcels. Groundwater monitoring to be completed for the Russel parcel to verify sufficient separation from LIDs. Ongoing groundwater monitoring across overall site may impact LID recommendations.
(2) Targeted annual infiltration volumes extracted from DS Consultants Ltd, dated May 31, 2021: O:\2019\1151_Hicks Property_Caledon\Others\Hydro-G - DS\02_May3121_Infiltration Defecits_(da)
(3) Preliminary infiltration rates provided by DS Consultants Ltd. and to be verified by further testing
(4) Correction factor applied, as per CVC LID Design Manual (v2010), Appendix C - Table C2 (pg C8)
(5) Porosity assumed to be 0.40 for 50mm clear stone, as per CVC LID Design Manual (v2010), pg 4-57
(6) Recommended drawdown time of 48hrs, as per CVC LID Design Manual (v2010), pg 4-57

APPENDIX G

WATER MODEL ASSESSMENT

Hydraulic Capacity and Modeling Analysis Mayfield West Kennedy and Newhouse North Lands

Technical Memorandum

FINAL

Prepared for:
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Unit 203, 2502 St. John's Street
Port Moody, BC V3H 2B4

Submission Date: July 9, 2021

Contact: Mr. Werner de Schaetzen, Ph.D., P.Eng.
Project ID: 2021-045-DSE

Document History and Version Control

Revision No.	Date	Document Description	Revised By	Reviewed By
R0	May 31, 2021	Draft	Ben Loewen	Werner de Schaetzen
R1	July 9, 2021	Final	Ben Loewen	Werner de Schaetzen

Statement of Qualifications and Limitations

This document represents GeoAdvice Engineering Inc. best professional judgment based on the information available at the time of its completion and as appropriate for the project scope of work. Services performed in developing the content of this document have been conducted in a manner consistent with that level and skill ordinarily exercised by a member of the engineering profession currently practicing under similar conditions. No warranty, express or implied is made.

Contents

1 Introduction

GeoAdvice Engineering Inc. (GeoAdvice) was retained by David Schaeffer Engineering Ltd. (DSEL) to complete the hydraulic modeling and pipe network sizing of the Mayfield West Kennedy and Newhouse North Lands (Development) located in the Town of Caledon, Region of Peel (Region).

The Kennedy and Newhouse North Lands developments is located south of Old School Road and between Kennedy Road ad Hurontario Street in Caledon, ON. The site is shown in **Figure 1.1** and **Figure 1.2** on the following pages, illustrating the site layout, proposed water distribution system and connection points. As the timing for the future proposed distribution feeder main along Old School Road is unknown, two (2) water main size options were modeled along Old School Road fronting the development, both a 400 mm and 600 mm water main.

The development is expected to be developed in two stages:

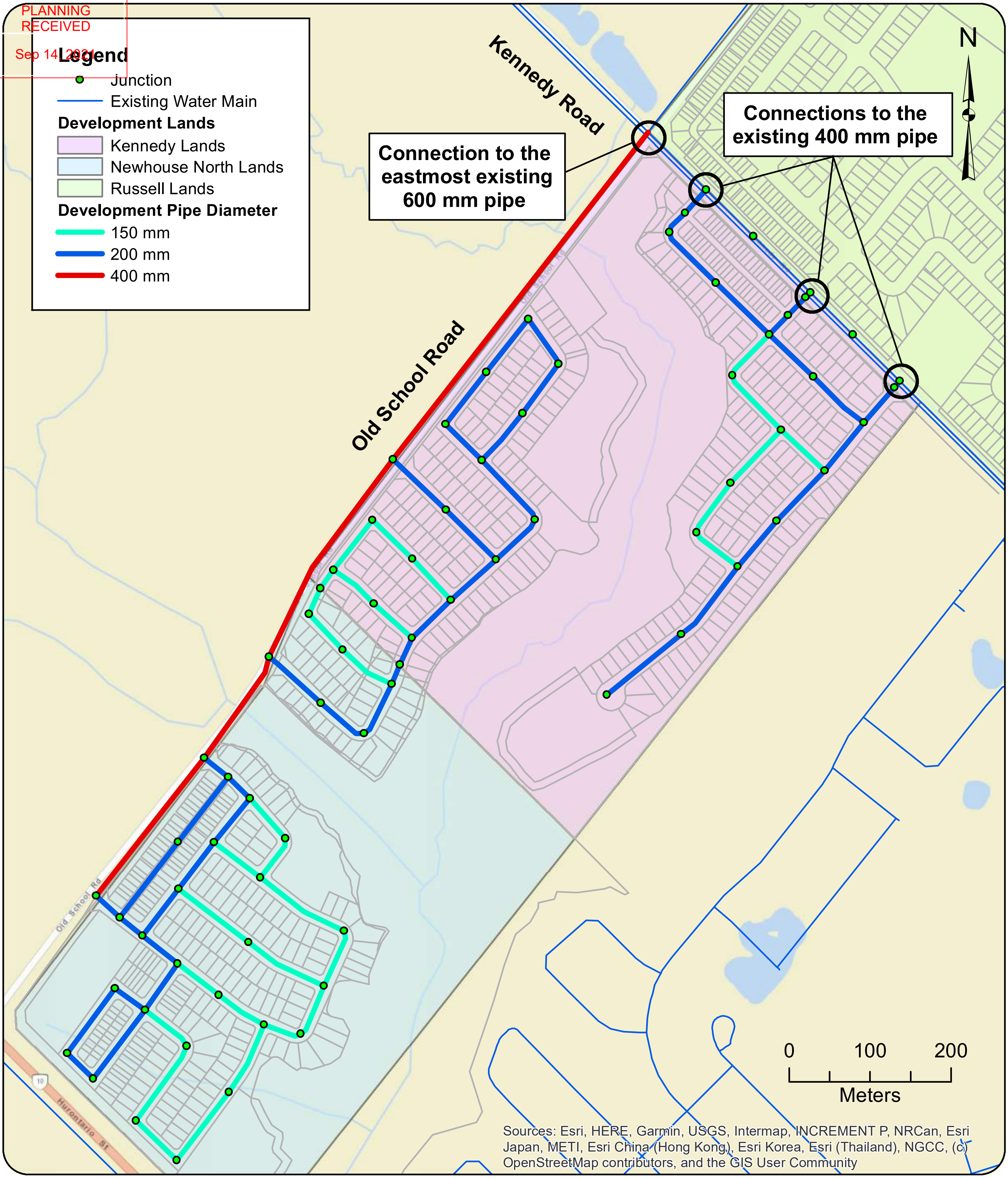
- Stage 1: Kennedy Lands (water main network modeled)
- Stage 2: Kennedy and Newhouse North Lands (water main network modeled) and Russell Lands (point load allocation, water main network not modeled)

Four (4) scenarios were considered for the capacity analysis of the Kennedy and Newhouse North Lands, and includes the following demands water main sizes:

- Scenario 1: Stage 1 demands with a 400 mm fronting Old School Road
- Scenario 2: Stage 2 demands with a 400 mm fronting Old School Road
- Scenario 3: Stage 1 demands with a 600 mm fronting Old School Road
- Scenario 4: Stage 2 demands with a 600 mm fronting Old School Road

This memo describes the assumptions and results of the hydraulic modeling and capacity analysis using the Region of Peel InfoWater water model dated on February 5, 2020 (Innovyze Software). InfoWater is a GIS water distribution system modeling and management software application. The development water network was incorporated into the Region model in order to complete the hydraulic and sizing analysis. For this study, all modeling, analysis, and recommendations were focused on the existing 2021 planning horizon.

The results presented in this memo are based on the analysis of steady state simulations. The predicted available fire flows, as calculated by the hydraulic model, represent the flow available in the water main while maintaining a residual pressure of 20 psi at the hydrant. No extended period simulations were completed in this analysis to assess the water quality or to assess the hydraulic impact on storage and pumping.



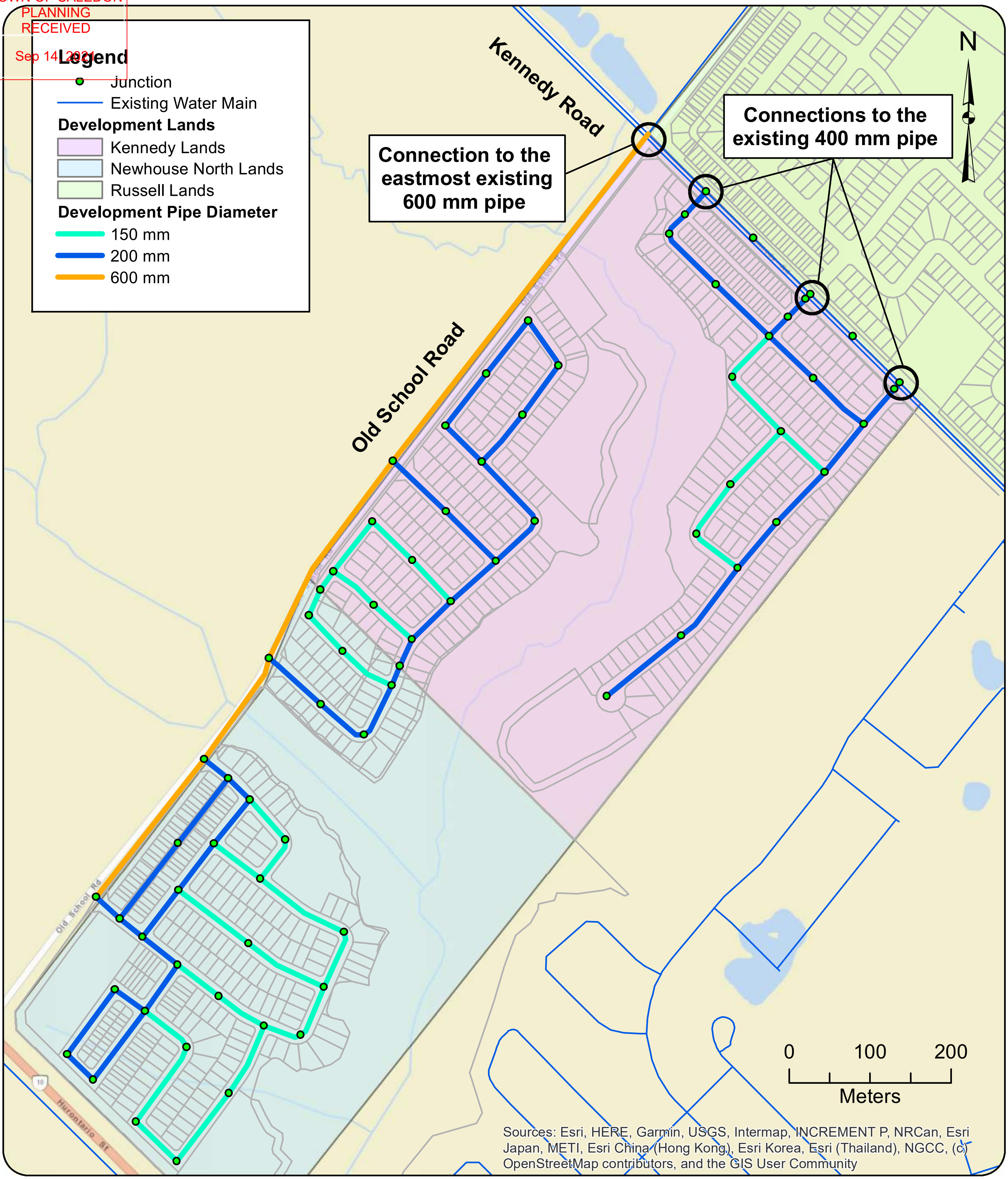
GeoAdvice Engineering Inc.

Project: **Hydraulic Capacity and Modeling Analysis Mayfield West Kennedy Lands Development 2021-045-DSE**
Client: **David Schaeffer Engineering Ltd.**
Date: **May 2021**
Created by: **BL**
Reviewed by: **WdS**

DISCLAIMER: GeoAdvice does not warrant in any way the accuracy and completeness of the information shown on this map. Field verification of the accuracy and completeness of the information shown on this map is the sole responsibility of the user.

Site Layout (Pipe Layout Option 1)

Figure 1.1



GeoAdvice Engineering Inc.

Project: **Hydraulic Capacity and Modeling Analysis**
Mayfield West Kennedy Lands Development
2021-045-DSE
Client: **David Schaeffer Engineering Ltd.**
Date: **May 2021**
Created by: **BL**
Reviewed by: **WdS**

DISCLAIMER: GeoAdvice does not warrant in any way the accuracy and completeness of the information shown on this map. Field verification of the accuracy and completeness of the information shown on this map is the sole responsibility of the user.

Site Layout (Pipe Layout Option 2)

Figure 1.2

Within the vicinity of the development area, the Region currently provides supply to Pressure Zone 7 through a 400 mm main along Kennedy Road south of Old School Road and a 600 mm main along Kennedy Road north of Old School Road. There is also a 600 mm transmission main that runs along Kennedy Road that has connects to the Mayfield tank north of Old School Road. The development will be connected to Pressure Zone 7 via three (3) connection to the existing 400 mm Kennedy Road water main and one (1) connection at the intersection of Kennedy Road at Old School Road. Pressure Zone 7 operates with an approximate HGL of 328 m. At the existing 2021 planning horizon, the primary water source for the development is predicted to be the Alloa Reservoir and Pump Station (to Pressure Zone 7; controlled by the level in the Zone 7 elevated tank (Mayfield Tank)). For the sake of this study, it was assumed that the proposed water main along Old School Road does not continue after the final proposed western connection to Newhouse North Lands. No connection to the Region of Peel network on Hurontario Street was considered.

2 Demands

2.1 Consumer Demands

To estimate the total development population requiring water service, population data were first assigned to each lot in accordance with the development's build-out plan. Population estimates were then multiplied by the Region's per capita demand design guidelines to estimate the development's average day demand. To be conservative, the potential short-term water demand unit rates were assumed for this development.

The assumptions used in estimating water demand for the development are summarized in **Table 2.1.**

Table 2.1: Region of Peel Short-Term Per Capita Water Demand Rates

Demand Type	Amount	Units
Average Day Demand (ADD)		
Residential	409	L/c/d
ICI*	300	L/c/d
Maximum Daily Demand (MDD)		
Residential	2.0 x ADD	L/c/d
ICI*	2.0 x ADD	L/c/d
Peak Hour Demand (PHD)		
Residential	3.0 x ADD	L/c/d
ICI*	3.0 x ADD	L/c/d

*Industrial, Commercial, and Institutional

Table 2.2 to **Table 2.7** summarize the water demand calculations for the Kennedy, Newhouse North, and Russel Lands.

Table 2.2: Residential Water Demand Calculations – Kennedy Lands

Dwelling Type	Number of Units	Persons Per Unit	Population	Average Day Demand (L/s)	Maximum Day Demand (L/s)	Peak Hour Demand (L/s)
Single Detached	286	3.2	916	4.34	8.67	13.01
Townhouse	45	3.2	144	0.68	1.36	2.05
Total	**331**		**1,060**	**5.02**	**10.04**	**15.05**

Table 2.3: Non-Residential Water Demand Calculations – Kennedy Lands

Land Use Type	Area	Average Day Demand	Maximum Day Demand	Peak Hour Demand
	(Ha)	(L/s)	(L/s)	(L/s)
Park*	0.67	0.12	0.24	0.35

*A rate of 50 cap/ha was assumed for the park blocks.

Table 2.4: Residential Water Demand Calculations – Newhouse North Lands

Dwelling Type	Number of Units	Persons Per Unit	Population	Average Day Demand (L/s)	Maximum Day Demand (L/s)	Peak Hour Demand (L/s)
Single Detached	158	3.2	506	2.40	4.79	7.19
Single Detached – Holdout Area	21	3.2	68	0.32	0.64	0.97
Rear Lane Townhouse	52	3.2	167	0.79	1.58	2.37
3-Storey Townhouse	34	3.2	109	0.52	1.03	1.55
Back-to-Back Townhouse	22	3.2	71	0.34	0.67	1.01
3-Storey Townhouse – Condo Block	8	3.2	26	0.12	0.25	0.37
Back-to-Back Townhouse – Condo Block	18	3.2	58	0.27	0.55	0.82
Apartments – Condo Block	168	2.7	454	2.15	4.30	6.45
Total	**481**		**1,459**	**6.91**	**13.81**	**20.72**

Table 2.5: Non-Residential Water Demand Calculations – Newhouse North Lands

Land Use Type	Area	Average Day Demand	Maximum Day Demand	Peak Hour Demand
	(Ha)	(L/s)	(L/s)	(L/s)
Park*	0.82	0.14	0.28	0.43

*A rate of 50 cap/ha was assumed for the park blocks.

Table 2.6: Residential Water Demand Calculations – Russell Lands

Dwelling Type	Number of Units	Persons Per Unit	Population	Average Day Demand (L/s)	Maximum Day Demand (L/s)	Peak Hour Demand (L/s)
Single Detached	333	3.2	1,066	5.05	10.09	15.14
Townhouse	135	3.2	432	2.05	4.09	6.14
Total	**468**		**1,498**	**7.09**	**14.18**	**21.27**

Table 2.7: Non-Residential Water Demand Calculations – Russell Lands

Land Use Type	Area	Average Day Demand	Maximum Day Demand	Peak Hour Demand
	(Ha)	(L/s)	(L/s)	(L/s)
Park*	1.87	0.33	0.65	0.98

*A rate of 50 cap/ha was assumed for the park blocks.

Demands were grouped into demand polygons and then uniformly distributed to the model nodes located within each polygon. Detailed calculations of demands as well as the illustrated allocation areas are shown in **Appendix A**.

2.2 Fire Flows

Fire flow demands are typically determined in accordance with the Fire Underwriters Survey's Water Supply for Public Fire Protection guideline (1999). FUS calculations are based on the types of building, floor area, number of stories, construction class, occupancy class and exposure facture. At this time, there is not enough information about the building construction details to complete these FUS calculations. Therefore, fire flow requirements for the proposed development were assigned in accordance with the Region's Design Guidelines, as shown in **Table 2.8**.

Table 2.8: Typical Fire Flow Requirements at 20 psi

Development Type	Fire Flow (L/s)
Residential*	83

*Single family, townhouse, back-to-back townhouse, medium density

As more information about the development becomes available, the fire flow requirements should be recalculated using the Fire Underwriters Survey. Please note that the proposed park blocks have been assumed to require the residential fire flow requirement.

3 Modeling Considerations

3.1 Water Main Configuration

The water main network was laid out based on the development layout prepared by David Schaeffer Engineering and provided to GeoAdvice on May 13, 2021.

3.2 Pressure Requirements

As outlined in the Region of Peel Design Guidelines, the generally accepted best practice is to design new water distribution systems to operate between 40 psi and 100 psi. Pressure requirements are outlined in **Table 3.1**.

Table 3.1: Region of Peel Pressure Requirements

Type	Minimum Pressure (psi)	Maximum Pressure (psi)
Minimum Distribution Pressure	40	-
Maximum Distribution Pressure	-	100
Maximum Day Plus Fire	20	-

3.3 Elevations

Elevations of the modeled junctions were assigned according to a site grading plan prepared by David Schaeffer Engineering and provided to GeoAdvice on May 25, 2021.

3.4 Pipe Characteristics

Pipe diameters and Hazen-Williams C-factors were assigned in the model according to the Region of Peel Design Guidelines and the Ministry of Environment. Pipe characteristics used for the development are outlined in **Table 3.2** below.

Table 3.2: Model Pipe Characteristics

Nominal Diameter (mm)	Hazen Williams C-Factor	Peel Design Standards
150	100	Minimum diameter for residential
200	110	-
400	120	-
600	130	-

4 Modeling Results

The proposed water mains within the development were sized to the minimum diameter which would satisfy the greater of maximum day plus fire and peak hour demand. Modeling was carried out for average day, peak hour and maximum day plus fire flow using InfoWater.

Detailed pipe and junction model input data can be found in **Appendix B**.

4.1 System Pressures

The modeling results indicate that the development can be adequately serviced by the proposed water main layout with the recommended sizes. Modeled service pressures for the development are summarized in **Table 4.1** and **Table 4.2** below.

Detailed Average Day Demand (ADD) and Peak Hour Demand (PHD) modeling results can be found in **Appendix C** and **Appendix D**, respectively.

Table 4.1: Summary of Pressures (ADD)

Scenario	Maximum Pressure (psi)	Average Pressure (psi)	Minimum Pressure (psi)
Scenario 1	85	79	75
Scenario 2	89	82	74
Scenario 3	85	79	75
Scenario 4	89	82	74

Table 4.2: Summary of Pressures (PHD)

Scenario	Maximum Pressure (psi)	Average Pressure (psi)	Minimum Pressure (psi)
Scenario 1	81	76	71
Scenario 2	84	76	68
Scenario 3	81	76	71
Scenario 4	84	76	68

As outlined in the Region of Peel Design Guidelines, the generally accepted best practice is to design new water distribution systems to operate between 40 psi and 100 psi. As shown in the tables above, both PHD and ADD pressures fall within this design range for either of the proposed water main layouts shown in **Figure 1.1** and **Figure 1.2**. Additionally, the model predicts that no water main will reach a velocity in excess of 2.0 m/s under PHD conditions. The similarities between results from Scenarios 1 and 3 and Scenarios 2 and 4 are due in part to the control settings of the Alloa Reservoir and Pump Station and the Mayfield Tank.

4.2 Available Fire Flows

The minimum allowable pressure under fire flow conditions is 20 psi at the location of the fire. A summary of available fire flows is shown in **Table 4.2**.

Table 4.3: Summary of Available Fire Flows (MDD + FF)

Scenario	Maximum Available Fire Flow (L/s)	Average Available Fire Flow (L/s)	Minimum Available Fire Flow (L/s)
Scenario 1	1,218	579	301
Scenario 2	1,277	609	359
Scenario 3	1,376	597	301
Scenario 4	1,532	732	438

*The predicted available fire flows, as calculated by the hydraulic model, represent the flow available in the water main while maintaining a residual pressure of 20 psi at the hydrant. High available fire flows (>500 L/s) are theoretical values. Actual available fire flow is limited by the hydraulic losses through the hydrant lateral and hydrant port sizes.

As shown in **Table 4.2**, the model predicts that all fire flow requirements can be met throughout the development with either the proposed water main layouts shown in **Figure 1.1** and **Figure 1.2**. Additionally, the model predicts that no water main will reach a velocity in excess of 3.0 m/s under maximum day demand with fire flow conditions, except for the interim dead-end water main GA-WM-0045 (between junctions GA-JCT-0030 and GA-JCT-0034) under Stage 1 conditions. Once the Newhouse North Lands is constructed, the water main will be looped and is predicted to have a velocity less than 3.0 m/s.

4.3 Residual Pressures

A summary of the residual pressures is shown below in **Table 4.3**.

Table 4.4: Summary of Residual Pressures (MDD + FF)

Scenario	Maximum Residual Pressure (psi)	Average Residual Pressure (psi)	Minimum Residual Pressure (psi)
Scenario 1	75	64	37
Scenario 2	82	69	54
Scenario 3	75	64	38
Scenario 4	84	70	55

As shown in **Table 4.3**, the model predicts that all fire flow requirements can be met throughout the development with either the proposed water main layouts shown in **Figure 1.1** and **Figure 1.2**.

Detailed fire flow maps can be found in **Appendix E**.

5 Conclusions

The hydraulic capacity and modeling analysis of the proposed water main network for the Mayfield West Kennedy and Newhouse North Lands yielded the following conclusions:

- The proposed water mains can deliver all domestic and fire flows as per the Region of Peel and the Ministry of Environment criteria
- The ADD service pressures are expected to range between the following pressures for each scenario under existing conditions:
    - Scenario 1: 75 psi and 85 psi
    - Scenario 2: 74 psi and 89 psi
    - Scenario 3: 75 psi and 85 psi
    - Scenario 4: 74 psi and 89 psi
    - These values are within the Region of Peel guidelines for water distribution systems.
- The PHD service pressures are expected to range between the following pressures for each scenario under existing conditions:
    - Scenario 1: 71 psi and 81 psi
    - Scenario 2: 68 psi and 84 psi
    - Scenario 3: 71 psi and 81 psi
    - Scenario 4: 68 psi and 84 psi
    - These values are within the Region of Peel guidelines for water distribution systems.
- All fire flows are achievable for the development (residual pressures exceed 20 psi) under the existing planning horizon.
- The model predicts that no water main will reach a velocity in excess of 3.0 m/s under maximum day demand with fire flow conditions, except for interim dead end water main GA-WM-0045 (between junctions GA-JCT-0030 and GA-JCT-0034) under interim stage 1 conditions. Once the Newhouse North Lands is constructed, the water main will be looped and is predicted to have a velocity less than 3.0 m/s.
- Trunk mains on Old School Road with nominal diameter of both 400 mm and 600 mm are sufficient to service the Kennedy and Newhouse Lands.

Submission

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Appendix A Demand Calculations

Consumer Water Demands

Kennedy Lands Residential Demands

Dwelling Type	Number of Units	Population: Persons per Unit	Population: Population Per Dwelling Type	Average Day Demand (L/c/d)	Average Day Demand (L/d)	Average Day Demand (L/s)	Max Day 2.0 x Avg. Day (L/s)	Peak Hour 3.0 x Avg. Day (L/s)
Single Detached	286	3.2	916	409	374,644	4.34	8.67	13.01
Traditional Townhome	45	3.2	144		58,896	0.68	1.36	2.05
Subtotal	**331**		**1,060**		**433,540**	**5.02**	**10.04**	**15.05**

Kennedy Lands Non Residential Demands

Property Type	Area (ha)	Population: Persons per ha	Population: Population Per Area	Average Day Demand (L/c/d)	Average Day Demand (L/d)	Average Day Demand (L/s)	Max Day 2.0 x Avg. Day (L/s)	Peak Hour 3.0 x Avg. Day (L/s)
Park*	0.67	50.0	34.0	300	10,200	0.12	0.24	0.35
Subtotal	**0.67**				**10,200**	**0.12**	**0.24**	**0.35**

Newhouse North Residential Demands

Dwelling Type	Number of Units	Population: Persons per Unit	Population: Population Per Dwelling Type	Average Day Demand (L/c/d)	Average Day Demand (L/d)	Average Day Demand (L/s)	Max Day 2.0 x Avg. Day (L/s)	Peak Hour 3.0 x Avg. Day (L/s)
Single Detached	158	3.2	506	409	206,954	2.40	4.79	7.19
Single Detached - Holdout	21	3.2	68		27,812	0.32	0.64	0.97
Rear Lane Townhome	52	3.2	167		68,303	0.79	1.58	2.37
3 Storey Townhouse	34	3.2	109		44,581	0.52	1.03	1.55
back To back Townhouse	22	3.2	71		29,039	0.34	0.67	1.01
3 Storey Townhouse - Condo Block	8	3.2	26		10,634	0.12	0.25	0.37
Back-to-Back Townhouse - Condo	18	3.2	58		23,722	0.27	0.55	0.82
Condo Apartments	168	2.7	454		185,686	2.15	4.30	6.45
Subtotal	**481**		**1,459**		**596,731**	**6.91**	**13.81**	**20.72**

Newhouse North Non Residential Demands

Property Type	Area (ha)	Population: Persons per ha	Population: Population Per Area	Average Day Demand (L/c/d)	Average Day Demand (L/d)	Average Day Demand (L/s)	Max Day 2.0 x Avg. Day (L/s)	Peak Hour 3.0 x Avg. Day (L/s)
Park*	0.82	50.0	41.0	300	12,300	0.14	0.28	0.43
Subtotal	**0.82**				**12,300**	**0.14**	**0.28**	**0.43**

Russell Residential Demands

Dwelling Type	Number of Units	Population: Persons per Unit	Population: Population Per Dwelling Type	Average Day Demand (L/c/d)	Average Day Demand (L/d)	Average Day Demand (L/s)	Max Day 2.0 x Avg. Day (L/s)	Peak Hour 3.0 x Avg. Day (L/s)
Single Detached	333	3.2	1,066	409	435,994	5.05	10.09	15.14
Traditional Townhome	135	3.2	432		176,688	2.05	4.09	6.14
Subtotal	**468**		**1,498**		**612,682**	**7.09**	**14.18**	**21.27**

Russell Non Residential Demands

Property Type	Area (ha)	Population: Persons per ha	Population: Population Per Area	Average Day Demand (L/ha/d)	Average Day Demand (L/d)	Average Day Demand (L/s)	Max Day 2.0 x Avg. Day (L/s)	Peak Hour 3.0 x Avg. Day (L/s)
Park*	1.87	50.0	94.0	300	28,200	0.33	0.65	0.98
Subtotal	**1.87**				**28,200**	**0.33**	**0.65**	**0.98**

		Residential	**Non-Residential**				
Kennedy Lands	Number of Units	Population	Population		**ADD**	**MDD**	**PHD**
Total Demand:	331	1,060	34.0		5.14	10.27	15.41
Newhouse North Lands	Number of Units	Population	Population		**ADD**	**ADD**	**PHD**
Total Demand:	481	1,459	41.00		7.05	14.10	21.15
Russell Lands	Number of Units	Population	Population		**ADD**	**ADD**	**PHD**
Total Demand:	468	1,498	94.0		7.42	14.84	22.25

Scenario Totals	Number of Units	Population	Population		**ADD**	**ADD**	**PHD**
Scenarios 1 and 3	**331**	1,060	34.0		**5.14**	**10.27**	**15.41**
Scenarios 2 and 4	**1,280**	4,017	169.00		**19.60**	**39.20**	**58.81**

*** A rate of 50 cap/ha was assumed for the park blocks**

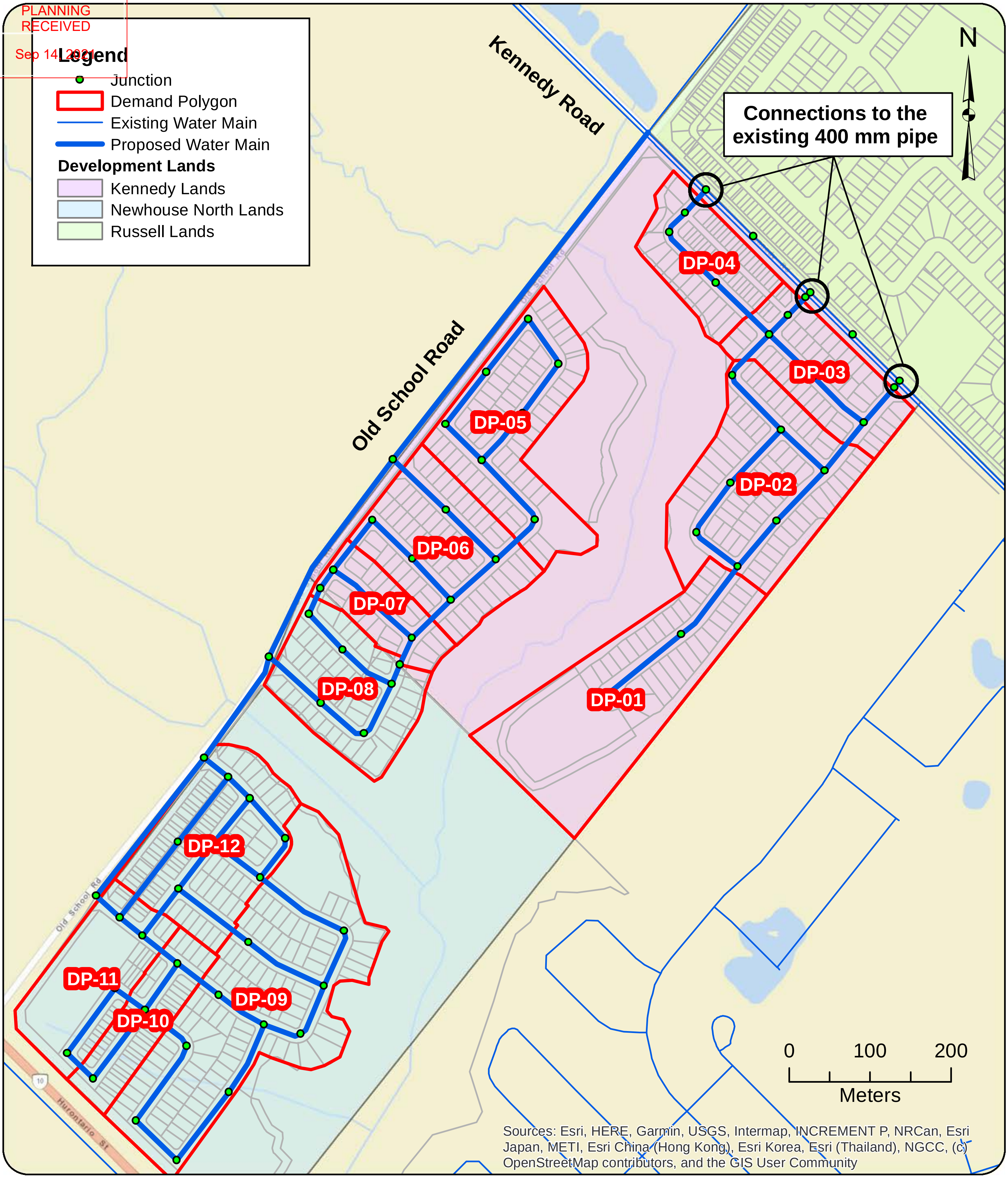
Domestic Demand Calculations and Allocation

Domestic Demands

Demand Polygon	Development	Junction ID	Dwelling Type	Number of Units	Population	Average Day Demand			Max Day 2.0 x Avg. Day (L/s)	Peak Hour 3.0 x Avg. Day (L/s)
						L/c/d	L/d	L/s		
1	Kennedy Lands	GA-JCT-0016	Single Detached	31	99	409	20,304	0.24	0.47	0.71
		GA-JCT-0017					20,304	0.24	0.47	0.71
2		GA-JCT-0009	Single Detached	65	208	409	12,164	0.14	0.28	0.42
		GA-JCT-0010					12,164	0.14	0.28	0.42
		GA-JCT-0011					12,164	0.14	0.28	0.42
		GA-JCT-0012					12,164	0.14	0.28	0.42
		GA-JCT-0013					12,164	0.14	0.28	0.42
		GA-JCT-0014					12,164	0.14	0.28	0.42
		GA-JCT-0015					12,164	0.14	0.28	0.42
3		GA-JCT-0001	Single Detached	41	131	409	6,840	0.08	0.16	0.24
		GA-JCT-0002					6,840	0.08	0.16	0.24
		GA-JCT-0003					6,840	0.08	0.16	0.24
		GA-JCT-0004					6,840	0.08	0.16	0.24
		GA-JCT-0071	Traditional Townhouse	6	19	409	6,840	0.08	0.16	0.24
		GA-JCT-0070					6,840	0.08	0.16	0.24
		GA-JCT-0074					6,840	0.08	0.16	0.24
		GA-JCT-0069					6,840	0.08	0.16	0.24
		GA-JCT-0072					6,840	0.08	0.16	0.24
4		GA-JCT-0005	Single Detached	13	42	409	13,614	0.16	0.32	0.47
		GA-JCT-0007					13,614	0.16	0.32	0.47
		GA-JCT-0008	Traditional Townhouse	39	125	409	13,614	0.16	0.32	0.47
		GA-JCT-0068					13,614	0.16	0.32	0.47
		GA-JCT-0075					13,614	0.16	0.32	0.47
5		GA-JCT-0018	Single Detached	59	189	409	11,041	0.13	0.26	0.38
		GA-JCT-0019					11,041	0.13	0.26	0.38
		GA-JCT-0020					11,041	0.13	0.26	0.38
		GA-JCT-0021					11,041	0.13	0.26	0.38
		GA-JCT-0022					11,041	0.13	0.26	0.38
		GA-JCT-0023					11,041	0.13	0.26	0.38
		GA-JCT-0024					11,041	0.13	0.26	0.38
6		GA-JCT-0025	Single Detached	55	176	409	14,409	0.17	0.33	0.50
		GA-JCT-0026					14,409	0.17	0.33	0.50
		GA-JCT-0027					14,409	0.17	0.33	0.50
		GA-JCT-0028					14,409	0.17	0.33	0.50
		GA-JCT-0029					14,409	0.17	0.33	0.50
7		GA-JCT-0032	Single Detached	22	70	409	5,764	0.07	0.13	0.20
		GA-JCT-0031					5,764	0.07	0.13	0.20
		GA-JCT-0030					5,764	0.07	0.13	0.20
		GA-JCT-0034					5,764	0.07	0.13	0.20
		GA-JCT-0033					5,764	0.07	0.13	0.20
8	Newhouse North Lands	GA-JCT-0037	Single Detached	23	74	409	11,588	0.13	0.27	0.40
		GA-JCT-0036					11,588	0.13	0.27	0.40
		GA-JCT-0035	Single Detached - Holdout	21	68	409	11,588	0.13	0.27	0.40
		GA-JCT-0038					11,588	0.13	0.27	0.40
		GA-JCT-0039					11,588	0.13	0.27	0.40
9		GA-JCT-0049	Single Detached	94	301	409	12,312	0.14	0.29	0.43
		GA-JCT-0050					12,312	0.14	0.29	0.43
		GA-JCT-0051					12,312	0.14	0.29	0.43
		GA-JCT-0052					12,312	0.14	0.29	0.43
		GA-JCT-0053					12,312	0.14	0.29	0.43
		GA-JCT-0055					12,312	0.14	0.29	0.43
		GA-JCT-0056					12,312	0.14	0.29	0.43
		GA-JCT-0057					12,312	0.14	0.29	0.43
		GA-JCT-0058					12,312	0.14	0.29	0.43
		GA-JCT-0059					12,312	0.14	0.29	0.43
10		GA-JCT-0054	Single Detached	5	16	409	18,387	0.21	0.43	0.64
		GA-JCT-0060	3 Storey Townhouse	26	83	409	18,387	0.21	0.43	0.64
		GA-JCT-0061	Back-to-Back Townhouse	11	36	409	18,387	0.21	0.43	0.64
11		GA-JCT-0062	Single Detached	2	6	409	63,888	0.74	1.48	2.22
		GA-JCT-0063	Traditional Townhouse	6	19	409	63,888	0.74	1.48	2.22
		GA-JCT-0045	3 Storey Townhouse	8	26	409	63,888	0.74	1.48	2.22
			Back-to-Back Townhouse	11	36	409				
		GA-JCT-0044	3 Storey Townhouse - Condo	8	26	409	63,888	0.74	1.48	2.22
			Back-to-Back Townhouse - Condo	18	58	409				
			Apartments - Condo	168	454	409				
12		GA-JCT-0046	Single Detached	34	109	409	14,994	0.17	0.35	0.52
		GA-JCT-0043					14,994	0.17	0.35	0.52
		GA-JCT-0047					14,994	0.17	0.35	0.52
		GA-JCT-0048					14,994	0.17	0.35	0.52
		GA-JCT-0041	Traditional Townhouse	46	148	409	14,994	0.17	0.35	0.52
		GA-JCT-0042					14,994	0.17	0.35	0.52
		GA-JCT-0040					14,994	0.17	0.35	0.52
13	Russell Lands	GA-JCT-0068	Single Detached	333	1066	409	122,536	1.42	2.84	4.25
		GA-JCT-0075					122,536	1.42	2.84	4.25
		GA-JCT-0069	Traditional Townhouse	135	432	409	122,536	1.42	2.84	4.25
		GA-JCT-0074					122,536	1.42	2.84	4.25
		GA-JCT-0070					122,536	1.42	2.84	4.25
total				812	2519	409	1,030,271	19.02	38.03	57.05

Non-Domestic Demands

Property Type	Development	Junction ID	Phase	Area (ha)	Population	Average Day Demand			Max Day 2.0 x Avg. Day (L/s)	Peak Hour 3.0 x Max Day (L/s)
						(L/c/d)	(L/d)	(L/s)		
Park	Kennedy Lands	GA-JCT-0014	DP-02	0.33	16.75	300	5,024	0.06	0.12	0.17
Park		GA-JCT-0024	DP-05	0.34	17.25	300	5,176	0.06	0.12	0.18
Park	Newhouse North Lands	GA-JCT-0048	DP-09	0.82	41.00	300	12,300	0.14	0.28	0.43
Park	Russel Lands	GA-JCT-0069	DP-13	1.87	94.00	300	28,200	0.33	0.65	0.98
		Total:			**172.36**		**50,700**	**0.59**	**1.17**	**1.76**



GeoAdvice Engineering Inc.

Project:	**Hydraulic Capacity and Modeling Analysis Mayfield West Kennedy Lands Development 2021-045-DSE**
Client:	**David Schaeffer Engineering Ltd.**
Date:	**May 2021**
Created by:	**BL**
Reviewed by:	**WdS**

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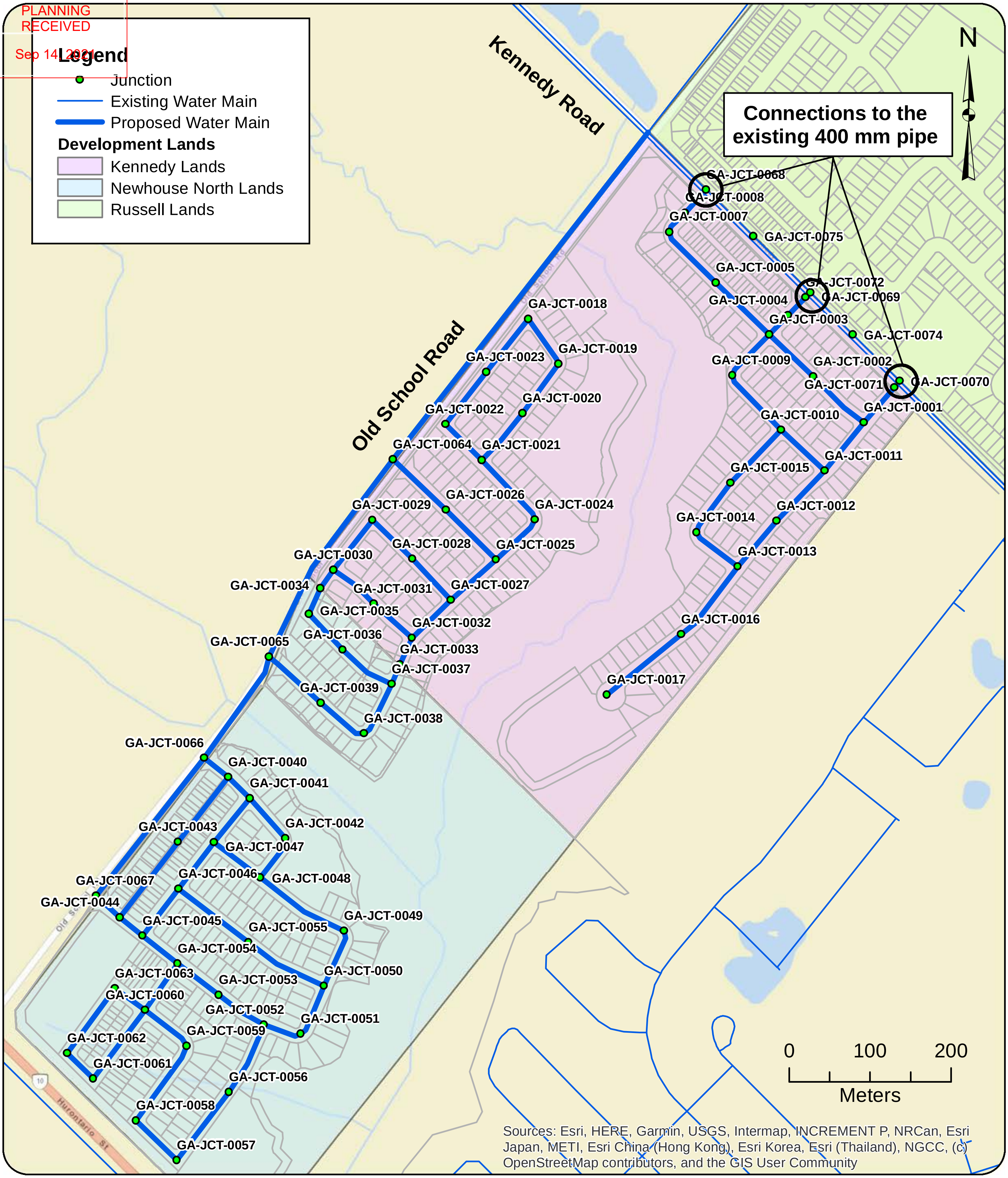
Demand Allocation

Figure A.1

Appendix B Modeling Schematics – Pipe and Junction IDs



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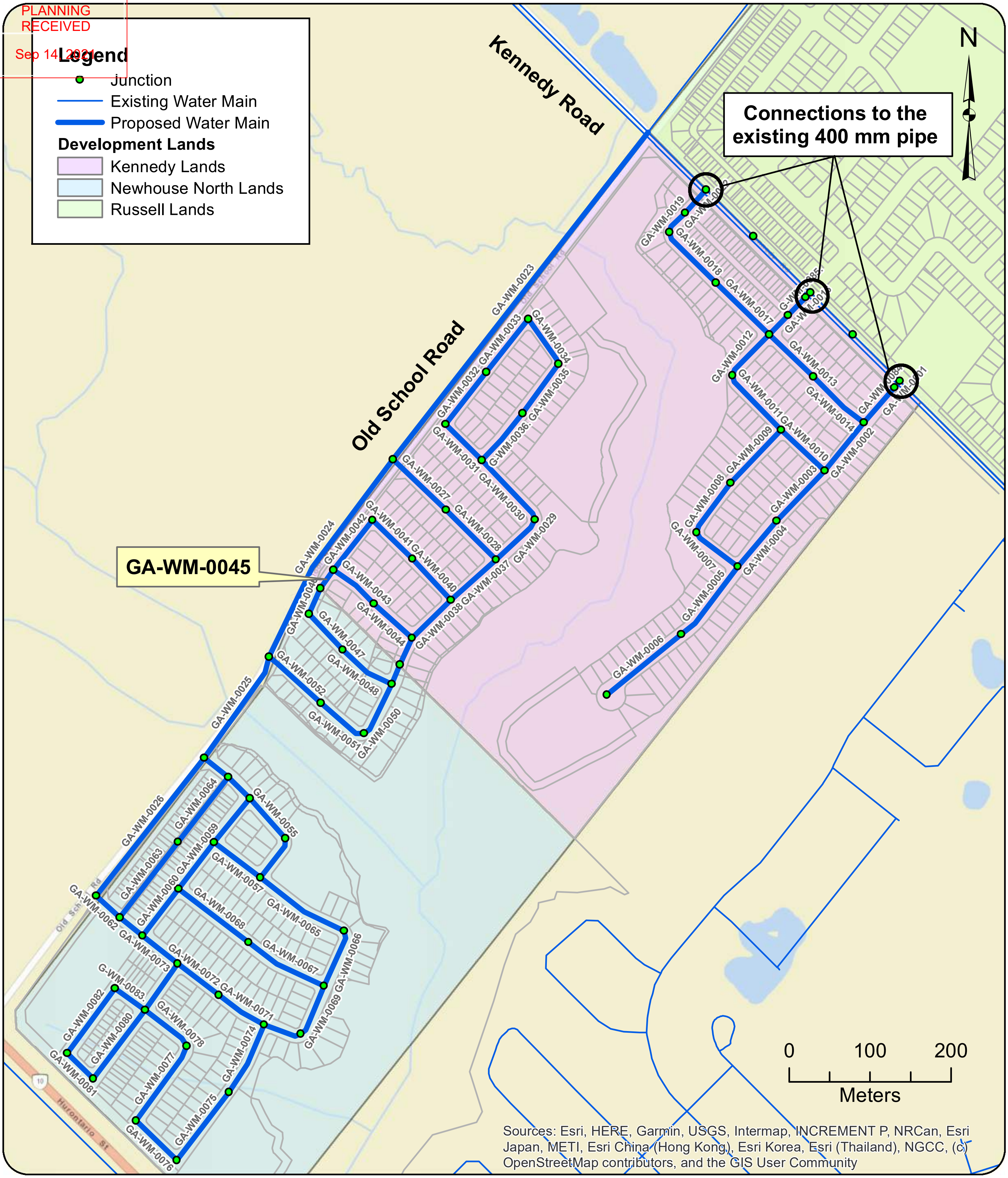
Junction IDs

Figure B.1



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Reviewed by: **WdS**

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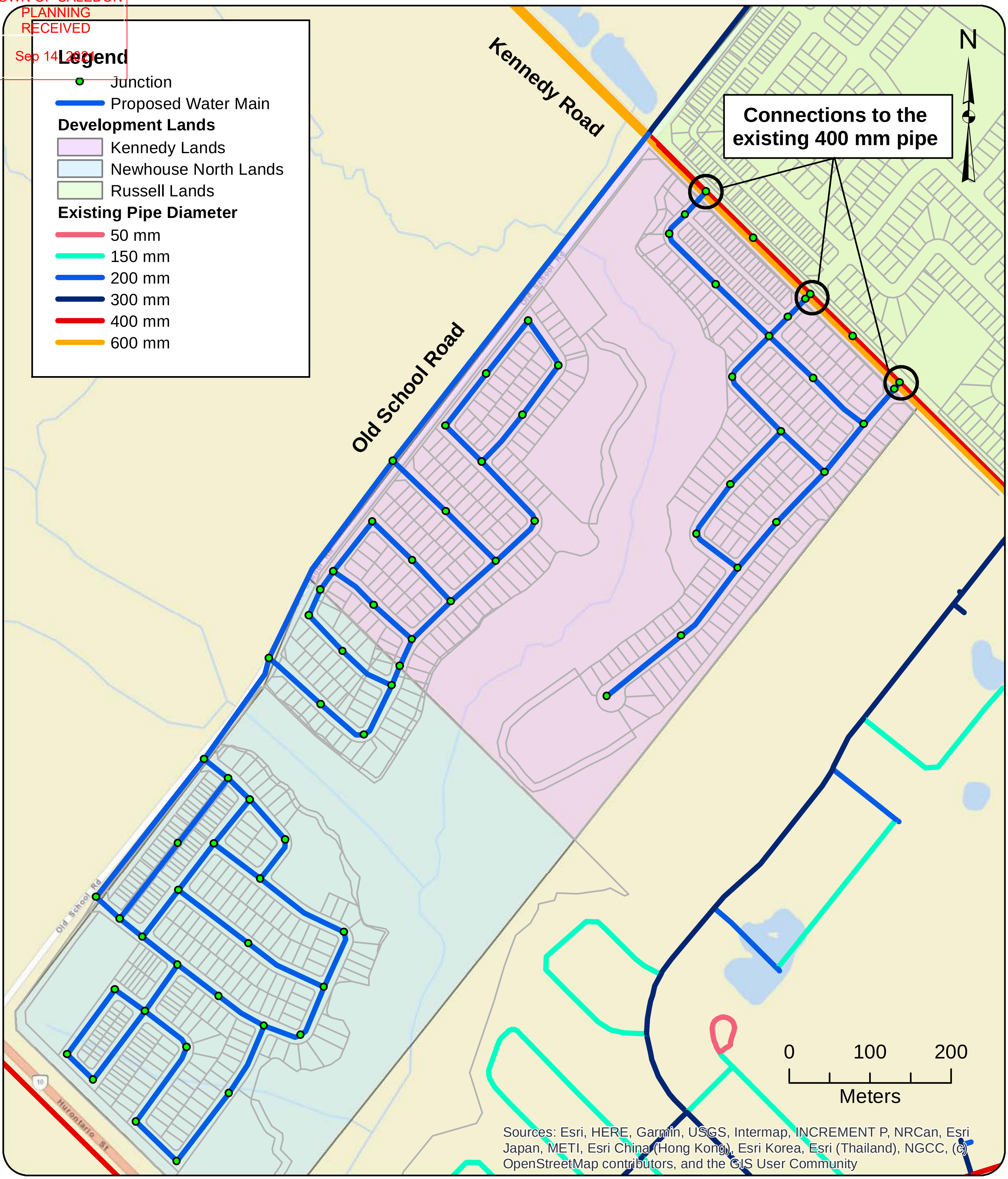
Pipe IDs

Figure B.2



GeoAdvice Engineering Inc.

Project: **Hydraulic Capacity and Modeling Analysis Mayfield West Kennedy Lands Development 2021-045-DSE**
Client: **David Schaeffer Engineering Ltd.**
Date: **May 2021**
Created by: **BL**
Reviewed by: **WdS**

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Existing Pipe Diamters

Figure B.3

Pipe Data

ID (Char)	Length (m)	Diameter (mm)	Roughness (Double)
GA-WM-0001	10.2	200	110
GA-WM-0002	76.2	200	110
GA-WM-0003	86.2	200	110
GA-WM-0004	73.9	200	110
GA-WM-0005	109.4	200	110
GA-WM-0006	118.0	200	110
GA-WM-0007	66.9	150	100
GA-WM-0008	74.5	150	100
GA-WM-0009	90.1	150	100
GA-WM-0010	73.8	150	100
GA-WM-0011	91.2	150	100
GA-WM-0012	68.1	150	100
GA-WM-0013	75.0	200	110
GA-WM-0014	84.9	200	110
GA-WM-0015	33.4	200	110
GA-WM-0016	30.9	200	110
GA-WM-0017	91.7	200	110
GA-WM-0018	86.1	200	110
GA-WM-0019	31.4	200	110
GA-WM-0022	38.5	200	110
GA-WM-0023	511.3	400/600	120/130
GA-WM-0024	288.9	400/600	120/130
GA-WM-0025	149.6	400/600	120/130
GA-WM-0026	215.9	400/600	120/130
GA-WM-0027	90.4	200	110
GA-WM-0028	87.0	200	110
GA-WM-0029	69.2	200	110
GA-WM-0030	99.3	200	110
GA-WM-0031	62.8	200	110
GA-WM-0032	81.9	200	110
GA-WM-0033	83.4	200	110
GA-WM-0034	66.8	200	110
GA-WM-0035	75.2	200	110
GA-WM-0036	76.7	200	110
GA-WM-0037	74.6	200	110
GA-WM-0038	67.2	200	110
GA-WM-0039	35.9	200	110
GA-WM-0040	69.7	150	100
GA-WM-0041	68.3	150	100
GA-WM-0042	77.9	150	100
GA-WM-0043	65.4	150	100
GA-WM-0044	63.5	150	100
GA-WM-0045	27.6	150	100
GA-WM-0046	35.0	150	100
GA-WM-0047	60.9	150	100
GA-WM-0048	74.4	150	100

Pipe Data

ID (Char)	Length (m)	Diameter (mm)	Roughness (Double)
GA-WM-0049	26.3	200	110
GA-WM-0050	70.5	200	110
GA-WM-0051	67.4	200	110
GA-WM-0052	85.6	200	110
GA-WM-0053	38.2	200	110
GA-WM-0054	37.3	200	110
GA-WM-0055	65.9	150	100
GA-WM-0056	58.5	150	100
GA-WM-0057	72.0	150	100
GA-WM-0058	70.0	200	110
GA-WM-0059	72.2	200	110
GA-WM-0060	73.1	200	110
GA-WM-0061	36.0	200	110
GA-WM-0062	39.5	200	110
GA-WM-0063	117.5	200	110
GA-WM-0064	101.3	200	110
GA-WM-0065	122.6	150	100
GA-WM-0066	73.9	150	100
GA-WM-0067	108.2	150	100
GA-WM-0068	108.8	150	100
GA-WM-0069	66.6	150	100
GA-WM-0070	48.1	150	100
GA-WM-0071	66.9	150	100
GA-WM-0072	64.0	150	100
GA-WM-0073	55.4	200	110
GA-WM-0074	93.9	150	100
GA-WM-0075	105.9	150	100
GA-WM-0076	69.9	150	100
GA-WM-0077	111.4	150	100
GA-WM-0078	68.2	150	100
GA-WM-0079	69.9	200	110
GA-WM-0080	105.9	200	110
GA-WM-0081	44.5	200	110
GA-WM-0082	99.3	200	110
GA-WM-0083	45.9	200	110
GA-WM-0084	57.5	200	110
GA-WM-0085	8.5	200	110

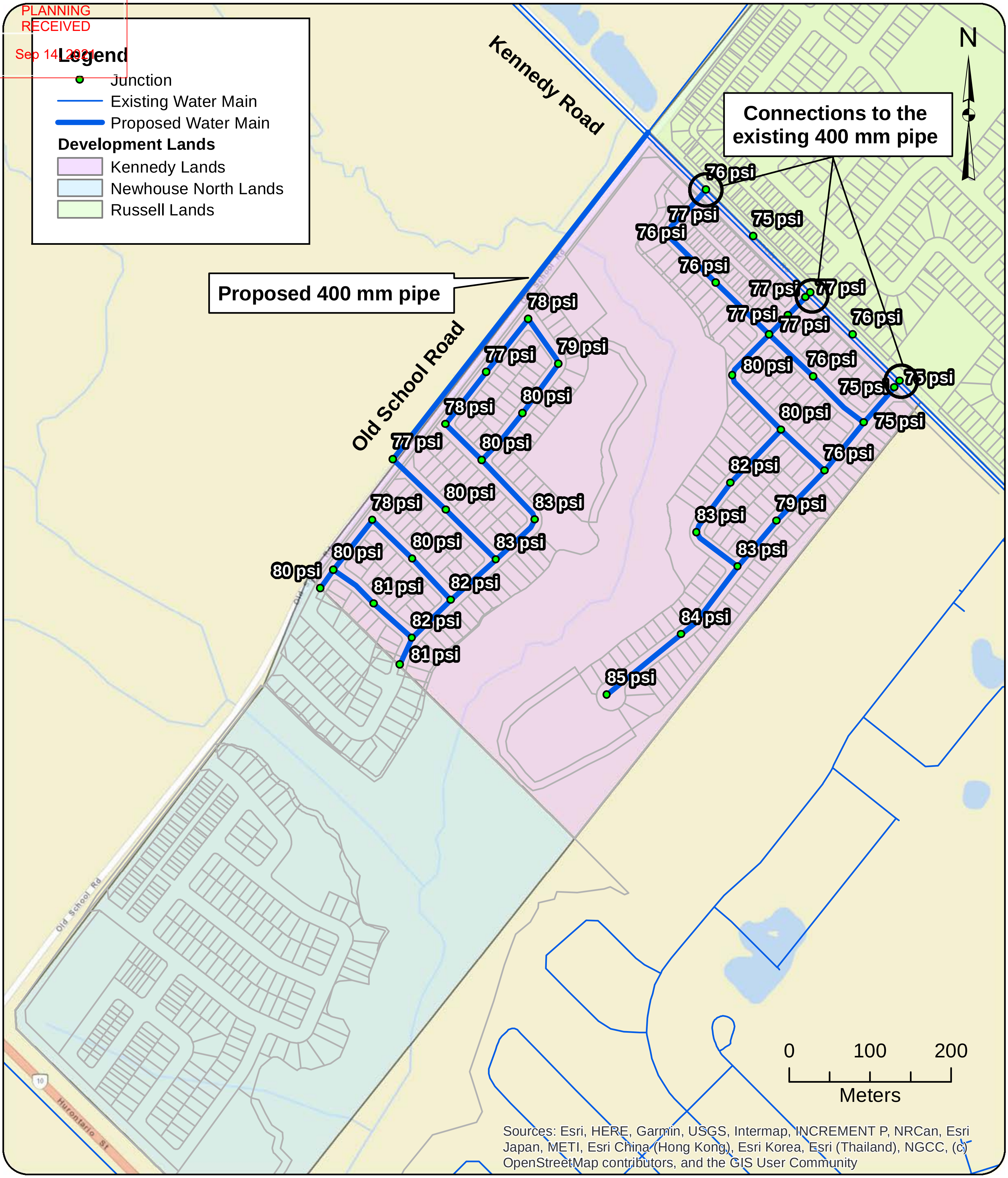
Junction Data

ID (Char)	Elevation (m)
GA-JCT-0001	274.0
GA-JCT-0002	273.0
GA-JCT-0003	272.4
GA-JCT-0004	272.6
GA-JCT-0005	273.0
GA-JCT-0007	272.7
GA-JCT-0008	272.9
GA-JCT-0009	270.4
GA-JCT-0010	270.4
GA-JCT-0011	273.1
GA-JCT-0012	270.7
GA-JCT-0013	268.1
GA-JCT-0014	268.4
GA-JCT-0015	269.2
GA-JCT-0016	267.5
GA-JCT-0017	267.0
GA-JCT-0018	272.0
GA-JCT-0019	270.7
GA-JCT-0020	270.6
GA-JCT-0021	270.2
GA-JCT-0022	271.6
GA-JCT-0023	272.3
GA-JCT-0024	268.1
GA-JCT-0025	268.5
GA-JCT-0026	270.5
GA-JCT-0027	268.9
GA-JCT-0028	270.4
GA-JCT-0029	271.8
GA-JCT-0030	270.5
GA-JCT-0031	269.7
GA-JCT-0032	269.2
GA-JCT-0033	269.3
GA-JCT-0034	270.5
GA-JCT-0035	269.5
GA-JCT-0036	268.9
GA-JCT-0037	268.3
GA-JCT-0038	266.6
GA-JCT-0039	267.1
GA-JCT-0040	266.8
GA-JCT-0041	266.6
GA-JCT-0042	266.2
GA-JCT-0043	267.2
GA-JCT-0044	267.6
GA-JCT-0045	267.4
GA-JCT-0046	267.7
GA-JCT-0047	267.0

Junction Data

ID (Char)	Elevation (m)
GA-JCT-0048	265.8
GA-JCT-0049	265.1
GA-JCT-0050	264.6
GA-JCT-0051	264.3
GA-JCT-0052	264.0
GA-JCT-0053	264.1
GA-JCT-0054	265.7
GA-JCT-0055	264.7
GA-JCT-0056	263.5
GA-JCT-0057	264.2
GA-JCT-0058	264.9
GA-JCT-0059	264.4
GA-JCT-0060	265.8
GA-JCT-0061	266.4
GA-JCT-0062	266.2
GA-JCT-0063	265.7
GA-JCT-0064	272.7
GA-JCT-0065	265.7
GA-JCT-0066	265.5
GA-JCT-0067	267.8
GA-JCT-0068	272.9
GA-JCT-0069	272.7
GA-JCT-0070	273.9
GA-JCT-0071	273.9
GA-JCT-0072	272.7

Appendix C Average Day Demand Pressure Modeling Results



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Mayfield West Kennedy Lands Development
2021-045-DSE
Client: **David Schaeffer Engineering Ltd.**
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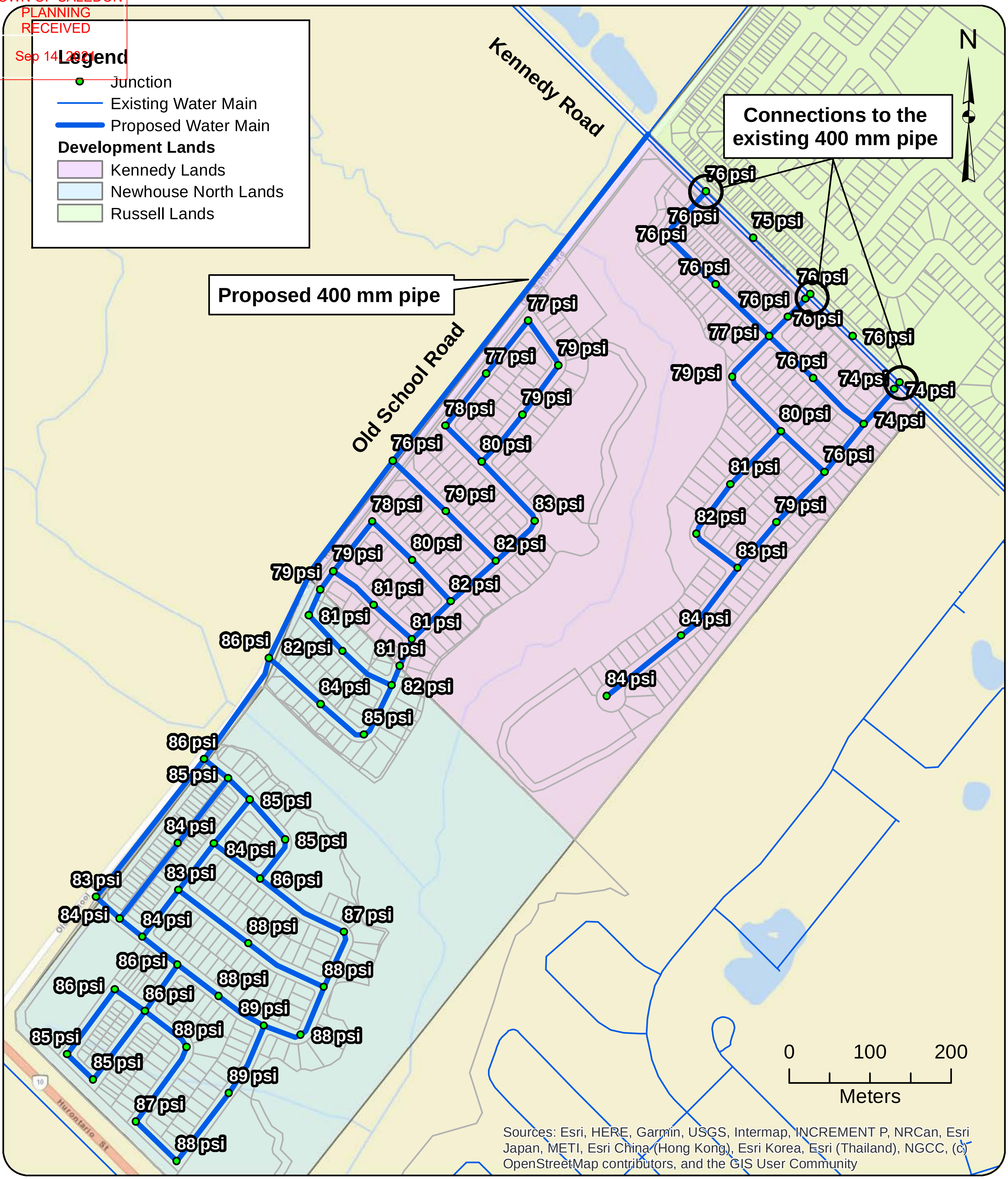
ADD Pressure Results Scenario 1

Figure C.1



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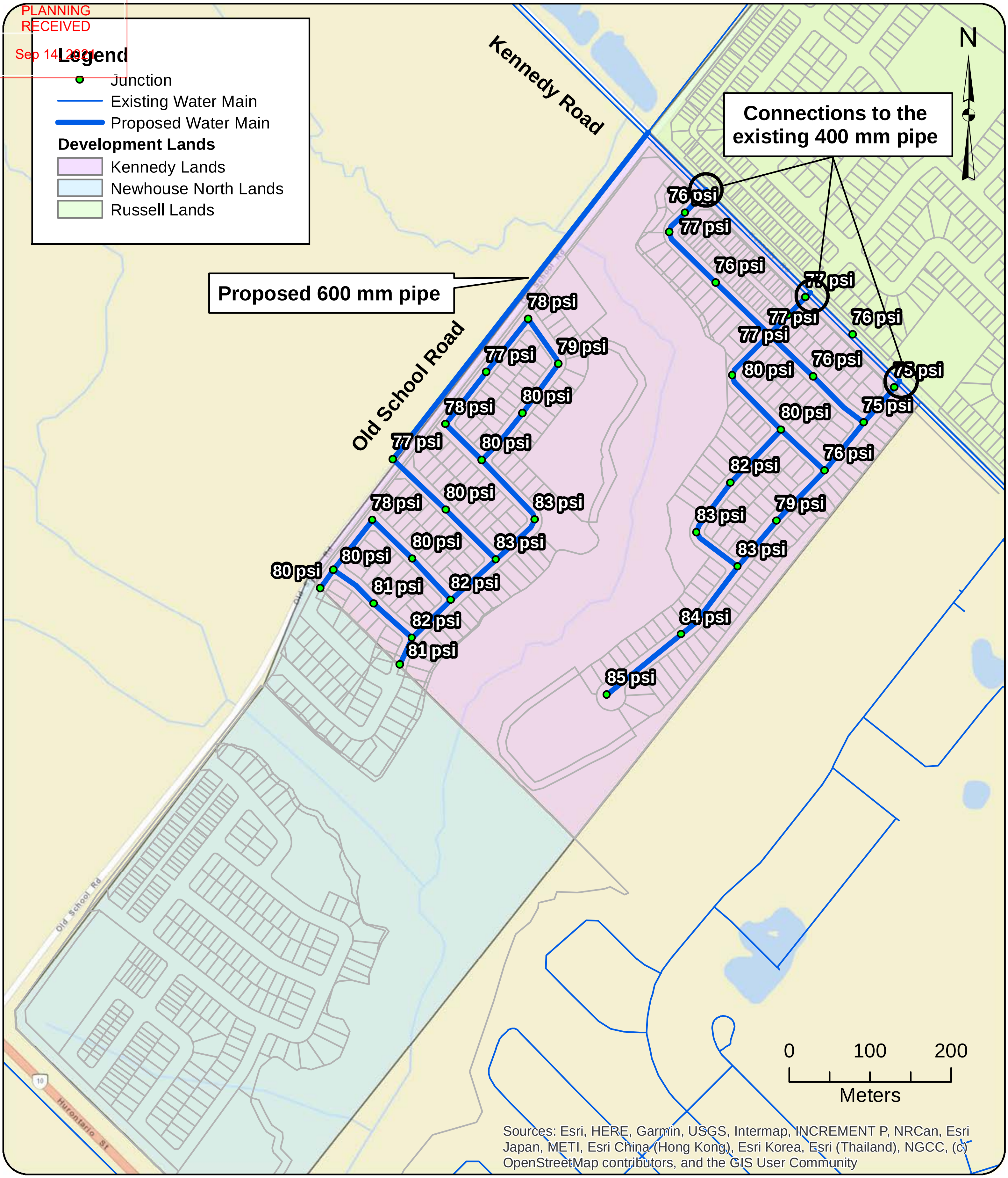
ADD Pressure Results Scenario 2

Figure C.2



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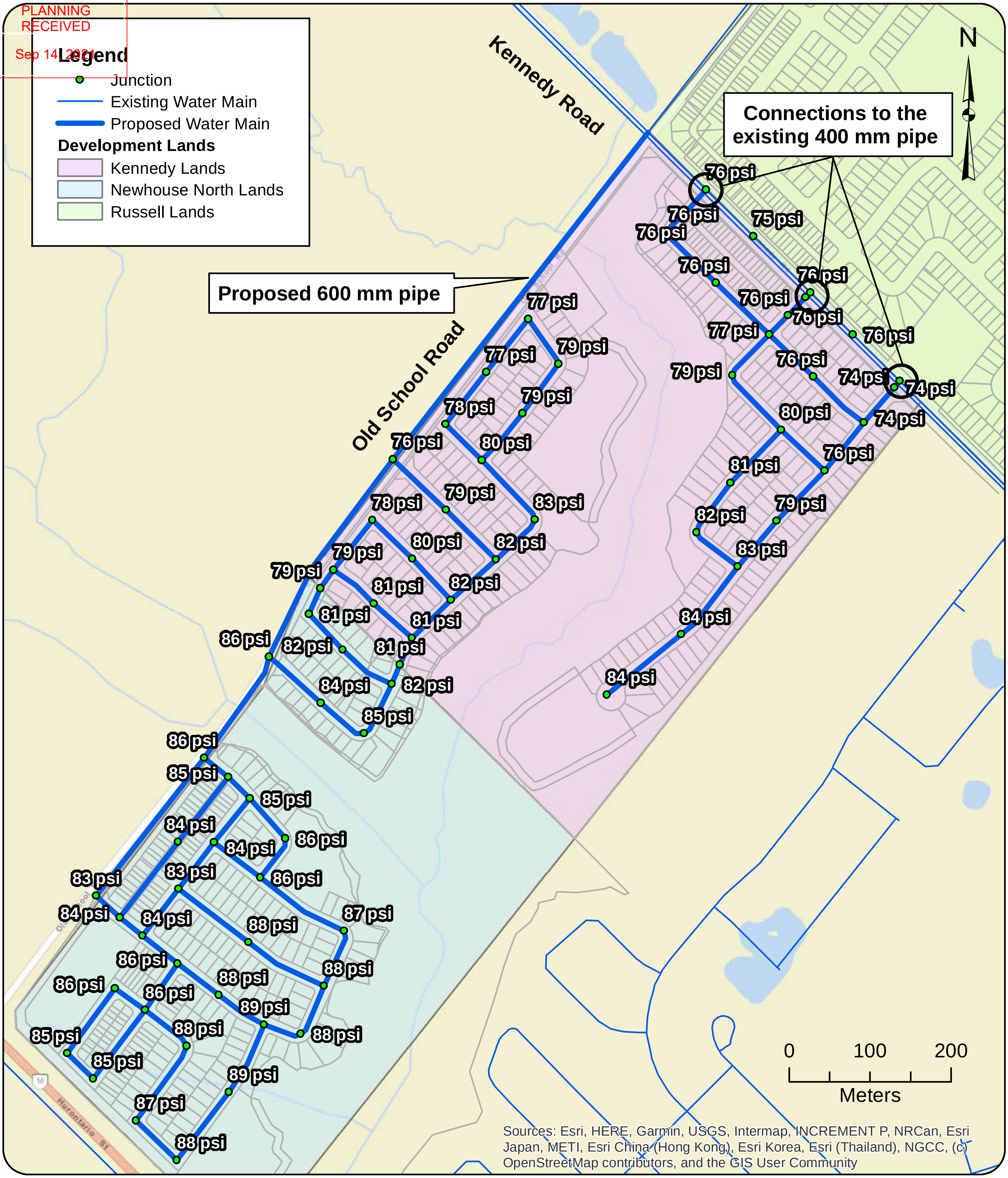
ADD Pressure Results Scenario 3

Figure C.3



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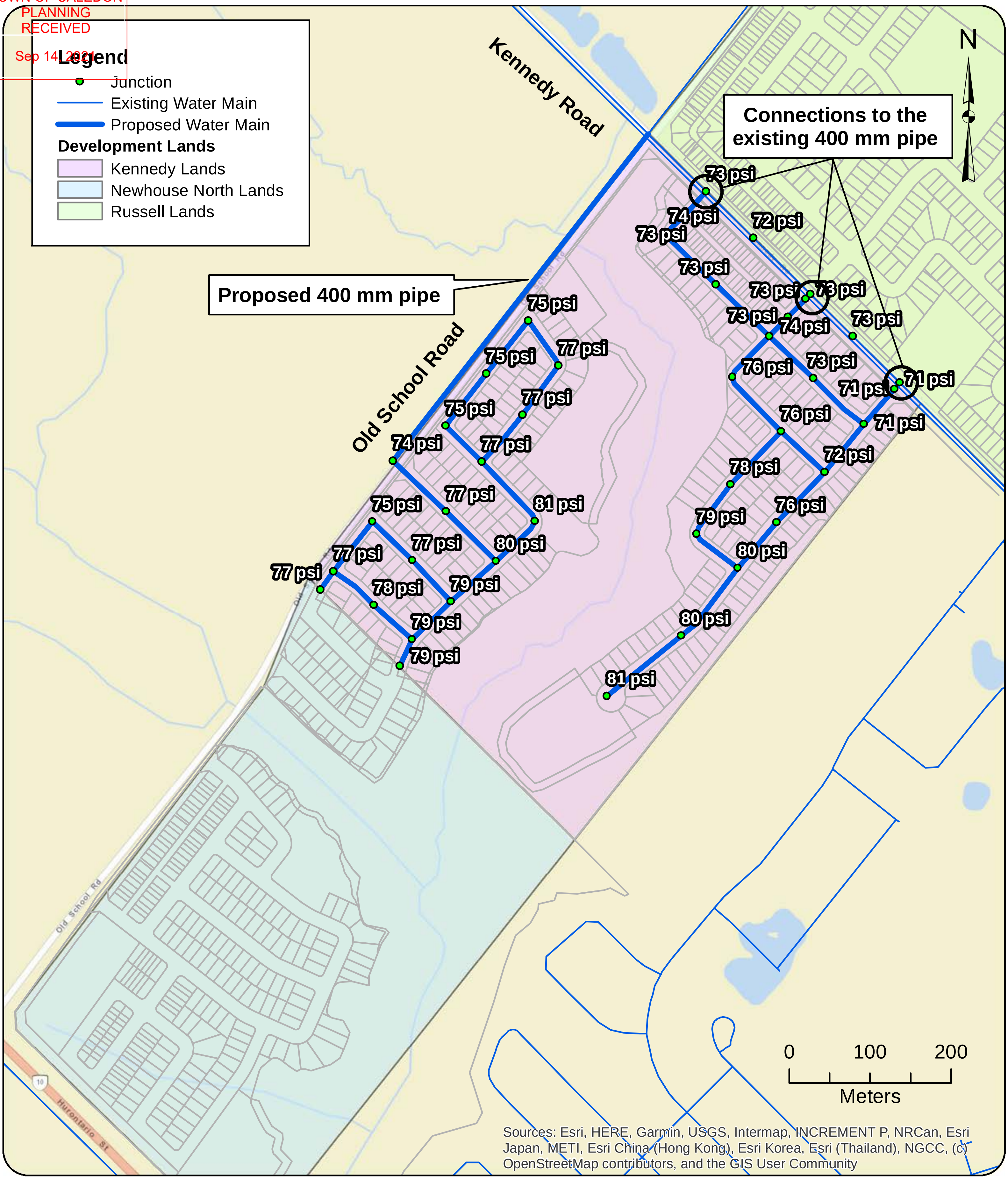
ADD Pressure Results Scenario 4

Figure C.4

Appendix D Peak Hour Demand Pressure Modeling Results



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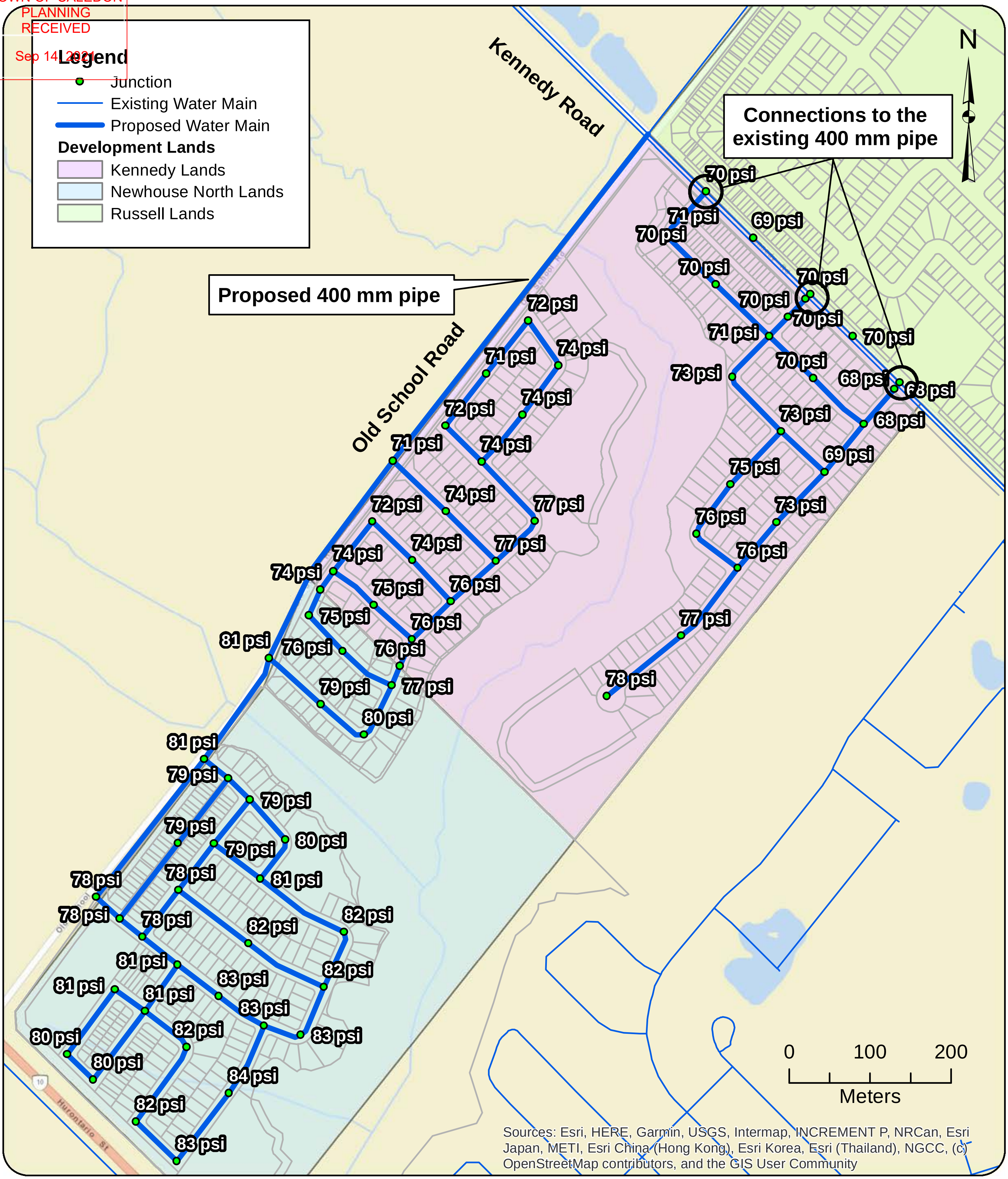
PHD Pressure Results
Scenario 1

Figure D.1



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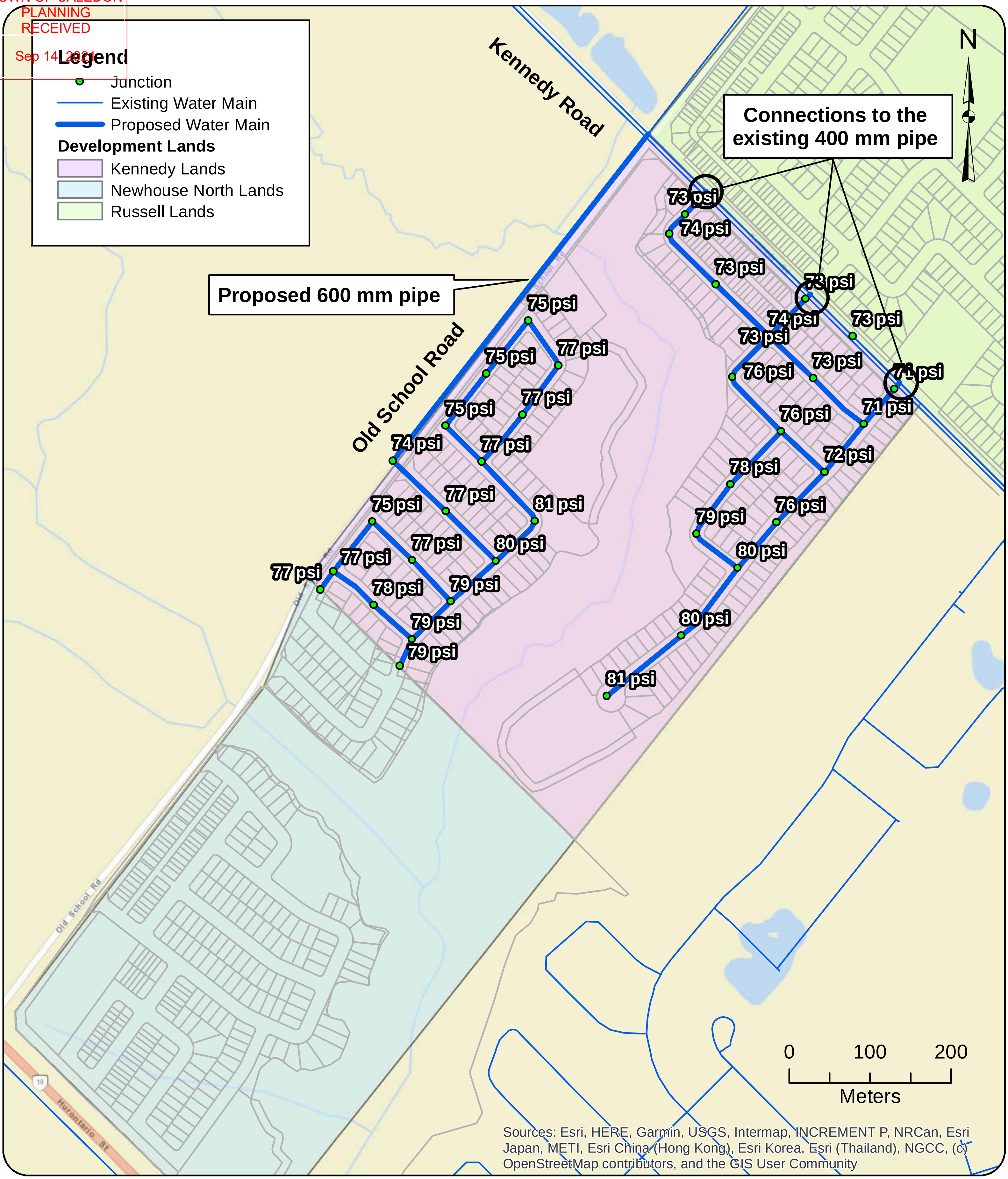
PHD Pressure Results Scenario 2

Figure D.2



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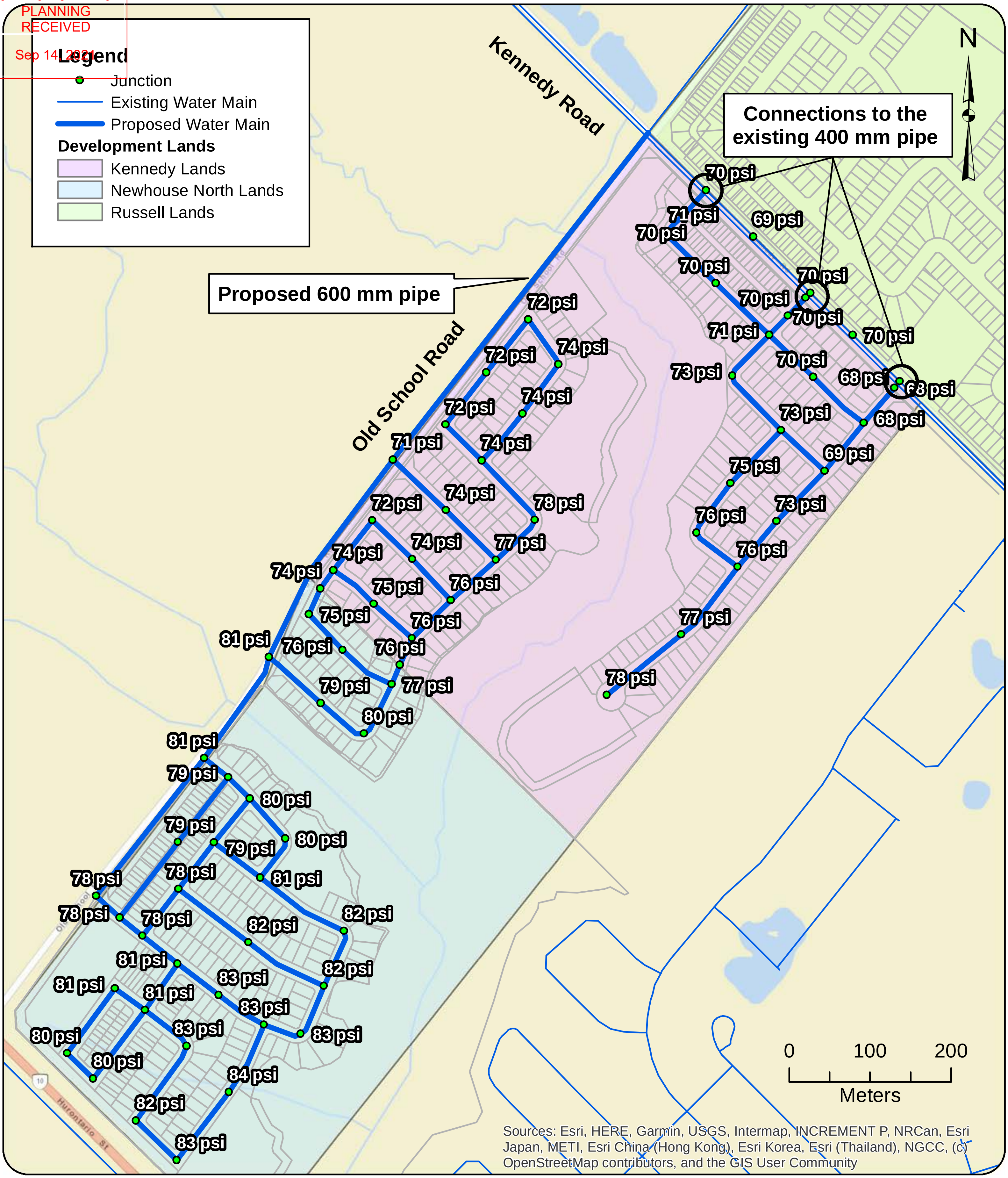
PHD Pressure Results Scenario 3

Figure D.3



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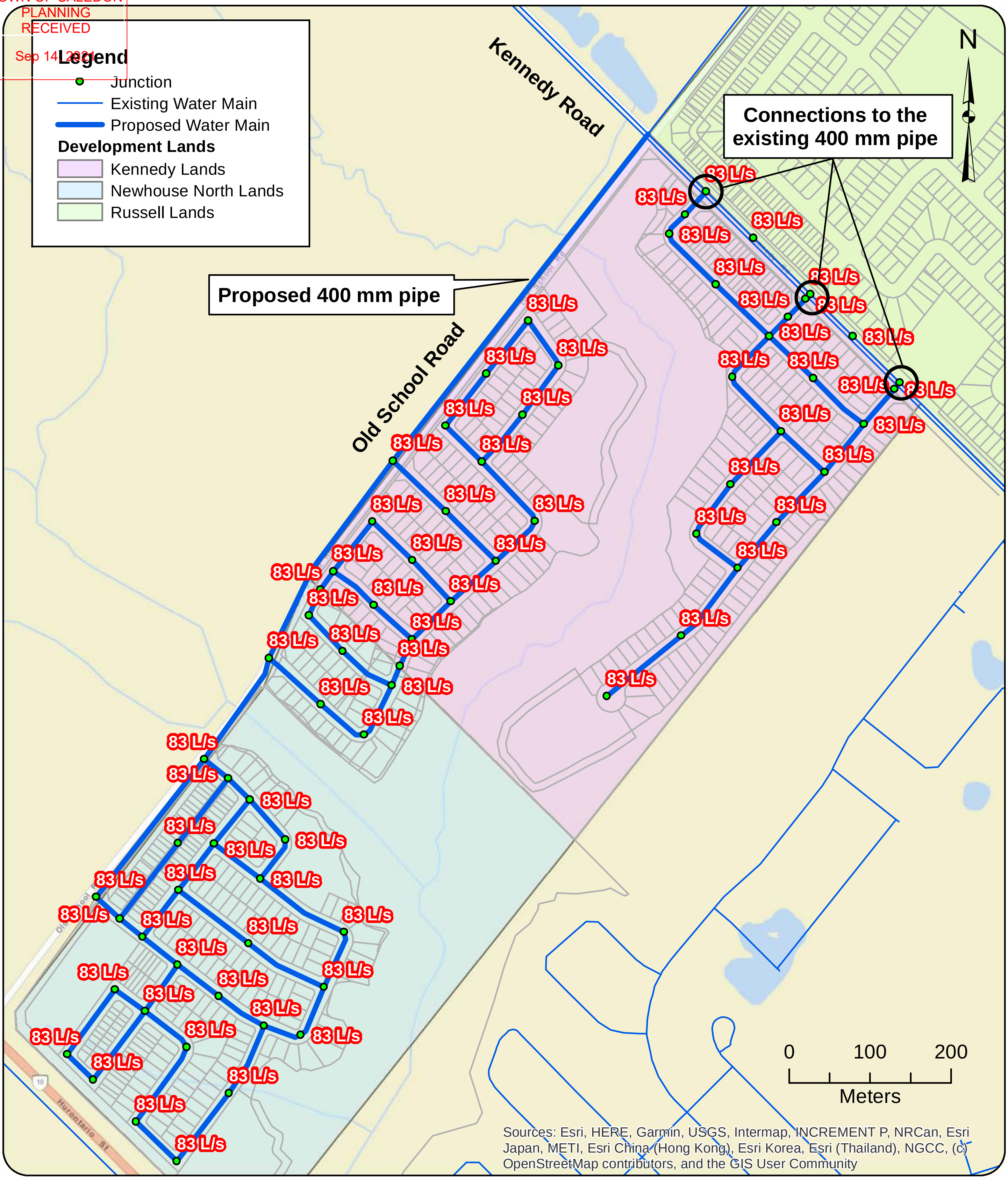
PHD Pressure Results Scenario 4

Figure D.4

Appendix E Fire Flow Modeling Results



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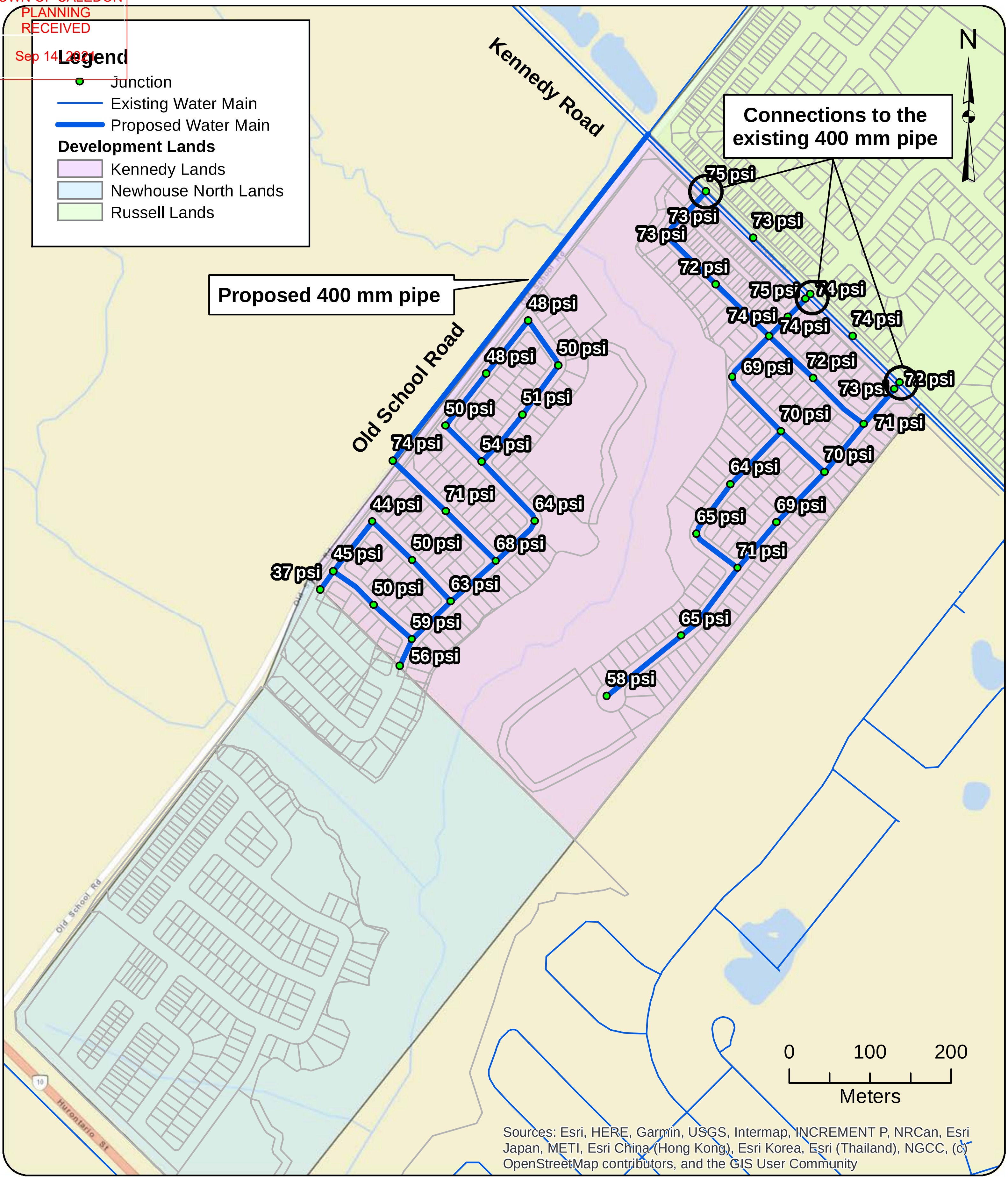
Required Fire Flow

Figure E.1



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2021-045-DSE

Client: **David Schaeffer Engineering Ltd.**

Date: **May 2021**

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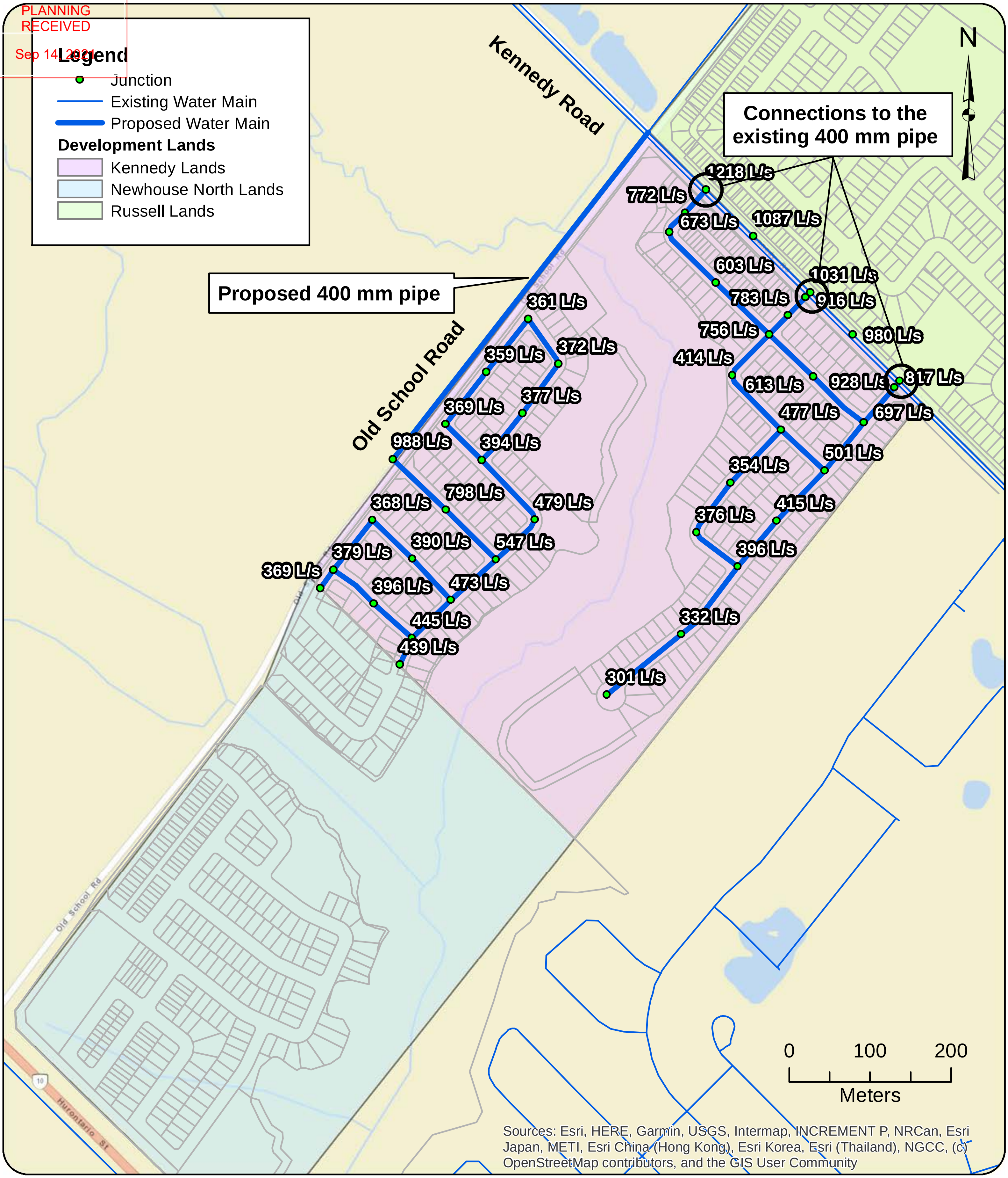
Residual Pressure @ Required Fire Flow Scenario 1

Figure E.2



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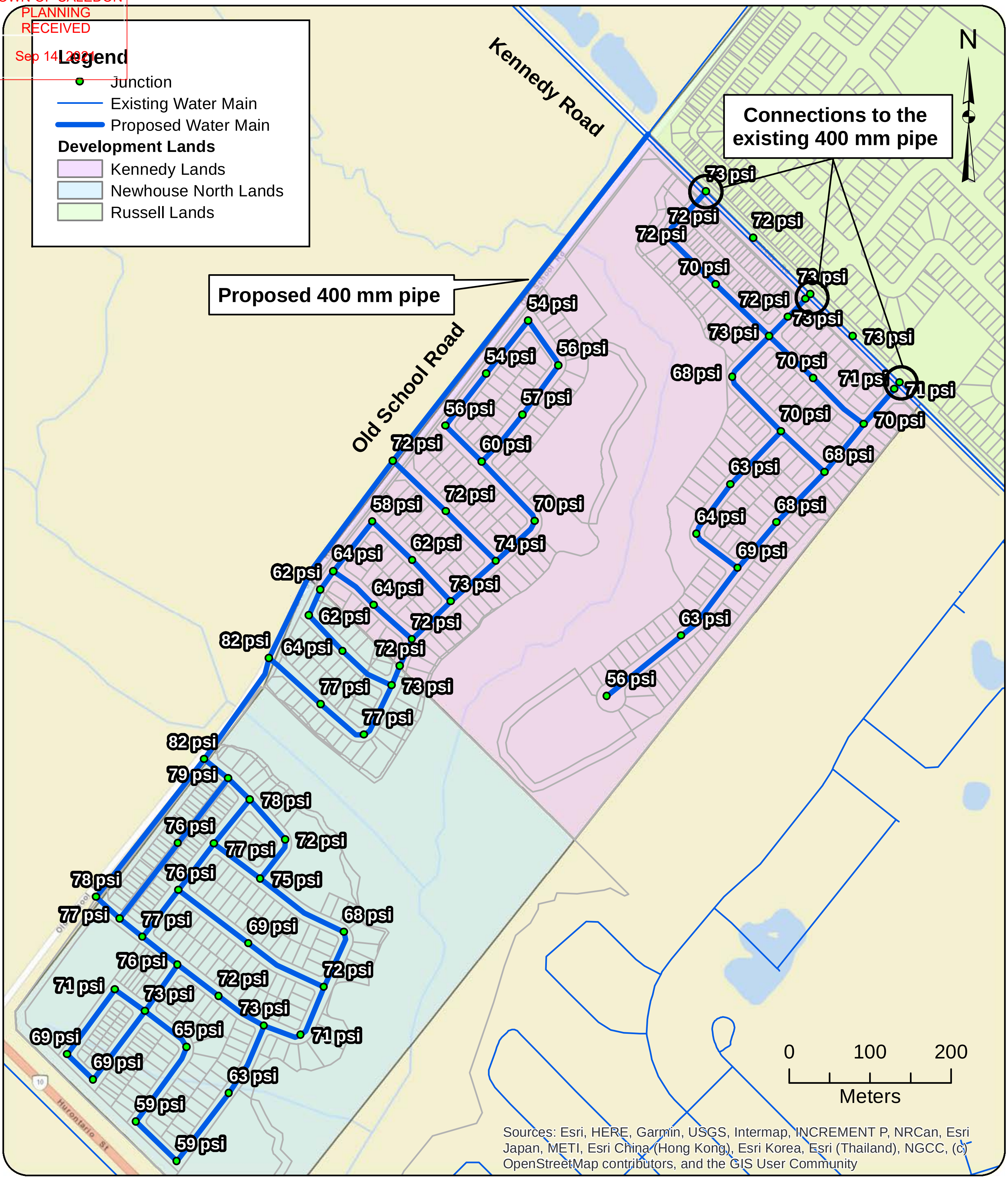
Available Fire Flow @ 20 psi Scenario 1

Figure E.3



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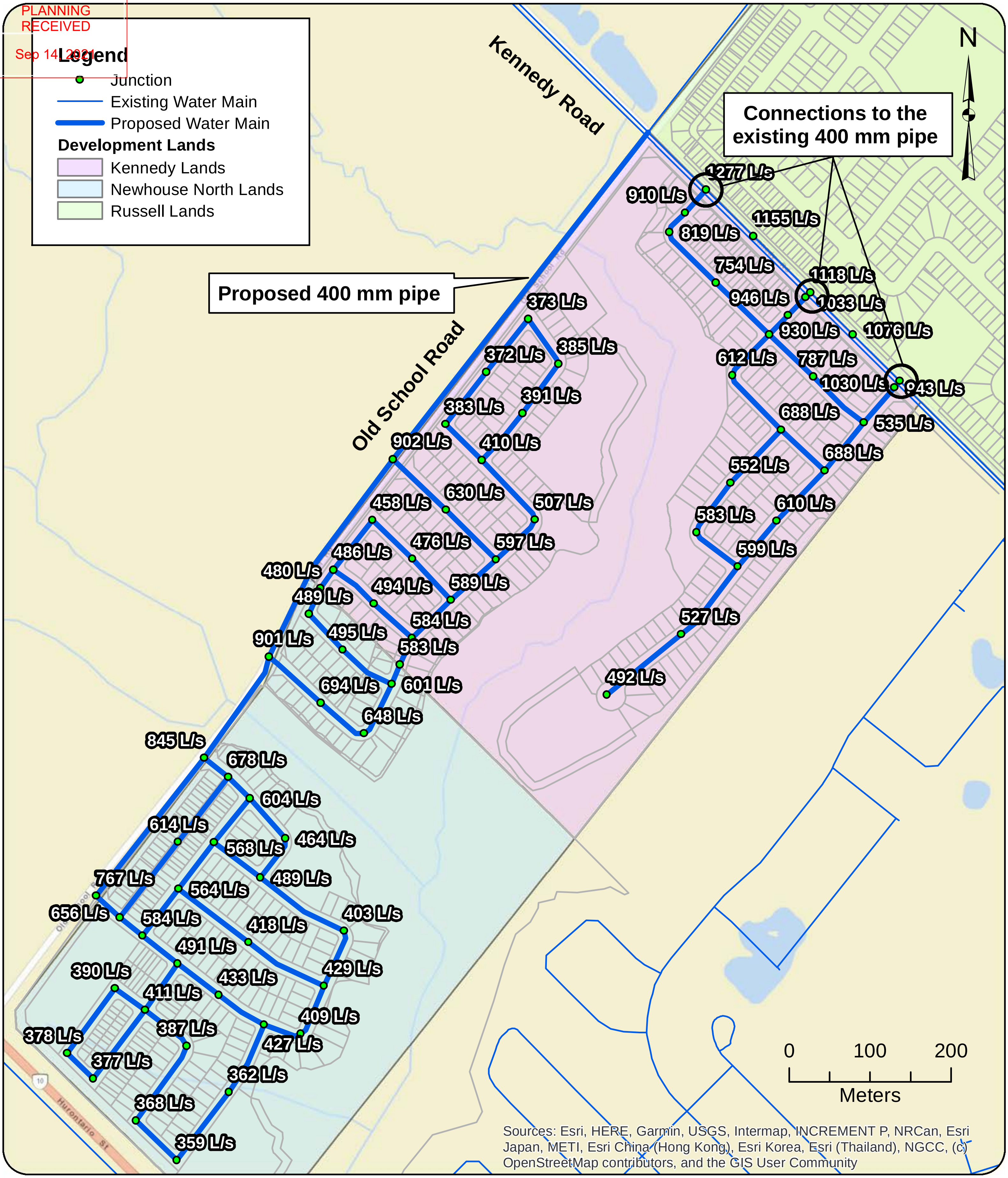
Residual Pressure @ Required Fire Flow Scenario 2

Figure E.4



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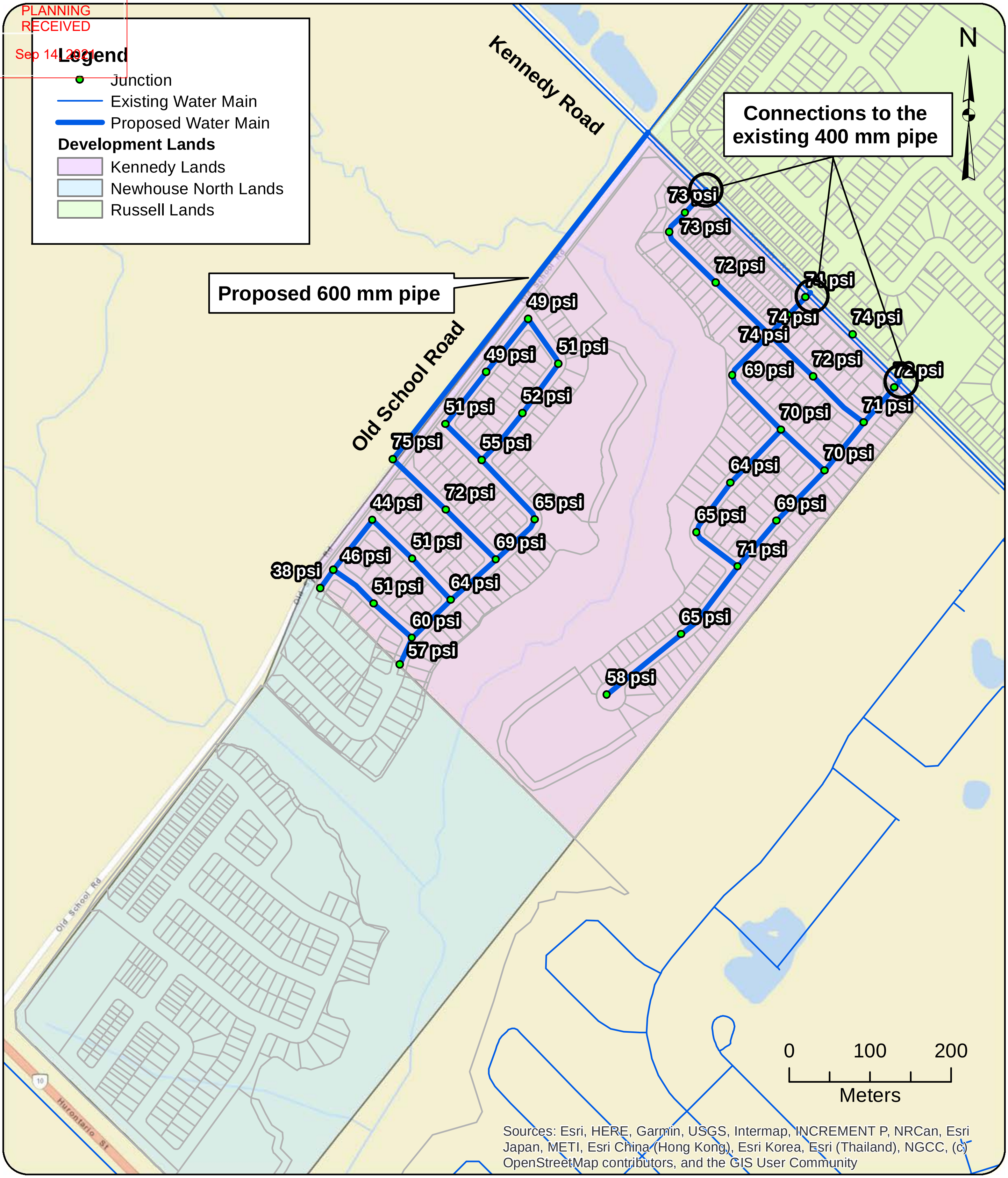
Available Fire Flow @ 20 psi Scenario 2

Figure E.5



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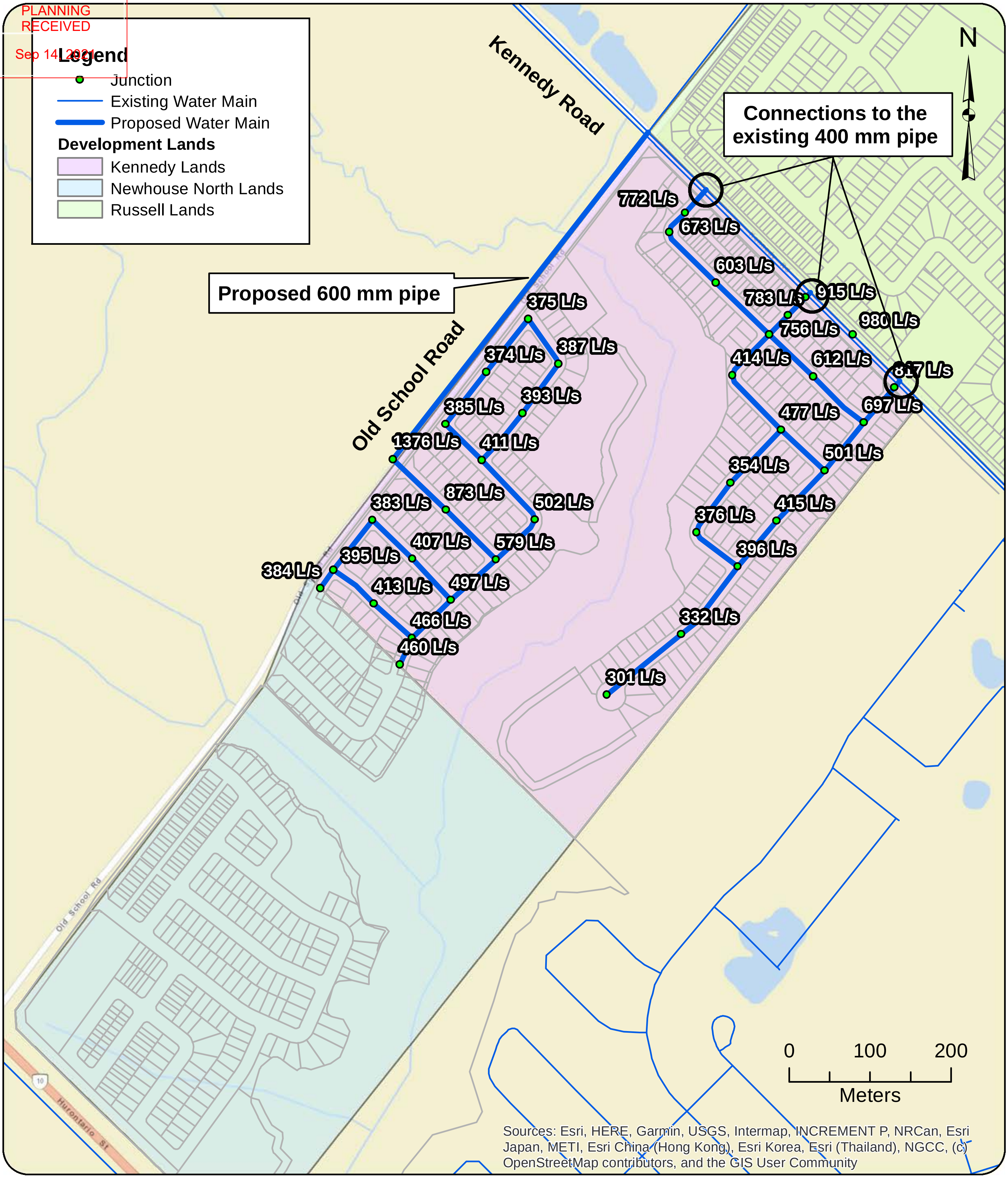
Residual Pressure @ Require Fire Flow Scenario 3

Figure E.6



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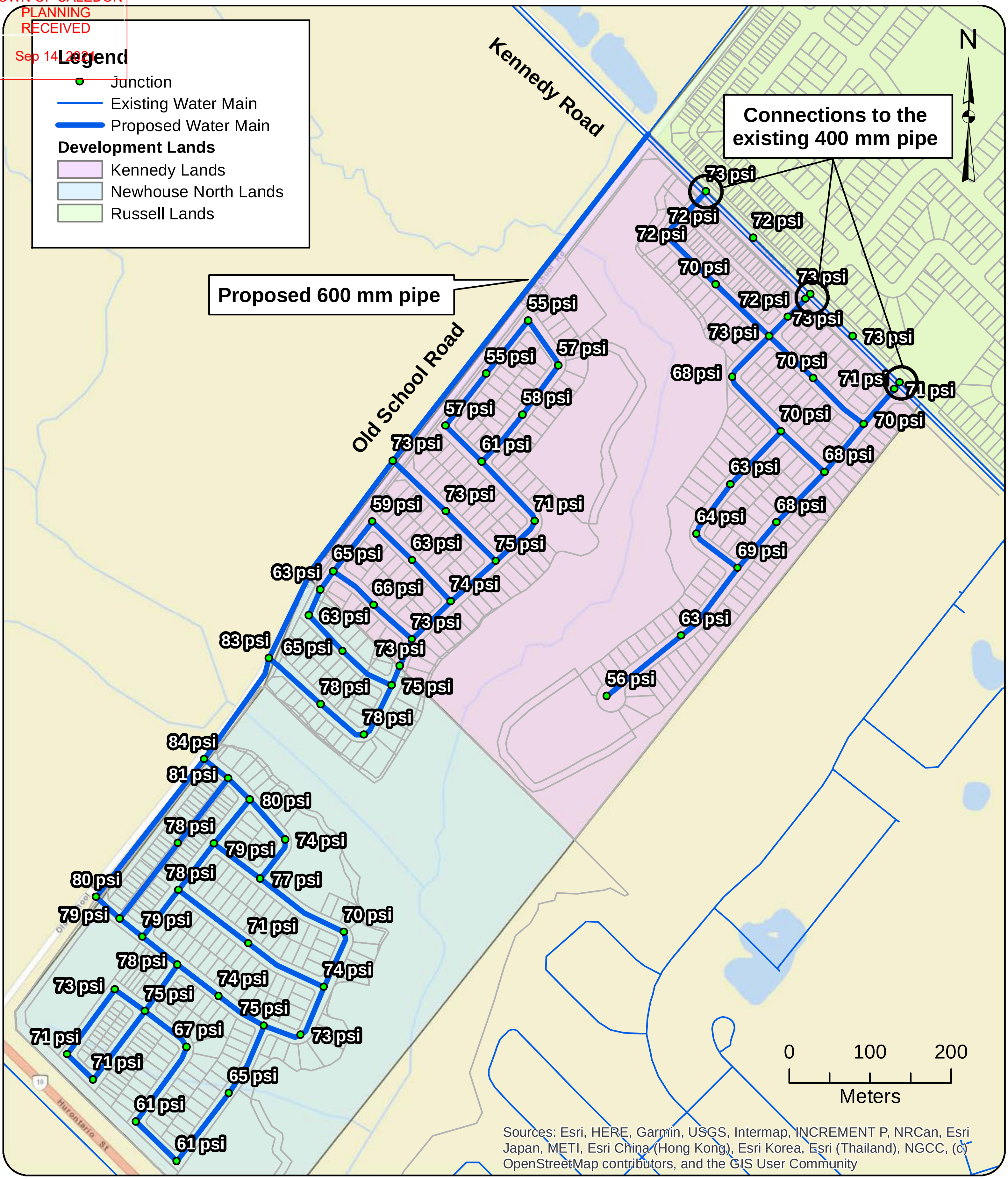
Available Fire Flow @ 20 psi Scenario 3

Figure E.7



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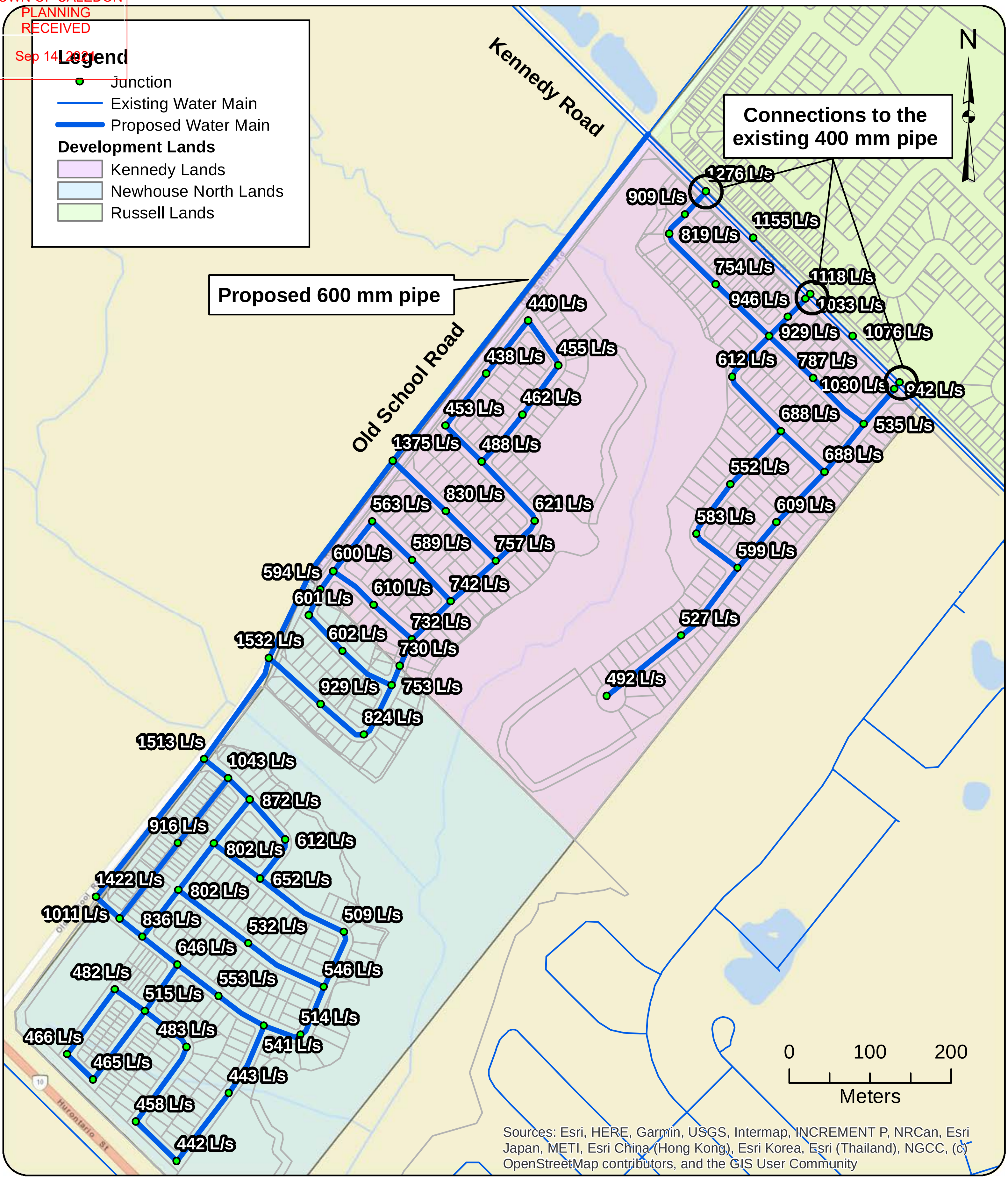
Residual Pressure @ Required Fire Flow Scenario 4

Figure E.8



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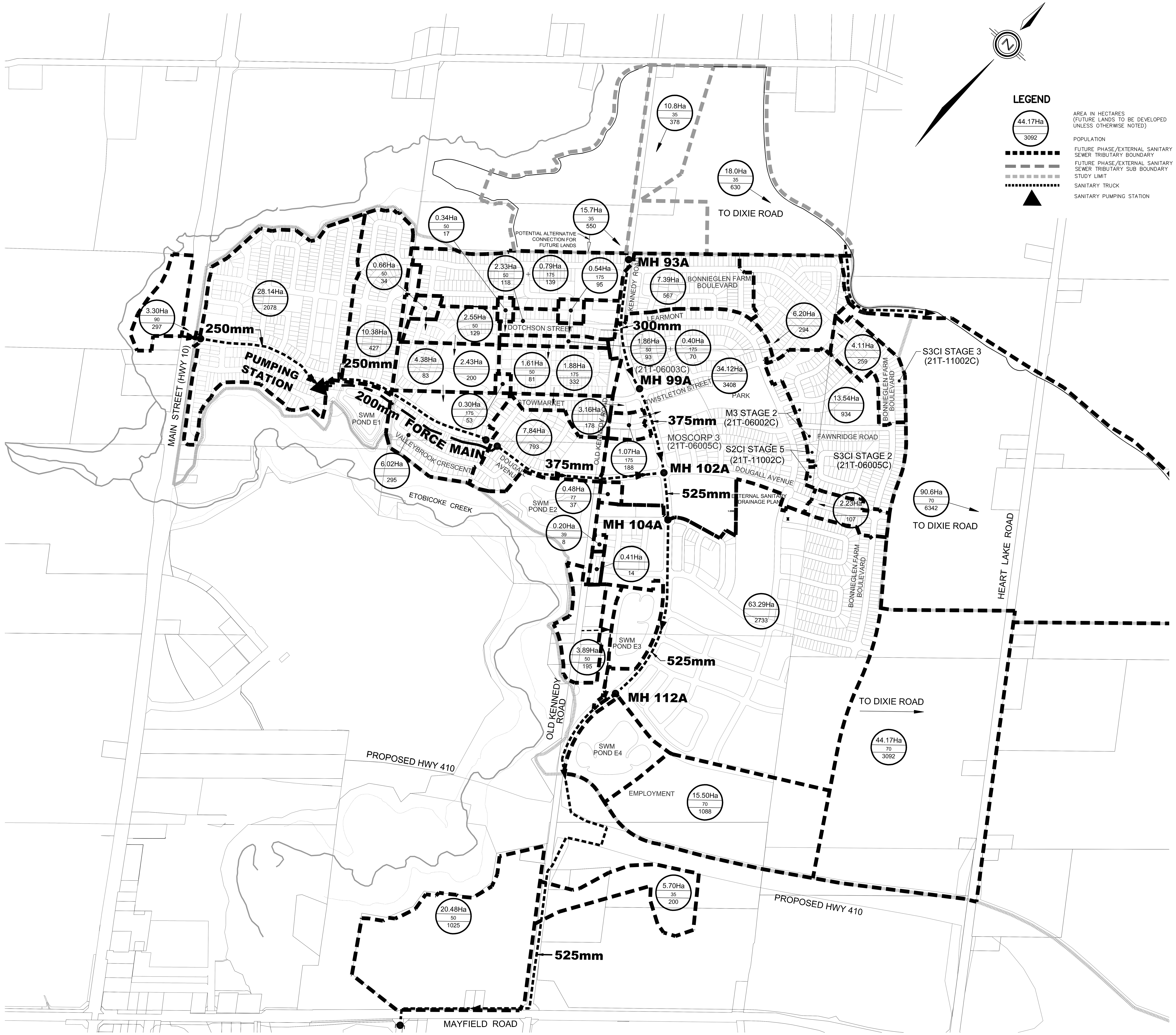
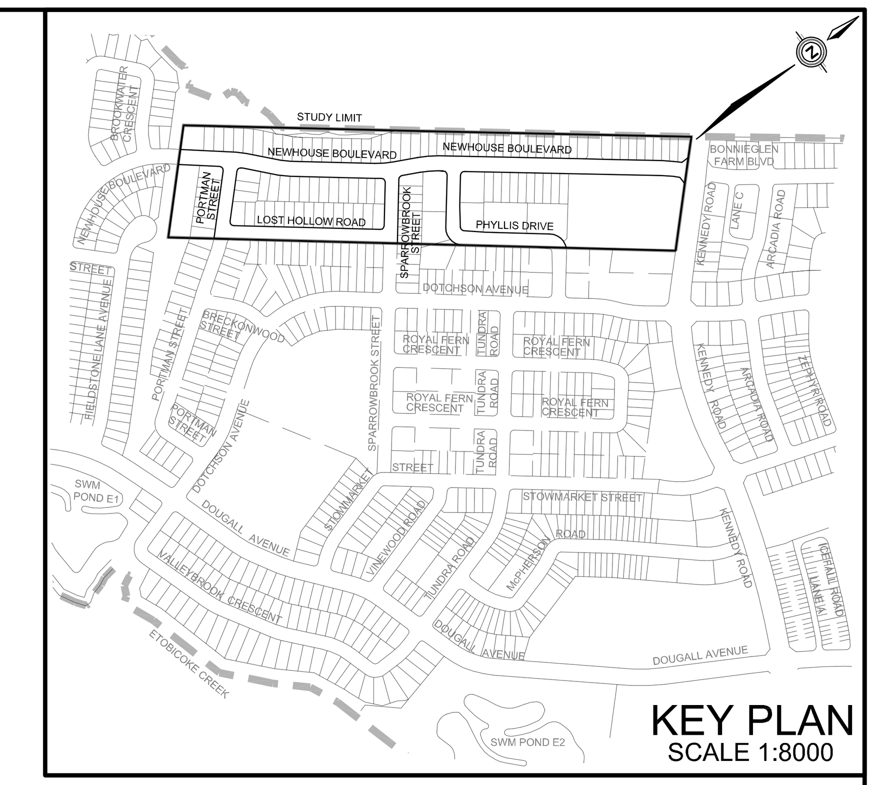
Available Fire Flow @ 20 psi Scenario 4

Figure E.9

APPENDIX H

SANITARY TRUNK BACKGROUND





TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.H. GELBLOOM SURVEYING LIMITED, PROJECT No. 11-005, TOPOGRAPHIC SURVEY DATED ON MAY 26, 2015.

LEGAL INFORMATION

CALCULATED M-PLAN PROVIDED BY J. H. GELBLOOM SURVEYING LIMITED, PROJECT No. 11-005, RECEIVED ON NOVEMBER 24, 2016.

NO.	BY	DATE	REVISION	CONS. CHECKED	TOWN APPR'D
6	Z.L.	17-03-13	REVISED AS PER REGION COMMENTS		
5	Z.L.	17-02-24	4th SUBMISSION		
4	Z.L.	16-10-21	MOE SUBMISSION		
3	Z.L.	16-10-07	3rd SUBMISSION		
2	Z.L.	16-08-19	2nd SUBMISSION		
1	Z.L.	16-02-19	1st SUBMISSION		

BENCH MARK:

ELEVATIONS ARE GEODETIC AND ARE REFERRED TO THE TOWN OF CALEDON BENCHMARK No. 0008, HAVING AN ELEVATION OF 259.795 METRES. LOCATED ON TOP OF THE CONCRETE STRUCTURE AT THE DITCH INLET, AT THE WEST SIDE OF THE STORM WATER MANAGEMENT POND E4, BEING 47.6 METRES SOUTH OF THE CENTER LINE OF ABBOTSIDE WAY AND 83.1 METRES EAST OF THE CENTRE LINE OF KENNEDY ROAD.

ELEVATION = 259.795 m

LICENSED PROFESSIONAL ENGINEER
Z. LI
PROVINCE OF ONTARIO

KENNEDY TRAILS DEVELOPMENT LTD.
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REGION FILE: T-12003Ca

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600 Alden Road, Suite 500
Markham, Ontario, L3R 0E7
Tel. (905) 475-3080
Fax. (905) 475-3081
www.DSEL.ca

Region of Peel
Public Works

TOWN OF CALEDON

EXTERNAL SANITARY DRAINAGE PLAN

© DSEL

SCALE:		PROJECT No. 15-826
DESIGNED BY: C.M.	DRAWN BY: A.F.	DRAWING No. 10
CHECKED BY: Z.L.	DATE: FEBRUARY 2016	

APPENDIX I

PRELIMINARY SANITARY DESIGN SHEETS

LOCATION	FROM MH	TO MH	AREA (ha)	DENSITY (ppha)	POPULATION	CUMULATIVE AREA (HA)	CUMULATIVE POPULATION	SEWAGE FLOW (m3/s), [1]	INFILTRATION FLOW 0.0002c.m./s/ha (m3/s), [2]	FOUNDATION DRAINS (m3/s), [3]	TOTAL FLOW (m3/s), [1+2+3]	PIPE LENGTH (m)	PIPE DIAMETER (mm)	GRADIENT (%)	CAPACITY (m3/s)	VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	DROP IN LOWER MH (m)
ALIGNMENT 204																		
	223A	224A	0.50	50	25	0.50	25	0.013	0.0001	0.00	0.013	58.5	250	1.55	0.074	1.51	1.1380	
	224A	225A	0.46	50	23	0.96	48	0.013	0.0003	0.00	0.013	74.0	250	1.45	0.072	1.46	1.1113	
	225A	226A	0.37	50	19	1.33	67	0.013	0.0004	0.00	0.013	67.5	250	1.50	0.073	1.48	1.1303	
To ALIGNMENT 201, Pipe 226A - 227A						1.33	67											
ALIGNMENT 209																		
	203A	205A	0.65	175	114	0.65	114	0.013	0.0002	0.00	0.013	112.0	250	1.00	0.059	1.21	0.9655	
To ALIGNMENT 209, Pipe 205A - 206A						0.65	114											
	204A	218A	0.26	175	46	0.26	46	0.013	0.0001	0.00	0.013	57.0	250	2.00	0.084	1.71	1.2409	
To ALIGNMENT 201, Pipe 218A - 219A						0.26	46											
	200A	201A	0.30	175	53	0.30	53	0.013	0.0001	0.00	0.013	82.0	250	1.00	0.059	1.21	0.9655	
	201A	202A	0.08	175	14	0.38	67	0.013	0.0001	0.00	0.013	13.0	250	2.00	0.084	1.71	1.2409	
	202A	205A	0.13	50	7	0.51	74	0.013	0.0001	0.00	0.013	38.5	250	0.75	0.052	1.05	0.8710	
Contribution From ALIGNMENT 209, Pipe 204A - 218A						0.65	114											
	205A	206A	0.24	50	12	1.40	200	0.013	0.0004	0.00	0.013	63.5	250	0.50	0.042	0.86	0.7583	
	206A	207A	0.10	50	5	1.50	205	0.013	0.0004	0.00	0.013	12.5	250	0.50	0.042	0.86	0.7583	
	207A	208A	0.74	50	37	2.24	242	0.013	0.0006	0.00	0.014	95.5	250	0.50	0.042	0.86	0.7632	
	208A	209A	0.07	50	4	2.31	246	0.013	0.0007	0.00	0.014	14.0	250	0.75	0.052	1.05	0.8844	
	209A	210A	0.08	50	4	2.39	250	0.013	0.0007	0.00	0.014	53.5	250	0.65	0.048	0.98	0.8414	
	210A	211A	0.04	50	2	2.43	252	0.013	0.0007	0.00	0.014	11.5	250	1.55	0.074	1.51	1.1490	
	211A	212A	0.28	50	14	2.71	266	0.013	0.0008	0.00	0.014	65.0	250	0.50	0.042	0.86	0.7632	
	212A	213A	0.26	50	13	2.97	279	0.013	0.0008	0.00	0.014	65.0	250	0.50	0.042	0.86	0.7681	
	213A	220A	0.31	50	16	3.28	295	0.013	0.0009	0.00	0.014	63.0	250	0.50	0.042	0.86	0.7681	
To ALIGNMENT 201, Pipe 220A - 221A						3.28	295											
ALIGNMENT 203																		
	216A	217A	0.08	175	14	0.08	14	0.013	0.0000	0.00	0.013	23.5	250	1.00	0.059	1.21	0.9655	
To ALIGNMENT 201, Pipe 217A - 218A						0.08	14											

CONSULTANT: David Schaeffer Engineering Ltd.
SUBDIVISION:
Mayfield West Phase 1 Stage 2 Community

SHEET 1 OF 13
PROJECT NO.: 21-1257
DATE: Jul 2021 DESIGNED BY: V.C.

THE REGIONAL MUNICIPALITY OF PEEL
DEPARTMENT OF PUBLIC WORKS
STANDARD DRAWING

n = 0.013
single family > 10m lots --- 50 p/ha
single family < 10m lots / semi-detached --- 70 p/ha
townhouse --- 175p/ha

Approved:

Date:

STD. DWG

LOCATION	FROM MH	TO MH	AREA (ha)	DENSITY (ppha)	POPULATION	CUMULATIVE AREA (HA)	CUMULATIVE POPULATION	SEWAGE FLOW (m3/s), [1]	INFILTRATION FLOW 0.0002c.m./s/ha (m3/s), [2]	FOUNDATION DRAINS (m3/s), [3]	TOTAL FLOW (m3/s), [1+2+3]	PIPE LENGTH (m)	PIPE DIAMETER (mm)	GRADIENT (%)	CAPACITY (m3/s)	VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	DROP IN LOWER MH (m)
	230A	232A	0.44	175	77	0.44	77	0.013	0.0001	0.00	0.013	110.0	250	1.00	0.059	1.21	0.9655	
To ALIGNMENT 201, Pipe 232A - 233A						0.44	77											
			0.18	50	9	0.18	9											
	231A	232A	0.20	175	35	0.38	44	0.013	0.0001	0.00	0.013	59.5	250	1.00	0.059	1.21	0.9655	
To ALIGNMENT 201, Pipe 232A - 233A						0.38	44											
ALIGNMENT 202																		
	214A	215A	0.09	175	16	0.09	16	0.013	0.0000	0.00	0.013	30.5	250	1.00	0.059	1.21	0.9655	
To ALIGNMENT 201, Pipe 215A - 217A						0.09	16											
	235A	236A	0.46	175	81	0.46	81	0.013	0.0001	0.00	0.013	113.5	250	1.00	0.059	1.21	0.9655	
	236A	237A	0.23	175	41	0.69	122	0.013	0.0002	0.00	0.013	66.0	250	0.95	0.058	1.18	0.9491	
To ALIGNMENT 205, Pipe 237A - 238A						0.69	122											
ALIGNMENT 201																		
Contribution From ALIGNMENT 203, Pipe 230A - 232A						0.44	77											
Contribution From ALIGNMENT 203, Pipe 231A - 232A						0.38	44											
	232A	233A	0.28	50	14	1.10	135	0.013	0.0003	0.00	0.013	72.0	250	0.50	0.042	0.86	0.7583	
To ALIGNMENT 205, Pipe 233A - 234A						1.10	135											
Contribution From ALIGNMENT 202, Pipe 214A - 215A						0.09	16											
			0.15	50	8	0.24	24											
	215A	217A	1.08	475	513	1.32	537	0.013	0.0004	0.00	0.013	34.0	250	1.45	0.072	1.46	1.1113	
Contribution From ALIGNMENT 203, Pipe 216A - 217A						0.08	14											
	217A	218A	0.36	50	18	1.76	569	0.013	0.0005	0.00	0.014	61.0	250	2.00	0.084	1.71	1.2541	
Contribution From ALIGNMENT 209, Pipe 204A - 218A						0.26	46											
	218A	219A	0.61	50	31	2.63	646	0.013	0.0008	0.00	0.014	100.5	250	0.60	0.046	0.94	0.8141	
	219A	220A	0.11	50	6	2.74	652	0.013	0.0008	0.00	0.014	27.0	250	0.50	0.042	0.86	0.7632	
Contribution From ALIGNMENT 209, Pipe 213A - 220A						3.28	295											
	220A	221A	0.18	50	9	6.20	956	0.013	0.0018	0.00	0.015	40.0	250	0.30	0.033	0.66	0.6459	

CONSULTANT: David Schaeffer Engineering Ltd.
SUBDIVISION:
Mayfield West Phase 1 Stage 2 Community

SHEET 2 OF 13
PROJECT NO.: 21-1257
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THE REGIONAL MUNICIPALITY OF PEEL
DEPARTMENT OF PUBLIC WORKS
STANDARD DRAWING

n = 0.013
single family > 10m lots --- 50 p/ha
single family < 10m lots / semi-detached --- 70 p/ha
townhouse --- 175p/ha

Approved:

Date:

STD. DWG

LOCATION	FROM MH	TO MH	AREA (ha)	DENSITY (ppha)	POPULATION	CUMULATIVE AREA (HA)	CUMULATIVE POPULATION	SEWAGE FLOW (m3/s), [1]	INFILTRATION FLOW 0.0002c.m./s/ha (m3/s), [2]	FOUNDATION DRAINS (m3/s), [3]	TOTAL FLOW (m3/s), [1+2+3]	PIPE LENGTH (m)	PIPE DIAMETER (mm)	GRADIENT (%)	CAPACITY (m3/s)	VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	DROP IN LOWER MH (m)
	221A	222A	0.21	50	11	6.41	967	0.013	0.0018	0.00	0.015	13.5	250	0.30	0.033	0.66	0.6459	
	222A	226A	0.42	50	21	6.83	988	0.013	0.0020	0.00	0.015	62.0	250	0.30	0.033	0.66	0.6489	
Contribution From ALIGNMENT 204, Pipe 225A - 226A						1.33	67											
	226A	227A	0.43	50	22	8.59	1077	0.014	0.0025	0.00	0.017	61.5	250	0.30	0.033	0.66	0.6663	
	227A	228A	0.11	50	6	8.70	1083	0.014	0.0025	0.00	0.017	10.5	250	0.30	0.033	0.66	0.6663	
	228A	229A	0.29	50	15	8.99	1098	0.015	0.0026	0.00	0.017	52.0	250	0.30	0.033	0.66	0.6691	
			0.33	50	17	9.32	1115											
	229A	233A	0.82	0	0	10.14	1115	0.015	0.0029	0.00	0.018	72.0	250	0.30	0.033	0.66	0.6745	
To ALIGNMENT 205, Pipe 233A - 234A						10.14	1115											
ALIGNMENT 205																		
Contribution From ALIGNMENT 202, Pipe 236A - 237A						0.69	122											
	237A	238A	0.22	50	11	0.91	133	0.013	0.0003	0.00	0.013	9.0	250	0.50	0.042	0.86	0.7583	
	238A	239A	0.42	50	21	1.33	154	0.013	0.0004	0.00	0.013	81.0	250	0.60	0.046	0.94	0.8084	
	239A	240A				1.33	154	0.013	0.0004	0.00	0.013	12.0	250	0.50	0.042	0.86	0.7583	
To SERVICING EASEMENT - NEW HOUSE CROSSING, Pipe 240A - 241A						1.33	154											
Contribution From ALIGNMENT 201, Pipe 229A - 233A						10.14	1115											
Contribution From ALIGNMENT 201, Pipe 232A - 233A						1.10	135											
	233A	234A	0.19	50	10	11.43	1260	0.016	0.0033	0.00	0.020	46.5	250	0.30	0.033	0.66	0.6943	
	234A	240A	0.05	50	3	11.48	1263	0.017	0.0033	0.00	0.020	22.0	250	0.30	0.033	0.66	0.6943	
To SERVICING EASEMENT - NEW HOUSE CROSSING, Pipe 240A - 241A						11.48	1263											
SERVICING EASEMENT - NEW HOUSE CROSSING																		
Contribution From ALIGNMENT 205, Pipe 234A - 240A						11.48	1263											
Contribution From ALIGNMENT 205, Pipe 239A - 240A						1.33	154											
	240A	241A				12.81	1417	0.018	0.0037	0.00	0.022	36.0	250	0.30	0.033	0.66	0.7116	
	241A	242A				12.81	1417	0.018	0.0037	0.00	0.022	81.0	250	1.00	0.059	1.21	1.1193	
	242A	245A				12.81	1417	0.018	0.0037	0.00	0.022	32.5	250	0.30	0.033	0.66	0.7116	
To ALIGNMENT 207, Pipe 245A - 248A						12.81	1417											

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SUBDIVISION:
Mayfield West Phase 1 Stage 2 Community

SHEET 3 OF 13
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THE REGIONAL MUNICIPALITY OF PEEL
DEPARTMENT OF PUBLIC WORKS
STANDARD DRAWING

n = 0.013
single family > 10m lots --- 50 p/ha
single family < 10m lots / semi-detached --- 70 p/ha
townhouse --- 175p/ha

Approved: ....

Date: ....

STD. DWG

LOCATION	FROM MH	TO MH	AREA (ha)	DENSITY (ppha)	POPULATION	CUMULATIVE AREA (HA)	CUMULATIVE POPULATION	SEWAGE FLOW (m3/s), [1]	INFILTRATION FLOW 0.0002c.m./s/ha (m3/s), [2]	FOUNDATION DRAINS (m3/s), [3]	TOTAL FLOW (m3/s), [1+2+3]	PIPE LENGTH (m)	PIPE DIAMETER (mm)	GRADIENT (%)	CAPACITY (m3/s)	VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	DROP IN LOWER MH (m)
ALIGNMENT 208																		
	320A	321A	0.14	50	7	0.14	7	0.013	0.0000	0.00	0.013	27.0	250	1.00	0.059	1.21	0.9655	
	321A	324A	0.08	50	4	0.22	11	0.013	0.0001	0.00	0.013	25.0	250	0.50	0.042	0.86	0.7533	
To ALIGNMENT 304, Pipe 324A - 325A						0.22	11											
	327A	328A	0.62	50	31	0.62	31	0.013	0.0002	0.00	0.013	90.0	250	1.00	0.059	1.21	0.9655	
	328A	329A	0.04	50	2	0.66	33	0.013	0.0002	0.00	0.013	27.0	250	0.50	0.042	0.86	0.7533	
	329A	330A	0.01	50	1	0.67	34	0.013	0.0002	0.00	0.013	7.0	250	0.50	0.042	0.86	0.7533	
To ALIGNMENT 207, Pipe 330A - 331A						0.67	34											
ALIGNMENT 207																		
	246A	247A	0.52	50	26	0.52	26	0.013	0.0001	0.00	0.013	55.0	250	2.00	0.084	1.71	1.2409	
	247A	248A				0.52	26	0.013	0.0001	0.00	0.013	2.5	250	0.50	0.042	0.86	0.7533	
Contribution From ALIGNMENT 208, Pipe 329A - 330A						0.67	34											
	330A	331A	0.28	50	14	0.95	48	0.013	0.0003	0.00	0.013	38.0	250	0.50	0.042	0.86	0.7583	
To ALIGNMENT 302, Pipe 331A - 332A						0.95	48											
	243A	244A	0.63	50	32	0.63	32	0.013	0.0002	0.00	0.013	81.5	250	1.00	0.059	1.21	0.9655	
	244A	245A	0.26	50	13	0.89	45	0.013	0.0003	0.00	0.013	44.5	250	0.50	0.042	0.86	0.7583	
Contribution From SERVICING EASEMENT - NEW HOUSE CROSSING, Pipe 242A - 245A						12.81	1417											
	245A	248A	0.20	50	10	13.90	1472	0.019	0.0040	0.00	0.023	12.5	250	0.30	0.033	0.66	0.7174	
	248A	333A				14.42	1498	0.019	0.0041	0.00	0.023	65.0	300	0.20	0.043	0.61	0.6219	
	333A	334A				14.42	1498	0.019	0.0041	0.00	0.023	38.0	300	0.20	0.043	0.61	0.6219	
To ALIGNMENT 302, Pipe 334A - 335A						14.42	1498											
ALIGNMENT 301																		
	313A	314A	0.57	50	29	0.57	29	0.013	0.0002	0.00	0.013	60.5	250	2.00	0.084	1.71	1.2409	
	314A	319A	0.40	50	20	0.97	49	0.013	0.0003	0.00	0.013	86.0	250	1.30	0.068	1.38	1.0720	
To ALIGNMENT 302, Pipe 319A - 337A						0.97	49											

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SHEET 4 OF 13
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THE REGIONAL MUNICIPALITY OF PEEL
DEPARTMENT OF PUBLIC WORKS
STANDARD DRAWING

n = 0.013
single family > 10m lots --- 50 p/ha
single family < 10m lots / semi-detached --- 70 p/ha
townhouse --- 175p/ha

Approved:

Date:

STD. DWG

LOCATION	FROM MH	TO MH	AREA (ha)	DENSITY (ppha)	POPULATION	CUMULATIVE AREA (HA)	CUMULATIVE POPULATION	SEWAGE FLOW (m3/s), [1]	INFILTRATION FLOW 0.0002c.m./s/ha (m3/s), [2]	FOUNDATION DRAINS (m3/s), [3]	TOTAL FLOW (m3/s), [1+2+3]	PIPE LENGTH (m)	PIPE DIAMETER (mm)	GRADIENT (%)	CAPACITY (m3/s)	VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	DROP IN LOWER MH (m)
ALIGNMENT 303																		
	315A	316A	0.40	50	20	0.40	20	0.013	0.0001	0.00	0.013	60.0	250	2.00	0.084	1.71	1.2409	
	316A	318A	0.37	50	19	0.77	39	0.013	0.0002	0.00	0.013	75.5	250	0.50	0.042	0.86	0.7583	
To ALIGNMENT 302, Pipe 318A - 319A						0.77	39											
	322A	323A	0.24	50	12	0.24	12	0.013	0.0001	0.00	0.013	42.5	250	2.00	0.084	1.71	1.2409	
	323A	324A	0.02	50	1	0.26	13	0.013	0.0001	0.00	0.013	11.5	250	1.70	0.078	1.58	1.1682	
To ALIGNMENT 304, Pipe 324A - 325A						0.26	13											
ALIGNMENT 304																		
Contribution From ALIGNMENT 208, Pipe 321A - 324A						0.22	11											
Contribution From ALIGNMENT 303, Pipe 323A - 324A						0.26	13											
	324A	325A	0.05	50	3	0.53	27	0.013	0.0002	0.00	0.013	34.0	250	0.50	0.042	0.86	0.7533	
	325A	326A	0.42	50	21	0.95	48	0.013	0.0003	0.00	0.013	59.0	250	0.60	0.046	0.94	0.8084	
	326A	332A	0.05	50	3	1.00	51	0.013	0.0003	0.00	0.013	32.5	250	0.50	0.042	0.86	0.7583	
Contribution From ALIGNMENT 302, Pipe 331A - 332A						1.11	56											
	332A	335A				2.11	107	0.013	0.0006	0.00	0.014	2.5	250	0.50	0.042	0.86	0.7632	
To ALIGNMENT 302, Pipe 335A - 336A						2.11	107											
ALIGNMENT 302																		
	317A	318A	0.48	50	24	0.48	24	0.013	0.0001	0.00	0.013	51.0	250	1.00	0.059	1.21	0.9655	
Contribution From ALIGNMENT 303, Pipe 316A - 318A						0.77	39											
	318A	319A	0.53	50	27	1.78	90	0.013	0.0005	0.00	0.014	76.0	250	0.50	0.042	0.86	0.7583	
	306A	307A	0.22	50	11	0.22	11	0.013	0.0001	0.00	0.013	47.0	250	1.00	0.059	1.21	0.9655	
	307A	308A	0.15	50	8	0.37	19	0.013	0.0001	0.00	0.013	53.0	250	0.55	0.044	0.90	0.7794	
	308A	309A	0.06	50	3	0.43	22	0.013	0.0001	0.00	0.013	11.5	250	2.00	0.084	1.71	1.2409	
	309A	310A	0.37	50	19	0.80	41	0.013	0.0002	0.00	0.013	57.0	250	2.00	0.084	1.71	1.2409	
Contribution From ALIGNMENT 207, Pipe 330A - 331A						0.95	48											
	331A	332A	0.16	50	8	1.11	56	0.013	0.0003	0.00	0.013	26.5	250	0.90	0.056	1.15	0.9392	
To ALIGNMENT 304, Pipe 332A - 335A						1.11	56											

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SHEET 5 OF 13
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LOCATION	FROM MH	TO MH	AREA (ha)	DENSITY (ppha)	POPULATION	CUMULATIVE AREA (HA)	CUMULATIVE POPULATION	SEWAGE FLOW (m3/s), [1]	INFILTRATION FLOW 0.0002c.m./s/ha (m3/s), [2]	FOUNDATION DRAINS (m3/s), [3]	TOTAL FLOW (m3/s), [1+2+3]	PIPE LENGTH (m)	PIPE DIAMETER (mm)	GRADIENT (%)	CAPACITY (m3/s)	VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	DROP IN LOWER MH (m)
	300A	301A	0.17	50	9	0.17	9	0.013	0.0000	0.00	0.013	33.0	250	1.00	0.059	1.21	0.9655	
	301A	302A	0.12	50	6	0.29	15	0.013	0.0001	0.00	0.013	15.0	250	0.50	0.042	0.86	0.7533	
	302A	303A	0.24	50	12	0.53	27	0.013	0.0002	0.00	0.013	53.5	250	2.00	0.084	1.71	1.2409	
	303A	304A	0.09	50	5	0.62	32	0.013	0.0002	0.00	0.013	10.5	250	1.55	0.074	1.51	1.1380	
	304A	305A	0.83	50	42	1.45	74	0.013	0.0004	0.00	0.013	116.5	250	0.55	0.044	0.90	0.7848	
	305A	310A	0.06	50	3	1.51	77	0.013	0.0004	0.00	0.013	38.0	250	0.50	0.042	0.86	0.7583	
	310A	311A	0.55	50	28	2.86	146	0.013	0.0008	0.00	0.014	93.0	250	0.50	0.042	0.86	0.7632	
			0.02	50	1	2.88	147											
	311A	312A	0.34	0	0	3.22	147	0.013	0.0009	0.00	0.014	9.5	250	0.50	0.042	0.86	0.7681	
	312A	319A				3.22	147	0.013	0.0009	0.00	0.014	61.5	250	0.50	0.042	0.86	0.7681	
Contribution From ALIGNMENT 301, Pipe 314A - 319A						0.97	49											
	319A	337A				5.97	286	0.013	0.0017	0.00	0.015	2.5	250	0.50	0.042	0.86	0.7776	
To SERVICING EASEMENT - HICKS CROSSING, Pipe 337A - 338A						5.97	286											
Contribution From ALIGNMENT 207, Pipe 333A - 334A						14.42	1498											
	334A	335A				14.42	1498	0.019	0.0041	0.00	0.023	26.0	300	0.20	0.043	0.61	0.6219	
Contribution From ALIGNMENT 304, Pipe 332A - 335A						2.11	107											
	335A	336A				16.53	1605	0.021	0.0047	0.00	0.025	65.5	300	0.20	0.043	0.61	0.6336	
	336A	337A				16.53	1605	0.021	0.0047	0.00	0.025	76.0	300	0.20	0.043	0.61	0.6336	
To SERVICING EASEMENT - HICKS CROSSING, Pipe 337A - 338A						16.53	1605											
SERVICING EASEMENT - HICKS CROSSING																		
Contribution From ALIGNMENT 302, Pipe 319A - 337A						5.97	286											
Contribution From ALIGNMENT 302, Pipe 336A - 337A						16.53	1605											
	337A	338A	0.48	50	24	22.98	1915	0.024	0.0066	0.00	0.031	46.5	300	0.20	0.043	0.61	0.6631	
	338A	339A				22.98	1915	0.024	0.0066	0.00	0.031	129.0	300	1.00	0.097	1.37	1.2110	
	339A	132A				22.98	1915	0.024	0.0066	0.00	0.031	26.0	300	0.20	0.043	0.61	0.6631	
To SANITARY PUMP STATION						22.98	1915											

CONSULTANT: David Schaeffer Engineering Ltd.
SUBDIVISION:
Mayfield West Phase 1 Stage 2 Community

SHEET 6 OF 13
PROJECT NO.: 21-1257
DATE: Jul 2021 DESIGNED BY: V.C.

THE REGIONAL MUNICIPALITY OF PEEL
DEPARTMENT OF PUBLIC WORKS
STANDARD DRAWING

n = 0.013
single family > 10m lots --- 50 p/ha
single family < 10m lots / semi-detached --- 70 p/ha
townhouse --- 175p/ha

Approved:

Date:

STD. DWG

LOCATION	FROM MH	TO MH	AREA (ha)	DENSITY (ppha)	POPULATION	CUMULATIVE AREA (HA)	CUMULATIVE POPULATION	SEWAGE FLOW (m3/s), [1]	INFILTRATION FLOW 0.0002c.m./s/ha (m3/s), [2]	FOUNDATION DRAINS (m3/s), [3]	TOTAL FLOW (m3/s), [1+2+3]	PIPE LENGTH (m)	PIPE DIAMETER (mm)	GRADIENT (%)	CAPACITY (m3/s)	VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	DROP IN LOWER MH (m)
OLD SCHOOL ROAD																		
	413A	414A	0.33	175	58	0.33	58	0.013	0.0001	0.00	0.013	97.5	250	1.00	0.059	1.21	0.9655	
To ALIGNMENT 401, Pipe 414A - 415A						0.33	58											
	100A	101A	0.36	175	63	0.36	63	0.013	0.0001	0.00	0.013	92.5	250	1.50	0.073	1.48	1.1195	
	101A	102A	0.36	175	63	0.72	126	0.013	0.0002	0.00	0.013	120.0	250	2.00	0.084	1.71	1.2409	
To KENNEDY ROAD, Pipe 102A - 104A						0.72	126											
KENNEDY ROAD																		
Contribution From OLD SCHOOL ROAD, Pipe 101A - 102A						0.72	126											
	102A	104A	0.42	175	74	1.14	200	0.013	0.0003	0.00	0.013	103.0	250	0.50	0.042	0.86	0.7583	
To ALIGNMENT 102, Pipe 104A - 105A						1.14	200											
	103A	104A	0.57	175	100	0.57	100	0.013	0.0002	0.00	0.013	83.5	250	1.60	0.075	1.53	1.1449	
To ALIGNMENT 102, Pipe 104A - 105A						0.57	100											
	108A	111A	0.53	175	93	0.53	93	0.013	0.0002	0.00	0.013	80.0	250	1.20	0.065	1.33	1.0300	
To ALIGNMENT 103, Pipe 111A - 114A						0.53	93											
	109A	110A	0.58	50	29	0.58	29	0.013	0.0002	0.00	0.013	55.0	250	1.00	0.059	1.21	0.9655	
	110A	111A	0.37	50	19	0.95	48	0.013	0.0003	0.00	0.013	60.0	250	0.60	0.046	0.94	0.8084	
To ALIGNMENT 103, Pipe 111A - 114A						0.95	48											
ALIGNMENT 102																		
	112A	113A	0.53	50	27	0.53	27	0.013	0.0002	0.00	0.013	60.0	250	1.00	0.059	1.21	0.9655	
	113A	114A	0.35	50	18	0.88	45	0.013	0.0003	0.00	0.013	60.0	250	2.00	0.084	1.71	1.2409	
To ALIGNMENT 103, Pipe 114A - 115A						0.88	45											

CONSULTANT: David Schaeffer Engineering Ltd.
SUBDIVISION:
Mayfield West Phase 1 Stage 2 Community

SHEET 7 OF 13
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THE REGIONAL MUNICIPALITY OF PEEL
DEPARTMENT OF PUBLIC WORKS
STANDARD DRAWING

n = 0.013
single family > 10m lots --- 50 p/ha
single family < 10m lots / semi-detached --- 70 p/ha
townhouse --- 175p/ha

Approved:

Date:

STD. DWG

LOCATION	FROM MH	TO MH	AREA (ha)	DENSITY (ppha)	POPULATION	CUMULATIVE AREA (HA)	CUMULATIVE POPULATION	SEWAGE FLOW (m3/s), [1]	INFILTRATION FLOW 0.0002c.m./s/ha (m3/s), [2]	FOUNDATION DRAINS (m3/s), [3]	TOTAL FLOW (m3/s), [1+2+3]	PIPE LENGTH (m)	PIPE DIAMETER (mm)	GRADIENT (%)	CAPACITY (m3/s)	VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	DROP IN LOWER MH (m)
Contribution From KENNEDY ROAD, Pipe 102A - 104A						1.14	200											
Contribution From KENNEDY ROAD, Pipe 103A - 104A						0.57	100											
	104A	105A	0.24	50	12	1.95	312	0.013	0.0006	0.00	0.014	58.0	250	0.50	0.042	0.86	0.7632	
	105A	106A	0.17	50	9	2.12	321	0.013	0.0006	0.00	0.014	14.5	250	0.50	0.042	0.86	0.7632	
			0.26	175	46	2.38	367											
	106A	107A	0.42	50	21	2.80	388	0.013	0.0008	0.00	0.014	88.0	250	0.50	0.042	0.86	0.7632	
			0.22	175	39	3.02	427											
	107A	114A	0.24	50	12	3.26	439	0.013	0.0009	0.00	0.014	80.0	250	0.50	0.042	0.86	0.7681	
To ALIGNMENT 103, Pipe 114A - 115A						3.26	439											
ALIGNMENT 103																		
	117A	118A	0.37	50	19	0.37	19	0.013	0.0001	0.00	0.013	54.0	250	2.00	0.084	1.71	1.2409	
To ALIGNMENT 104, Pipe 118A - 119A						0.37	19											
Contribution From KENNEDY ROAD, Pipe 108A - 111A						0.53	93											
Contribution From KENNEDY ROAD, Pipe 110A - 111A						0.95	48											
	111A	114A	0.25	175	44	1.73	185	0.013	0.0005	0.00	0.013	70.0	250	0.70	0.050	1.01	0.8607	
Contribution From ALIGNMENT 102, Pipe 107A - 114A						3.26	439											
Contribution From ALIGNMENT 102, Pipe 113A - 114A						0.88	45											
	114A	115A	0.22	50	11	6.09	680	0.013	0.0017	0.00	0.015	67.0	250	0.50	0.042	0.86	0.7776	
	115A	116A	0.06	50	3	6.15	683	0.013	0.0018	0.00	0.015	11.0	250	0.50	0.042	0.86	0.7776	
	116A	118A	0.53	50	27	6.68	710	0.013	0.0019	0.00	0.015	84.5	250	0.50	0.042	0.86	0.7823	
To ALIGNMENT 104, Pipe 118A - 119A						6.68	710											
ALIGNMENT 104																		
Contribution From ALIGNMENT 103, Pipe 116A - 118A						6.68	710											
Contribution From ALIGNMENT 103, Pipe 117A - 118A						0.37	19											
	118A	119A	0.18	50	9	7.23	738	0.013	0.0021	0.00	0.015	43.0	250	0.50	0.042	0.86	0.7823	
	119A	120A	0.51	50	26	7.74	764	0.013	0.0022	0.00	0.015	58.5	250	0.50	0.042	0.86	0.7868	
	120A	121A	0.32	50	16	8.06	780	0.013	0.0023	0.00	0.015	57.0	250	0.50	0.042	0.86	0.7868	
	121A	122A	0.03	50	2	8.09	782	0.013	0.0023	0.00	0.015	16.5	250	0.50	0.042	0.86	0.7868	
			0.24	50	12	8.33	794											
	122A	128A	0.33	0	0	8.66	794	0.013	0.0025	0.00	0.015	61.0	250	0.50	0.042	0.86	0.7868	
To ALIGNMENT 101, Pipe 128A - 129A						8.66	794											

CONSULTANT: David Schaeffer Engineering Ltd.
SUBDIVISION:
Mayfield West Phase 1 Stage 2 Community

SHEET 8 OF 13
PROJECT NO.: 21-1257
DATE: Jul 2021 DESIGNED BY: V.C.

THE REGIONAL MUNICIPALITY OF PEEL
DEPARTMENT OF PUBLIC WORKS
STANDARD DRAWING

n = 0.013
single family > 10m lots --- 50 p/ha
single family < 10m lots / semi-detached --- 70 p/ha
townhouse --- 175p/ha

Approved:

Date:

STD. DWG

1151_San1.xlsx

LOCATION	FROM MH	TO MH	AREA (ha)	DENSITY (ppha)	POPULATION	CUMULATIVE AREA (HA)	CUMULATIVE POPULATION	SEWAGE FLOW (m3/s), [1]	INFILTRATION FLOW 0.0002c.m./s/ha (m3/s), [2]	FOUNDATION DRAINS (m3/s), [3]	TOTAL FLOW (m3/s), [1+2+3]	PIPE LENGTH (m)	PIPE DIAMETER (mm)	GRADIENT (%)	CAPACITY (m3/s)	VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	DROP IN LOWER MH (m)
ALIGNMENT 101	123A	124A	0.35	50	18	0.35	18	0.013	0.0001	0.00	0.013	36.0	250	1.00	0.059	1.21	0.9655	
	124A	125A	0.50	50	25	0.85	43	0.013	0.0002	0.00	0.013	69.5	250	1.85	0.081	1.65	1.2062	
	125A	126A	0.19	50	10	1.04	53	0.013	0.0003	0.00	0.013	46.0	250	2.00	0.084	1.71	1.2409	
	126A	127A	0.46	50	23	1.50	76	0.013	0.0004	0.00	0.013	60.0	250	2.00	0.084	1.71	1.2541	
	127A	128A	0.38	50	19	1.88	95	0.013	0.0005	0.00	0.014	66.5	250	1.60	0.075	1.53	1.1562	
Contribution From ALIGNMENT 104, Pipe 122A - 128A						8.66	794											
	128A	129A	0.55	50	28	11.09	917	0.013	0.0032	0.00	0.016	84.5	250	0.50	0.042	0.86	0.8004	
	129A	130A	0.88	50	44	11.97	961	0.013	0.0034	0.00	0.016	114.0	250	0.50	0.042	0.86	0.8004	
	130A	131A	0.43	50	22	12.40	983	0.013	0.0035	0.00	0.017	24.5	250	0.50	0.042	0.86	0.8047	
To SERVICING EASEMENT - HICKS CROSSING, Pipe 131A - 132A						12.40	983											
SERVICING EASEMENT - HICKS CROSSING																		
Contribution From ALIGNMENT 101, Pipe 130A - 131A						12.40	983											
	131A	132A				12.40	983	0.013	0.0035	0.00	0.017	20.0	250	0.50	0.042	0.86	0.8047	
To SANITARY PUMP STATION						12.40	983											
KENNEDY ROAD																		
Contribution From SANITARY FORCEMAIN						22.98	1915											
Contribution From SANITARY FORCEMAIN						12.40	983											
			0.49	50	25	35.87	2923											
	135A	136A	0.95	0	0	36.82	2923	0.035	0.0105	0.00	0.046	60.0	250	2.00	0.084	1.71	1.7482	
	136A	Ex. PLUG	0.33	50	17	37.15	2940	0.036	0.0106	0.00	0.046	57.5	300	0.35	0.057	0.81	0.9003	
To EXISTING KENNEDY ROAD TRUNK Pipe 93A - 94A						37.15	2940											
ALIGNMENT 402			0.27	175	48	0.27	48											
	417A	418A	0.30	50	15	0.57	63	0.013	0.0002	0.00	0.013	80.0	250	1.10	0.062	1.27	1.0040	
To ALIGNMENT 408, Pipe 418A - 419A						0.57	63											
			0.42	50	21	0.42	21											
	400A	401A	0.47	175	83	0.89	104	0.013	0.0003	0.00	0.013	146.0	250	1.00	0.059	1.21	0.9738	
	401A	402A	0.12	175	21	1.01	125	0.013	0.0003	0.00	0.013	10.5	250	1.55	0.074	1.51	1.1380	
			0.18	175	32	1.19	157											
	402A	403A	0.19	50	10	1.38	167	0.013	0.0004	0.00	0.013	58.0	250	0.60	0.046	0.94	0.8084	
			0.23	175	41	1.61	208											
	403A	404A	0.27	50	14	1.88	222	0.013	0.0005	0.00	0.014	73.0	250	0.75	0.052	1.05	0.8777	

CONSULTANT: David Schaeffer Engineering Ltd.
SUBDIVISION:
Mayfield West Phase 1 Stage 2 Community

SHEET 9 OF 13
PROJECT NO.: 21-1257
DATE: Jul 2021 DESIGNED BY: V.C.

THE REGIONAL MUNICIPALITY OF PEEL
DEPARTMENT OF PUBLIC WORKS
STANDARD DRAWING

n = 0.013
single family > 10m lots --- 50 p/ha
single family < 10m lots / semi-detached --- 70 p/ha
townhouse --- 175p/ha

Approved:

Date:

STD. DWG
1151 San1.xlsx

LOCATION	FROM MH	TO MH	AREA (ha)	DENSITY (ppha)	POPULATION	CUMULATIVE AREA (HA)	CUMULATIVE POPULATION	SEWAGE FLOW (m3/s), [1]	INFILTRATION FLOW 0.0002c.m./s/ha (m3/s), [2]	FOUNDATION DRAINS (m3/s), [3]	TOTAL FLOW (m3/s), [1+2+3]	PIPE LENGTH (m)	PIPE DIAMETER (mm)	GRADIENT (%)	CAPACITY (m3/s)	VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	DROP IN LOWER MH (m)
			0.20	175	35	2.08	257											
	404A	410A	0.27	50	14	2.35	271	0.013	0.0007	0.00	0.014	73.0	250	0.70	0.050	1.01	0.8607	
To ALIGNMENT 406, Pipe 410A - 411A						2.35	271											
	405A	406A	0.38	50	19	0.38	19	0.013	0.0001	0.00	0.013	49.5	250	1.00	0.059	1.21	0.9655	
	406A	407A	0.22	50	11	0.60	30	0.013	0.0002	0.00	0.013	20.5	250	0.50	0.042	0.86	0.7533	
	407A	408A	0.43	50	22	1.03	52	0.013	0.0003	0.00	0.013	61.5	250	0.50	0.042	0.86	0.7583	
	408A	409A	0.15	50	8	1.18	60	0.013	0.0003	0.00	0.013	11.0	250	0.50	0.042	0.86	0.7583	
	409A	410A	0.41	50	21	1.59	81	0.013	0.0005	0.00	0.013	67.5	250	0.50	0.042	0.86	0.7583	
To ALIGNMENT 406, Pipe 410A - 411A						1.59	81											
ALIGNMENT 406																		
Contribution From ALIGNMENT 402, Pipe 404A - 410A						2.35	271											
Contribution From ALIGNMENT 402, Pipe 409A - 410A						1.59	81											
			0.06	50	3	4.00	355											
	410A	411A	0.33	175	58	4.33	413	0.013	0.0012	0.00	0.014	34.5	250	0.50	0.042	0.86	0.7729	
	411A	412A	0.63	50	32	4.96	445	0.013	0.0014	0.00	0.014	86.5	250	0.50	0.042	0.86	0.7729	
	412A	428A	0.06	50	3	5.02	448	0.013	0.0014	0.00	0.014	38.0	250	0.50	0.042	0.86	0.7729	
To ALIGNMENT 401, Pipe 428A - 430A						5.02	448											
ALIGNMENT 407	425A	426A	0.72	50	36	0.72	36	0.013	0.0002	0.00	0.013	94.5	250	1.00	0.059	1.21	0.9738	
	426A	427A	0.06	50	3	0.78	39	0.013	0.0002	0.00	0.013	39.0	250	0.50	0.042	0.86	0.7583	
To ALIGNMENT 401, Pipe 427A - 428A						0.78	39											
ALIGNMENT 408	421A	422A	0.49	50	25	0.49	25	0.013	0.0001	0.00	0.013	60.0	250	1.00	0.059	1.21	0.9655	
	422A	423A	0.34	50	17	0.83	42	0.013	0.0002	0.00	0.013	77.0	250	0.80	0.053	1.08	0.8926	
To ALIGNMENT 401, Pipe 423A - 424A						0.83	42											
Contribution From ALIGNMENT 402, Pipe 417A - 418A						0.57	63											
	418A	419A	0.20	50	10	0.77	73	0.013	0.0002	0.00	0.013	59.5	250	0.75	0.052	1.05	0.8777	
	419A	420A	0.07	50	4	0.84	77	0.013	0.0002	0.00	0.013	13.0	250	2.00	0.084	1.71	1.2409	
	420A	423A	0.62	50	31	1.46	108	0.013	0.0004	0.00	0.013	89.0	250	0.50	0.042	0.86	0.7583	
To ALIGNMENT 401, Pipe 423A - 424A						1.46	108											
ALIGNMENT 401	429A	430A	0.45	50	23	0.45	23	0.013	0.0001	0.00	0.013	53.5	250	1.00	0.059	1.21	0.9655	
To ALIGNMENT 405, Pipe 430A - 431A						0.45	23											

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SHEET 10 OF 13
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THE REGIONAL MUNICIPALITY OF PEEL
DEPARTMENT OF PUBLIC WORKS
STANDARD DRAWING

n = 0.013
single family > 10m lots --- 50 p/ha
single family < 10m lots / semi-detached --- 70 p/ha
townhouse --- 175p/ha

Approved:

Date:

STD. DWG

1151_San1.xlsx

LOCATION	FROM MH	TO MH	AREA (ha)	DENSITY (ppha)	POPULATION	CUMULATIVE AREA (HA)	CUMULATIVE POPULATION	SEWAGE FLOW (m3/s), [1]	INFILTRATION FLOW 0.0002c.m./s/ha (m3/s), [2]	FOUNDATION DRAINS (m3/s), [3]	TOTAL FLOW (m3/s), [1+2+3]	PIPE LENGTH (m)	PIPE DIAMETER (mm)	GRADIENT (%)	CAPACITY (m3/s)	VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	DROP IN LOWER MH (m)
			0.11	50	6	0.11	6											
	441A	443A	0.41	50	21	0.52	27	0.013	0.0001	0.00	0.013	75.5	250	1.00	0.059	1.21	0.9655	
To ALIGNMENT 402, Pipe 443A - 444A						0.52	27											
	442A	443A	0.27	50	14	0.27	14	0.013	0.0001	0.00	0.013	24.0	250	1.00	0.059	1.21	0.9655	
To ALIGNMENT 402, Pipe 443A - 444A						0.27	14											
	448A	449A	0.12	50	6	0.12	6	0.013	0.0000	0.00	0.013	23.0	250	1.00	0.059	1.21	0.9655	
To ALIGNMENT 402, Pipe 449A - 450A						0.12	6											
Contribution From OLD SCHOOL ROAD, Pipe 413A - 414A						0.33	58											
	414A	415A	0.06	175	11	0.39	69	0.013	0.0001	0.00	0.013	39.5	250	0.50	0.042	0.86	0.7533	
			0.05	175	9	0.44	78											
	415A	416A	0.14	175	25	0.58	103	0.013	0.0002	0.00	0.013	34.0	250	0.50	0.042	0.86	0.7533	
	416A	423A	0.26	50	13	0.84	116	0.013	0.0002	0.00	0.013	69.0	250	0.50	0.042	0.86	0.7583	
Contribution From ALIGNMENT 408, Pipe 420A - 423A						1.46	108											
Contribution From ALIGNMENT 408, Pipe 422A - 423A						0.83	42											
	423A	424A	0.11	50	6	3.24	272	0.013	0.0009	0.00	0.014	35.5	250	0.50	0.042	0.86	0.7681	
	424A	427A	0.20	50	10	3.44	282	0.013	0.0010	0.00	0.014	50.5	250	0.50	0.042	0.86	0.7681	
Contribution From ALIGNMENT 407, Pipe 426A - 427A						0.78	39											
	427A	428A	0.27	50	14	4.49	335	0.013	0.0013	0.00	0.014	72.5	250	0.50	0.042	0.86	0.7729	
Contribution From ALIGNMENT 406, Pipe 412A - 428A						5.02	448											
			0.27	50	14	9.78	797											
	428A	430A	1.87	0	0	11.65	797	0.013	0.0033	0.00	0.016	65.5	250	0.50	0.042	0.86	0.8004	
To ALIGNMENT 405, Pipe 430A - 431A						11.65	797											
ALIGNMENT 405																		
Contribution From ALIGNMENT 401, Pipe 428A - 430A						11.65	797											
Contribution From ALIGNMENT 401, Pipe 429A - 430A						0.45	23											
	430A	431A	0.12	50	6	12.22	826	0.013	0.0035	0.00	0.016	40.0	250	0.50	0.042	0.86	0.8047	
	431A	432A	0.73	50	37	12.95	863	0.013	0.0037	0.00	0.017	93.0	250	0.50	0.042	0.86	0.8047	
	432A	433A	0.13	50	7	13.08	870	0.013	0.0037	0.00	0.017	9.0	250	0.50	0.042	0.86	0.8047	
	433A	434A	0.14	50	7	13.22	877	0.013	0.0038	0.00	0.017	31.0	250	0.50	0.042	0.86	0.8047	

CONSULTANT: David Schaeffer Engineering Ltd.
SUBDIVISION:
Mayfield West Phase 1 Stage 2 Community

SHEET 11 OF 13
PROJECT NO.: 21-1257
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THE REGIONAL MUNICIPALITY OF PEEL
DEPARTMENT OF PUBLIC WORKS
STANDARD DRAWING

n = 0.013
single family > 10m lots --- 50 p/ha
single family < 10m lots / semi-detached --- 70 p/ha
townhouse --- 175p/ha

Approved:

Date:

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LOCATION	FROM MH	TO MH	AREA (ha)	DENSITY (ppha)	POPULATION	CUMULATIVE AREA (HA)	CUMULATIVE POPULATION	SEWAGE FLOW (m3/s), [1]	INFILTRATION FLOW 0.0002c.m./s/ha (m3/s), [2]	FOUNDATION DRAINS (m3/s), [3]	TOTAL FLOW (m3/s), [1+2+3]	PIPE LENGTH (m)	PIPE DIAMETER (mm)	GRADIENT (%)	CAPACITY (m3/s)	VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	DROP IN LOWER MH (m)
	434A	435A	0.16	50	8	13.38	885	0.013	0.0038	0.00	0.017	30.0	250	0.50	0.042	0.86	0.8047	
	435A	436A	0.02	50	1	13.40	886	0.013	0.0038	0.00	0.017	11.5	250	0.50	0.042	0.86	0.8047	
	436A	437A	0.07	50	4	13.47	890	0.013	0.0039	0.00	0.017	10.5	250	0.50	0.042	0.86	0.8091	
	437A	438A	0.70	50	35	14.17	925	0.013	0.0041	0.00	0.017	91.5	250	0.50	0.042	0.86	0.8091	
	438A	439A	0.10	50	5	14.27	930	0.013	0.0041	0.00	0.017	12.0	250	0.50	0.042	0.86	0.8091	
	439A	440A	0.18	50	9	14.45	939	0.013	0.0041	0.00	0.017	29.5	250	0.50	0.042	0.86	0.8091	
	440A	445A	0.06	50	3	14.51	942	0.013	0.0041	0.00	0.017	38.0	250	0.50	0.042	0.86	0.8091	
To ALIGNMENT 402, Pipe 445A - 446A						14.51	942											
ALIGNMENT 402			0.67	50	34	0.67	34											
	459A	461A	0.78	50	39	1.45	73	0.013	0.0004	0.00	0.013	95.5	250	1.00	0.059	1.21	0.9738	
To ALIGNMENT 403, Pipe 461A - 462A						1.45	73											
			0.05	50	3	0.05	3											
	460A	461A	0.09	50	5	0.14	8	0.013	0.0000	0.00	0.013	41.0	250	1.45	0.072	1.46	1.1007	
To ALIGNMENT 403, Pipe 461A - 462A						0.14	8											
	447A	449A	0.61	50	31	0.61	31	0.013	0.0002	0.00	0.013	64.5	250	1.00	0.059	1.21	0.9655	
Contribution From ALIGNMENT 401, Pipe 448A - 449A						0.12	6											
	449A	450A	0.63	50	32	1.36	69	0.013	0.0004	0.00	0.013	101.0	250	0.55	0.044	0.90	0.7848	
	450A	451A	0.75	50	38	2.11	107	0.013	0.0006	0.00	0.014	101.0	250	0.50	0.042	0.86	0.7632	
	451A	452A	0.18	50	9	2.29	116	0.013	0.0007	0.00	0.014	10.5	250	0.50	0.042	0.86	0.7632	
	452A	453A	0.25	50	13	2.54	129	0.013	0.0007	0.00	0.014	54.5	250	0.50	0.042	0.86	0.7632	
To POND 4 SANITARY SERVICING EASEMENT, Pipe 453A - 454A						2.54	129											
Contribution From ALIGNMENT 401, Pipe 441A - 443A						0.52	27											
Contribution From ALIGNMENT 401, Pipe 442A - 443A						0.27	14											
	443A	444A	0.14	50	7	0.93	48	0.013	0.0003	0.00	0.013	37.0	250	0.50	0.042	0.86	0.7583	
	444A	445A	0.25	50	13	1.18	61	0.013	0.0003	0.00	0.013	37.0	250	0.50	0.042	0.86	0.7583	
Contribution From ALIGNMENT 405, Pipe 440A - 445A						14.51	942											
	445A	446A	0.84	50	42	15.35	984	0.013	0.0044	0.00	0.017	120.0	250	0.50	0.042	0.86	0.8134	
	446A	453A	0.03	50	2	15.38	986	0.013	0.0044	0.00	0.017	12.0	250	0.50	0.042	0.86	0.8134	
To POND 4 SANITARY SERVICING EASEMENT, Pipe 453A - 454A						15.38	986											

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SHEET 12 OF 13
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STANDARD DRAWING

n = 0.013
single family > 10m lots --- 50 p/ha
single family < 10m lots / semi-detached --- 70 p/ha
townhouse --- 175p/ha

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LOCATION	FROM MH	TO MH	AREA (ha)	DENSITY (ppha)	POPULATION	CUMULATIVE AREA (HA)	CUMULATIVE POPULATION	SEWAGE FLOW (m3/s), [1]	INFILTRATION FLOW 0.0002c.m./s/ha (m3/s), [2]	FOUNDATION DRAINS (m3/s), [3]	TOTAL FLOW (m3/s), [1+2+3]	PIPE LENGTH (m)	PIPE DIAMETER (mm)	GRADIENT (%)	CAPACITY (m3/s)	VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	DROP IN LOWER MH (m)
ALIGNMENT 403																		
Contribution From ALIGNMENT 402, Pipe 459A - 461A						1.45	73											
Contribution From ALIGNMENT 402, Pipe 460A - 461A						0.14	8											
	461A	462A	0.21	50	11	1.80	92	0.013	0.0005	0.00	0.014	47.5	250	1.20	0.065	1.33	1.0394	
	462A	463A	0.24	50	12	2.04	104	0.013	0.0006	0.00	0.014	26.0	250	0.65	0.048	0.98	0.8355	
	463A	464A	0.10	50	5	2.14	109	0.013	0.0006	0.00	0.014	10.5	250	2.00	0.084	1.71	1.2541	
	464A	465A	0.58	50	29	2.72	138	0.013	0.0008	0.00	0.014	79.0	250	0.50	0.042	0.86	0.7632	
	465A	Ex. 79A				2.72	138	0.013	0.0008	0.00	0.014	50.5	250	0.50	0.042	0.86	0.7632	
To Kennedy Road via Bonnieglen Farm Blvd, Pipe 79A - 81A						2.72	138											
POND 4 SANITARY SERVICING EASEMENT																		
Contribution From ALIGNMENT 402, Pipe 446A - 453A						15.38	986											
Contribution From ALIGNMENT 402, Pipe 452A - 453A						2.54	129											
	453A	454A				17.92	1115	0.015	0.0051	0.00	0.020	11.5	250	0.50	0.042	0.86	0.8416	
	454A	455A				17.92	1115	0.015	0.0051	0.00	0.020	33.0	250	0.50	0.042	0.86	0.8416	
	455A	456A				17.92	1115	0.015	0.0051	0.00	0.020	102.0	250	0.50	0.042	0.86	0.8416	
	456A	457A				17.92	1115	0.015	0.0051	0.00	0.020	75.5	250	0.50	0.042	0.86	0.8416	
	457A	458A				17.92	1115	0.015	0.0051	0.00	0.020	71.0	250	1.00	0.059	1.21	1.0862	
To HEART LAKE/DIXIE ROAD TRUNK						17.92	1115											

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SHEET 13 OF 13
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STANDARD DRAWING

n = 0.013
single family > 10m lots --- 50 p/ha
single family < 10m lots / semi-detached --- 70 p/ha
townhouse --- 175p/ha

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APPENDIX J

SANITARY DOWNSTREAM CAPACITY ANALYSIS

Table 1: Sanitary Pipe Data and Hydraulic Simulation Results During Normal Pumping Station Operation (Existing Flows)

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak / Design Flow	Surcharge U/S (1) (m)	Max. U/S HGL (m)	Max. D/S HGL (m)	Est. USF (2) (m)	Freeboard (m)
28A	29A	254.980	254.693	525	113.0	0.3	0.013	260.520	260.520	0.993	0.215	0.215	1.0	-0.104	255.401	255.087	258.72	3.319
29A	30A	254.663	254.363	525	120.0	0.3	0.013	260.520	260.520	0.993	0.215	0.215	1.0	-0.101	255.087	254.756	258.72	3.633
30A	31A	254.336	254.031	525	120.0	0.3	0.013	260.520	260.520	0.993	0.215	0.215	1.0	-0.105	254.756	254.396	258.72	3.964
31A	32A	254.015	253.632	525	79.0	0.5	0.013	260.520	260.520	1.376	0.298	0.215	0.7	-0.144	254.396	254.187	258.72	4.324
32A	6A	253.608	253.392	525	86.4	0.3	0.013	260.520	260.520	0.993	0.215	0.215	1.0	0.054	254.187	253.917	258.72	4.533
93A	94A	262.520	262.430	300	43.0	0.2	0.013	269.420	269.420	0.625	0.044	0.018	0.4	-0.165	262.655	262.553	267.62	4.965
94A	95A	262.410	261.990	300	120.0	0.4	0.013	269.420	268.840	0.809	0.057	0.024	0.4	-0.157	262.553	262.102	267.62	5.067
95A	96A	261.960	261.740	300	69.5	0.3	0.013	268.840	268.590	0.770	0.054	0.024	0.4	-0.158	262.102	261.905	267.04	4.938
96A	97A	261.720	261.530	300	43.5	0.4	0.013	268.590	268.430	0.904	0.064	0.044	0.7	-0.115	261.905	261.707	266.79	4.885
97A	98A	261.500	261.210	300	84.0	0.3	0.013	268.430	268.120	0.804	0.057	0.045	0.8	-0.093	261.707	261.390	266.63	4.923
98A	99A	261.180	260.830	300	98.5	0.4	0.013	268.120	267.760	0.815	0.058	0.045	0.8	-0.090	261.390	260.993	266.32	4.930
99A	100A	260.760	260.560	375	59.0	0.3	0.013	267.760	267.540	0.924	0.102	0.070	0.7	-0.142	260.993	260.811	265.96	4.967
100A	101A	260.540	260.324	375	89.5	0.2	0.013	267.540	267.210	0.779	0.086	0.074	0.9	-0.104	260.811	260.539	265.74	4.929
101A	102A	260.294	259.890	375	110.5	0.4	0.013	267.210	266.800	0.960	0.106	0.076	0.7	-0.130	260.539	260.083	265.41	4.871
102A	103A	259.790	259.430	525	88.0	0.4	0.013	266.800	266.480	1.271	0.275	0.162	0.6	-0.232	260.083	259.754	265.00	4.917
103A	104A	259.390	259.260	525	66.5	0.2	0.013	266.480	266.160	0.877	0.190	0.165	0.9	-0.161	259.754	259.583	264.68	4.926
104A	105A	259.220	259.060	525	73.0	0.2	0.013	266.160	265.690	0.930	0.201	0.166	0.8	-0.162	259.583	259.420	264.36	4.777
105A	106A	259.050	258.850	525	100.0	0.2	0.013	265.690	265.500	0.888	0.192	0.166	0.9	-0.155	259.420	259.151	263.89	4.470
106A	107A	258.800	258.660	525	48.1	0.3	0.013	265.500	265.400	1.072	0.232	0.181	0.8	-0.174	259.151	259.007	263.70	4.549
107A	108A	258.610	258.440	525	76.9	0.2	0.013	265.400	265.250	0.934	0.202	0.182	0.9	-0.128	259.007	258.844	263.60	4.593
108A	109A	258.410	258.300	525	79.2	0.1	0.013	265.250	265.100	0.741	0.160	0.184	1.1	-0.091	258.844	258.675	263.45	4.606
109A	110A	258.290	258.090	525	83.8	0.2	0.013	265.100	264.560	0.971	0.210	0.188	0.9	-0.140	258.675	258.450	263.30	4.625
110A	111A	258.060	257.930	525	64.2	0.2	0.013	264.560	263.380	0.893	0.193	0.190	1.0	-0.135	258.450	258.236	262.76	4.310
111A	112A	257.890	257.660	525	67.6	0.3	0.013	263.380	262.160	1.158	0.251	0.191	0.8	-0.179	258.236	257.972	261.58	3.344
112A	113A	257.560	257.430	525	47.4	0.3	0.013	262.160	261.300	1.040	0.225	0.212	0.9	-0.113	257.972	257.841	260.36	2.388
113A	115A	257.400	257.250	525	77.2	0.2	0.013	261.300	260.520	0.875	0.189	0.215	1.1	-0.084	257.841	257.613	259.50	1.659
115A	116A	257.220	257.010	525	58.5	0.4	0.013	260.520	260.520	1.190	0.258	0.215	0.8	-0.132	257.613	257.449	258.72	1.107
116A	117A	256.990	256.860	525	47.4	0.3	0.013	260.520	260.520	1.040	0.225	0.215	1.0	-0.066	257.449	257.343	258.72	1.271
117A	118A	256.850	256.720	525	70.0	0.2	0.013	260.520	260.520	0.857	0.185	0.215	1.2	-0.032	257.343	257.185	258.72	1.377
118A	119A	256.710	256.490	525	88.5	0.2	0.013	260.520	260.520	0.991	0.215	0.215	1.0	-0.050	257.185	256.986	258.72	1.535
119A	120A	256.450	256.380	525	74.5	0.1	0.013	260.520	260.520	0.609	0.132	0.215	1.6	0.011	256.986	256.743	258.72	1.734
120A	121A	256.300	256.083	525	88.0	0.3	0.013	260.520	260.520	0.993	0.215	0.215	1.0	-0.082	256.743	256.529	258.72	1.977
121A	122A	256.053	255.833	525	85.0	0.3	0.013	260.520	260.520	0.993	0.215	0.215	1.0	-0.049	256.529	256.223	258.72	2.191
122A	123A	255.788	255.636	600	60.5	0.3	0.013	260.520	260.520	1.086	0.307	0.215	0.7	-0.165	256.223	256.050	258.72	2.497
123A	124A	255.621	255.409	525	85.0	0.3	0.013	260.520	260.520	0.993	0.215	0.215	1.0	-0.096	256.050	255.826	258.72	2.670
124A	125A	255.379	255.199	525	72.0	0.3	0.013	260.520	260.520	0.993	0.215	0.215	1.0	-0.078	255.826	255.566	258.72	2.894
125A	28A	255.169	255.071	525	39.0	0.3	0.013	260.520	260.520	0.993	0.215	0.215	1.0	-0.128	255.566	255.401	258.72	3.154

Note: (1) A negative surcharge implies that the pipe is not flowing full.

(2) Underside of footing elevation estimated at 1.8 m below the upstream manhole cover elevation.

Table 2: Sanitary Pipe Data and Hydraulic Simulation Results During Normal Pumping Station Operation (Proposed Flows)

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	Pipe Dia. / Height (mm)	Pipe Length (m)	Pipe Slope (%)	n	U/S MH Cover Elev. (m)	D/S MH Cover Elev. (m)	Design Vel. (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak / Design Flow	Surcharge U/S [(1)] (m)	Max. U/S HGL (m)	Max. D/S HGL (m)	Est. USF [(2)] (m)	Freeboard (m)
28A	29A	254.980	254.693	525	113.0	0.3	0.013	260.520	260.520	0.993	0.215	0.238	1.1	-0.052	255.453	255.139	258.72	3.267
29A	30A	254.663	254.363	525	120.0	0.3	0.013	260.520	260.520	0.993	0.215	0.238	1.1	-0.049	255.139	254.806	258.72	3.581
30A	31A	254.336	254.031	525	120.0	0.3	0.013	260.520	260.520	0.993	0.215	0.238	1.1	-0.055	254.806	254.464	258.72	3.914
31A	32A	254.015	253.632	525	79.0	0.5	0.013	260.520	260.520	1.376	0.298	0.238	0.8	-0.076	254.464	254.248	258.72	4.256
32A	6A	253.608	253.392	525	86.4	0.3	0.013	260.520	260.520	0.993	0.215	0.238	1.1	0.115	254.248	253.917	258.72	4.472
93A	94A	262.520	262.430	300	43.0	0.2	0.013	269.420	269.420	0.625	0.044	0.049	1.1	0.259	263.079	262.969	267.62	4.541
94A	95A	262.410	261.990	300	120.0	0.4	0.013	269.420	268.840	0.809	0.057	0.055	1.0	0.259	262.969	262.587	267.62	4.651
95A	96A	261.960	261.740	300	69.5	0.3	0.013	268.840	268.590	0.770	0.054	0.055	1.0	0.327	262.587	262.365	267.04	4.453
96A	97A	261.720	261.530	300	43.5	0.4	0.013	268.590	268.430	0.904	0.064	0.073	1.1	0.345	262.365	262.120	266.79	4.425
97A	98A	261.500	261.210	300	84.0	0.3	0.013	268.430	268.120	0.804	0.057	0.073	1.3	0.320	262.120	261.637	266.63	4.510
98A	99A	261.180	260.830	300	98.5	0.4	0.013	268.120	267.760	0.815	0.058	0.074	1.3	0.157	261.637	261.071	266.32	4.683
99A	100A	260.760	260.560	375	59.0	0.3	0.013	267.760	267.540	0.924	0.102	0.097	1.0	-0.064	261.071	260.898	265.96	4.889
100A	101A	260.540	260.324	375	89.5	0.2	0.013	267.540	267.210	0.779	0.086	0.101	1.2	-0.017	260.898	260.603	265.74	4.842
101A	102A	260.294	259.890	375	110.5	0.4	0.013	267.210	266.800	0.960	0.106	0.103	1.0	-0.066	260.603	260.112	265.41	4.807
102A	103A	259.790	259.430	525	88.0	0.4	0.013	266.800	266.480	1.271	0.275	0.186	0.7	-0.203	260.112	259.794	265.00	4.888
103A	104A	259.390	259.260	525	66.5	0.2	0.013	266.480	266.160	0.877	0.190	0.188	1.0	-0.121	259.794	259.630	264.68	4.886
104A	105A	259.220	259.060	525	73.0	0.2	0.013	266.160	265.690	0.930	0.201	0.190	0.9	-0.115	259.630	259.474	264.36	4.730
105A	106A	259.050	258.850	525	100.0	0.2	0.013	265.690	265.500	0.888	0.192	0.190	1.0	-0.101	259.474	259.269	263.89	4.416
106A	107A	258.800	258.660	525	48.1	0.3	0.013	265.500	265.400	1.072	0.232	0.205	0.9	-0.056	259.269	259.172	263.70	4.431
107A	108A	258.610	258.440	525	76.9	0.2	0.013	265.400	265.250	0.934	0.202	0.205	1.0	0.037	259.172	259.006	263.60	4.428
108A	109A	258.410	258.300	525	79.2	0.1	0.013	265.250	265.100	0.741	0.160	0.207	1.3	0.071	259.006	258.830	263.45	4.444
109A	110A	258.290	258.090	525	83.8	0.2	0.013	265.100	264.560	0.971	0.210	0.211	1.0	0.015	258.830	258.631	263.30	4.470
110A	111A	258.060	257.930	525	64.2	0.2	0.013	264.560	263.380	0.893	0.193	0.214	1.1	0.046	258.631	258.479	262.76	4.129
111A	112A	257.890	257.660	525	67.6	0.3	0.013	263.380	262.160	1.158	0.251	0.214	0.9	0.064	258.479	258.318	261.58	3.101
112A	113A	257.560	257.430	525	47.4	0.3	0.013	262.160	261.300	1.040	0.225	0.235	1.0	0.233	258.318	258.173	260.36	2.042
113A	115A	257.400	257.250	525	77.2	0.2	0.013	261.300	260.520	0.875	0.189	0.238	1.3	0.248	258.173	257.935	259.50	1.327
115A	116A	257.220	257.010	525	58.5	0.4	0.013	260.520	260.520	1.190	0.258	0.238	0.9	0.190	257.935	257.756	258.72	0.785
116A	117A	256.990	256.860	525	47.4	0.3	0.013	260.520	260.520	1.040	0.225	0.238	1.1	0.241	257.756	257.608	258.72	0.964
117A	118A	256.850	256.720	525	70.0	0.2	0.013	260.520	260.520	0.857	0.185	0.238	1.3	0.233	257.608	257.392	258.72	1.112
118A	119A	256.710	256.490	525	88.5	0.2	0.013	260.520	260.520	0.991	0.215	0.238	1.1	0.157	257.392	257.119	258.72	1.328
119A	120A	256.450	256.380	525	74.5	0.1	0.013	260.520	260.520	0.609	0.132	0.238	1.8	0.144	257.119	256.874	258.72	1.601
120A	121A	256.300	256.083	525	88.0	0.3	0.013	260.520	260.520	0.993	0.215	0.238	1.1	0.049	256.874	256.613	258.72	1.846
121A	122A	256.053	255.833	525	85.0	0.3	0.013	260.520	260.520	0.993	0.215	0.238	1.1	0.035	256.613	256.271	258.72	2.107
122A	123A	255.788	255.636	600	60.5	0.3	0.013	260.520	260.520	1.086	0.307	0.238	0.8	-0.117	256.271	256.108	258.72	2.449
123A	124A	255.621	255.409	525	85.0	0.3	0.013	260.520	260.520	0.993	0.215	0.238	1.1	-0.038	256.108	255.876	258.72	2.612
124A	125A	255.379	255.199	525	72.0	0.3	0.013	260.520	260.520	0.993	0.215	0.238	1.1	-0.028	255.876	255.605	258.72	2.844
125A	28A	255.169	255.071	525	39.0	0.3	0.013	260.520	260.520	0.993	0.215	0.238	1.1	-0.089	255.605	255.453	258.72	3.115

Note: [(1)] A negative surcharge implies that the pipe is not flowing full.

[(2)] Underside of footing elevation estimated at 1.8 m below the upstream manhole cover elevation.

BASED ON DESIGN SLOPES

LOCATION	FROM MH	TO MH	AREA (ha)	DENSITY (ppha)	POPULATION	CUMULATIVE AREA (HA)	CUMULATIVE POPULATION	SEWAGE FLOW (m3/s), [1]	INFILTRATION FLOW 0.0002c.m./s/ha (m3/s), [2]	FOUNDATION DRAINS (m3/s), [3]	TOTAL FLOW (m3/s), [1+2+3]	PIPE LENGTH (m)	PIPE DIAMETER (mm)	GRADIENT (%)	CAPACITY (m3/s)	VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	RATIO (Q/Qfull)
KENNEDY ROAD																		
Contribution from Kennedy Rd, Pipe 136A - Ex. Plug						37.15	2940											
	PLUG	Ex. 93A	3.60		500	40.75	3440	0.041	0.0082	0.00	0.049	8.0	300	0.35	0.074	1.05	1.1219	0.66
	Ex. 93A	Ex. 94A	0.11		0	40.86	3440	0.041	0.0082	0.00	0.049	43.0	300	0.35	0.074	1.05	1.1219	0.66
						40.86	3440											
Contribution from Bonnieglen Farm Blvd, Pipe81A - Ex. 94A (Cole Engineering)						3.37	164											
Contribution from Alignment 403 via Bonnieglen Farm Blvd, Pipe81A - Ex. 94A						2.72	138											
Contribution from Newhouse Blvd (826), Pipe 100A - Ex. 94A						1.66	81											
	Ex. 94A	Ex. 95A	0.16		11	48.77	3834	0.045	0.0098	0.00	0.055	120.0	300	0.35	0.074	1.05	1.1488	0.74
	Ex. 95A	Ex. 96A	0.25		18	49.02	3852	0.045	0.0098	0.00	0.055	69.5	300	0.35	0.074	1.05	1.1488	0.74
						49.02	3852											
Contribution From LEARMONT AVENUE, Pipe 8A - 96A (10-440)						6.06	479											
Contribution From Dotchson Street, Pipe Plug - 96A (11-478 & 10-422)						8.80	971											
	Ex. 96A	Ex. 97A				63.88	5302	0.060	0.0128	0.00	0.073	43.5	300	0.35	0.074	1.05	1.1989	0.98
			0.24		42	64.12	5344											
	Ex. 97A	Ex. 98A	0.48	50	24	64.60	5368	0.061	0.0129	0.00	0.073	84.0	300	0.35	0.074	1.05	1.1994	0.99
	Ex. 98A	Ex. 99A	0.55	50	28	65.15	5396	0.061	0.0130	0.00	0.074	98.5	300	0.35	0.074	1.05	1.1994	0.99
						65.15	5396											
Contribution From TWISTLETON STREET, Pipe 26A - 99A (10-440)						22.74	1196											
Contribution From Stowmarket Street, Pipe 28A - Ex. 99A (12-617)						9.36	595											
	Ex. 99A	Ex. 100A	0.13			97.38	7187	0.078	0.0195	0.00	0.097	59.0	375	0.30	0.125	1.13	1.2478	0.78
						97.38	7187											
Contribution from Block 167 (10-617)						2.06	259											
			1.23		0	100.67	7446											
	Ex. 100A	Ex. 101A	0.42	175	74	101.09	7520	0.081	0.0202	0.00	0.101	89.5	375	0.30	0.125	1.13	1.2886	0.81
						101.09	7520											
Contribution from Block 172 (Residential), Cont. MH 5A - Ex. MH 103A			0.21	175	37	0.21	37											
	Ex. 101A	Ex. 102A	0.69	175	121	101.99	7678	0.083	0.0204	0.00	0.103	110.5	375	0.30	0.125	1.13	1.2617	0.82
						101.99	7678											

CONSULTANT: David Schaeffer Engineering Ltd.
SUBDIVISION:
Existing Kennedy Road Trunk

SHEET 1 OF 3
PROJECT NO.: 19-1151
DATE: Jul 2021 DESIGNED BY: V.C.

THE REGIONAL MUNICIPALITY OF PEEL
DEPARTMENT OF PUBLIC WORKS
STANDARD DRAWING

n = 0.011
single family > 10m lots --- 50 p/ha
single family < 10m lots / semi-detached --- 70 p/ha
townhouse --- 175p/ha

Approved:

Date:

STD. DWG

LOCATION	FROM MH	TO MH	AREA (ha)	DENSITY (ppha)	POPULATION	CUMULATIVE AREA (HA)	CUMULATIVE POPULATION	SEWAGE FLOW (m3/s), [1]	INFILTRATION FLOW 0.0002c.m./s/ha (m3/s), [2]	FOUNDATION DRAINS (m3/s), [3]	TOTAL FLOW (m3/s), [1+2+3]	PIPE LENGTH (m)	PIPE DIAMETER (mm)	GRADIENT (%)	CAPACITY (m3/s)	VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	RATIO (Q/Qfull)
Contribution From DOUGALL AVENUE, Pipe 56A - 102A (10-440)						28.76	2373											
Contribution From DOUGALL AVENUE, Pipe 59A - 102A (10-440)						71.03	4857											
	Ex. 102A	Ex. 103A	0.23			202.01	14908	0.145	0.0404	0.00	0.186	88.0	525	0.25	0.215	0.99	1.1171	0.86
						202.01	14908											
Contribution from Mixed Use Site, Cont. MH 2A - Ex. MH 103A			1.59	175	279	1.59	279											
	Ex. 103A	Ex. 104A	0.16			203.76	15187	0.148	0.0408	0.00	0.188	66.5	525	0.25	0.215	0.99	1.1200	0.88
						203.76	15187											
Contribution From Waterville Way, Pipe 85A - 104A (07-294)						1.78	76											
Contribution From Waterville Way, Pipe 79A - 104A (09-385)						0.78	18											
			0.15		8	206.47	15289											
			0.08		6	206.55	15295											
	104A	105A	0.09		0	206.64	15295	0.148	0.0413	0.00	0.190	73.0	525	0.25	0.215	0.99	1.1200	0.88
			0.35		28	206.99	15323											
	105A	106A	0.09		0	207.08	15323	0.149	0.0414	0.00	0.190	100.0	525	0.25	0.215	0.99	1.1213	0.88
						207.08	15323											
Contribution From Larson Peak Road, Pipe 76A - 106A (07-294)						24.08	880											
Contribution From Larson Peak Road, Pipe 91A - 106A (07-294)						4.39	237											
	106A	107A	0.12			235.67	16440	0.158	0.0471	0.00	0.205	48.1	525	0.25	0.215	0.99	1.1306	0.95
	107A	108A	0.21			235.88	16440	0.158	0.0472	0.00	0.205	76.9	525	0.25	0.215	0.99	1.1306	0.95
						235.88	16440											
Contribution From Kearny Avenue, Pipe 60A - 108A (07-294)						2.96	196											
	108A	109A	0.20			239.04	16636	0.159	0.0478	0.00	0.207	79.2	525	0.25	0.215	0.99	1.1324	0.96
						239.04	16636											
Contribution From Losino Street, Pipe 54A - 109A (07-294)						5.88	360											
	109A	110A	0.19			245.11	16996	0.162	0.0490	0.00	0.211	83.8	525	0.25	0.215	0.99	1.1321	0.98
						245.11	16996											
Contribution From Benadir Avenue, Pipe 6A - 110A (07-294)						3.16	189											
	110A	111A	0.41		23	248.68	17208	0.164	0.0497	0.00	0.214	64.2	525	0.25	0.215	0.99	1.1324	0.99
						248.68	17208											

CONSULTANT: David Schaeffer Engineering Ltd.
SUBDIVISION:
Existing Kennedy Road Trunk

SHEET 2 OF 3
PROJECT NO.: 19-1151
DATE: Jul 2021 DESIGNED BY: V.C.

THE REGIONAL MUNICIPALITY OF PEEL
DEPARTMENT OF PUBLIC WORKS
STANDARD DRAWING

n = 0.013
single family > 10m lots --- 50 p/ha
single family < 10m lots / semi-detached --- 70 p/ha
townhouse --- 175p/ha

Approved:

Date:

STD. DWG

LOCATION	FROM MH	TO MH	AREA (ha)	DENSITY (ppha)	POPULATION	CUMULATIVE AREA (HA)	CUMULATIVE POPULATION	SEWAGE FLOW (m3/s), [1]	INFILTRATION FLOW 0.0002c.m./s/ha (m3/s), [2]	FOUNDATION DRAINS (m3/s), [3]	TOTAL FLOW (m3/s), [1+2+3]	PIPE LENGTH (m)	PIPE DIAMETER (mm)	GRADIENT (%)	CAPACITY (m3/s)	VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	RATIO (Q/Qfull)
Contribution From Block 197 (11-544)						0.11	4											
	111A	112A	0.37		29	249.16	17241	0.164	0.0498	0.00	0.214	67.6	525	0.25	0.215	0.99	1.1324	1.00
						249.16	17241											
Contribution From Block 197 (11-544)						0.21	7											
Contribution From Abbotside Way, Pipe 13A - 112A						31.77	1872											
	112A	113A				281.14	19120	0.179	0.0562	0.00	0.235	47.4	525	0.25	0.215	0.99	1.0953	1.09
						281.14	19120											
Contribution From Sanitary Easement, Pipe 201A - 113A						3.89	195											
	113A	115A				285.03	19315	0.181	0.0570	0.00	0.238	77.2	525	0.25	0.215	0.99	1.1324	1.10
	115A	116A				285.03	19315	0.181	0.0570	0.00	0.238	58.5	525	0.25	0.215	0.99	1.0953	1.10
	116A	117A				285.03	19315	0.181	0.0570	0.00	0.238	47.4	525	0.25	0.215	0.99	1.0953	1.10
	117A	118A				285.03	19315	0.181	0.0570	0.00	0.238	70.0	525	0.25	0.215	0.99	1.1324	1.10
	118A	119A				285.03	19315	0.181	0.0570	0.00	0.238	88.5	525	0.25	0.215	0.99	1.1324	1.10
	119A	120(B.O.)				285.03	19315	0.181	0.0570	0.00	0.238	74.5	525	0.25	0.215	0.99	1.1324	1.10
To Kennedy, Pipe 120(B.O.) - 121(B.O.)						285.03	19315											
Kennedy Trunk																		
Contribution From Kennedy Trunk, Pipe 119A - 120(B.O.)						285.03	19315											
	120(B.O.)	121(B.O.)				285.03	19315	0.181	0.0570	0.00	0.238	88.0	525	0.25	0.215	0.99	1.0953	1.10
	121(B.O.)	122(B.O.)				285.03	19315	0.181	0.0570	0.00	0.238	85.0	525	0.25	0.215	0.99	1.0953	1.10
	122(B.O.)	123(B.O.)				285.03	19315	0.181	0.0570	0.00	0.238	60.5	525	0.25	0.215	0.99	1.0953	1.10
	123(B.O.)	124(B.O.)				285.03	19315	0.181	0.0570	0.00	0.238	85.0	525	0.25	0.215	0.99	1.0953	1.10
	124(B.O.)	125(B.O.)				285.03	19315	0.181	0.0570	0.00	0.238	72.0	525	0.25	0.215	0.99	1.0953	1.10
	125(B.O.)	28(BO.)				285.03	19315	0.181	0.0570	0.00	0.238	39.0	525	0.25	0.215	0.99	1.0953	1.10
	28(BO.)	29(B.O.)				285.03	19315	0.181	0.0570	0.00	0.238	117.0	525	0.29	0.232	1.07	1.2176	1.03
	29(B.O.)	30(B.O.)				285.03	19315	0.181	0.0570	0.00	0.238	120.0	525	0.27	0.223	1.03	1.1644	1.06
	30(B.O.)	31(B.O.)				285.03	19315	0.181	0.0570	0.00	0.238	120.0	525	0.26	0.219	1.01	1.1170	1.08
	31(B.O.)	32(B.O.)				285.03	19315	0.181	0.0570	0.00	0.238	77.4	525	0.32	0.243	1.12	1.2806	0.98
	32(B.O.)	6A(B.O.)				285.03	19315	0.181	0.0570	0.00	0.238	86.5	525	0.25	0.215	0.99	1.0953	1.10
To Inder Heights Drive Existing Sanitary						285.03	19315											

CONSULTANT: David Schaeffer Engineering Ltd.
SUBDIVISION:
Existing Kennedy Road Trunk

SHEET 3 OF 3
PROJECT NO.: 19-1151
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THE REGIONAL MUNICIPALITY OF PEEL
DEPARTMENT OF PUBLIC WORKS
STANDARD DRAWING

n = 0.013
single family > 10m lots --- 50 p/ha
single family < 10m lots / semi-detached --- 70 p/ha
townhouse --- 175p/ha

Approved:

Date:

STD. DWG

BASED ON AS-CONSTRUCTED SLOPES

LOCATION	FROM MH	TO MH	AREA (ha)	DENSITY (ppha)	POPULATION	CUMULATIVE AREA (HA)	CUMULATIVE POPULATION	SEWAGE FLOW (m3/s), [1]	INFILTRATION FLOW 0.0002c.m./s/ha (m3/s), [2]	FOUNDATION DRAINS (m3/s), [3]	TOTAL FLOW (m3/s), [1+2+3]	PIPE LENGTH (m)	PIPE DIAMETER (mm)	GRADIENT (%)	CAPACITY (m3/s)	VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	RATIO (Q/Qfull)
KENNEDY ROAD																		
Contribution from Kennedy Rd, Pipe 136A - Ex. Plug						37.15	2940											
	PLUG	Ex. 93A	3.60		500	40.75	3440	0.041	0.0082	0.00	0.049	8.0	298	0.35	0.073	1.05	1.1223	0.67
	Ex. 93A	Ex. 94A	0.11		0	40.86	3440	0.041	0.0082	0.00	0.049	43.0	298	0.21	0.056	0.81	0.9107	0.87
						40.86	3440											
Contribution from Bonnieglen Farm Blvd, Pipe81A - Ex. 94A (Cole Engineering)						3.37	164											
Contribution from Alignment 403 via Bonnieglen Farm Blvd, Pipe81A - Ex. 94A						2.72	138											
Contribution from Newhouse Blvd (826), Pipe 100A - Ex. 94A						1.66	81											
	Ex. 94A	Ex. 95A	0.16		11	48.77	3834	0.045	0.0098	0.00	0.055	120.0	298	0.35	0.073	1.05	1.1480	0.75
	Ex. 95A	Ex. 96A	0.25		18	49.02	3852	0.045	0.0098	0.00	0.055	69.5	298	0.32	0.070	1.00	1.1091	0.79
						49.02	3852											
Contribution From LEARMONT AVENUE, Pipe 8A - 96A (10-440)						6.06	479											
Contribution From Dotchson Street, Pipe Plug - 96A (11-478 & 10-422)						8.80	971											
	Ex. 96A	Ex. 97A				63.88	5302	0.060	0.0128	0.00	0.073	43.5	299	0.44	0.083	1.18	1.3282	0.88
			0.24		42	64.12	5344											
	Ex. 97A	Ex. 98A	0.48	50	24	64.60	5368	0.061	0.0129	0.00	0.073	84.0	299	0.35	0.074	1.05	1.1977	0.99
	Ex. 98A	Ex. 99A	0.55	50	28	65.15	5396	0.061	0.0130	0.00	0.074	98.5	299	0.36	0.075	1.07	1.2147	0.98
						65.15	5396											
Contribution From TWISTLETON STREET, Pipe 26A - 99A (10-440)						22.74	1196											
Contribution From Stowmarket Street, Pipe 28A - Ex. 99A (12-617)						9.36	595											
	Ex. 99A	Ex. 100A	0.13			97.38	7187	0.078	0.0195	0.00	0.097	59.0	366	0.34	0.125	1.18	1.3080	0.78
						97.38	7187											
Contribution from Block 167 (10-617)						2.06	259											
			1.23		0	100.67	7446											
	Ex. 100A	Ex. 101A	0.42	175	74	101.09	7520	0.081	0.0202	0.00	0.101	89.5	366	0.24	0.105	1.00	1.1349	0.96
						101.09	7520											
Contribution from Block 172 (Residential), Cont. MH 5A - Ex. MH 103A			0.21	175	37	0.21	37											
	Ex. 101A	Ex. 102A	0.69	175	121	101.99	7678	0.083	0.0204	0.00	0.103	110.5	366	0.37	0.130	1.24	1.3699	0.79
						101.99	7678											

CONSULTANT: David Schaeffer Engineering Ltd.
SUBDIVISION:
Existing Kennedy Road Trunk

SHEET 1 OF 3
PROJECT NO.: 19-1151
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THE REGIONAL MUNICIPALITY OF PEEL
DEPARTMENT OF PUBLIC WORKS
STANDARD DRAWING

n = 0.011
single family > 10m lots --- 50 p/ha
single family < 10m lots / semi-detached --- 70 p/ha
townhouse --- 175p/ha

Approved:

Date:

STD. DWG

LOCATION	FROM MH	TO MH	AREA (ha)	DENSITY (ppha)	POPULATION	CUMULATIVE AREA (HA)	CUMULATIVE POPULATION	SEWAGE FLOW (m3/s), [1]	INFILTRATION FLOW 0.0002c.m./s/ha (m3/s), [2]	FOUNDATION DRAINS (m3/s), [3]	TOTAL FLOW (m3/s), [1+2+3]	PIPE LENGTH (m)	PIPE DIAMETER (mm)	GRADIENT (%)	CAPACITY (m3/s)	VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	RATIO (Q/Qfull)
Contribution From DOUGALL AVENUE, Pipe 56A - 102A (10-440)						28.76	2373											
Contribution From DOUGALL AVENUE, Pipe 59A - 102A (10-440)						71.03	4857											
	Ex. 102A	Ex. 103A	0.23			202.01	14908	0.145	0.0404	0.00	0.186	88.0	533	0.46	0.304	1.36	1.4242	0.61
						202.01	14908											
Contribution from Mixed Use Site, Cont. MH 2A - Ex. MH 103A			1.59	175	279	1.59	279											
	Ex. 103A	Ex. 104A	0.16			203.76	15187	0.148	0.0408	0.00	0.188	66.5	533	0.26	0.227	1.02	1.1352	0.83
						203.76	15187											
Contribution From Waterville Way, Pipe 85A - 104A (07-294)						1.78	76											
Contribution From Waterville Way, Pipe 79A - 104A (09-385)						0.78	18											
			0.15		8	206.47	15289											
			0.08		6	206.55	15295											
	104A	105A	0.09		0	206.64	15295	0.148	0.0413	0.00	0.190	73.0	533	0.22	0.210	0.94	1.0649	0.90
			0.35		28	206.99	15323											
	105A	106A	0.09		0	207.08	15323	0.149	0.0414	0.00	0.190	100.0	533	0.20	0.200	0.90	1.0210	0.95
						207.08	15323											
Contribution From Larson Peak Road, Pipe 76A - 106A (07-294)						24.08	880											
Contribution From Larson Peak Road, Pipe 91A - 106A (07-294)						4.39	237											
	106A	107A	0.12			235.67	16440	0.158	0.0471	0.00	0.205	48.1	533	0.29	0.241	1.08	1.2120	0.85
	107A	108A	0.21			235.88	16440	0.158	0.0472	0.00	0.205	76.9	533	0.22	0.210	0.94	1.0726	0.98
						235.88	16440											
Contribution From Kearny Avenue, Pipe 60A - 108A (07-294)						2.96	196											
	108A	109A	0.20			239.04	16636	0.159	0.0478	0.00	0.207	79.2	533	0.14	0.168	0.75	0.8560	1.24
						239.04	16636											
Contribution From Losino Street, Pipe 54A - 109A (07-294)						5.88	360											
	109A	110A	0.19			245.11	16996	0.162	0.0490	0.00	0.211	83.8	533	0.24	0.219	0.98	1.1195	0.96
						245.11	16996											
Contribution From Benadir Avenue, Pipe 6A - 110A (07-294)						3.16	189											
	110A	111A	0.41		23	248.68	17208	0.164	0.0497	0.00	0.214	64.2	533	0.24	0.219	0.98	1.1203	0.97
						248.68	17208											

CONSULTANT: David Schaeffer Engineering Ltd.
SUBDIVISION:
Existing Kennedy Road Trunk

SHEET 2 OF 3
PROJECT NO.: 19-1151
DATE: Jul 2021 DESIGNED BY: V.C.

THE REGIONAL MUNICIPALITY OF PEEL
DEPARTMENT OF PUBLIC WORKS
STANDARD DRAWING

n = 0.013
single family > 10m lots --- 50 p/ha
single family < 10m lots / semi-detached --- 70 p/ha
townhouse --- 175p/ha

Approved:

Date:

STD. DWG

LOCATION	FROM MH	TO MH	AREA (ha)	DENSITY (ppha)	POPULATION	CUMULATIVE AREA (HA)	CUMULATIVE POPULATION	SEWAGE FLOW (m3/s), [1]	INFILTRATION FLOW 0.0002c.m./s/ha (m3/s), [2]	FOUNDATION DRAINS (m3/s), [3]	TOTAL FLOW (m3/s), [1+2+3]	PIPE LENGTH (m)	PIPE DIAMETER (mm)	GRADIENT (%)	CAPACITY (m3/s)	VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	RATIO (Q/Qfull)
Contribution From Block 197 (11-544)						0.11	4											
	111A	112A	0.37		29	249.16	17241	0.164	0.0498	0.00	0.214	67.6	533	0.34	0.261	1.17	1.3039	0.82
						249.16	17241											
Contribution From Block 197 (11-544)						0.21	7											
Contribution From Abbotside Way, Pipe 13A - 112A						31.77	1872											
	112A	113A				281.14	19120	0.179	0.0562	0.00	0.235	47.4	533	0.27	0.233	1.04	1.1882	1.01
						281.14	19120											
Contribution From Sanitary Easement, Pipe 201A - 113A						3.89	195											
	113A	115A				285.03	19315	0.181	0.0570	0.00	0.238	77.2	533	0.19	0.197	0.88	1.0076	1.20
	115A	116A				285.03	19315	0.181	0.0570	0.00	0.238	58.5	533	0.36	0.268	1.20	1.3573	0.89
	116A	117A				285.03	19315	0.181	0.0570	0.00	0.238	47.4	533	0.27	0.233	1.04	1.1874	1.02
	117A	118A				285.03	19315	0.181	0.0570	0.00	0.238	70.0	533	0.19	0.195	0.87	0.9972	1.22
	118A	119A				285.03	19315	0.181	0.0570	0.00	0.238	88.5	533	0.25	0.224	1.00	1.1439	1.06
	119A	120(B.O.)				285.03	19315	0.181	0.0570	0.00	0.238	74.5	533	0.10	0.142	0.63	0.7234	1.68
To Kennedy, Pipe 120(B.O.) - 121(B.O.)						285.03	19315											
Kennedy Trunk																		
Contribution From Kennedy Trunk, Pipe 119A - 120(B.O.)						285.03	19315											
	120(B.O.)	121(B.O.)				285.03	19315	0.181	0.0570	0.00	0.238	88.0	533	0.25	0.224	1.00	1.1340	1.06
	121(B.O.)	122(B.O.)				285.03	19315	0.181	0.0570	0.00	0.238	85.0	533	0.25	0.224	1.00	1.1340	1.06
	122(B.O.)	123(B.O.)				285.03	19315	0.181	0.0570	0.00	0.238	60.5	533	0.25	0.224	1.00	1.1340	1.06
	123(B.O.)	124(B.O.)				285.03	19315	0.181	0.0570	0.00	0.238	85.0	533	0.25	0.224	1.00	1.1340	1.06
	124(B.O.)	125(B.O.)				285.03	19315	0.181	0.0570	0.00	0.238	72.0	533	0.25	0.224	1.00	1.1340	1.06
	125(B.O.)	28(BO.)				285.03	19315	0.181	0.0570	0.00	0.238	39.0	533	0.25	0.224	1.00	1.1340	1.06
	28(BO.)	29(B.O.)				285.03	19315	0.181	0.0570	0.00	0.238	117.0	533	0.29	0.242	1.08	1.2323	0.98
	29(B.O.)	30(B.O.)				285.03	19315	0.181	0.0570	0.00	0.238	120.0	533	0.27	0.233	1.04	1.1884	1.02
	30(B.O.)	31(B.O.)				285.03	19315	0.181	0.0570	0.00	0.238	120.0	533	0.26	0.229	1.02	1.1637	1.04
	31(B.O.)	32(B.O.)				285.03	19315	0.181	0.0570	0.00	0.238	77.4	533	0.32	0.254	1.14	1.2905	0.94
	32(B.O.)	6A(B.O.)				285.03	19315	0.181	0.0570	0.00	0.238	86.5	533	0.25	0.224	1.00	1.1340	1.06
To Inder Heights Drive Existing Sanitary						285.03	19315											

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