500 & 515 Erbsville Road, Waterloo
Functional Servicing Report

Draft Plan Submission

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1 Introduction

Stantec Consulting Ltd. (Stantec) has been retained by 10000507877 Ontario Inc. and 2844319 Ontario Inc. to prepare a Functional Servicing Report (FSR) for lands associated with the municipal addresses 500 and 515 Erbsville Road, Waterloo, Ontario (herein referred to as the Subject Lands).

The Draft Plans of Subdivision prepared by Arcadis dated July 10, 2025, includes single residential blocks, stacked townhome blocks, park blocks / open space and a stormwater management block. The Draft Plan is provided in Appendix A. This FSR has been prepared in support of a Plan of Subdivision and Zoning By-Law Amendment.

1.1 Site Location

The Subject Lands are located in the northwest of the City of Waterloo (City), as illustrated on Figure 1.0, provided in Appendix B. The Subject Lands is approximately 8.3 ha in size and split into two parcels by Erbsville Road (Regional Road 16).

The subject lands at 500 Erbsville are bound by the existing Laurelwood Area V subdivision to the north, east and south as well as Erbsville road and an existing SWM facility to the west.

The Subject Lands at 515 Erbsville are bound by the existing Laurel Creek subdivision to the north. White Birch Avenue & Wild Ginger Area are connected by a temporary asphalt road which abuts the north property line of the 515 Erbsville Road property. The property is also bound by significant woodlands to the west, the existing Columbia Forest subdivision to the south, and Erbsville Road to the east.

1.2 Purpose of the Report

The purpose of this *Functional Servicing Report* is to outline how the Subject Lands can be serviced with adequate municipal services, including sanitary, domestic water and utilities, to support the proposed development. This Report is prepared in support of a Zoning By-Law Amendment and a Draft Plan of Subdivision Approval for the Subject Lands and forms the basis for the preliminary review of the servicing and grading concepts.

This Report documents the servicing requirements including sanitary and stormwater servicing, water distribution, as well as area grading, roadworks, and utility requirements for the proposed development. Supplementary reports that should be read in conjunction with this report include:

- *Geotechnical Investigation Report, 500 Erbsville Road* (Stantec, 2025)
- *Geotechnical Investigation Report, 515 Erbsville Road* (Stantec, 2025)
- *Hydrogeological Investigation Report* (Stantec, 2025)
- *Noise Feasibility Study* (Stantec, 2025)

- *Phase I Environmental Site Assessment* (Stantec, 2023)
- *Section 59 Notice (WSP, 2025)*
- *Stormwater Management (SWM) Report* (Stantec, 2025)
- *Traffic Impact Study (*Paradigm, 2025)
- *Tree Management Plan/Vegetation Plan* (WSP, 2025)

This report demonstrates that the Subject Lands can be developed with full municipal servicing and utilities to the requirements of the various approval agencies. The drawings included in Appendix A of this report illustrate concept plans for review of grading and servicing within the development and are based on the latest Draft Plan prepared by Arcadis, dated June 27, 2025.

The servicing strategies presented in this report are conceptual. Detailed engineering drawings and a final SWM Report will be submitted as part of the engineering detailed design process, once the Subject Lands have received Draft Plan Approval.

1.3 Background Reference Materials

In preparation of this *Functional Servicing Report*, the following documents were referenced to inform the design:

- *City of Waterloo Comprehensive Engineering and Landscape Manual* (City of Waterloo, 2024).
- *City of Waterloo Open Source Data* (City of Waterloo, 2025).
- *Design Criteria for Sanitary Sewers, Storm Sewers and Forcemains for Alterations Authorized under an Environmental Compliance Approval* (Ministry of Environment, Conservation and Parks, May 2023).
- *Design Guidelines for Drinking-Water Systems* (Ministry of Environment, Conservation & Parks, 2008).
- *Development Charges Background Study*, *The City of Waterloo* (Hemson Consulting Ltd., 2020).
- *Erosion and Sediment Control Guide for Urban Construction* (Toronto and Region Conservation Authority, 2019).
- *Functional Servicing Report Terms of Reference* (City of Waterloo, 2025).
- *Laurelwood Area V Final Stormwater Management Report* (Stanley Consulting, 1997).
- *Region of Waterloo Water Supply and Distribution Master Plan* (Region of Waterloo).
- *Region of Waterloo and Area Municipalities, Design Guidelines and Supplemental Specifications for Municipal Services - DGSSMS* (Region of Waterloo, 2022).
- *Terms of Reference for Development Applications* (City of Waterloo, 2024)
- *Water Supply for Public Fire Protection, A Guide to Recommended Practice* (Fire Underwriter's Survey, 1999).

2 Overall Grading and Drainage

2.1 Existing Site Topography and Land Use

The existing predevelopment conditions for the Subject Lands are illustrated on *The Existing Conditions Plan,* Drawings C-050 and C-051, included in Appendix A.

The topography of the 515 Erbsville Road property generally slopes from southwest to northeast with localized low points and some rolling hills. The highest elevation within the subdivision is 388.5 m AMSL (above mean sea level) and is at the southwest area of the Subject Lands. The lowest elevation is 349 m AMSL and is in the northeast portion of the Subject Lands. The topography slopes are moderate across 500 Erbsville, with slopes ranging from 2 to 10%, and steeper at 515 Erbsville with slopes at 10%. In existing conditions, the 515 Erbsville Road property generally drains east to the Erbsville Road ditch, which then either flows south or to the existing SWM facility across the road through a culvert fed by a ditch inlet catchbasin. The 500 Erbsville Road property generally drains east to the existing Laurelwood Area V subdivision.

The Lands at 515 Erbsville are currently vacant, and the former dwelling has been demolished. In the east area of this property, there is low-lying area fed by groundwater seepage from a perched system and a wetland sustained primarily from surface water drainage. The Lands are bounded by a row of trees along the north and south property line. The remainder of the 515 Erbsville property is a cleared woodlot and a driveway with access to Erbsville Road.

The 500 Erbsville property includes a dwelling, several storage buildings, and a concrete pad connected by gravel and asphalt roads. The dwelling is serviced by a 150 mm watermain and a 100 mm sanitary forcemain located in the easement connecting 500 Erbsville and Woodlawn Place. There is a provincially significant wetland part of the Sunfish Lake – Laurel Creek Complex on this property

A Geotechnical Investigation was completed for the site by Stantec in 2025. It is recommended that prior to area grading the surface topsoil should be removed from cut and fill areas. The average thickness of topsoil encountered in boreholes at 500 Erbsville was 500 mm and ranged from 400 mm to 600 mm. The topsoil encountered at 515 Erbsville ranged in thickness from 50 mm to 1120 mm, with an average of 548 mm.

It is expected that there will be a significant variation in soils generated from cut areas as borehole logs show fine-grained clayey soils and non cohesive silt soils across the site. The fine-grained soils can be used as engineered fill provided moisture content is controlled within ± 2% of its optimum moisture content. This fill should be placed in 200 mm thick lifts and compacted to 100% Standard Proctor Maximum Dry Density (SPMDD). The non cohesive sandy silt soils (with a high sand content) may also be used for engineered fill provided they are free of organics and deleterious materials. This fill should be placed in 200 mm thick lifts and compacted to 98% SPMDD.

Once on-site fill is removed, the exposed subgrade should be inspected by a geotechnical engineer, compacted, and proof rolled where required. All exposed subgrade should be proof rolled using a grader or loaded dump truck. Any loose or soft areas should be sub-excavated and replaced with the engineered fill material comprised of approved on-site excavated or imported OPSS Granular B Type I engineered fill in maximum 200 mm thick loose lifts, compacted to at least 98% SPMDD.

It is recommended that pipe bedding for water and sewer services be Granular 'A' embedment material, compacted to 100% SPMDD and backfilled with suitable native backfill compacted to at least 98% SPMDD. The contractor is to confirm the specified type of bedding and obtain Contract Administrator's approval before any backfilling operations are undertaken.

Groundwater flows in an eastern to northeastern direction towards Laurel Creek. Borehole logs on 500 Erbsville found the high groundwater level varied at a depth of 0.22 m below ground surface (BGS) to 5.21 m BGS. The high groundwater level at 515 Erbsville varied at a depth of 0.00 m BGS to 5.95 m BGS.

For more details of the geotechnical investigation, please see *Geotechnical Investigation Report, 500 Erbsville Road* (Stantec, 2025) and *Geotechnical Investigation Report, 515 Erbsville Road* (Stantec, 2025). For more details of the hydrogeological conditions, please see the *Hydrogeological Investigation Report* (Stantec, 2025).

2.2 Design Constraints and Procedures

Constraints in designing the road profiles and lot grading are as follows:

- Match existing grades, where possible, to minimize grading and cut/fill quantities and minimize changes to the surface hydrology and hydrogeology of the area.
- Match existing boundary grades around the perimeter of the site.
- Satisfy the City of Waterloo's requirements for minimum and maximum road grades where possible.
- Where possible, provide a major overland flow route for flows more than the storm sewer capacities.
- Maintain adequate cover over storm and sanitary sewers, and watermains.
- Respect existing environmental feature configurations, elevations that are to be retained, and prescribed wetland buffer limits.

2.3 Proposed Site Grading

Preliminary road profiles were established for the site, based on the proposed street pattern, to satisfy the design constraints outlined above. The road profiles are moderate to accommodate the boundary site grades, with road profiles ranging from a minimum of 0.5% to a maximum of 7.2% in slope. The design strategy for the perimeter road grades was to match existing elevations; however, to provide adequate distance to transition grades existing portions of White Birch Avenue, Wild Ginger Avenue, and Royal Fern Street will be reconstructed.

The internal road grades of the proposed subdivision are constrained by these existing connections, which required one road profile to be greater than 7%. Per consultation with the City, the maximum allowable road slope is 8%. Please refer to attached correspondence in Appendix E for more details. The proposed centerline road elevations are illustrated on the *Conceptual Lot Grading Plans*, Drawing C-400, in Appendix A. The internal streets on-site are to be 16.5 m in width and will follow the City of Waterloo design standards.

The proposed lot grading within the site are a mixture of type “B” walkout or lookouts and type “C” walkups. Lot grades will range between a minimum of 2.0% and a maximum of 5.0% with 3:1 transition slope to match the walkout/walkup unit type.

A maximum transition slope of 2:1 between Wild Ginger Avenue and the Erbsville site plan block will accommodate the significant grade drop due to existing topography. Localized areas of retaining walls are proposed along a portion of the southeastern property line and will be reduced where possible through detailed design.

The proposed preliminary earthwork calculations have been performed based on the preliminary road profiles and lot grades. Please refer to Conceptual Cut/Fill Plans in Appendix A.

3 Sanitary Servicing

3.1 Servicing of the Draft Plan Lands

Sanitary servicing for 515 Erbsville Road will be provided from the existing 200 mm diameter sanitary sewer located on Wild Ginger Avenue and the existing 200 mm diameter sanitary sewer located on Woodlawn Place. The Wild Ginger Avenue connection will service the single-family homes and west site plan block. The sanitary sewer on Wild Ginger Avenue outlets to a sanitary trunk along Laurelwood Drive.

The Woodlawn Place connection will service the east site plan block fronting Erbsville Road. A sanitary sewer will be constructed across Erbsville Road to convey these flows to the Woodlawn Place sanitary sewer. This sewer ultimately outlets to a sanitary trunk along Willow Wood Drive, part of the Laurelwood Area V subdivision. The existing sanitary forcemain servicing 500 Erbsville will be connected to the proposed sanitary system to provide continued service. Please refer to the enclosed *Conceptual Servicing Plan*, Drawing C-100 and C-101, in Appendix A.

Local sanitary sewers of 200 mm diameter will be extended throughout the 515 Erbsville Road property, and will generally be constructed with cover to road grade of 2.8 – 3.8 m. This design provides the sewer cover requirements, as per the City of Waterloo, and the capacity to convey sewage flows based on residential population, to service the site.

Please refer to Appendix D for the sanitary sewer design calculations completed for the proposed Subject Lands. The number of units for the Subject Lands was estimated from the Draft Plan (Arcadis, May 2025), and the population densities of 2.30 ppl / multiblock unit & 3.49 ppl / detached unit was referenced from the *Development Charges Background Study* (Hemson Consulting Ltd., 2020). The sanitary flow loading was calculated referencing the *City of Waterloo Comprehensive Engineering and Landscape Development Manual* (City of Waterloo, 2024) and the *Design Guidelines and Supplemental Specifications for Municipal Services* (Region of Waterloo, 2022).

4 Water Distribution System Analysis

4.1 Overview

A water distribution analysis, including fire flow analysis, has been undertaken for the proposed development at 515 Erbsville Road based on the Draft Plan of Subdivision and Preliminary Servicing and Grading Plans presented in the previous sections. The primary intent of the analysis is to determine the appropriate watermain sizes that will adequately distribute projected domestic and fire water demands, and to confirm that the required fire flow can be provided through the proposed fire hydrants under various domestic and fire demand scenarios recommended in the Ministry of the Environment, Conservation and Parks (MECP), Region of Waterloo, and City of Waterloo pressure and distribution guidelines.

The water servicing strategy for the proposed development at 515 Erbsville Road will include four connections to the existing watermains in the area to provide a looped system. This will include connections to the existing 200 mm diameter watermain on White Birch Avenue, existing 150 mm diameter watermain on Wild Ginger Avenue, existing 200 mm diameter watermain on Royal Fern Street, and existing 300 mm diameter watermain on Erbsville Road, as shown on the Conceptual Servicing Plan Drawing C-100, included in Appendix A. The existing property at 500 Erbsville will continue to be supplied by municipal services as it is presently.

4.2 Methodology

4.2.1 Model Development and Design Criteria

The water distribution system analysis was performed using the Haestad Methods hydraulic modeling WaterCAD software. The distribution network was created by assigning physical parameters to each node and pipe. The model was run under various demand scenarios, and each was checked against the relevant guidelines for operating and residual pressures as well as fire flow availability. The parameters and criteria are outlined in the following sections.

The proposed development at 515 Erbsville Road is currently located within the Waterloo Pressure Zone 6 referred to as “Wat 6”. Appendix C contains correspondence dated June 5, 2025, from the Region of Waterloo and the boundary conditions data they have provided from the Region’s overall water model. The Region has provided data pertaining to Node ‘JCT_23131’ which is located at the proposed Erbsville Road connection, and Node ‘JCT_20093’ which is located at the proposed White Birch Avenue connection. Based on a review of the data provided for these two nodes, it is determined that Node ‘JCT_23131’ located at the proposed Erbsville Road connection provides a better representation of anticipated boundary conditions in the area once all four connections are made to the existing watermains as outlined above. Hydraulic modeling results for this node under various demand scenarios provided by the Region were utilized to establish the Hydraulic Grade Line (HGL) for the proposed analysis.

4.2.2 Region of Waterloo Municipal Design Guidelines

The Region of Waterloo document entitled *Region of Waterloo and Area Municipal Design Guidelines and Supplemental Specifications for Municipal Services (DGSSMS),* intended to provide a common regional and area-wide standardization for municipal water distribution and wastewater designs and installation was used in completing this analysis. The general guidelines have been published to provide direction for water distribution system analysis and design, including:

- Pressure, demand, and velocity criteria
- Hydraulic modeling parameters (i.e., friction factors)
- Hydrant spacing and location
- Minimum watermain sizing criteria

4.2.3 Boundary Conditions

HGL information for the proposed subdivision at 515 Erbsville Road is based on the modeling results provided by the Region, included in Appendix C. The HGLs were obtained for the average day and maximum day as well as data pertaining to a range of fire flow scenarios. A reservoir was assigned the HGL determined from the Region's model for each demand scenario. Fire flows were derived from the fire flow analysis flow curve provided by the Region. Table 1 provides a summary of the hydraulic grade lines used in the analysis:

Table 1: Hydraulic Grade Lines (Node JCT_23131)

Demand Scenario	Hydraulic Grade Line (m)
Average Day	426.38
Maximum Day	426.28
Minimum Hour	427.47
Peak Hour	424.87
Max Day + 100 L/s Fire *	417.30
Max Day + 133 L/s Fire	411.99
*HGL interpolated from the fire flow analysis data provided by the Region of Waterloo	

4.2.4 Peaking Factors

The peaking factors used in the model are based on the *Region of Waterloo's DGSSMS* document and Table 3-1 of the *2008 MECP Design Guidelines for Drinking-Water Systems*, as outlined in Table 2.

Table 2: Peaking Factors

Demand Scenario	Factor
Average Day	1.00
Maximum Day	2.00
Peak Hour	3.00
Minimum Hour	0.50

4.2.5 Domestic Water Demands

Population projections were used in conjunction with per capita rates and demand factors to calculate future water demands for the proposed subdivision at 515 Erbsville Road. A residential per capita rate of 225 L/cap/day was used based on the rate recommended in *Region of Waterloo Water Supply and Distribution Master Plan* dated May 2015. Using the Draft Plan and population estimates, demand allocation was completed by assigning the demand from contributory areas to each applicable node. Detailed water demand calculations have been provided in Appendix C.

4.2.6 Fire Flow Requirements

The fire flow demand for the proposed development at 515 Erbsville Road was determined using the *Water Supply for Public Fire Protection, A Guide to Recommended Practice (1999), Fire Underwriter's Survey (FUS)*. Based on the FUS manual, the required fire flows are as follows:

- Modern semi and detached home > 3 m separation – 4,000 L/min (67 L/s)
- Modern semi and detached home < 3 m separation – 6,000 L/min (100 L/s)
- High-density, contiguous multi-block homes – 8,000 L/min (133 L/s)

Assuming a worst-case scenario where the majority of the proposed residences at 515 Erbsville Road may be within a 3 m separation of each other, the larger 100 L/S fire flow was used in the modeling of single detached residential areas. The Multi-Residential blocks were modeled using the 133 L/s fire flow demand.

4.2.7 Pressure Requirements

The Region of Waterloo Pressure Guidelines are to be maintained for all demand scenarios and are consistent with the MECP requirements. The guidelines are shown in Table 3 below.

Table 3: Region of Waterloo Pressure Requirements

Demand Scenario	Pressure Guidelines (kPa)	
	Min.	Max.
Average Day	350	550
Maximum Day	350	550
Peak Hour	275	700
Minimum Hour	275	700
Max. Day + Fire	140	700

The Region of Waterloo requires the use of individual pressure-reducing valves (PRV) on each water service where pressures exceed 550 kPa (80 psi) under any demand scenario.

4.2.8 Velocity Requirements

The Region of Waterloo and the MECP recommend that velocities throughout the distribution system not exceed a maximum of 5 m/s for non-regional watermains and 1.5 m/s for regional watermains during any demand scenario. Areas of concern are typically at long cul-de-sacs or dead-end stubs of smaller diameter (150mm diameter). Large fire flow loads may cause the velocity in these mains to exceed 5 m/s.

4.2.9 Friction Factors

The following Hazen-Williams C-factors are commonly used to estimate frictional losses through the distribution system based on material type, as outlined in Table 4.

Table 4: Hazen-Williams C-Factors

Pipe Material	C
PVC	150
Ductile Iron (D.I.)	130
Concrete Pressure Pipe (CPP)	140
High-Density Polyethylene (HDPE)	140

All pipes were assumed to be PVC and a C value of 150 was applied.

4.3 Results

The model was run to optimize pipe sizes in the proposed subdivision at 515 Erbsville Road according to the boundary conditions and demand criteria outlined in the previous sections. There are existing 200 mm diameter watermains on White Birch Avenue and Royal Fern Street, and 150mm diameter watermain on Wild Ginger Avenue within the existing developments adjacent to the proposed subdivision. Accordingly, 200 mm diameter watermains have been assumed along the proposed White Birch Avenue and Royal Fern Street extensions, and 150 mm diameter watermains have been assumed along the proposed Wild Ginger Avenue extension within the proposed Subdivision at 515 Erbsville Road. The pipe sizes within the remaining streets and multi-family blocks of the subdivision blocks at 515 Erbsville Road were initially assumed as 150 mm diameter. Pipes were then increased in diameter to achieve the aforementioned design criteria. Based on the analysis, the proposed network configuration included in Appendix C provides the adequate pressures and fire flow capacities required.

A series of tables summarizing the output results of the WaterCAD analysis are also included in Appendix C. Tables 5 and 6 present a summary of the modeling results at select nodes within the development.

Based on the results shown in Table 5 and Appendix C, a fire flow of 100 L/s at each detached residential node, and a fire flow of 133 L/s at each multi-residential node can be provided with the MECP recommended minimum system pressure of 140 kPa as per the DGSSMS. Overall, the required fire flows can be achieved for the proposed land uses.

Table 5: Modeling Results – Fire Flow[1]

Node	Node Elevation (m)	Required Fire Flow (L/s)	Available Fire Flow (L/s)	Required System Pressure (kPa)	Fire Node Pressure (kPa)	Residual System Pressure (kPa)
J-2	379.30	100	>105	140	355	304
J-7	384.50	133	>138	140	168	236
J-12	366.20	133	>138	140	278	250

1. Representative nodes shown. See Appendix C for remaining nodes and all pipe results

The Region of Waterloo requires the use of individual PRV on each water service where pressures exceed 550 kPa (80 psi) under any demand scenario. Table 6 provides a summary of pressures during normal operating conditions. Based on the results shown in Table 6 and Appendix C, individual PRVs will be required within the proposed multi-residential block 6 located off of Erbsville Road.

Table 6: Modeling Results - Pressures[1]

Node	Node Elevation (m)	Pressure (kPa)			
		Average Day Demand	Maximum Day Demand	Peak Hour Demand	Minimum Hour Demand
J-2	379.30	461	460	446	471
J-7	384.50	410	409	395	421
J-12	366.20	589	588	574	600

1. Representative nodes shown. See Appendix C for remaining nodes.

The City of Waterloo and Region of Waterloo recommend maintaining the velocity in watermains below 5 m/s where possible, to prevent transient pressures from damaging the pipe system. The watermain configuration for the proposed development at 515 Erbsville Road can generally deliver the required fire flow to the onsite hydrants while maintaining velocities of less than or equal to 5 m/s

4.4 Summary

From the analysis presented in the above sections, the main findings can be summarized as follows:

- The water servicing for the proposed development at 515 Erbsville Road will include four connections to the existing watermains in the area to provide a looped system. The proposed water distribution network will
  consist of:
  - 200 mm diameter watermains on White Birch Avenue and Royal Fern Street; and 150mm diameter watermains on Wild Ginger Avenue
  - 150 mm and 200 mm diameter watermains within proposed multi-residential blocks
- All required fire flows can be provided by onsite hydrants while adhering to the minimum Region of Waterloo and MECP recommended residual pressure of 140 kPa (20 psi)
- Watermain velocities within the proposed subdivision are below 5 m/s
- Individual PRVs will be required within the proposed multi-residential block 6 located off of Erbsville Road.

Given the proposed water distribution network, the proposed subdivision at 515 Erbsville Road can be serviced, in compliance with all requirements of the City of Waterloo, Region of Waterloo and the Ministry of the Environment, with sufficient water supply available to the proposed development.

5 Storm Servicing

5.1 Servicing the Draft Plan Lands

The proposed storm sewers within the Subject Lands will be designed to convey all minor storm events (up to and including five (5) years) as per the City of Waterloo design requirements. The storm sewer network was designed with adequate cover. The storm sewer network is shown on the *Conceptual Servicing Plans*, Drawing C-100 and C-101, included in Appendix A, and the storm sewer design sheet is included in Appendix D.

Storm sewers sized for major storm events (up to and including hundred (100) years) will be required to convey major overland flow from the Subject Lands at 515 Erbsville, across Erbsville Road and to the proposed SWM facility at 500 Erbsville. A portion of 515 Erbsville property drains uncontrolled offsite in a southwesterly direction to the existing forested area. The majority of the site is captured in the storm sewer network and conveyed to the proposed SWM facility at 500 Erbsville.

The majority of the 500 Erbsville property drains towards the proposed SWM facility. The remainder drains to existing drainage structures part of the Laurelwood Area V Subdivision and the existing SWM facility adjacent to Erbsville Road.

The proposed SWM facility will outlet to the existing storm sewer network on Old Oak Drive in the Laurelwood Subdivision before outling to the existing Laurelwood V Basin D SWM facility

Based on the *Laurelwood Area V Subdivision SWM Report* (Stantec, 1997), the downstream Laurelwood Basin D was designed to accommodate the Subject Lands drainage area. A full downstream capacity analysis of the receiving storm sewer was completed and is included in Appendix D. The proposed SWM facility will outlet at a controlled rate to prevent surcharging in the existing network.

Currently there is no existing major overland route connecting the Subject Lands at 500 Erbsville to the existing Laurelwood Area V subdivision. The existing trail parallel to Woodrow Drive will be regraded with a berm to convey flows greater than 100-year storm (including the regional storm event) to Old Oak Drive in the existing Laurelwood Subdivision, as confirmed through consultation with the City of Waterloo.

For more details on the stormwater management strategy, please see the *Stormwater Management Report* (Stantec, 2025).

6 Erosion and Sediment Control Plan

An erosion and sediment control strategy will be developed during detailed design and implemented during the construction process to minimize the potential for on-site erosion, off-site discharge of sediment and any associated negative environmental impacts.

6.1 Evaluation of Erosion Potential

The Erosion and Sediment Control Guide for Urban Construction (TRCA, 2019) was used to determine erosion potential for the site, as a best management practice. The erosion potential is based on slope gradient, slope length and soil texture, and helps determine the appropriate site-specific erosion control methods. The site was divided into two properties, 515 and 500 Erbsville road, to account for differences in their erosive characteristics.

515 Erbsville road characteristics relevant to erosion potential are as follows:

- Site Slopes: High (>10%) – Average slope is >10%;
- Slope Lengths: Long (generally greater than 30 m); and,
- Erodibility Factor: Moderate (silty clay loam or clay loam)

500 Erbsville road characteristics relevant to erosion potential are as follows:

- Site Slopes: Moderate (2-10%) – Average slope is approximately 2-3%;
- Slope Lengths: Long (generally greater than 30 m); and,
- Erodibility Factor: Moderate (silty clay loam or clay loam)

Based on the Erosion and Sediment Control Guide for Urban Construction (TRCA, 2019), the overall site is classified as having a high erosion risk. Specifically, 515 Erbsville is identified as high risk, while 500 Erbsville is classified as having a moderate to high erosion risk. This classification was used to develop the on-site erosion and sediment control plan (ESC plan).

6.2 Preliminary Erosion and Sedimentation Control Plan

The following approach to erosion and sediment control onsite has been prepared to minimize the potential impacts associated with onsite erosion and/or offsite transport of sediment.

Prior to any grading or servicing works commencing onsite, erosion and sedimentation control measures shall be implemented as detailed on the *Erosion and Sedimentation Control Plans* (to be prepared during detail design). The erosion and sedimentation controls will include the following items:

- Erosion blankets on steep slopes (>3:1).
- Light and/or heavy-duty silt fencing on all site boundaries where there is potential for runoff to be discharged offsite, and around all protected wetlands and natural areas, to protect adjacent downstream lands from migration of sediment in overland flow. The location of this fencing will be adjacent to the limit of grading.
- Storm service outlets installed during servicing and roadworks construction to provide lot level dead and live storage.
- Erosion control berms/swales located in appropriate (critical) areas to divert flows to temporary sediment basins.
- A construction entrance feature ("mud-mat") at all site entrances to minimize the offsite transport of sediment via construction vehicles.
- Swales constructed onsite will have temporary rock check dams to help attenuate flows and encourage deposition of suspended sediment where appropriate.
- All disturbed areas where construction is not expected for 30 days shall be re-vegetated with 50 mm of topsoil and hydro-seeding according to OPSS 572.
- During construction, all catchbasins are to be sealed until roads are paved to prevent sediment deposition in the catchbasins sumps and conveyance of silt to the SWM Facility.
- Sediment traps to provide settling of sediment during on-site grading operations for areas < 2 ha.
- A temporary sediment basin to provide settling of sediment during the on-site grading operations for drainage areas >2 ha.
- Flow / Runoff Diversion in areas where stabilization is not feasible, through use of interceptor swales directed to a rock-check or straw-bale dam.
- Straw bales placed to intercept localized overland flow.
- Street sweeping to remove soil accumulation caused by construction traffic.

Following completion of construction, defined as 90% house construction, and site stabilization, all erosion and sediment control measures and accumulated sediment are to be removed

The erosion control measures shall be maintained in good repair during the entire construction period and shall only be removed as contributing drainage areas are restored and stabilized. In addition, the condition of erosion control works, their overall performance, and any repairs, replacement or modifications to the installed items shall be noted in Monitoring Reports submitted to the Grand River Conservation Authority (GRCA) and the City of Waterloo.

7 Utilities

Internal hydro services, Bell, Rogers cable lines and gas mains for the development would be buried in a joint trench within the Subject Lands. For copies of utility correspondence, please refer to Appendix E.

7.1 Enova Power

Enova stated that existing single-phase infrastructure on Wild Ginger Avenue and three-phase infrastructure on Erbsville Road could be used to service the site, with potential to require another single-phase feed depending on the loading, to be confirmed at detailed design.

7.2 Bell Canada

Bell has existing infrastructure that can be used to service the stacked town block on Erbsville Road, to be confirmed at detailed design. Bell has stated the existing copper infrastructure on White Birch and Wild Ginger will not be expanded to service further development. A path would be required for fibre to be routed from the Erbsville multiblock or through the existing subdivision.

7.3 Rogers Cable

Rogers confirmed that there is infrastructure in the area which would be used to service the Subject Lands

7.4 Enbridge

Enbridge Gas stated that the Subject Lands can be serviced with an extension off the existing main on Erbsville Road and by tying into existing mains along Royal Fern Street, White Birch Avenue, and Wild Ginger Avenue, to be confirmed during detailed design.

8 Conclusions and Recommendations

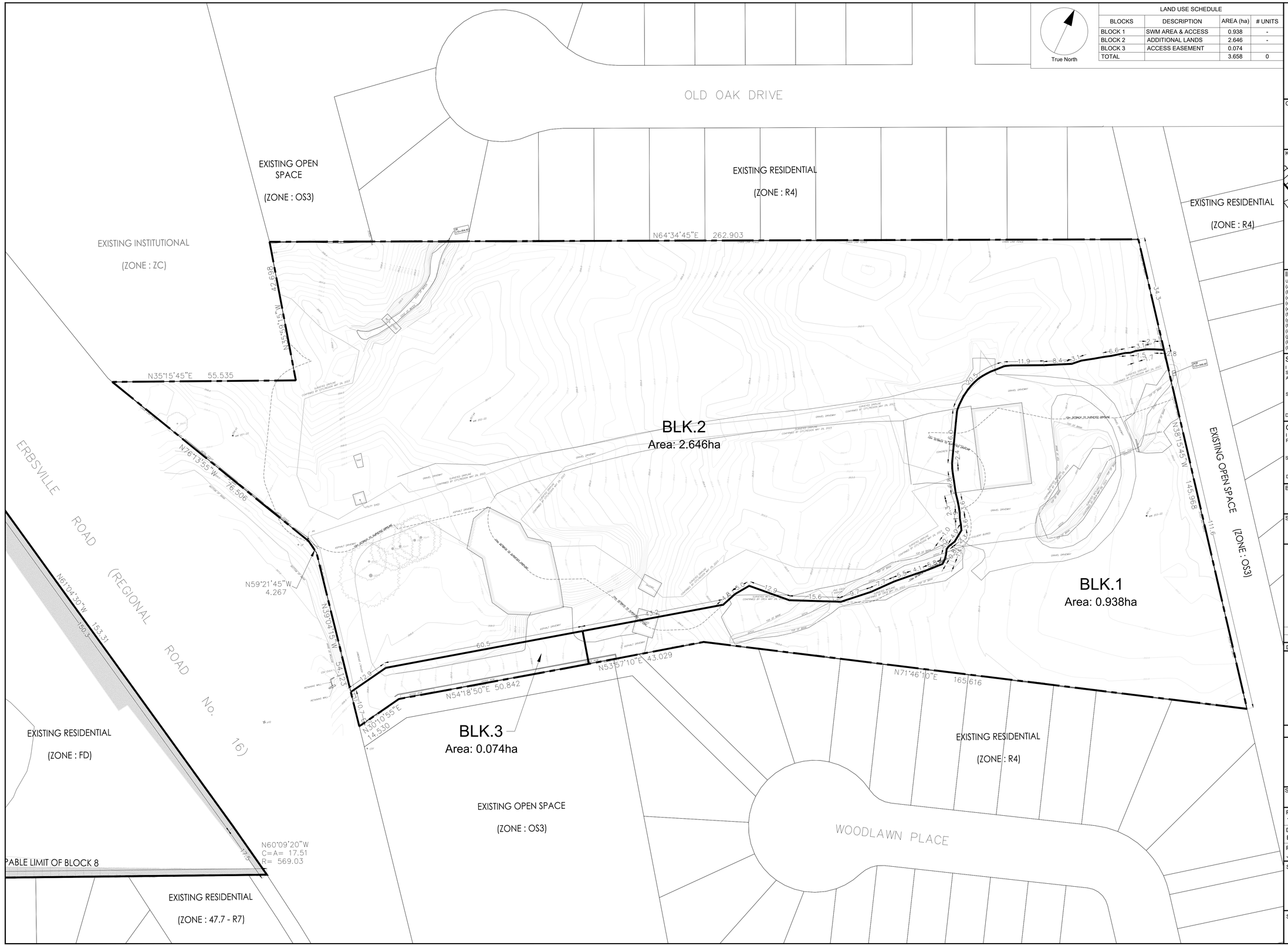
Based on the findings of this Report, it is concluded that:

- The proposed development can be adequately serviced by municipal sewage, storm drainage, water services and utilities
- Municipal servicing and roadworks can be provided in accordance with the City of Waterloo standards, with exceptions as agreed upon through consultation with the City.
- Streets within the subdivision will be constructed according to City of Waterloo Standards
- The subdivision can be serviced with Hydro, Bell, Cable, and Gas extended from existing facilities surrounding the Subject Lands.

It is further recommended that:

- The Report be circulated to the municipalities and various approval agencies in support of the Draft Plan Application for the site.
- Detailed grading and servicing design drawings be prepared, and a *Final Stormwater Management Report* and *Erosion and Sediment Control Plan* be completed once the development plan for the Subject Lands have been finalized.

Appendix A
Drawing Set



LAND USE SCHEDULE

BLOCKS	DESCRIPTION	AREA (ha)	# UNITS
BLOCK 1	SWM AREA & ACCESS	0.938	-
BLOCK 2	ADDITIONAL LANDS	2.646	-
BLOCK 3	ACCESS EASEMENT	0.074	
TOTAL		3.658	0

DRAFT PLAN OF SUBDIVISION

500 ERBSVILLE ROAD

CITY OF WATERLOO
PART 7 OF PLAN 58R-14906

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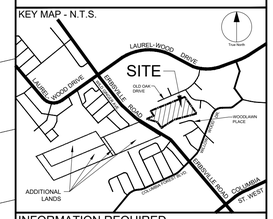
Arcadis Professional Services (Canada) Inc.

KEY MAP - N.T.S.



INFORMATION REQUIRED

UNDER SECTION 51 (17) OF THE PLANNING ACT, R.S.O. 1990, c.P.13 AS AMENDED
(a) - AS SHOWN
(b) - AS SHOWN
(c) - AS SHOWN
(d) - AS LISTED BELOW
(e) - AS SHOWN
(f) - AS SHOWN
(g) - AS SHOWN
(h) - MUNICIPAL WATER
(i) - WATERLOO FINE SANDY LOAM
(j) - AS SHOWN
(k) - PROPOSED MUNICIPAL SANITARY AND STORM SEWERS
(l) - NONE

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED ON THIS PLAN AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

SIGNED
JASON FINCH, O.L.S.
STANTEC GEOMATICS LTD.
DATE August 8, 2025

OWNER'S CERTIFICATE

I HEREBY CONSENT TO THE FILING OF THIS PLAN BY ARCADIS PROFESSIONAL SERVICE (CANADA) INC., IN DRAFT FORM.

SIGNED
PETER ARMBRUSTER
1000907877 ONTARIO INC.
DATE August 8, 2025

BENCHMARK
REFER TO TOPOGRAPHIC SURVEY AS DETAILED BELOW

SOURCE
PLAN OF TOPOGRAPHIC SURVEY OF PART OF LOTS 30 & 43 GERMAN COMPANY TRACT, PREPARED BY STANTEC GEOMATICS LTD., DATED 09-JAN-2024, REF.: 161414128

No.	DESCRIPTION	DATE
01	INITIAL DRAFT PLAN SUBMISSION	2025-07-04

DRAWING ISSUE RECORD

APPROVALS

ARCADIS

SCALE 5 0 5 10 20
1:500 (m)

PROJECT NO: 134476

DRAWN BY: E.T.	CHECKED BY: P.A.
PROJECT MGR: J.H.	APPROVED BY: J.H.

SHEET TITLE
DRAFT PLAN OF SUBDIVISION

SHEET NUMBER SP01

ISSUE 01

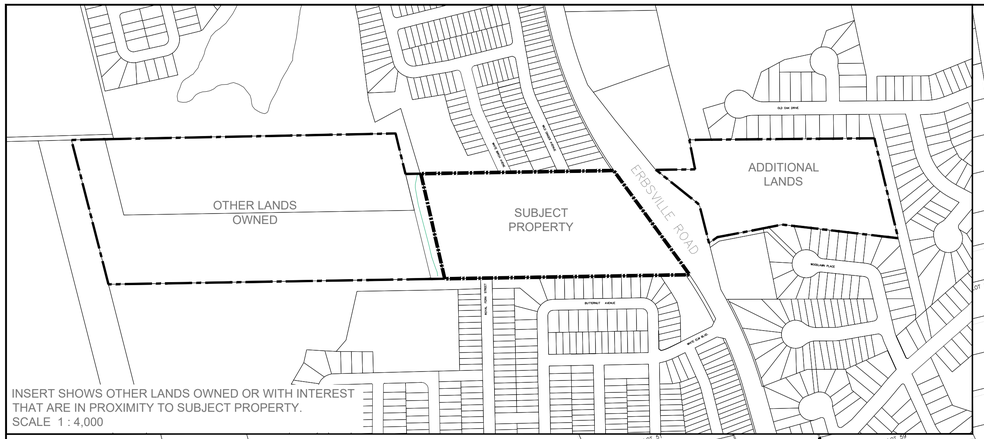
SCALE CHECK 1 in

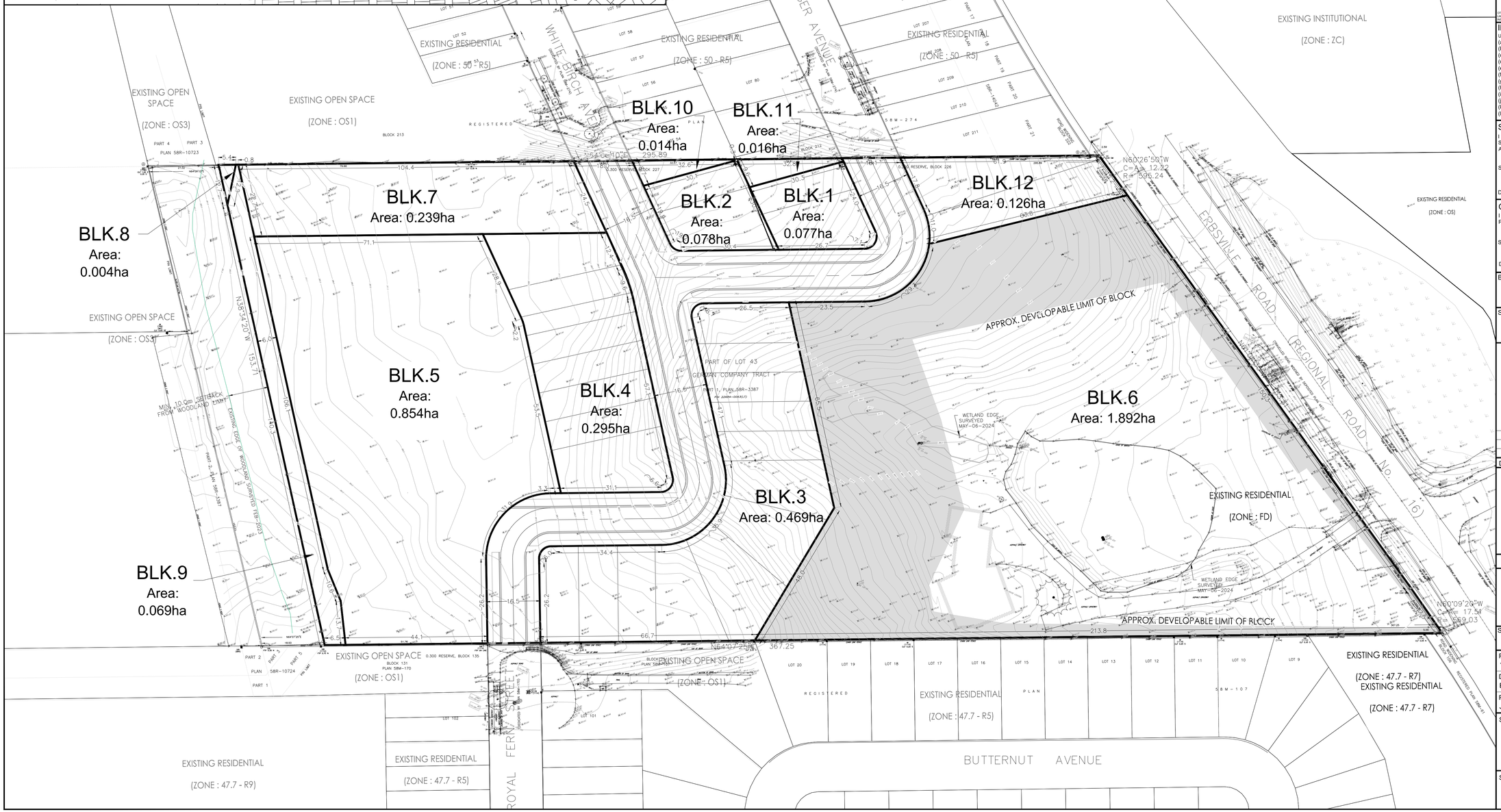
File Location: J:\134476_515_Erbsv\7.0_Production\7.03_Design\7_Planning\Sheets\134476_DP_SUB.dwg Last Saved: July 17, 2025, by tilleyn8881 Plotted: July 22, 2025 11:14:47 AM by Tilley, Emma

DRAFT PLAN OF SUBDIVISION

515 ERBSVILLE ROAD

CITY OF WATERLOO
PART OF LOT 43, GERMAN COMPANY TRACT





LAND USE SCHEDULE

BLOCKS	DESCRIPTION	AREA (ha)	# UNITS	UNITS / ha
BLOCK 1	RESIDENTIAL	0.076	± 2	± 26
BLOCK 2	RESIDENTIAL	0.079	± 2	± 26
BLOCK 3	RESIDENTIAL	0.469	± 12	± 26
BLOCK 4	RESIDENTIAL	0.295	± 7	± 24
BLOCK 5	RESIDENTIAL (MULTI-RES BLOCK)	0.854	± 56	± 66
BLOCK 6	RESIDENTIAL (MULTI-RES BLOCK)	1.891	± 96	± 87*
BLOCK 7	OPEN SPACE (PARK)	0.240	-	-
BLOCK 8	OPEN SPACE (NATURAL HERITAGE)	0.003	-	-
BLOCK 9	OPEN SPACE (TRAIL)	0.091	-	-
BLOCK 10	FUTURE LOT(S)	0.013	-	-
BLOCK 11	FUTURE LOT(S)	0.016	-	-
BLOCK 12	FUTURE LOT(S)	0.125	-	-
	R.O.W.	0.503	-	-
TOTAL		4.655	± 175	± 37.6

* Units / hectre based on approximate developable area of 1.108ha

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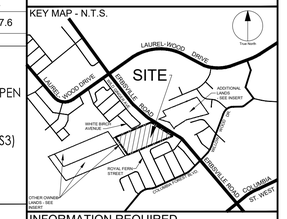
Arcadis Professional Services (Canada) Inc.

KEY MAP - N.T.S.



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(d) - AS LISTED BELOW
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(h) - MUNICIPAL WATER
(i) - WATERLOO FINE SANDY LOAM
(j) - AS SHOWN
(k) - PROPOSED MUNICIPAL SANITARY AND STORM SEWERS
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SIGNED

JASON FINCH, O.L.S.
STANTEC GEOMATICS LTD.

DATE August 8, 2025

OWNER'S CERTIFICATE

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SIGNED Peter Armbruster

PETER ARMBRUSTER
2844319 ONTARIO INC.

DATE August 8, 2025

BENCHMARK
REFER TO TOPOGRAPHIC SURVEY AS DETAILED BELOW

SOURCE
PLAN OF TOPOGRAPHIC SURVEY OF PART OF LOT 43 GERMAN COMPANY TRACT, PREPARED BY STANTEC GEOMATICS LTD., DATED 31-JAN-2024, REF.: 161414128

No.	DESCRIPTION	DATE
2	INITIAL DRAFT PLAN SUBMISSION	2025-07-04
1	FOR PRE-CONSULTATION	2024-09-25

DRAWING ISSUE RECORD

APPROVALS

ARCADIS
420 Wes Graham Way - Suite 106
Waterloo, ON N2L 0J6 Canada
tel 519 585 2255
www.arcadis.com

SCALE 0 5 10 20 30
1:600 (m)

PROJECT NO: 134476

DRAWN BY:	CHECKED BY:
E.T.	P.A.
PROJECT MGR:	APPROVED BY:
J.H.	J.H.

SHEET TITLE
DRAFT PLAN OF SUBDIVISION

SHEET NUMBER	ISSUE
DP01	02

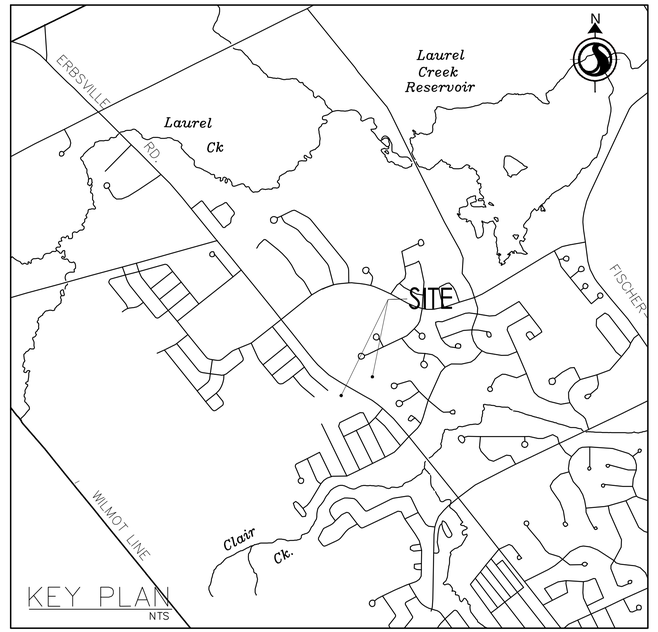
Stantec

10000507877 ONTARIO INC.
2844319 ONTARIO INC.

500 & 515 ERBSVILLE ROAD
WATERLOO, ON

DRAFT PLAN FIRST SUBMISSION
OCTOBER 2025

Project Number: 161414128



INDEX

SHEET NO.	REV NO.	DESCRIPTION
C-050	0	EXISTING CONDITIONS AND REMOVALS PLAN
C-051	0	EXISTING CONDITIONS AND REMOVALS PLAN
C-100	0	PRELIMINARY SERVICING PLAN
C-101	0	PRELIMINARY SERVICING PLAN
C-200	0	CONCEPTUAL ROAD PROFILES
C-400	0	PRELIMINARY GRADING PLAN
C-401	0	PRELIMINARY GRADING PLAN
C-800	0	CONCEPTUAL STORMWATER MANAGEMENT FACILITY
C-900	0	PRELIMINARY CUT/FILL ISOPAC
C-901	0	PRELIMINARY CUT/FILL ISOPAC

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9/9/2025 12:39:14 PM By: Akash, Alei
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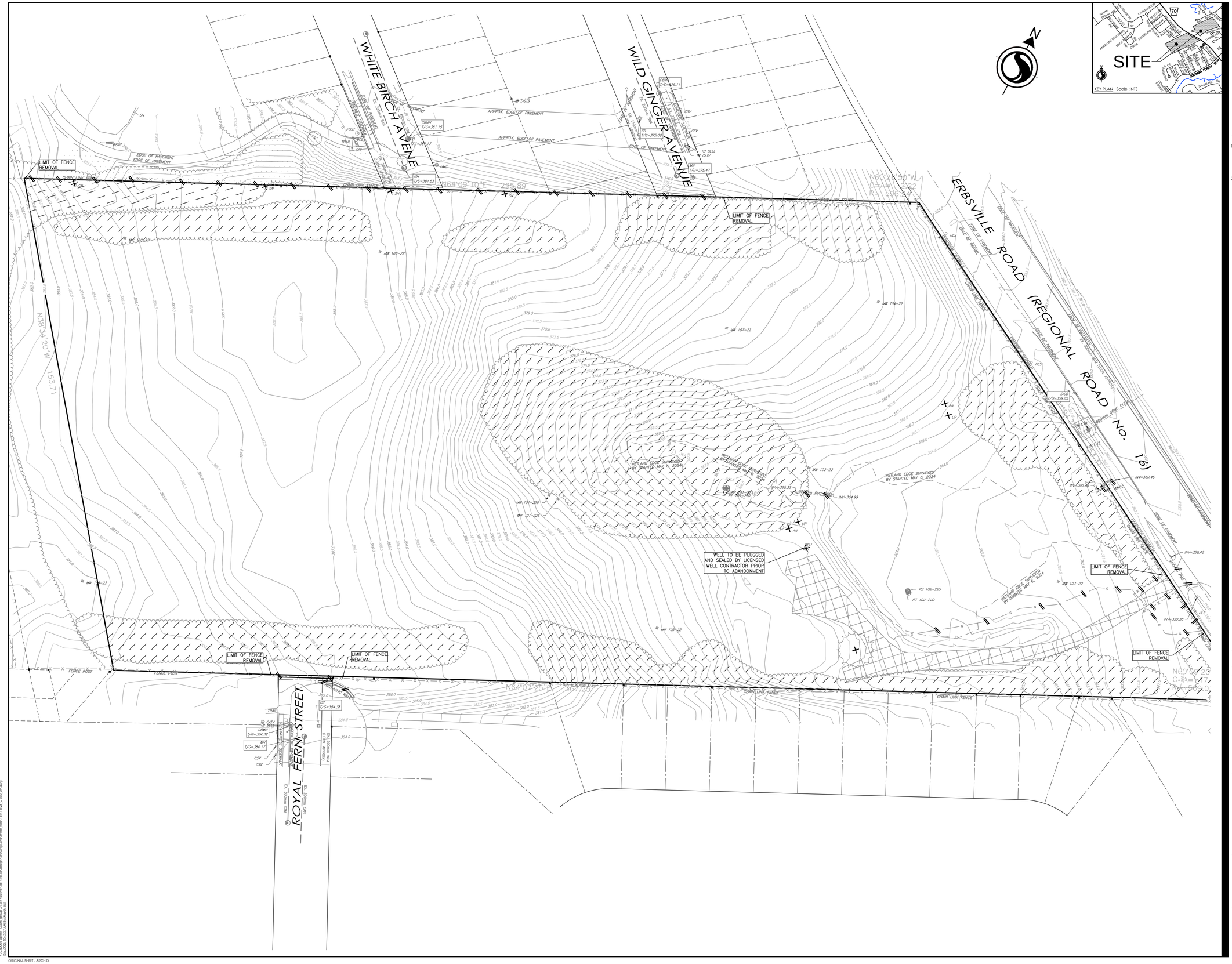

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Notes

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ORP	NORTHING	EASTING
A	4,812,721.09	532,967.24
B	4,812,848.98	533,231.16

2. TOPOGRAPHICAL SURVEY PREPARED BY STANTEC CONSULTING LTD., DATED MARCH 15, 2023 & APRIL 26, 2024. CONTOURS OUTSIDE OF THE PROPERTY LINE, AND WITHIN THE HEAVILY WOODED AREA OF THE SITE, HAVE BEEN OBTAINED FROM OMAFRA LIDAR SURVEY (2016-2018).

Legend

- REMOVALS (LINEAR INFRASTRUCTURE)
- REMOVALS (INDIVIDUAL ITEMS)
- 349.0 EXISTING CONTOUR
- TREE REMOVAL
- ASPHALT REMOVAL
- DRIPLINE (SURVEYED BY STANTEC, 2024)
- WETLAND EDGE (SURVEYED BY STANTEC, 2024)
- EXISTING FENCE (TYPE VARIES)
- EXISTING CULVERT
- EXISTING DITCH
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- EXISTING WATERMAIN
- EXISTING SANITARY MH
- EXISTING STORM MH
- EXISTING CATCHBASIN

0.	DRAFT PLAN SUBMISSION	WAM	SZ	2025.10.10
	Revision	By	Appd	YYYY.MM.DD
File Name:	161414128_C-050_DP	Dwn.	Dsgn.	2025.07.18
			Chkd.	YYYY.MM.DD

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Client/Project
2844319 ONTARIO INC.

515 ERBSVILLE ROAD

Waterloo, ON

Title
EXISTING CONDITIONS AND REMOVALS PLAN

Project No.
161414128

Scale 1:500 (0 5 15 25m)

Revision 0 Sheet of Drawing No. **C-050**

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Oct 9, 2025 10:43:31 AM By: Aaron, Will

ORIGINAL SHEET - ARCH D



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ORP	NORTHING	EASTING
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B	4,812,848.98	533,231.16

2. TOPOGRAPHICAL SURVEY PREPARED BY STANTEC CONSULTING LTD., DATED MARCH 15, 2023 & APRIL 26, 2024. CONTOURS OUTSIDE OF THE PROPERTY LINE, AND WITHIN THE HEAVILY WOODED AREA OF THE SITE, HAVE BEEN OBTAINED FROM OMAFRA LIDAR SURVEY (2016-2018).

Legend

- REMOVALS (LINEAR INFRASTRUCTURE)
- REMOVALS (INDIVIDUAL ITEMS)
- 349.0 EXISTING CONTOUR
- TREE REMOVAL
- ASPHALT REMOVAL
- GRAVEL REMOVAL
- CONCRETE REMOVAL
- DRIPLINE (CONFIRMED BY CITY/REGION, 2023)
- 10m SETBACK TO SURVEYED DRIPLINE
- WETLAND EDGE (GRCA 2023, 2025)
- EXISTING FENCE (TYPE VARIES)
- EXISTING CULVERT
- EXISTING DITCH
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- EXISTING WATERMAIN
- EXISTING SANITARY MH
- EXISTING STORM MH
- EXISTING CATCHBASIN

0	DRAFT PLAN SUBMISSION	WAM	SZ	2025.10.10
Revision		By	Appd	YYYY.MM.DD
File Name: 161414128_C-050_DP		Dwn.	Dsgn.	Chkd.	2025.07.18 YYYY.MM.DD

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Client/Project
10000507877 ONTARIO INC.

500 ERBSVILLE ROAD

Waterloo, ON

Title
EXISTING CONDITIONS AND REMOVALS PLAN

Project No. 161414128

Scale 1:500 (0 5 15 25m)

Revision 0 Sheet of

Drawing No. **C-051**

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03/6/2025 10:42:28 AM By: Martin, Will

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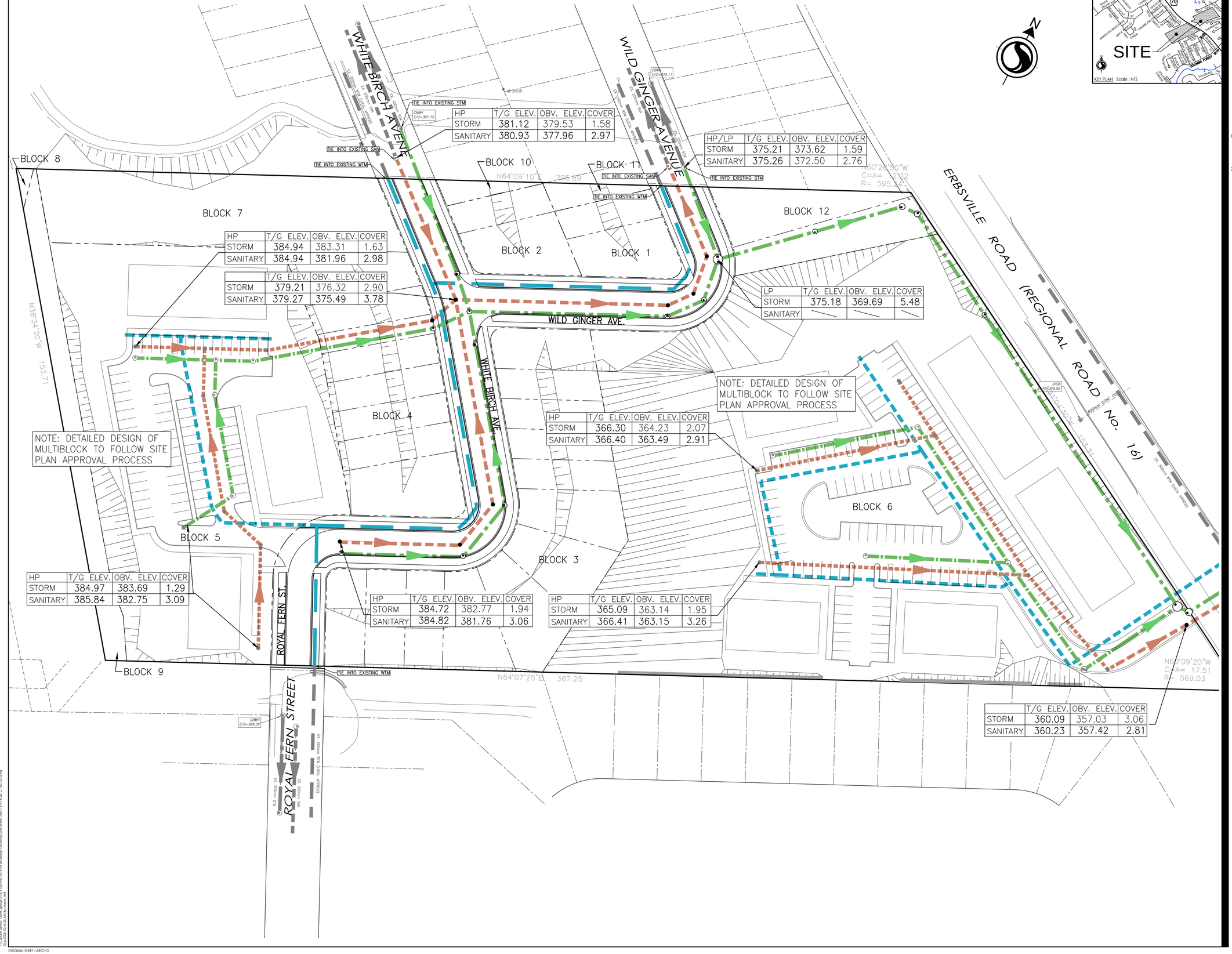

HP	T/G ELEV.	OBV. ELEV.	COVER
STORM	381.12	379.53	1.58
SANITARY	380.93	377.96	2.97

HP/LP	T/G ELEV.	OBV. ELEV.	COVER
STORM	375.21	373.62	1.59
SANITARY	375.26	372.50	2.76

HP	T/G ELEV.	OBV. ELEV.	COVER
STORM	384.94	383.31	1.63
SANITARY	384.94	381.96	2.98

	T/G ELEV.	OBV. ELEV.	COVER
STORM	379.21	376.32	2.90
SANITARY	379.27	375.49	3.78

LP	T/G ELEV.	OBV. ELEV.	COVER
STORM	375.18	369.69	5.48
SANITARY			

HP	T/G ELEV.	OBV. ELEV.	COVER
STORM	366.30	364.23	2.07
SANITARY	366.40	363.49	2.91

HP	T/G ELEV.	OBV. ELEV.	COVER
STORM	384.97	383.69	1.29
SANITARY	385.84	382.75	3.09

HP	T/G ELEV.	OBV. ELEV.	COVER
STORM	384.72	382.77	1.94
SANITARY	384.82	381.76	3.06

HP	T/G ELEV.	OBV. ELEV.	COVER
STORM	365.09	363.14	1.95
SANITARY	366.41	363.15	3.26

	T/G ELEV.	OBV. ELEV.	COVER
STORM	360.09	357.03	3.06
SANITARY	360.23	357.42	2.81

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Legend
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED WATERMAIN
- PROPOSED FUTURE SANITARY SEWER
- PROPOSED FUTURE STORM SEWER
- PROPOSED FUTURE WATERMAIN
- EXISTING SANITARY MH
- EXISTING STORM MH
- EXISTING CATCHBASIN
- PROPOSED SANITARY MH
- PROPOSED STORM MH
- PROPOSED CATCHBASIN
- PROPOSED FUTURE SANITARY MH
- PROPOSED FUTURE STORM MH
- PROPOSED FUTURE CATCHBASIN
- PROPOSED RETAINING WALL
- BLOCK LIMITS
- PROPERTY LINE

0.	DRAFT PLAN SUBMISSION	WAM	SZ	2025.10.10
Revision		By	Appd	YYYY.MM.DD
File Name: 161414128_C-100_UG				2025.07.18
		Dwn.	Dsgn.	Chkd. YYYY.MM.DD

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Client/Project
2844319 ONTARIO INC.

515 ERBSVILLE ROAD

Waterloo, ON

Title
PRELIMINARY SERVICING PLAN

Project No. 161414128

Scale 1:500 (0 5 15 25m)

Revision 0 Sheet of Drawing No. **C-100**

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07/9/2025 10:44:51 AM By Adams, Will
ORIGINAL SHEET - ARCH D

OLD OAK DRIVE

N64°34'45"E 262.903

CB T/G=354.42

CB T/G=349.38

CB INV=348.56

Ex. 300mm STM (LOCN. APPROX)

Ex. 600mm STM

N35°15'45"E 55.535

N35°50'15"W 49.698

BLOCK 2

BLOCK 1

N76°13'55"W 76.206

WETLAND EDGE FROM GRCA MAPPING JUNE 24, 2025

EXISTING SWM FACILITY

N59°21'45"W 4.267

200mm CONC CLVT

53.321

N59°04'15"W 43.123

HOUSE LIMITS

EXISTING LOCATION OF WATER SERVICE IS UNKNOWN AT THIS TIME AND WILL BE CONFIRMED DURING DETAILED DESIGN/CONSTRUCTION. THERE ARE NO PROPOSED CHANGES TO THE EXISTING WATER SERVICE

EX. SANITARY FORCEMAIN TO BE TIED-IN TO STRUCTURE (FIELD FIT)

Ex. 150mm SAN FM (LOCN. APPROX)

ASPHALT DRIVEWAY

BLOCK 3

N53°57'10"E 43.029

N54°18'50"E 50.842

Ex. 150mm WTM (LOCN. APPROX)

N30°10'55"E

N71°46'16"E 165.616

TIE INTO EXISTING WTM

HYD

Ex. 150mm WTM (LOCN. APPROX)

Ex. 300mm WTM (LOCN. APPROX)

ERBSVILLE ROAD (REGIONAL ROAD No. 16)

N60°09'20"W C=A= 17.51 R= 569.03

Ex. 250mm SAN (LOCN. APPROX)

TIE INTO EXISTING SAN

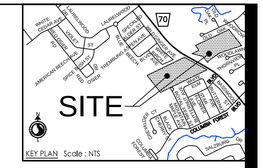
Ex. 200mm SAN (LOCN. APPROX)

WOODLAWN PLACE

N39°15'45"W 145.966

BOL

HP	T/G ELEV.	OBV. ELEV.	COVER
STORM	349.00	349.90	
SANITARY	352.83	349.98	2.85



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ORP	NORTHING	EASTING
A	4,812,721.09	532,967.24
B	4,812,848.98	533,231.16

2. TOPOGRAPHICAL SURVEY PREPARED BY STANTEC CONSULTING LTD., DATED MARCH 15, 2023 & APRIL 26, 2024. CONTOURS OUTSIDE OF THE PROPERTY LINE, AND WITHIN THE HEAVILY WOODED AREA OF THE SITE, HAVE BEEN OBTAINED FROM OMAFRA LIDAR SURVEY (2016-2018).

Legend

- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED WATERMAIN
- PROPOSED FUTURE SANITARY SEWER
- PROPOSED FUTURE STORM SEWER
- PROPOSED FUTURE WATERMAIN
- EXISTING SANITARY MH
- EXISTING STORM MH
- EXISTING CATCHBASIN
- PROPOSED SANITARY MH
- PROPOSED STORM MH
- PROPOSED CATCHBASIN
- PROPOSED FUTURE SANITARY MH
- PROPOSED FUTURE STORM MH
- PROPOSED FUTURE CATCHBASIN
- PROPOSED RETAINING WALL
- BLOCK LIMITS
- PROPERTY LINE

0. DRAFT PLAN SUBMISSION	WAM	SZ	2025.10.10
Revision	By	Appd	YYYY.MM.DD
File Name: 161414128_C-100_UG			2025.07.18
	Dwn.	Dsgn.	Chkd. YYYY.MM.DD

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Client/Project
10000507877 ONTARIO INC.

500 ERBSVILLE ROAD

Waterloo, ON

Title
PRELIMINARY SERVICING PLAN

Project No. 161414128

Scale 1:500 (0 5 15 25m)

Revision 0

Sheet of

Drawing No. **C-101**

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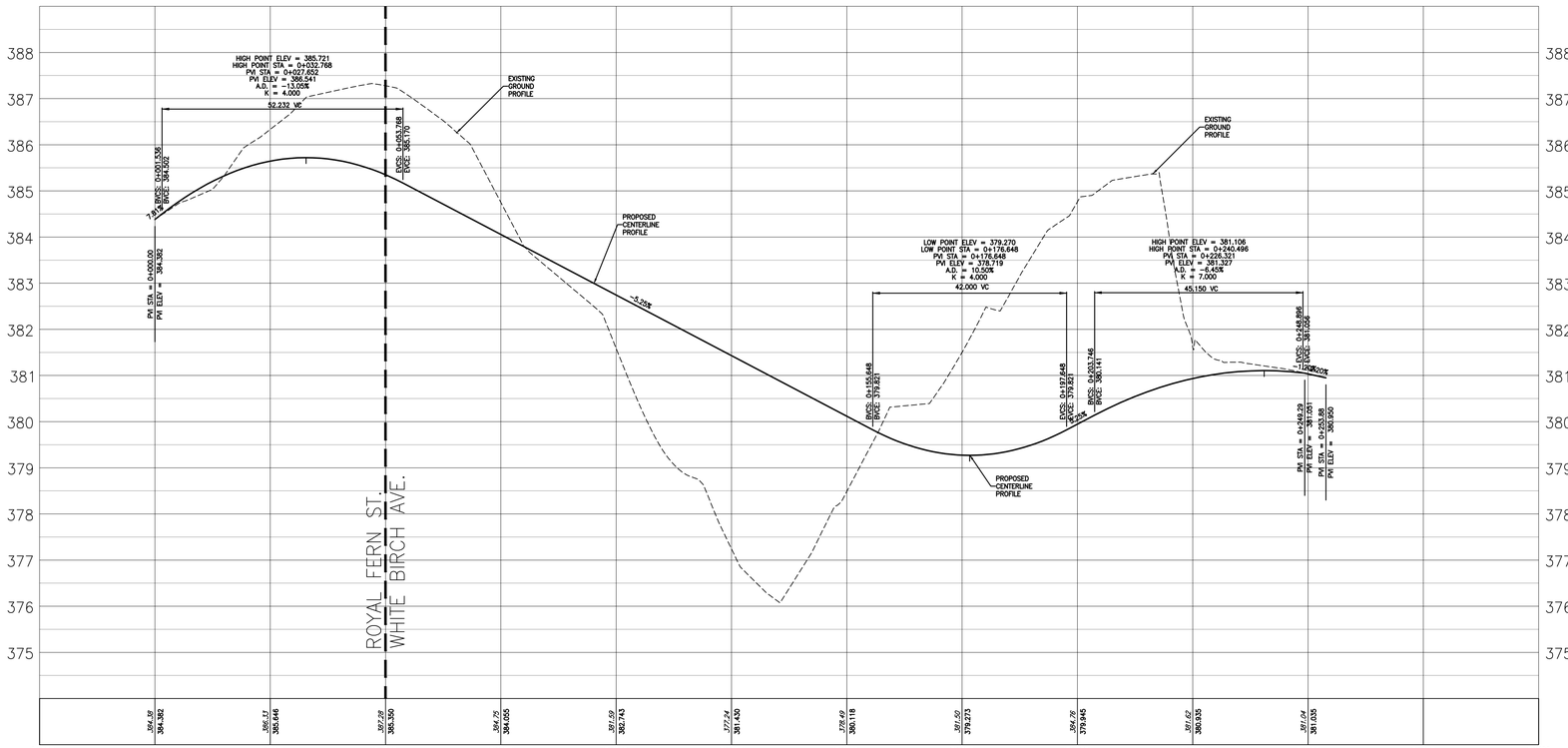
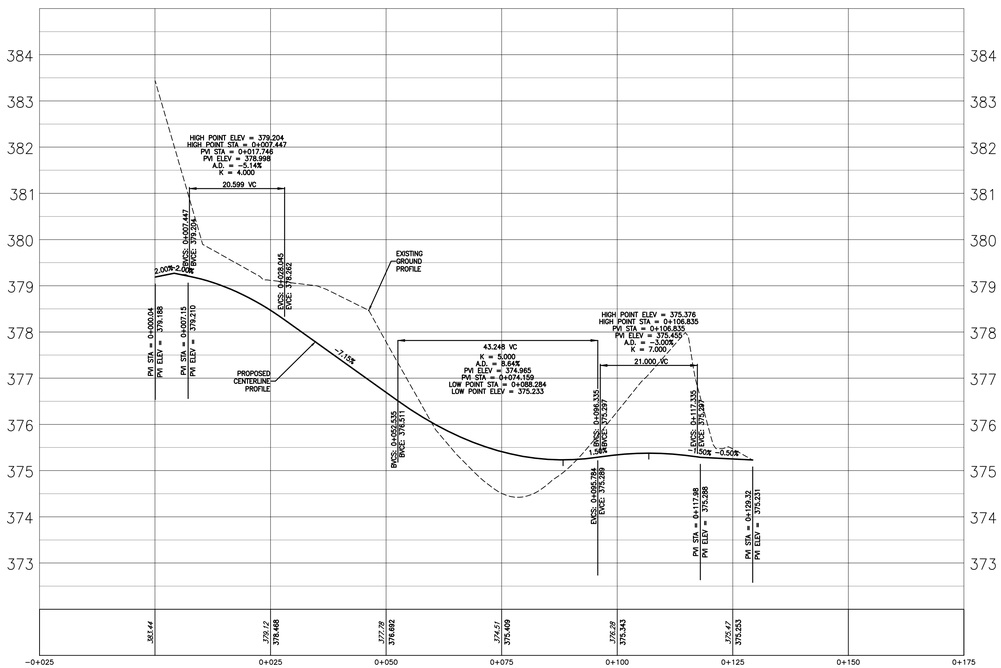


ROYAL FERN ST. / WHITE BIRCH AVE.



WILD GINGER AVE.



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Legend

0.	DRAFT PLAN SUBMISSION	WAM.	SZ	2025.10.10
Revision		By	Appd	YYYY.MM.DD
File Name:	161414128_C-200ST			2025.07.18
		Dwn.	Dsgn.	Chkd. YYYY.MM.DD

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Client/Project
2844319 ONTARIO INC.

515 ERBSVILLE ROAD

Waterloo, ON

Title
CONCEPTUAL ROAD PROFILES

Project No. 161414128

Scale

Revision 0

Sheet of

Drawing No. **C-200**

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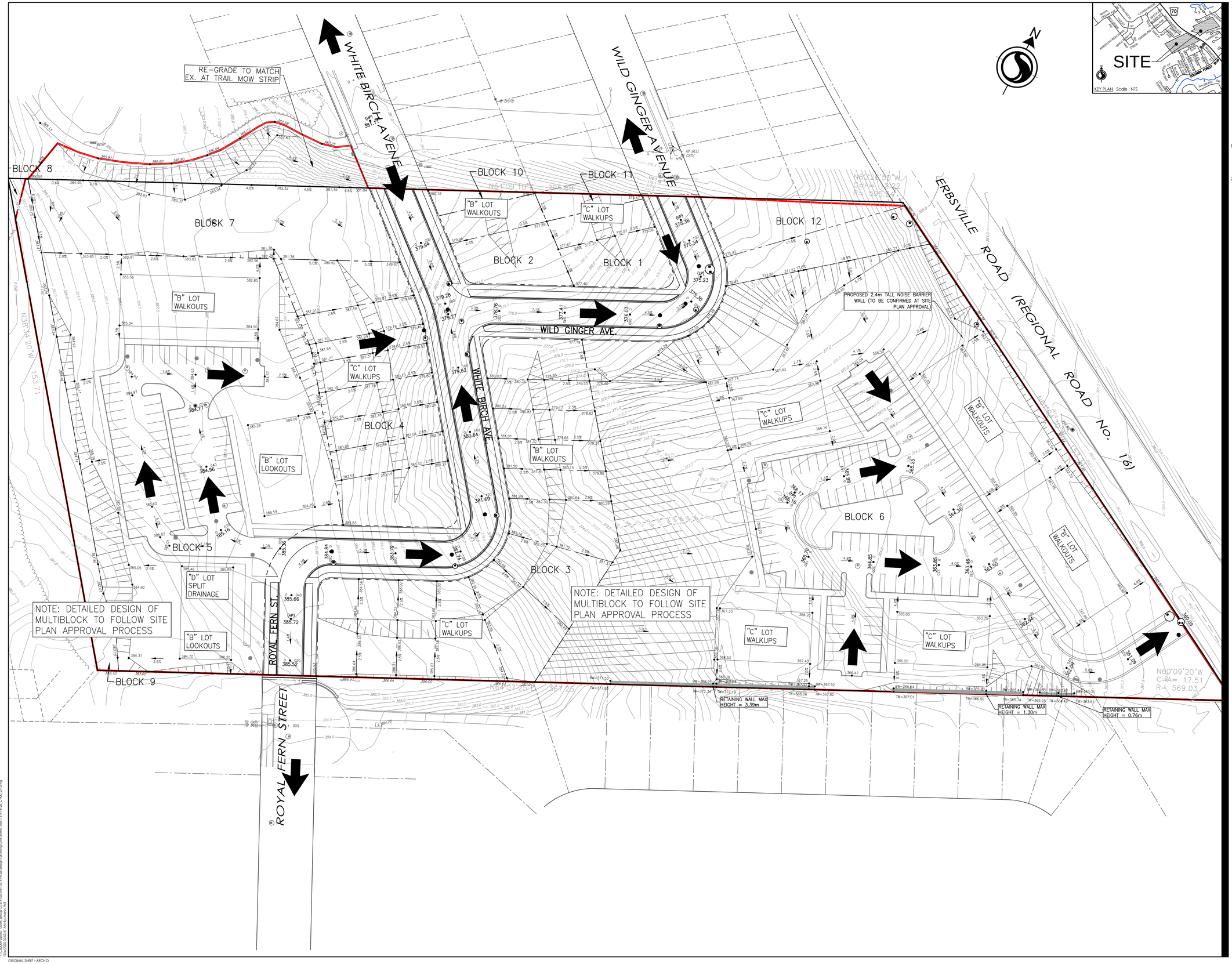

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Legend

- 3:1 SLOPE (UNLESS NOTED OTHERWISE)
- 352.90 PROPOSED ELEVATION
- 360.97 EXISTING ELEVATION
- 349.0 EXISTING CONTOUR
- 3.2% SLOPE
- RE-GRADE TO TIE INTO TRAIL MOW STRIP
- BLOCK LIMITS
- PROPERTY LINE
- PROPOSED RETAINING WALL
- MAJOR OVERLAND FLOW ROUTE
- GRADING LIMITS
- DRIPLINE (SURVEYED BY STANTEC, 2024)

0	DRAFT PLAN SUBMISSION	WAM	SZ	2025.10.10
	Revision	By	Appd	YYYY.MM.DD
File Name: 161414128_C-400_GP		Dwn.	Dsgn.	Chkd. 2025.07.18 YYYY.MM.DD

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Client/Project

2844319 ONTARIO INC.

515 ERBSVILLE ROAD

Waterloo, ON

Title

PRELIMINARY GRADING PLAN

Project No. 161414128

Scale 1:500 (0 5 15 25m)

Revision 0

Sheet of

Drawing No. **C-400**

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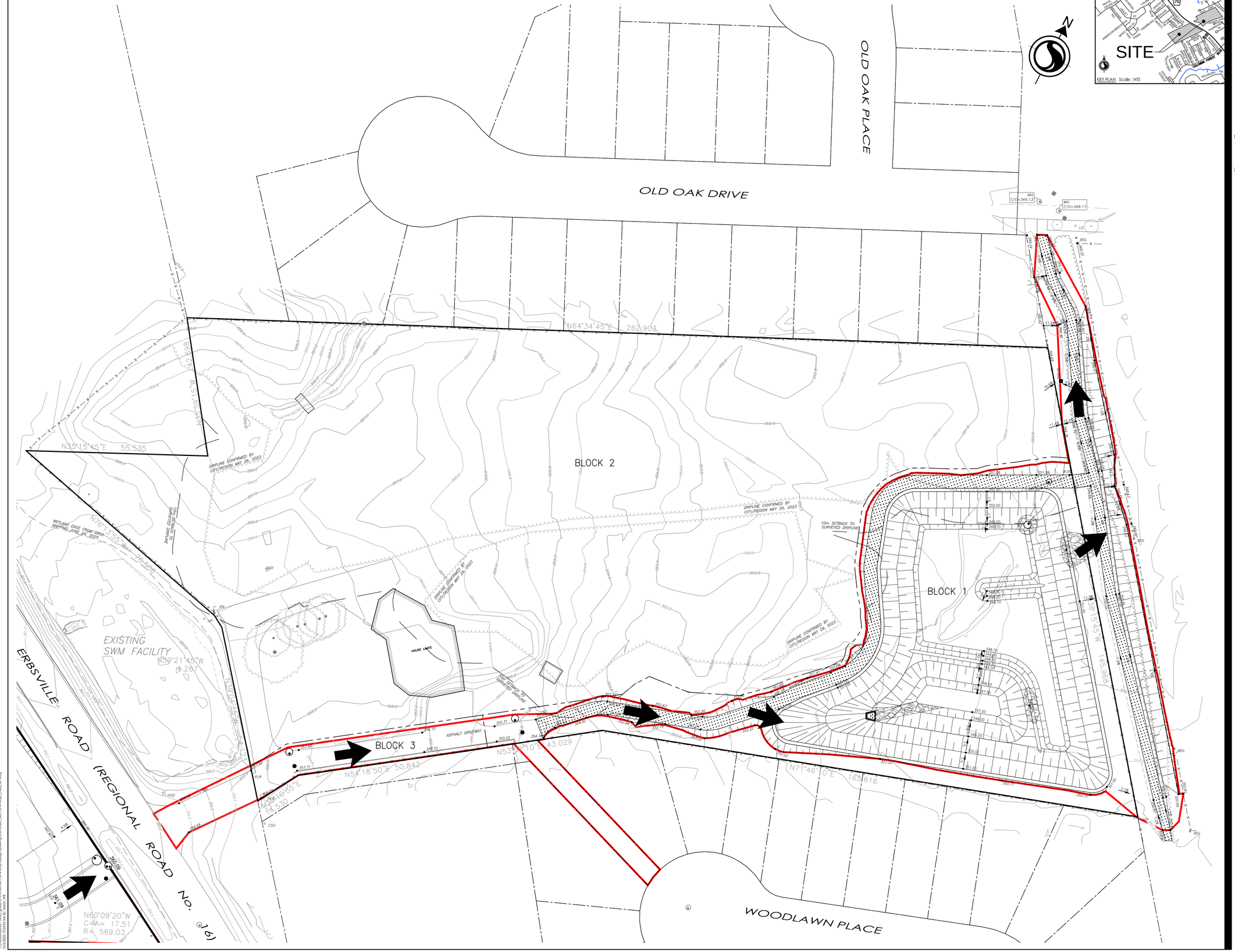

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Legend

- 3:1 SLOPE (UNLESS NOTED OTHERWISE)
- 352.90 PROPOSED ELEVATION
- 360.97 EXISTING ELEVATION
- 349.0 EXISTING CONTOUR
- 3.2% SLOPE
- BLOCK LIMITS
- PROPERTY LINE
- RIP RAP
- MAJOR OVERLAND FLOW ROUTE
- GRADING LIMITS
- SURVEYED DRIPLINE (CONFIRMED BY CITY REGION, 2023)
- 10m DRIPLINE SETBACK

0.	DRAFT PLAN SUBMISSION	WAM	SZ	2025.10.10
	Revision	By	Appd.	YYYY.MM.DD
File Name:	161414128_C-400_GP	Dwn.	Dsgn.	Chkd. 2025.07.18 YYYY.MM.DD

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Client/Project
10000507877 ONTARIO INC.

500 ERBSVILLE ROAD

Waterloo, ON

Title
PRELIMINARY GRADING PLAN

Project No. 161414128
Scale 1:500 (0, 5, 15, 25m)
Revision 0
Sheet of
Drawing No. **C-401**

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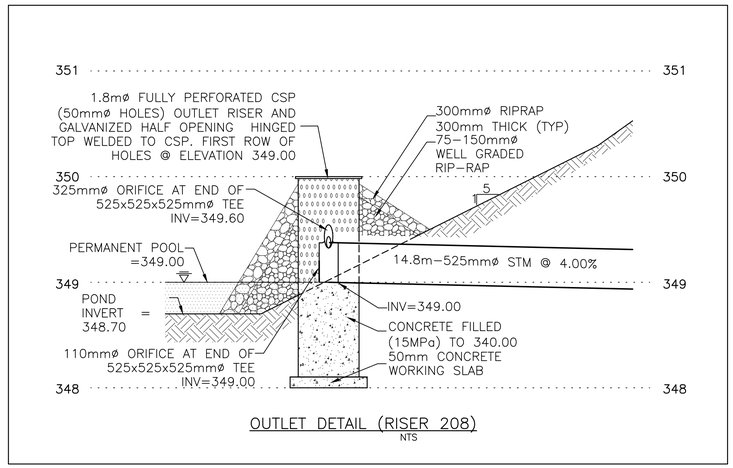
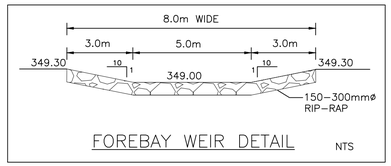
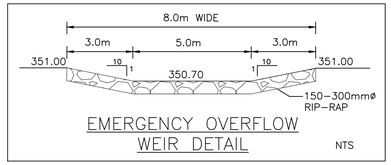
03/6/2025 10:54:03 AM By: Adam, Will



OUTLET DETAIL (RISER 208)
NTS



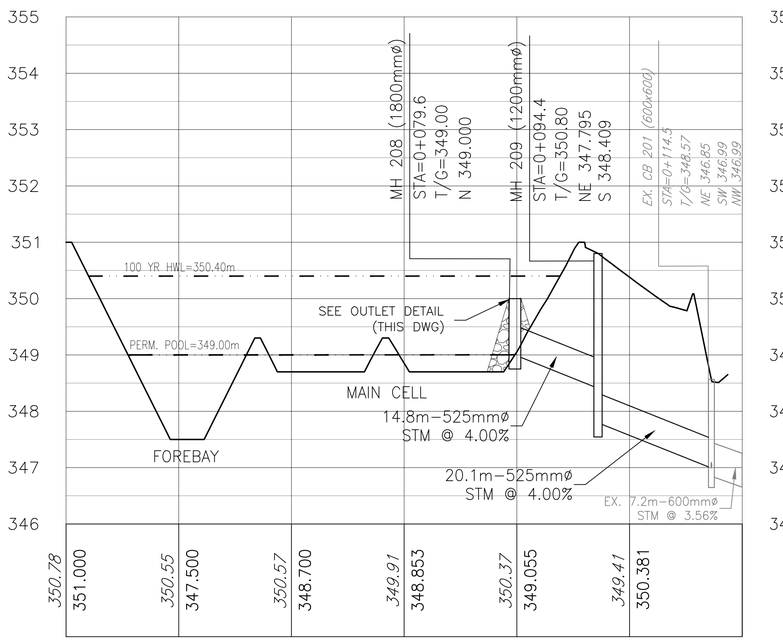
FOREBAY WEIR DETAIL
NTS

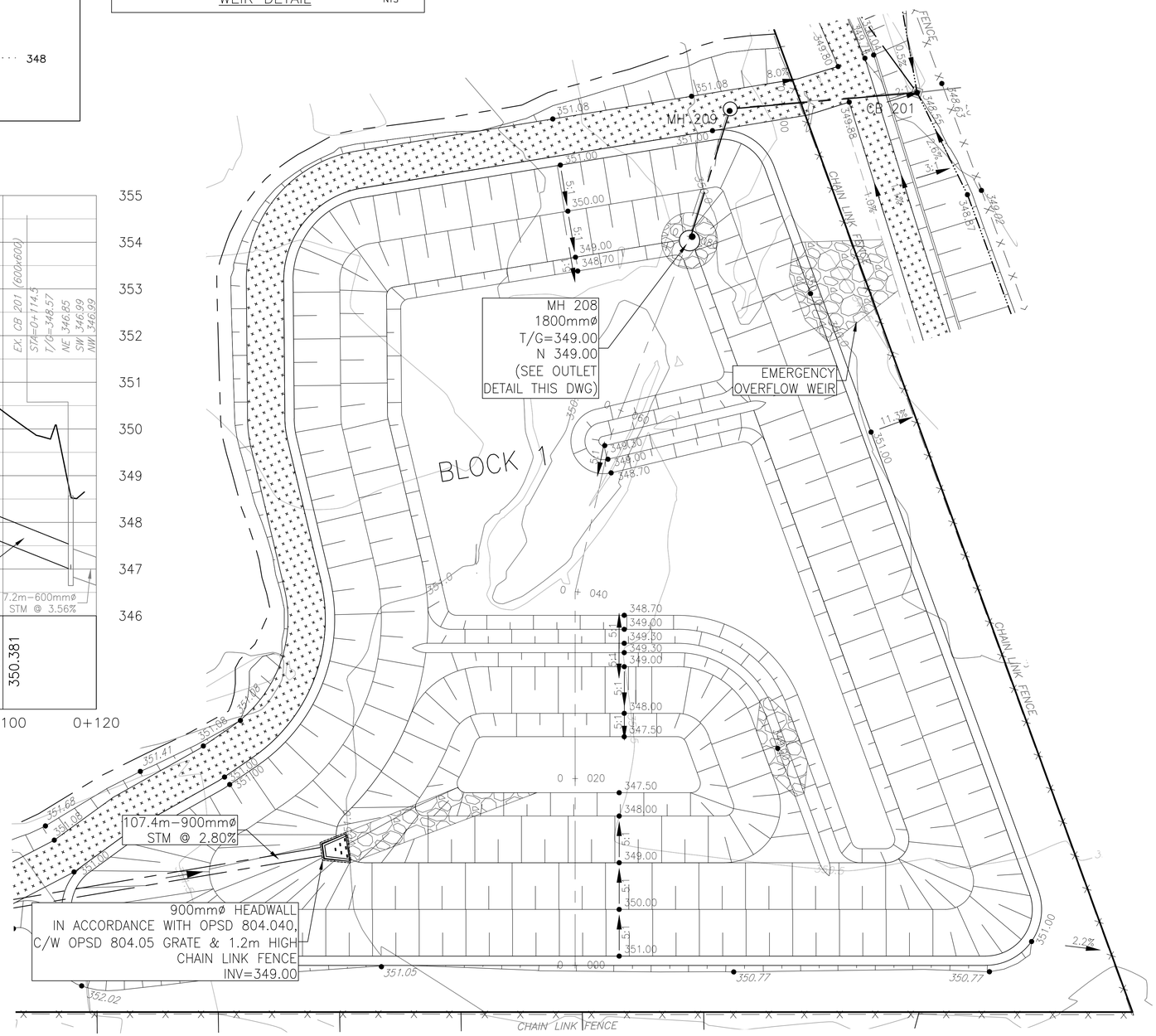


EMERGENCY OVERFLOW WEIR DETAIL
NTS

SWM POND STATISTICS

DESCRIPTION	ELEVATION
POND BOTTOM (FOREBAY)	347.50
POND BOTTOM (MAIN CELL)	348.70
PERMANENT POOL	349.00
QUALITY EXTENDED DETENTION (25mm)	349.39
5 YEAR WATER LEVEL	349.79
25 YEAR WATER LEVEL	350.08
100 YEAR WATER LEVEL	350.40
REGIONAL WATER LEVEL	350.98





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Legend

- PROPOSED STORM MH
- BLOCK LIMITS
- PROPERTY LINE
- 352.90 PROPOSED ELEVATION
- 360.97 EXISTING ELEVATION
- 349.0 EXISTING CONTOUR
- 3.2% SLOPE
- RIP RAP

0.	DRAFT PLAN SUBMISSION	WAM	SZ	2025.10.10
	Revision	By	Appd	YYYY.MM.DD
File Name:	161414128_C-800HX	Dwn.	Dsgn.	2025.09.29
			Chkd.	YYYY.MM.DD

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Client/Project

10000507877 ONTARIO INC.

500 ERBSVILLE ROAD

Waterloo ON Canada

Title

CONCEPTUAL STORMWATER MANAGEMENT FACILITY

Project No.	Scale	Revision	Sheet	Drawing No.
161414128	1:250 (0 2.5 7.5 12.5m)	0	of	C-800

\\CA0019-svpfs01\work_group\514.KA\active\161414128\design\drawing\ka0dwg\ka0dwg_Rev1.14.1-4.13&_C-800HX.dwg
10/1/2025 10:40:58 AM By: Kevin Wil

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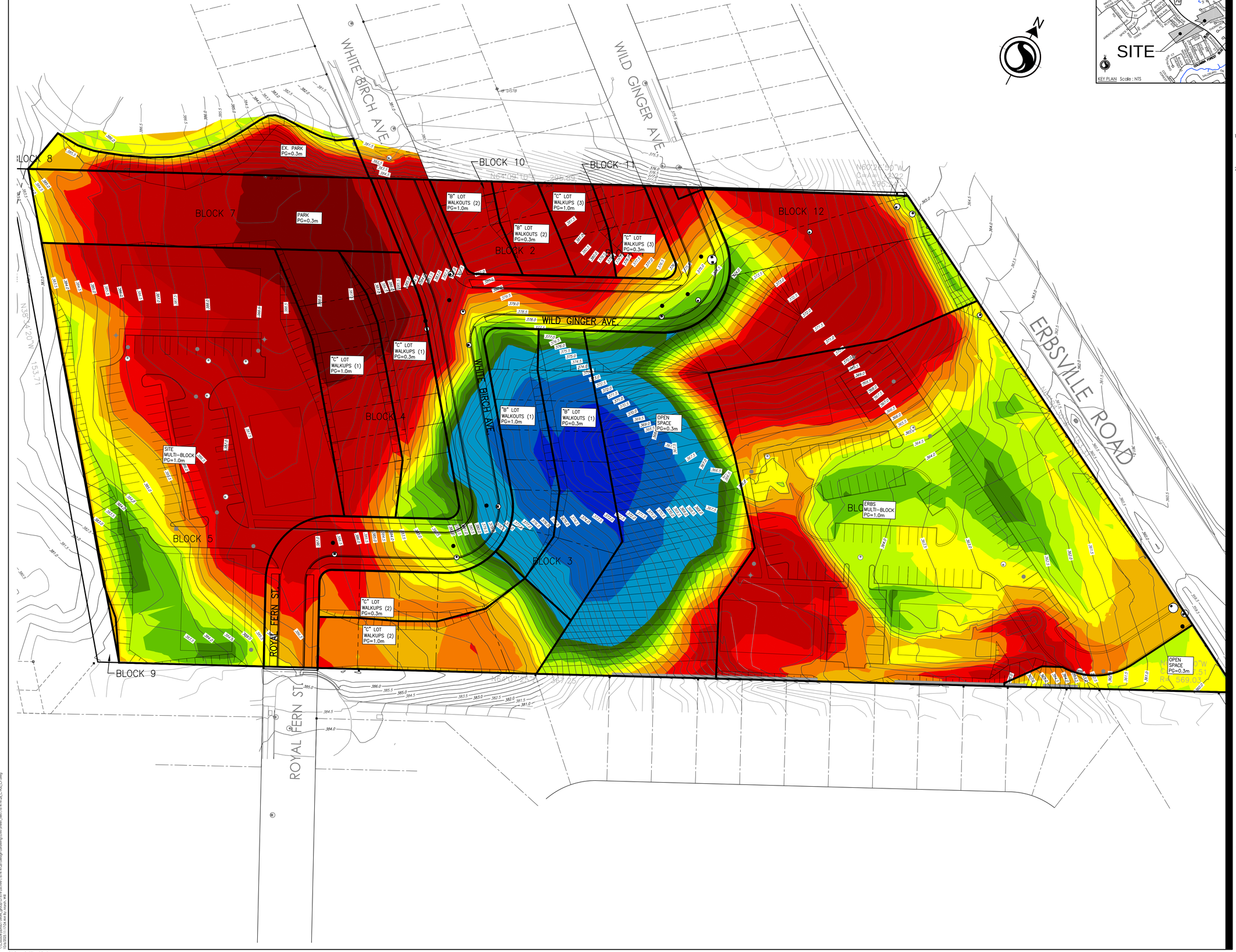

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Legend

Elevations Table

Number	Minimum Elevation	Maximum Elevation	Color
1	−8.00	−6.00	
2	−6.00	−4.00	
3	−4.00	−2.00	
4	−2.00	−1.50	
5	−1.50	−1.00	
6	−1.00	−0.50	
7	−0.50	0.00	
8	0.00	0.50	
9	0.50	1.00	
10	1.00	1.50	
11	1.50	2.00	
12	2.00	5.00	
13	5.00	7.50	
14	7.50	10.00	

0.	DRAFT PLAN SUBMISSION	WAM	SZ	2025.10.10
	Revision	By	Appd	YYYY.MM.DD

File Name: 161414128_C-900_CF			2025.07.16
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Client/Project
2844319 ONTARIO INC.

515 ERBSVILLE ROAD

Waterloo, ON

Title
PRELIMINARY CUT/FILL ISOPAC

Project No.
161414128

Scale
1:500

Revision
0

Sheet
of

Drawing No.
C-900

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07/15/2025 11:17:04 AM By: Martin, Will

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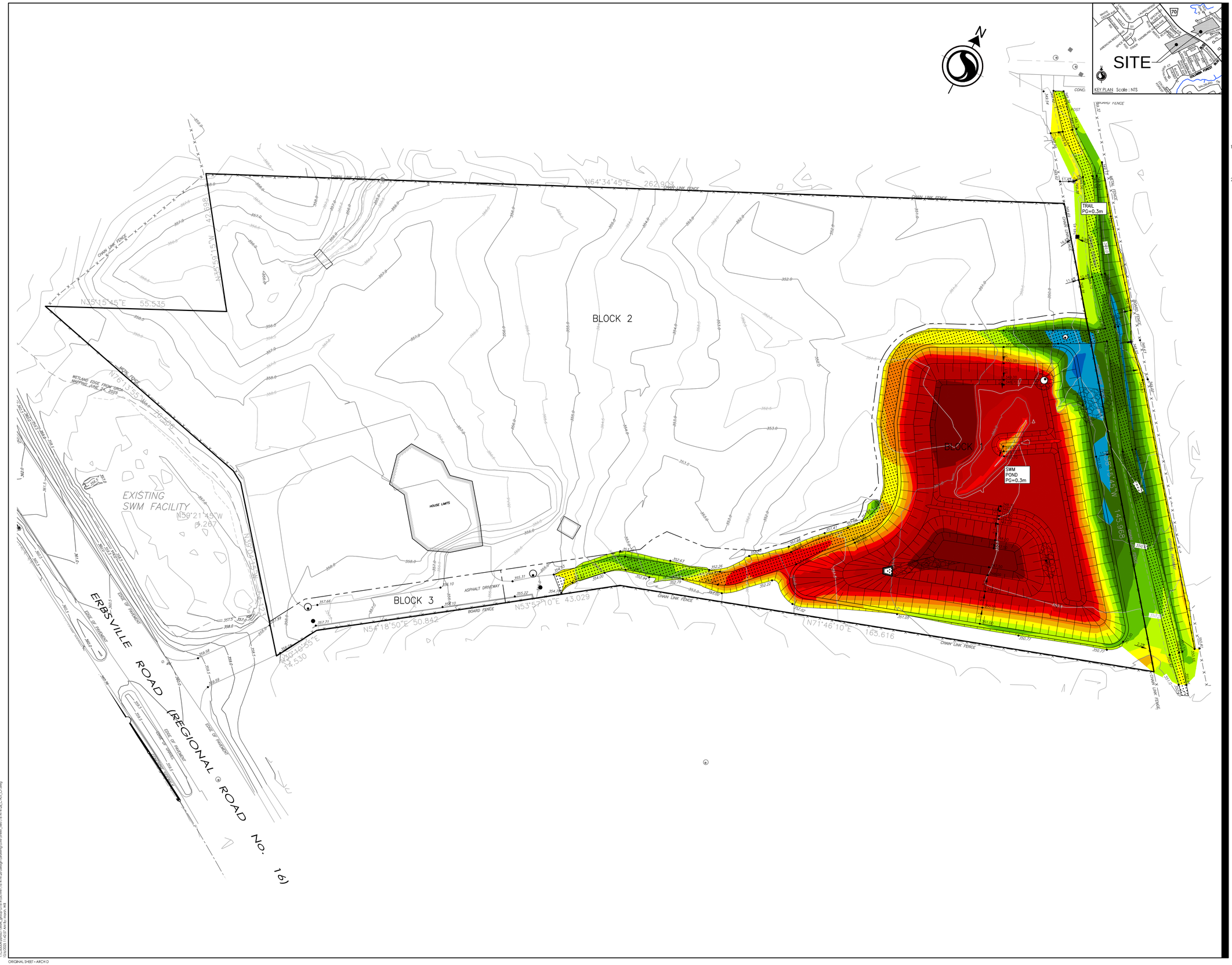

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Legend

Elevations Table

Number	Minimum Elevation	Maximum Elevation	Color
1	−3.50	−2.50	
2	−2.50	−1.50	
3	−1.50	−1.00	
4	−1.00	−0.75	
5	−0.75	−0.50	
6	−0.50	−0.25	
7	−0.25	0.00	
8	0.00	0.25	
9	0.25	0.50	
10	0.50	0.75	
11	0.75	1.00	
12	1.00	1.50	
13	1.50	2.50	
14	2.50	3.50	

0.	DRAFT PLAN SUBMISSION	WAM	SZ	2025.10.10
Revision		By	Appd	YYYY.MM.DD
File Name:	161414128_C-901_CF			2025.07.16
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Client/Project
10000507877 ONTARIO INC.

500 ERBSVILLE ROAD

Waterloo, ON

Title
PRELIMINARY CUT/FILL ISOPAC

Project No.
161414128

Scale
1:500
0 5 15 25m

Revision
0

Sheet
of

Drawing No.
C-901

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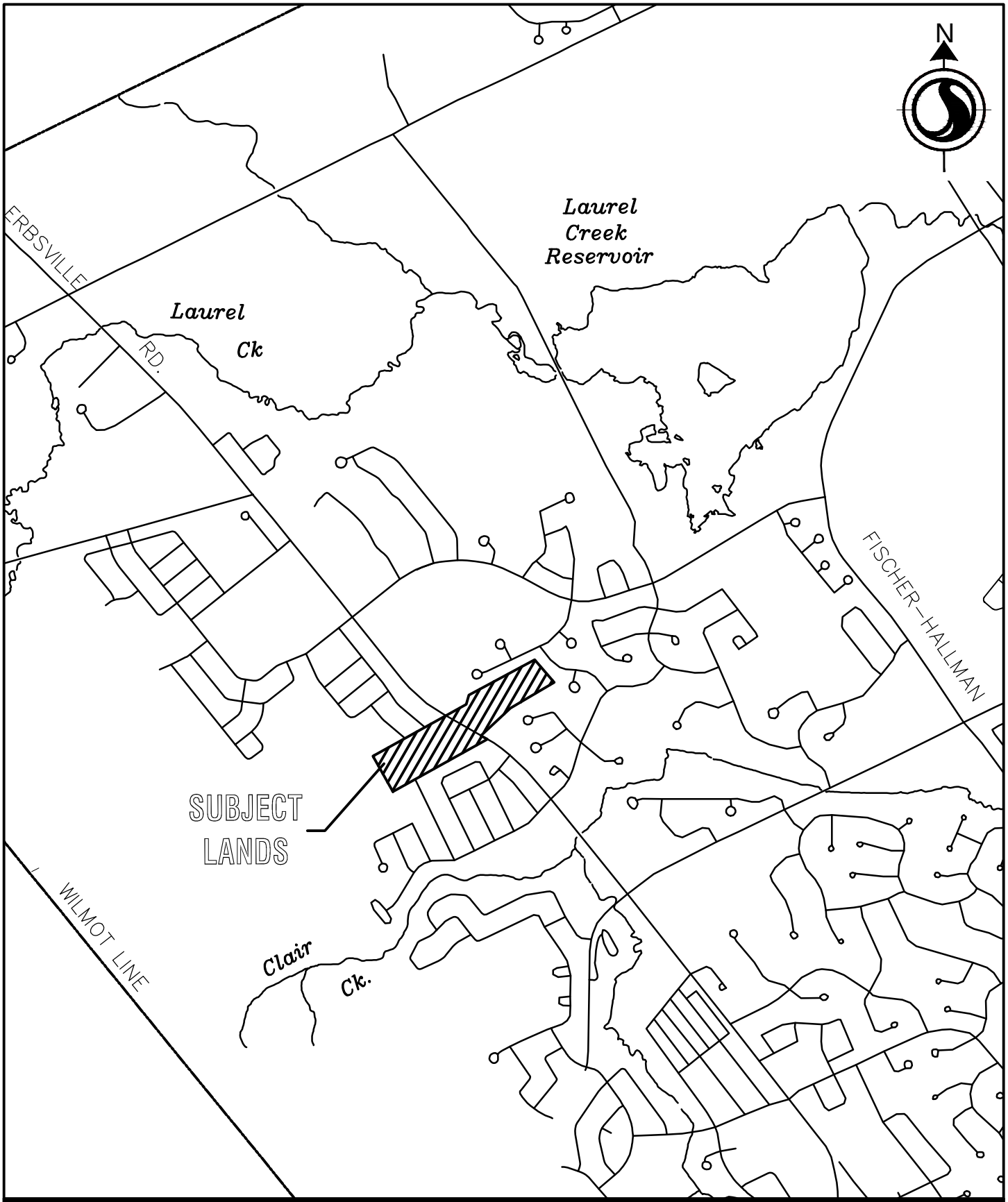
03/6/2025 11:43:21 AM By Adam, Will

ORIGINAL SHEET - ARCH D

Appendix B
Figures



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Client/Project
10000507877 ONTARIO INC.
2844319 ONTARIO INC.
500 & 515 ERBSVILLE ROAD

Project No.
161414128

Title
SITE LOCATION PLAN

Date
2025-10-06

Figure No.
1.0

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10/6/2025 10:16:32 AM By: Marsh, Will

Appendix C
Water Distribution System

Region of Waterloo

ENGINEERING AND
ENVIRONMENTAL SERVICES
Water and Wastewater Services
150 Frederick Street 7th Floor
Kitchener Ontario N2G 4J3 Canada
Telephone: 519-575-4400; TTY: 519-575-4608
Email: waterservices@regionofwaterloo.ca
www.regionofwaterloo.ca/water

Hitesh Lad
Stantec
100-300 Hagey Boulevard
Waterloo ON N2L 0A4
Hitesh.Lad@stantec.com

Date: June 5, 2025

Dear: Hitesh Lad,

Re: 515 Erbsville Road

Please find the results of the modeling simulations for boundary conditions requested on May 8th, 2025. The results include a figure showing the location of the nodes from the Region's model. Attached are a series of spreadsheets containing results for Average Day, Maximum Day demands and available fire flows for nodes JCT_23131 and JCT_20093 located on Erbsville Road and White Birch Ave respectively. The diurnal 24-hour demand distribution accounts for the minimum hour and peak hour peaking factors. The maximum pressure on the average day represents the minimum hour, and the minimum pressure on the maximum day represents the peak hour.

Table 1 – Modeling Results

Node	Elevation (mASL)	Demand		Fire Flow Results	
		Ave Day (L/s)	Max Day (L/s)	Design Flow (L/s)	Design Pressure (m)
JCT_23131	360.00	0.18	0.24	210.80	35.60
JCT_20093	381.00	0.27	0.34	141.70	14.10

A fire flow analysis shows the maximum flow available at a node with an associated design pressure during the maximum day scenario while maintaining the minimum design pressure of 14 m (140 kPa) at all nodes within the pressure zone.

If you have any questions, please contact me

Kevin Dolishny P.Eng.
Senior Engineer, Water Services
c. 226.751.4551 e. kdolishny@regionofwaterloo.ca

WAT 6 White Birch Ave and Wild Ginger Ave

JCT_20093 Average Day 24 Hour Simulation

Time	Demand (L/s)	Head (m)	Pressure (m)
00:00 hrs	0.27	426.45	45.45
01:00 hrs	0.31	426.59	45.59
02:00 hrs	0.34	426.73	45.73
03:00 hrs	0.30	426.90	45.90
04:00 hrs	0.24	427.09	46.09
05:00 hrs	0.39	427.17	46.17
06:00 hrs	0.83	426.76	45.76
07:00 hrs	1.02	426.31	45.31
08:00 hrs	0.83	426.31	45.31
09:00 hrs	0.82	426.15	45.15
10:00 hrs	0.78	426.02	45.02
11:00 hrs	0.73	425.91	44.91
12:00 hrs	0.70	425.82	44.82
13:00 hrs	0.65	425.77	44.77
14:00 hrs	0.60	425.74	44.74
15:00 hrs	0.64	425.64	44.64
16:00 hrs	0.68	425.52	44.52
17:00 hrs	0.78	425.60	44.60
18:00 hrs	0.85	425.87	44.87
19:00 hrs	0.86	426.19	45.19
20:00 hrs	0.80	426.59	45.59
21:00 hrs	0.71	427.06	46.06
22:00 hrs	0.56	427.45	46.45
23:00 hrs	0.36	427.23	46.23
Average Day HGL:		426.37	
Minimum Hour:		427.45	

JCT_20093 Maximum Day 24 Hour Simulation

Time	Demand (L/s)	Head (m)	Pressure (m)
00:00 hrs	0.34	427.32	46.32
01:00 hrs	0.43	427.76	46.76
02:00 hrs	0.51	427.50	46.50
03:00 hrs	0.49	427.22	46.22
04:00 hrs	0.40	426.99	45.99
05:00 hrs	0.75	426.82	45.82
06:00 hrs	1.56	426.15	45.15
07:00 hrs	1.83	425.58	44.58
08:00 hrs	1.31	425.69	44.69
09:00 hrs	1.02	425.68	44.68
10:00 hrs	0.95	425.54	44.54
11:00 hrs	0.83	425.98	44.98
12:00 hrs	1.06	426.23	45.23
13:00 hrs	1.40	426.37	45.37
14:00 hrs	1.17	426.83	45.83
15:00 hrs	1.56	426.86	45.86
16:00 hrs	1.64	426.74	45.74
17:00 hrs	1.92	425.78	44.78
18:00 hrs	2.06	425.24	44.24
19:00 hrs	2.04	424.82	43.82
20:00 hrs	1.83	424.87	43.87
21:00 hrs	1.24	425.51	44.51
22:00 hrs	0.87	426.04	45.04
23:00 hrs	0.54	426.66	45.66
Maximum Day HGL:		426.26	
Peak Hour:		424.82	

Available Flow (L/s)	Residual Pressure (m)
0.0	45.0
10.0	44.5
20.0	43.7
30.0	42.7
40.0	41.3
50.0	39.8
60.0	37.9
70.0	35.8
80.0	33.5
90.0	30.9
100.0	28.1
110.0	25.1
120.0	21.9
130.0	18.4
140.0	14.7
141.7	14.1

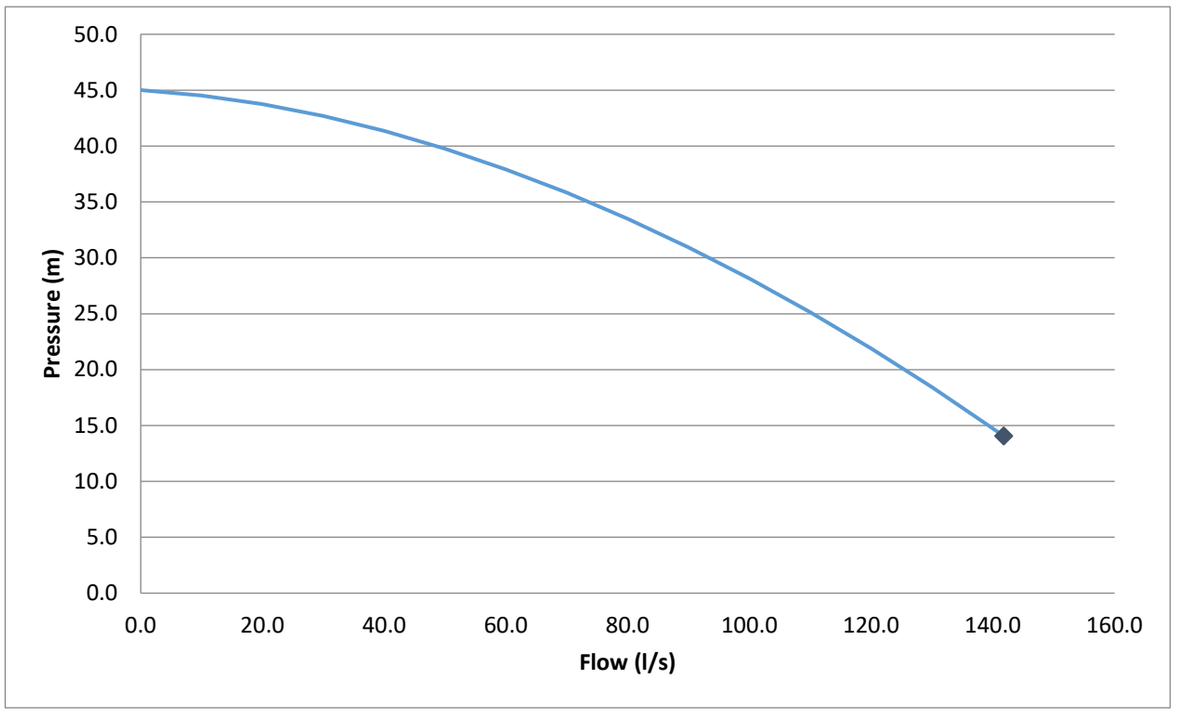
Fire Flow Analysis

Fire Flow Node:	JCT_20093
Design Flow (L/s):	141.7
Design Pressure (m):	14.1

Design Flow: *The final adjusted flow at the node to maintain the minimum design pressure (14m (140 kPa)) at ALL locations within the pressure zone.*

Design Pressure: *The lowest allowable pressure at the node to maintain the minimum design pressure (14m (140 kPa)) at ALL locations within the pressure zone.*

Critical Node ID: *The constraining node within the pressure zone that drops to the minimum design pressure of (14m (140 kPa)) during the design flow.*



WAT 6 Erbsville Rd and White Elm Blvd

JCT_23131 Average Day 24 Hour Simulation

Time	Demand (L/s)	Head (m)	Pressure (m)
00:00 hrs	0.18	426.45	66.45
01:00 hrs	0.21	426.60	66.60
02:00 hrs	0.23	426.74	66.74
03:00 hrs	0.20	426.90	66.90
04:00 hrs	0.16	427.09	67.09
05:00 hrs	0.26	427.18	67.18
06:00 hrs	0.56	426.78	66.78
07:00 hrs	0.68	426.34	66.34
08:00 hrs	0.56	426.33	66.33
09:00 hrs	0.55	426.18	66.18
10:00 hrs	0.52	426.04	66.04
11:00 hrs	0.49	425.93	65.93
12:00 hrs	0.47	425.84	65.84
13:00 hrs	0.43	425.78	65.78
14:00 hrs	0.40	425.75	65.75
15:00 hrs	0.43	425.66	65.66
16:00 hrs	0.45	425.53	65.53
17:00 hrs	0.53	425.62	65.62
18:00 hrs	0.57	425.89	65.89
19:00 hrs	0.58	426.21	66.21
20:00 hrs	0.54	426.61	66.61
21:00 hrs	0.47	427.07	67.07
22:00 hrs	0.38	427.47	67.47
23:00 hrs	0.24	427.24	67.24
Average Day HGL:		426.38	
Minimum Hour:		427.47	

JCT_23131 Maximum Day 24 Hour Simulation

Time	Demand (L/s)	Head (m)	Pressure (m)
00:00 hrs	0.24	427.32	67.32
01:00 hrs	0.31	427.76	67.76
02:00 hrs	0.37	427.50	67.50
03:00 hrs	0.35	427.23	67.23
04:00 hrs	0.29	426.99	66.99
05:00 hrs	0.55	426.83	66.83
06:00 hrs	1.13	426.19	66.19
07:00 hrs	1.33	425.62	65.62
08:00 hrs	0.95	425.71	65.71
09:00 hrs	0.74	425.69	65.69
10:00 hrs	0.69	425.56	65.56
11:00 hrs	0.60	425.99	65.99
12:00 hrs	0.77	426.25	66.25
13:00 hrs	1.02	426.39	66.39
14:00 hrs	0.85	426.85	66.85
15:00 hrs	1.13	426.89	66.89
16:00 hrs	1.19	426.77	66.77
17:00 hrs	1.39	425.82	65.82
18:00 hrs	1.50	425.29	65.29
19:00 hrs	1.48	424.87	64.87
20:00 hrs	1.33	424.91	64.91
21:00 hrs	0.90	425.53	65.53
22:00 hrs	0.63	426.06	66.06
23:00 hrs	0.39	426.67	66.67
Maximum Day HGL:		426.28	
Peak Hour:		424.87	

Available Flow (L/s)	Residual Pressure (m)
0.0	66.0
20.0	65.2
40.0	63.9
60.0	62.1
80.0	59.9
100.0	57.3
120.0	54.2
140.0	50.8
160.0	47.0
180.0	42.8
200.0	38.2
210.8	35.6

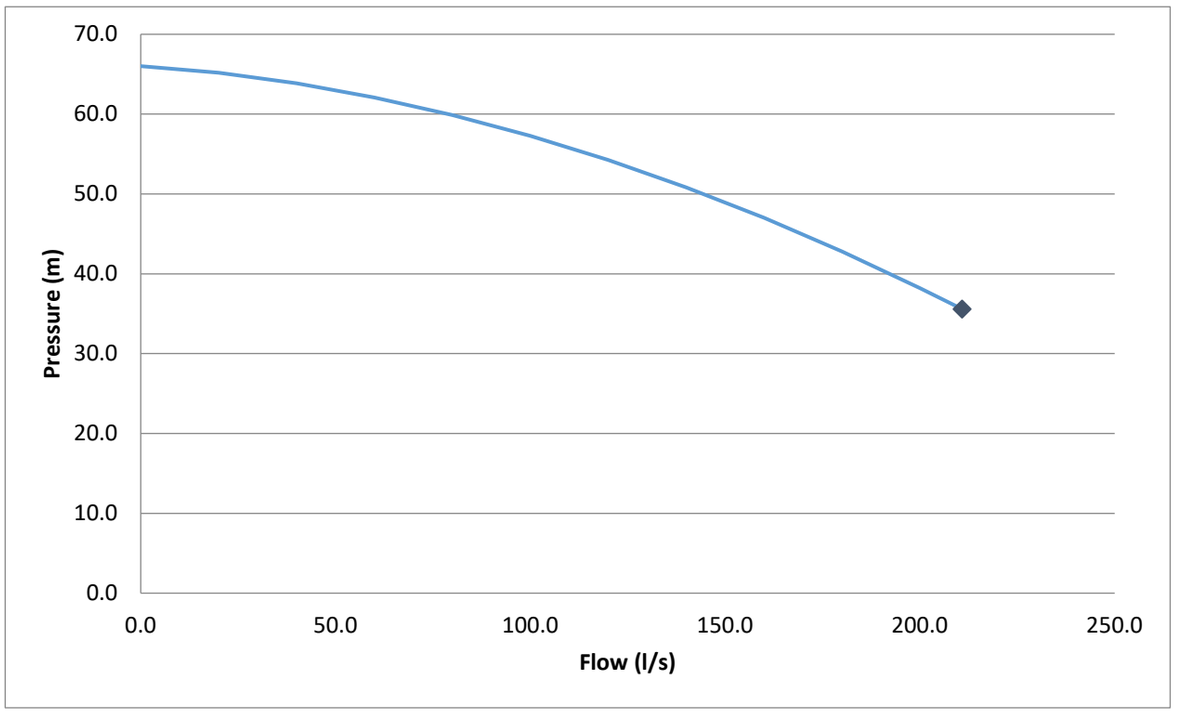
Fire Flow Analysis

Fire Flow Node:	JCT_23131
Design Flow (L/s):	210.8
Design Pressure (m):	35.6

Design Flow: *The final adjusted flow at the node to maintain the minimum design pressure (14m (140 kPa)) at ALL locations within the pressure zone.*

Design Pressure: *The lowest allowable pressure at the node to maintain the minimum design pressure (14m (140 kPa)) at ALL locations within the pressure zone.*

Critical Node ID: *The constraining node within the pressure zone that drops to the minimum design pressure of (14m (140 kPa)) during the design flow.*



(UEVYLOOH 5RDG? ?6WDQWHF (UEVYLOOH 5RDG? ?0RGHOLQJ 5HTXHVWV

515 Erbsville Road, Waterloo (Activa Holdings Inc.) 1614-14128

Nodal Data Input - Water Demand Calculations 2-Jul-25

Location	Node	Residential						Commercial		External	Avg Day	Min. Hour	Max Day	Peak Hour	Fire Flow
	No.	Single Family			Multi Family (Stacked Towns)					Demand	Demand	Demand	Demand	Demand	Demand
		Units	#persons	Demand	Units	#persons	Demand	Area	Demand						
				(L/s)			(L/s)	(ha)	(L/s)	(L/s)	(L/s)	(L/s)	(L/s)	(L/s)	(L/s)
Connection Node	J1			0.00			0.00				0.00	0.00	0.00	0.00	133
Single Family	J2	4	14	0.04			0.00				0.04	0.02	0.08	0.12	100
Connection Node	J3			0.00			0.00				0.00	0.00	0.00	0.00	133
Single Family and Multi Res Block 5	J5	17	60	0.16	16	34	0.09				0.25	0.13	0.50	0.75	133
Single Family and Connection Node	J6	2	7	0.02			0.00				0.02	0.01	0.04	0.06	100
Multi Res Block 5	J7			0.00	40	83	0.22				0.22	0.11	0.44	0.66	133
Connection Node	J8			0.00							0.00	0.00	0.00	0.00	133
Multi Res Block 6	J9			0.00	24	50	0.13				0.13	0.07	0.26	0.39	133
Multi Res Block 6	J10			0.00	16	34	0.09				0.09	0.05	0.18	0.27	133
Multi Res Block 6	J11			0.00	16	34	0.09				0.09	0.05	0.18	0.27	133
Multi Res Block 6	J12			0.00	16	34	0.09				0.09	0.05	0.18	0.27	133
Multi Res Block 6	J13			0.00	24	50	0.13				0.13	0.07	0.26	0.39	133
TOTAL		**23**	**81**	**0.22**	**152**	**319**	**0.84**	**0.00**	**0.00**	**0.00**	**1.06**	**0.53**	**2.12**	**3.18**	

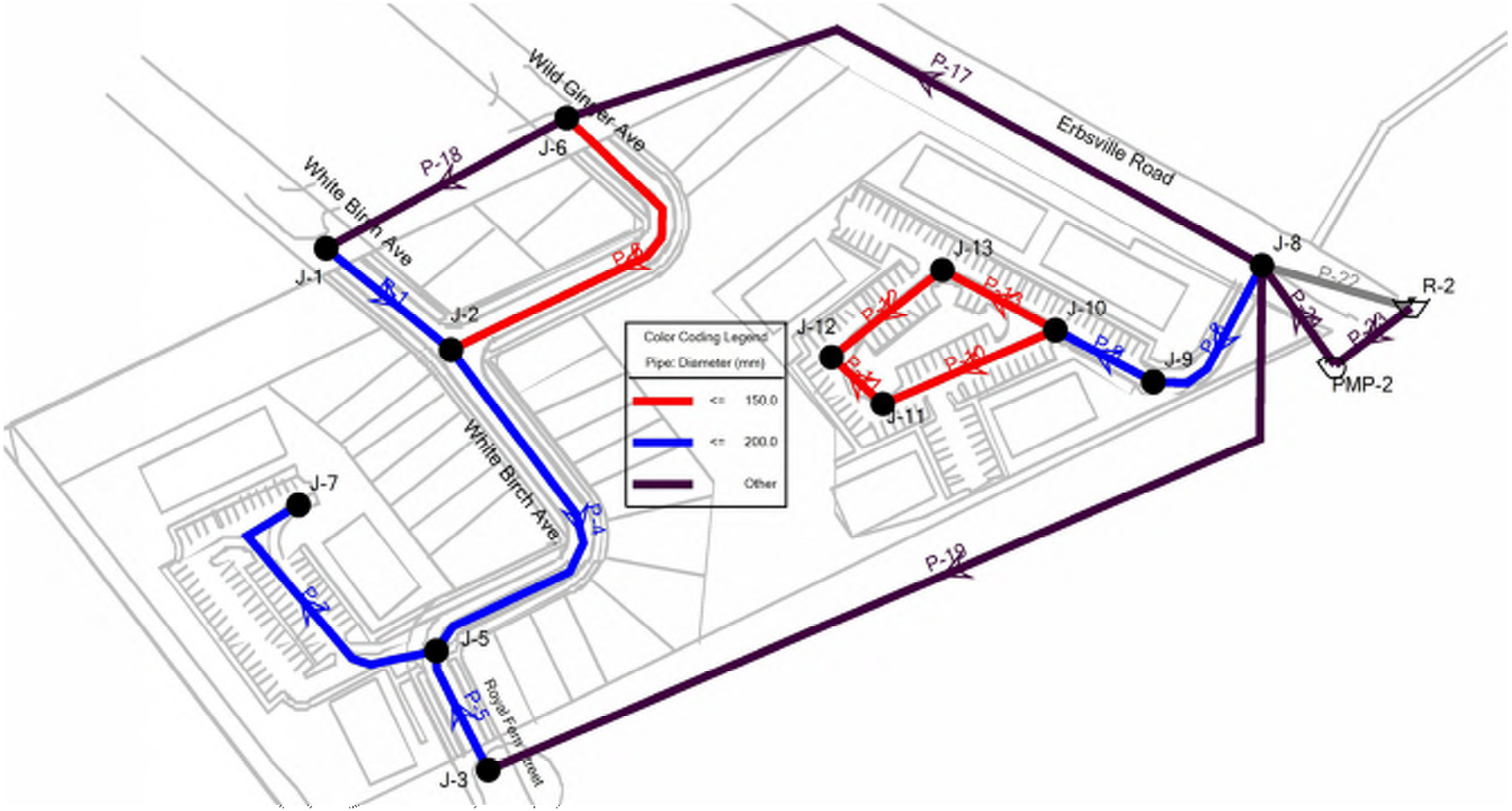
Specific Usage Rates

Land Use	Average Day		Source
Residential (Single Family)	3.49 c/units 225 L/c/d		Population Density based on City of Waterloo Development Charges Background Study dated January 6, 2020; and Per capita water usage based on Region of Waterloo DGSSMS.
Residential (Townhouse)	2.07 c/units 225 L/c/d		
Peaking Factors: Residential	avg max peak peak	1.00 2.00 3.00 0.50	Peaking factors based on Region of Waterloo DGSSMS.

515 Erbsville Road, Waterloo

Scenario: Max_Day+100 L/s Fire Flow

Active Scenario: Max_Day+100 L/s Fire Flow



515 Erbsville Road, Waterloo
FlexTable: Junction Table
Active Scenario: Avg_Day

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-1	381.00	0.00	426.38	444
J-2	379.30	0.04	426.38	461
J-3	385.30	0.00	426.38	402
J-5	385.00	0.25	426.38	405
J-6	375.30	0.02	426.38	500
J-7	384.50	0.22	426.38	410
J-8	360.00	0.00	426.38	650
J-9	362.00	0.13	426.38	630
J-10	363.50	0.09	426.38	615
J-11	365.75	0.09	426.38	593
J-12	366.20	0.09	426.38	589
J-13	365.25	0.13	426.38	598

515 Erbsville Road, Waterloo
FlexTable: Junction Table
Active Scenario: Max_Day

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-1	381.00	0.00	426.28	443
J-2	379.30	0.08	426.28	460
J-3	385.30	0.00	426.28	401
J-5	385.00	0.50	426.28	404
J-6	375.30	0.04	426.28	499
J-7	384.50	0.44	426.28	409
J-8	360.00	0.00	426.28	649
J-9	362.00	0.26	426.28	629
J-10	363.50	0.18	426.28	614
J-11	365.75	0.18	426.28	592
J-12	366.20	0.18	426.28	588
J-13	365.25	0.26	426.28	597

515 Erbsville Road, Waterloo
FlexTable: Junction Table
Active Scenario: Peak_Hour

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-1	381.00	0.00	424.87	429
J-2	379.30	0.12	424.87	446
J-3	385.30	0.00	424.87	387
J-5	385.00	0.75	424.87	390
J-6	375.30	0.06	424.87	485
J-7	384.50	0.66	424.87	395
J-8	360.00	0.00	424.87	635
J-9	362.00	0.39	424.87	615
J-10	363.50	0.27	424.87	601
J-11	365.75	0.27	424.87	579
J-12	366.20	0.27	424.87	574
J-13	365.25	0.39	424.87	583

515 Erbsville Road, Waterloo
FlexTable: Junction Table
Active Scenario: Min_Hour

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-1	381.00	0.00	427.47	455
J-2	379.30	0.04	427.47	471
J-3	385.30	0.00	427.47	413
J-5	385.00	0.25	427.47	416
J-6	375.30	0.02	427.47	511
J-7	384.50	0.22	427.47	421
J-8	360.00	0.00	427.47	660
J-9	362.00	0.13	427.47	641
J-10	363.50	0.09	427.47	626
J-11	365.75	0.09	427.47	604
J-12	366.20	0.09	427.47	600
J-13	365.25	0.13	427.47	609

515 Erbsville Road, Waterloo

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: Max_Day+100 L/s Fire Flow

Label	Satisfies Fire Flow Constraints?	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (System Lower Limit) (kPa)	Pressure (Calculated System Lower Limit) (kPa)	Junction w/ Minimum Pressure (System)
J-1	True	100.00	105.00	140	346	140	304	J-3
J-2	True	100.08	105.08	140	355	140	304	J-3
J-3	True	100.00	105.00	140	304	140	307	J-5
J-5	True	100.50	105.50	140	297	140	301	J-7
J-6	True	100.04	105.04	140	402	140	304	J-3
J-7	True	100.44	105.44	140	258	140	297	J-5
J-8	True	100.00	105.00	140	551	140	304	J-3
J-9	True	100.26	105.26	140	504	140	304	J-3
J-10	True	100.18	105.18	140	468	140	304	J-3
J-11	True	100.18	105.18	140	404	140	304	J-3
J-12	True	100.18	105.18	140	396	140	304	J-3
J-13	True	100.26	105.26	140	415	140	304	J-3

515 Erbsville Road, Waterloo

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: Max_Day+133 L/s Fire Flow

Label	Satisfies Fire Flow Constraints?	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (System Lower Limit) (kPa)	Pressure (Calculated System Lower Limit) (kPa)	Junction w/ Minimum Pressure (System)
J-1	True	133.00	138.00	140	292	140	250	J-3
J-2	True	133.08	138.08	140	295	140	249	J-5
J-3	True	133.00	138.00	140	250	140	253	J-5
J-5	True	133.50	138.50	140	236	140	241	J-7
J-6	True	133.04	138.04	140	348	140	250	J-3
J-7	True	133.44	138.44	140	168	140	236	J-5
J-8	True	133.00	138.00	140	497	140	250	J-3
J-9	True	133.26	138.26	140	431	140	250	J-3
J-10	True	133.18	138.18	140	382	140	250	J-3
J-11	True	133.18	138.18	140	290	140	250	J-3
J-12	True	133.18	138.18	140	278	140	250	J-3
J-13	True	133.26	138.26	140	303	140	250	J-3

515 Erbsville Road, Waterloo

FlexTable: Junction Table

Active Scenario: Max_Day+100 L/s Fire Flow to J-2

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-1	381.00	0.00	417.09	353
J-2	379.30	100.08	416.34	363
J-3	385.30	0.00	417.09	311
J-5	385.00	0.50	416.87	312
J-6	375.30	0.04	417.09	409
J-7	384.50	0.44	416.87	317
J-8	360.00	0.00	417.09	559
J-9	362.00	0.26	417.09	539
J-10	363.50	0.18	417.09	524
J-11	365.75	0.18	417.09	502
J-12	366.20	0.18	417.09	498
J-13	365.25	0.26	417.09	507

515 Erbsville Road, Waterloo

FlexTable: Pipe Table

Active Scenario: Max_Day+100 L/s Fire Flow to J-2

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Hazen-Williams C	Minor Loss Coefficient (Local)	Flow (L/s)	Velocity (m/s)	Length (User Defined) (m)
P-1	49	J-1	J-2	200.0	150.0	1.330	53.61	1.71	0
P-4	129	J-2	J-5	200.0	150.0	1.330	-29.19	0.93	0
P-5	40	J-5	J-3	200.0	150.0	1.330	-30.13	0.96	0
P-6	122	J-2	J-6	150.0	150.0	1.330	-17.27	0.98	0
P-7	93	J-5	J-7	200.0	150.0	1.330	0.44	0.01	0
P-8	53	J-8	J-9	200.0	150.0	1.330	1.06	0.03	0
P-9	34	J-9	J-10	200.0	150.0	1.330	0.80	0.03	0
P-10	57	J-10	J-11	150.0	150.0	1.330	0.28	0.02	0
P-11	21	J-11	J-12	150.0	150.0	1.330	0.10	0.01	0
P-12	43	J-12	J-13	150.0	150.0	1.330	-0.08	0.00	0
P-13	39	J-13	J-10	150.0	150.0	1.330	-0.34	0.02	0
P-17	234	J-8	J-6	1,000.0	150.0	0.000	70.93	0.09	1
P-18	83	J-6	J-1	1,000.0	150.0	0.000	53.61	0.07	1
P-19	308	J-8	J-3	1,000.0	150.0	0.000	30.13	0.04	1
P-22	47	R-2	J-8	1,000.0	150.0	0.000	(N/A)	(N/A)	1
P-23	29	R-2	PMP-2	1,000.0	150.0	0.000	102.12	0.13	1
P-24	38	PMP-2	J-8	1,000.0	150.0	0.000	102.12	0.13	1

515 Erbsville Road, Waterloo

FlexTable: Junction Table

Active Scenario: Max_Day+133 L/s Fire Flow to J-7

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-1	381.00	0.00	411.72	301
J-2	379.30	0.08	411.38	314
J-3	385.30	0.00	411.72	259
J-5	385.00	0.50	410.11	246
J-6	375.30	0.04	411.72	356
J-7	384.50	133.44	403.22	183
J-8	360.00	0.00	411.72	506
J-9	362.00	0.26	411.72	487
J-10	363.50	0.18	411.72	472
J-11	365.75	0.18	411.72	450
J-12	366.20	0.18	411.72	446
J-13	365.25	0.26	411.72	455

515 Erbsville Road, Waterloo

FlexTable: Pipe Table

Active Scenario: Max_Day+133 L/s Fire Flow to J-7

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Hazen-Williams C	Minor Loss Coefficient (Local)	Flow (L/s)	Velocity (m/s)	Length (User Defined) (m)
P-1	49	J-1	J-2	200.0	150.0	1.330	35.51	1.13	0
P-4	129	J-2	J-5	200.0	150.0	1.330	46.80	1.49	0
P-5	40	J-5	J-3	200.0	150.0	1.330	-87.14	2.77	0
P-6	122	J-2	J-6	150.0	150.0	1.330	-11.37	0.64	0
P-7	93	J-5	J-7	200.0	150.0	1.330	133.44	4.25	0
P-8	53	J-8	J-9	200.0	150.0	1.330	1.06	0.03	0
P-9	34	J-9	J-10	200.0	150.0	1.330	0.80	0.03	0
P-10	57	J-10	J-11	150.0	150.0	1.330	0.31	0.02	0
P-11	21	J-11	J-12	150.0	150.0	1.330	0.13	0.01	0
P-12	43	J-12	J-13	150.0	150.0	1.330	-0.05	0.00	0
P-13	39	J-13	J-10	150.0	150.0	1.330	-0.31	0.02	0
P-17	234	J-8	J-6	1,000.0	150.0	0.000	46.92	0.06	1
P-18	83	J-6	J-1	1,000.0	150.0	0.000	35.51	0.05	1
P-19	308	J-8	J-3	1,000.0	150.0	0.000	87.14	0.11	1
P-22	47	R-2	J-8	1,000.0	150.0	0.000	(N/A)	(N/A)	1
P-23	29	R-2	PMP-2	1,000.0	150.0	0.000	135.12	0.17	1
P-24	38	PMP-2	J-8	1,000.0	150.0	0.000	135.12	0.17	1

515 Erbsville Road, Waterloo

FlexTable: Junction Table

Active Scenario: Max_Day+133 L/s Fire Flow to J-12

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-1	381.00	0.00	411.72	301
J-2	379.30	0.08	411.72	317
J-3	385.30	0.00	411.72	259
J-5	385.00	0.50	411.72	262
J-6	375.30	0.04	411.72	356
J-7	384.50	0.44	411.72	266
J-8	360.00	0.00	411.72	506
J-9	362.00	0.26	407.24	443
J-10	363.50	0.18	403.96	396
J-11	365.75	0.18	399.02	326
J-12	366.20	133.18	396.59	297
J-13	365.25	0.26	400.39	344

515 Erbsville Road, Waterloo

FlexTable: Pipe Table

Active Scenario: Max_Day+133 L/s Fire Flow to J-12

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Hazen-Williams C	Minor Loss Coefficient (Local)	Flow (L/s)	Velocity (m/s)	Length (User Defined) (m)
P-1	49	J-1	J-2	200.0	150.0	1.330	0.32	0.01	0
P-4	129	J-2	J-5	200.0	150.0	1.330	0.30	0.01	0
P-5	40	J-5	J-3	200.0	150.0	1.330	-0.64	0.02	0
P-6	122	J-2	J-6	150.0	150.0	1.330	-0.06	0.00	0
P-7	93	J-5	J-7	200.0	150.0	1.330	0.44	0.01	0
P-8	53	J-8	J-9	200.0	150.0	1.330	134.06	4.27	0
P-9	34	J-9	J-10	200.0	150.0	1.330	133.80	4.26	0
P-10	57	J-10	J-11	150.0	150.0	1.330	67.39	3.81	0
P-11	21	J-11	J-12	150.0	150.0	1.330	67.21	3.80	0
P-12	43	J-12	J-13	150.0	150.0	1.330	-65.97	3.73	0
P-13	39	J-13	J-10	150.0	150.0	1.330	-66.23	3.75	0
P-17	234	J-8	J-6	1,000.0	150.0	0.000	0.42	0.00	1
P-18	83	J-6	J-1	1,000.0	150.0	0.000	0.32	0.00	1
P-19	308	J-8	J-3	1,000.0	150.0	0.000	0.64	0.00	1
P-22	47	R-2	J-8	1,000.0	150.0	0.000	(N/A)	(N/A)	1
P-23	29	R-2	PMP-2	1,000.0	150.0	0.000	135.12	0.17	1
P-24	38	PMP-2	J-8	1,000.0	150.0	0.000	135.12	0.17	1

Appendix D
Servicing Design

Stantec

10000507877, 2844319 ONTARIO INC.
500 & 515 Erbsville Road

DATE: October 6, 2025
DESIGNED BY: WAM
CHECKED BY: CVP

SANITARY SEWER DESIGN SHEET

FILE NUMBER: N/A
Project Number 161414128

Design Parameters

Mininum Velocity=	0.800	m/s	Residential:	275 L/day/Person
				0.0032 L/s/Person
n=	0.013		Comercial:	1.500 L/s/Ha
Max Peak Factor=	4.500		Industrial:	0.400 L/s/Ha
Min Peak Factor=	1.500		Institutional:	0.375 L/s/Ha
			Infiltration:	0.250 L/s/Ha

LOCATION			RESIDENTIAL AREA AND POPULATION								COMMERCIAL			INDUSTRIAL			INSTITUTIONAL				INFILTRATION				PIPE SELECTION							
Street	U/S	D/S	Area ID	Residential Area (ha)	Population Density (P/ha)	Population (P)	Cummulative Area (ha)	Cumulative Population (min)	Peak Factor	Peak Flow L/s	Area ID	Area (ha)	Accumulated Area (ha)	Area ID	Area (ha)	Accumulated Area (ha)	Area ID	Area (ha)	Accumulated Area (ha)	Total C+I+I Flow (L/s)	Total Area (ha)	Accumulated Area (ha)	Flow (L/s)	Total Flow (L/s)	Length Design (m)	Design Size (mm)	Slope Design (%)	Full Capacity (L/s)	Full Velocity (m/s)	Actual Velocity (m/s)	Q_A/Q_C (%)
Wild Ginger Avenue	102	78	1	1.80	0	217	1.80	217	4.13	2.86			0.00			0.00			0.00	0.00	1.80	1.80	0.450	3.31	30.1	200	0.50	24.94	0.82	0.84	13.3%
Woodlawn Place	131	129	2	1.89	0	221	1.89	221	4.13	2.91			0.00			0.00			0.00	0.00	1.89	1.89	0.473	3.38	77.7	200	0.50	24.94	0.82	0.84	13.6%

NOTE:
AS PER DRAFT PLAN, THE SITE WILL TOTAL 25 SINGLE RESIDENTIAL UNITS AND 152 MULTI-RESIDENTIAL UNITS. CONSIDERING 3.49 & 2.30 PEOPLE PER UNIT RESPECTIVELY (*WATERLOO DC REPORT 2020, HEMSON*) THIS IS A POPULATION OF 438 PEOPLE.

NOTE:
Area 1 is approx. 1.80ha in size and encompasses the single family dwellings and the western site plan block. The extent of the area includes roadways, lots, and the entirety of the eastern multiblock.

NOTE:
Area 2 is approx. 1.89ha in size and encompasses the the western site plan block. The extent of the area includes the entirety of the western multiblock.

Stantec

10000507877, 2844319 ONTARIO INC.
500 & 515 Erbsville Road

DATE: October 6, 2025
DESIGNED BY: WAM
CHECKED BY: BR

STORM SEWER DESIGN SHEET

FILE NUMBER: 30T- N/A

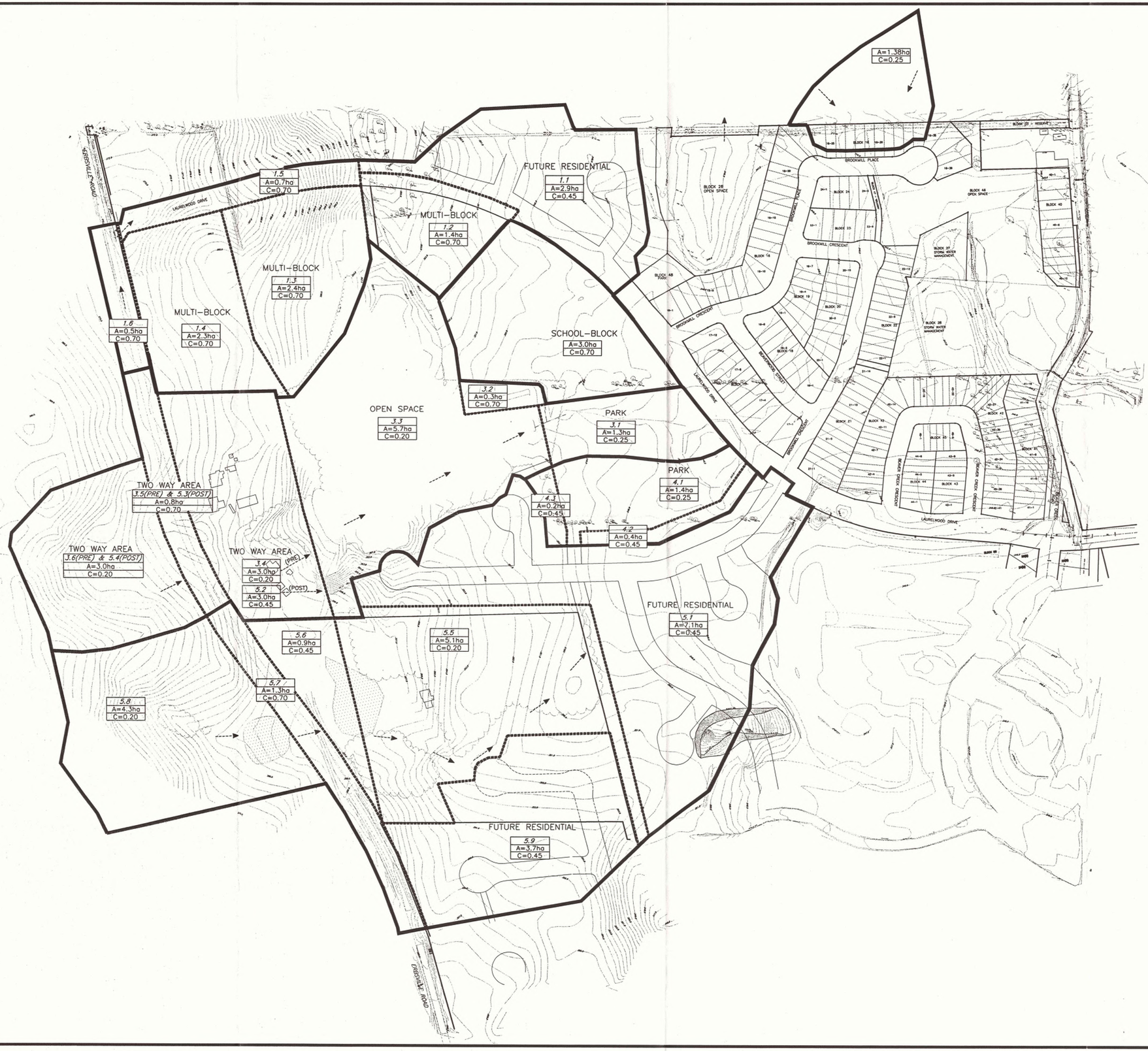
DESIGN PARAMETERS

DESIGN STORM 1 IN 100 Years

I = a / ((tc + b) ^c)

a=	4692.00	MANNING'S n =	0.013	
b=	17.44	MINIMUM COVER:	1.500	m
c=	0.9560	TIME OF ENTRY	10	min

LOCATION			DRAINAGE AREA								PIPE SELECTION							
Street	U/S	D/S	Area ID	5-Year Area Design (ha)	Runoff Coeff. Design	A x R	Accum. A x R	U/S T_C (min)	Rainfall Intensity (mm/hr)	Total Flow (m^3/s)	Length Design (m)	Design Size (mm)	Slope Design (%)	Full Capacity (m^3/s)	Full Velocity (m/s)	Actual Velocity (m/s)	Time of Flow (min)	100-Year Q_A/Q_C (%)
Proposed SWM Inlet	111	110	515 Erb	4.25	0.80	3.40	3.40	10.00	197.84	1.868	87.51	900	2.50	2.862	4.50	4.81	0.30	65.3%
	110		-	0.00	0.80	0.00	3.40	10.30										



north

notes

1. THE STORM SEWERS ARE DESIGNED ON THE BASIS THAT SUBCATCHMENT 3 WILL CONVEY THE UPSTREAM TWO WAY AREAS UNTIL SUCH TIME AS SUBCATCHMENT 3.4 IS DEVELOPED, AT WHICH TIME THE FLOWS OF SUBCATCHMENTS 3.4, 3.5 AND 3.6 WILL BE DIVERTED TO SUBCATCHMENT 5.

LEGEND

TOTAL AREA = 10.2ha
C (AVG. COEFFICIENT)= 0.629

TOTAL AREA = 3.0ha
C (AVG. COEFFICIENT)= 0.70

– REFER TO NOTE 1

CATCHMENT 3.4 IN PRE-DEVELOPMENT
TOTAL AREA= 14.1ha
C (AVG. COEFFICIENT)= 0.244

CATCHMENT 3.4 IN POST DEVELOPMENT
TOTAL AREA= 7.3ha
C (AVG. COEFFICIENT)= 0.229

TOTAL AREA = 2.0ha
C (AVG. COEFFICIENT)= 0.31

TOTAL AREA = 29.2ha
C (AVG. COEFFICIENT)= 0.362

TOTAL AREA = 1.38ha
C (AVG. COEFFICIENT)= 0.25

4.1	SUBCATCHMENT NUMBER
A=1.4ha	AREA IN HECTARES
C=0.25	RUNOFF COEFFICIENT

NO.	REVISION	BY	DATE

Stanley Consulting

LAURELWOOD AREA V CITY OF WATERLOO

EXTERNAL STORM DRAINAGE PLAN

FOR APPROVAL

DWN. BY: P.D.M.	CHK'D BY: J.L.G.
DATE: 97 10 23	DSGN. BY: P.D.M./J.L.G.
SCALE: 1:2000	DEC 2 3 1997

PROJECT NO.	SHEET NO.	REV. NO.
3-7018	1 of 1	

7018EXST

Stantec

10000507877, 2844319 ONTARIO INC.
Laurelwood Area V-A

DATE: 08/23/1999, 28/11/2000, 10/10/2025
DESIGNED BY: WAM
CHECKED BY: N/A

STORM SEWER DESIGN SHEET

FILE NUMBER: 30T- N/A

DESIGN PARAMETERS

DESIGN STORM 1 IN 5 Years

I = a / ((tc + b) ^c)

a=	1593.00	MANNING'S n =	0.013	
b=	11.00	MINIMUM COVER:	1.500	m
c=	0.8789	TIME OF ENTRY	10	min

LOCATION			DRAINAGE AREA								PIPE SELECTION							
Street	U/S	D/S	Area ID	5-Year Area Design (ha)	Runoff Coeff. Design	A x R	Accum. A x R	U/S T_C (min)	Rainfall Intensity (mm/hr)	Total Flow (m^3/s)	Length Design (m)	Design Size (mm)	Slope Design (%)	Full Capacity (m^3/s)	Full Velocity (m/s)	Actual Velocity (m/s)	Time of Flow (min)	5-Year Q_A/Q_C (%)
PHASE 1/2/2a																		
Thornview PL	59	58	-	0.05	0.45	0.02	0.02	10.00	109.68	0.007	62.80	200	2.58	0.053	1.68	1.11	0.95	13.0%
	58	57	-	1.35	0.45	0.61	0.63	10.95	105.51	0.185	64.10	375	2.77	0.292	2.64	2.80	0.38	63.3%
	57	55	-	0.49	0.45	0.22	0.85	11.33	103.93	0.246	10.40	525	0.58	0.328	1.51	1.67	0.11	75.0%
	55		-	0.00	0.45	0.00	0.85	11.44										
Woodlawn Pl	56	55	-	0.08	0.45	0.04	0.04	10.00	109.68	0.011	22.00	300	0.36	0.058	0.82	0.61	0.60	18.9%
	55		-			0.00	0.04	10.60										
Woodlawn Pl	55	53	-	0.00	0.45	0.00	0.89	11.44	103.46	0.255	71.30	525	0.40	0.272	1.26	1.44	0.82	93.7%
	53		-	0.00	0.45	0.00	0.89	12.26										
Woodlawn Pl	54	53	-	1.60	0.45	0.72	0.72	10.00	109.68	0.219	11.50	450	0.70	0.239	1.50	1.72	0.11	92.0%
	53		-			0.00	0.72	10.11										
EASEMENT	53	49AA	-	0.00	0.45	0.00	1.61	12.26	100.24	0.447	48.70	525	1.21	0.473	2.19	2.52	0.32	94.6%
	49AA	49			0.45		1.61	12.59	99.04	0.442	21.70	525	1.12	0.455	2.10	2.44	0.15	97.1%
	49	48	-	0.11	0.45	0.05	1.66	12.73	98.49	0.453	48.90	525	2.97	0.741	3.42	3.59	0.23	61.1%
Woodrow Pl	48	47	-	0.00	0.45	0.00	1.66	12.96	97.67	0.449	23.90	600	0.67	0.503	1.78	2.03	0.20	89.4%
	47	46	-	0.00	0.45	0.00	1.66	13.16	96.97	0.446	33.10	600	0.56	0.459	1.63	1.89	0.29	97.1%
	46	44	-	0.75	0.45	0.34	1.99	13.45	95.95	0.531	15.80	675	0.51	0.600	1.68	1.91	0.14	88.5%
	44		-	0.00	0.45	0.00	1.99	13.59										
Woodrow Dr (N)	45	44	-	0.05	0.45	0.02	0.02	10.00	109.68	0.007	20.90	200	7.90	0.092	2.93	1.53	0.23	7.4%
	44		-	0.00	0.45	0.00	0.02	10.23										
Woodrow Dr	44	43	-	0.08	0.45	0.04	2.05	13.59	95.48	0.544	28.40	675	0.49	0.588	1.64	1.89	0.25	92.5%
	43	42	-	0.00	0.45	0.00	2.05	13.84	94.63	0.539	37.10	675	0.82	0.761	2.13	2.32	0.27	70.9%
	42	39	-	0.42	0.45	0.19	2.24	14.10	93.75	0.584	23.10	675	1.01	0.845	2.36	2.56	0.15	69.1%
	39		-	0.00	0.45	0.00	2.24	14.25										

Stantec

10000507877, 2844319 ONTARIO INC.
Laurelwood Area V-A

DATE: 08/23/1999, 28/11/2000, 10/10/2025
DESIGNED BY: WAM
CHECKED BY: N/A

STORM SEWER DESIGN SHEET

FILE NUMBER: 30T- N/A

DESIGN PARAMETERS

DESIGN STORM 1 IN 5 Years

I = a / ((tc + b) ^c)

a=	1593.00	MANNING'S n =	0.013	
b=	11.00	MINIMUM COVER:	1.500	m
c=	0.8789	TIME OF ENTRY	10	min

LOCATION			DRAINAGE AREA								PIPE SELECTION							
Street	U/S	D/S	Area ID	5-Year Area Design (ha)	Runoff Coeff. Design	A x R	Accum. A x R	U/S T_C (min)	Rainfall Intensity (mm/hr)	Total Flow (m^3/s)	Length Design (m)	Design Size (mm)	Slope Design (%)	Full Capacity (m^3/s)	Full Velocity (m/s)	Actual Velocity (m/s)	Time of Flow (min)	5-Year Q_A/Q_C (%)
Total Ext. Area	41	40	-	10.25	0.18	1.85	1.85	30.00	60.92	0.312	11.60	675	1.34	0.973	2.72	2.41	0.08	32.1%
	40	39	-	0.72	0.45	0.32	2.17	30.08	60.81	0.366	53.00	675	0.49	0.588	1.64	1.74	0.51	62.3%
	39		-	0.00	0.45	0.00	2.17	30.59										
Woodrow Dr	39	38	-	0.00	0.45	0.00	4.41	30.59	60.16	0.737	53.60	825	0.28	0.760	1.42	1.65	0.54	97.0%
	38	37	-	0.50	0.45	0.23	4.64	31.13	59.48	0.766	15.00	825	0.54	1.055	1.97	2.17	0.12	72.6%
	37		-	0.00	0.45	0.00	4.64	31.24										
Old Oak Dr	72	71	-	0.87	0.20	0.17	0.17	10.00	109.68	0.053	10.30	300	4.26	0.200	2.82	2.32	0.07	26.6%
	71	70	-	0.00	0.45	0.00	0.17	10.07	109.34	0.053	35.30	300	1.48	0.118	1.66	1.61	0.37	44.9%
	70	69	-	0.00	0.45	0.00	0.17	10.44	107.69	0.052	67.00	300	2.35	0.148	2.10	1.89	0.59	35.1%
	69	67	-	0.72	0.45	0.32	0.50	11.03	105.15	0.145	49.80	300	3.22	0.174	2.45	2.76	0.30	83.8%
	67		-	0.00	0.45	0.00	0.50	11.33										
EASEMENT	68	67	-	0.13	0.45	0.06	0.06	10.00	109.68	0.018	36.50	300	1.64	0.124	1.75	1.21	0.50	14.4%
	67		-	0.00	0.45	0.00	0.06	10.50										
Old Oak Dr	67	63	-	0.26	0.45	0.12	0.67	11.33	103.90	0.194	20.60	375	2.12	0.255	2.31	2.57	0.13	76.1%
	63		-	0.00	0.45	0.00	0.67	11.47										
Old Oak Pl	66	65	-	0.05	0.45	0.02	0.02	10.00	109.68	0.007	36.10	200	1.32	0.038	1.20	0.89	0.68	18.2%
	65	64	-	0.05	0.45	0.02	0.05	10.68	106.66	0.013	32.80	200	2.56	0.052	1.67	1.34	0.41	25.4%
	64	63	-	0.58	0.45	0.26	0.31	11.09	104.92	0.089	13.50	300	0.53	0.070	1.00	1.14	0.20	126.7%
	63		-	0.00	0.45	0.00	0.31	11.29										
Old Oak Dr	63	61	-	0.00	0.45	0.00	0.98	11.47	103.36	0.281	59.50	375	2.64	0.285	2.58	2.99	0.33	98.7%
	61		-	0.00	0.45	0.00	0.98	11.80										
EASEMENT	62	61	-	0.19	0.45	0.09	0.09	10.00	109.68	0.026	35.00	300	1.80	0.130	1.84	1.39	0.42	20.1%
	61		-	0.00	0.45	0.00	0.09	10.42										

10000507877, 2844319 ONTARIO INC.
Laurelwood Area V-A

DATE: 08/23/1999, 28/11/2000, 10/10/2025
DESIGNED BY: WAM
CHECKED BY: N/A

STORM SEWER DESIGN SHEET

FILE NUMBER: 30T- N/A

DESIGN PARAMETERS

DESIGN STORM 1 IN 5 Years

I = a / ((tc + b) ^c)

a=	1593.00	MANNING'S n =	0.013	
b=	11.00	MINIMUM COVER:	1.500	m
c=	0.8789	TIME OF ENTRY	10	min

LOCATION			DRAINAGE AREA								PIPE SELECTION							
Street	U/S	D/S	Area ID	5-Year Area Design (ha)	Runoff Coeff. Design	A x R	Accum. A x R	U/S T_C (min)	Rainfall Intensity (mm/hr)	Total Flow (m^3/s)	Length Design (m)	Design Size (mm)	Slope Design (%)	Full Capacity (m^3/s)	Full Velocity (m/s)	Actual Velocity (m/s)	Time of Flow (min)	5-Year Q_A/Q_C (%)
Old Oak Dr	61	60	-	0.36	0.45	0.16	1.23	11.80	102.04	0.348	41.00	525	0.56	0.322	1.49	1.69	0.40	108.1%
	60	37	-	0.14	0.45	0.06	1.29	12.20	100.48	0.360	14.00	525	2.53	0.684	3.16	3.19	0.07	52.6%
	37		-	0.00	0.45	0.00	1.29	12.27										
Old Oak Dr	37	32	-	0.29	0.45	0.13	6.06	31.24	59.34	0.998	87.50	900	0.37	1.101	1.73	1.98	0.74	90.6%
	32		-	0.00	0.45	0.00	6.06	31.98										
Aspenwood Pl	34	33	-	0.05	0.45	0.02	0.02	10.00	109.68	0.007	58.50	200	3.00	0.057	1.81	1.19	0.82	12.1%
	33	32	-	0.79	0.45	0.36	0.38	10.82	106.06	0.111	10.50	300	1.50	0.118	1.68	1.94	0.09	94.0%
	32		-	0.00	0.45	0.00	0.38	10.91										
Old Oak Dr	32	30	-	0.32	0.45	0.14	6.58	31.98	58.44	1.068	73.50	975	0.42	1.452	1.95	2.14	0.57	73.5%
MH 3 is also known as	30	3	-	0.39	0.45	0.18	6.75	32.55	57.77	1.084	45.10	975	0.34	1.307	1.75	1.97	0.38	82.9%
MH L89R-84	3		-	0.00		0.00	6.75	32.93										
PHASE 5																		
Laurelwood Dr (N)	L89R-97	L89R-87	-	13.50	0.65	8.72	8.72	72.19	32.71	0.792	75.00	1050	0.50	1.931	2.23	2.10	0.60	41.0%
	L89R-87		-	0.00		0.00	8.72	72.79										
	L89R-88	L89R-87	-	0.35	0.45	0.16	0.16	10.00	109.68	0.048	22.00	300	0.50	0.068	0.97	1.05	0.35	70.2%
	L89R-87		-	0.00		0.00	0.16	10.35										
	L89R-87	L89R-86	-	0.27	0.45	0.12	9.00	72.79	32.50	0.813	53.00	1200	0.50	2.757	2.44	2.07	0.43	29.5%
	L89R-86					0.00	9.00	73.21										
	21	L89R-86	-	1.30	0.25	0.33	0.33	10.00	109.68	0.099	18.00	375	0.50	0.124	1.12	1.25	0.24	79.9%
	L89R-86		-	0.00														
	L89R-86	L89R-85	-	0.55	0.45	0.25	9.57	73.21	32.36	0.860	92.50	1200	0.50	2.757	2.44	2.12	0.73	31.2%

Stantec

10000507877, 2844319 ONTARIO INC.
Laurelwood Area V-A

DATE: 08/23/1999, 28/11/2000, 10/10/2025
DESIGNED BY: WAM
CHECKED BY: N/A

STORM SEWER DESIGN SHEET

FILE NUMBER: 30T- N/A

DESIGN PARAMETERS

DESIGN STORM 1 IN 5 Years

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LOCATION			DRAINAGE AREA								PIPE SELECTION							
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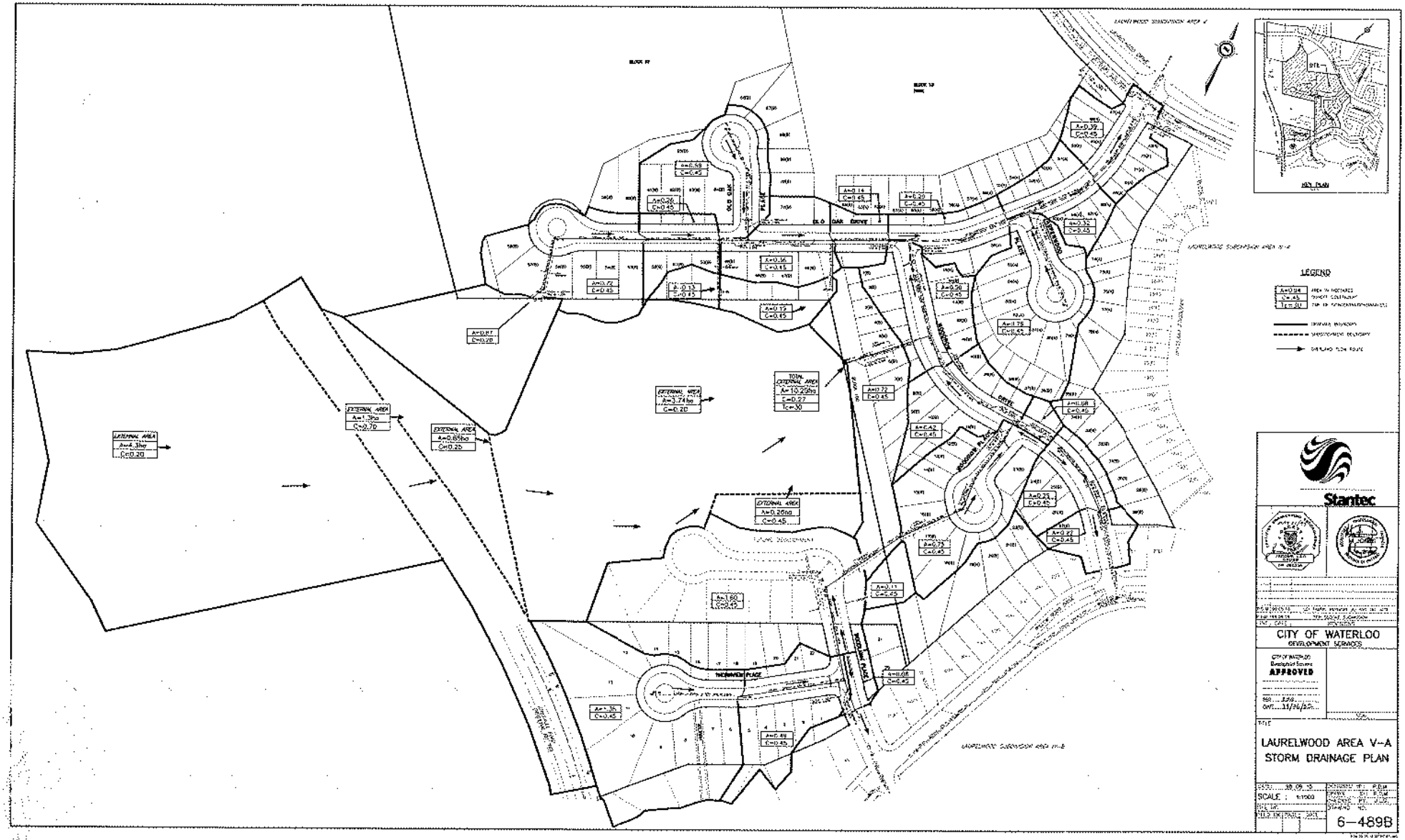
	L89R-85	3	-	14.50	0.29	4.26	13.84	73.94	32.12	1.234	50.00	1200	0.50	2.757	2.44	2.35	0.35	44.8%
	3		-	0.00		0.00	13.84	74.29										
PHASE 1																		
Laurelwood Dr (S)	L89R-98	3	-	1.02	0.65	0.66	0.66	13.79	94.80	0.175	10.00	450	0.50	0.202	1.27	1.44	0.12	86.6%
	3		-	0.00		0.00	0.66	13.91										
PHASE 3																		
Brookmill Cres	3	L89R-83	-	0.00		0.00	21.25	74.29	32.00	1.889	80.00	1500	0.30	3.872	2.19	2.17	0.61	48.8%
	L89R-83		-	0.00		0.00	21.25	74.91										
Beaverwood St	L89R-90	L89R-83	-	1.34	0.45	0.60	0.60	10.00	109.68	0.184	15.00	450	0.30	0.156	0.98	1.12	0.22	117.6%
	L89R-83		-	0.00		0.00	0.60	10.22										
Brookmill Cres	L89R-83	L89R-67	-	0.00		0.00	21.85	74.91	31.80	1.930	67.00	1500	0.30	3.872	2.19	2.17	0.51	49.9%
	L89R-67		-	0.00		0.00	21.85	75.42										
Phase 4a																		
Brookmill Cres (E)	L89R-68	L89R-67	-	3.71	0.45	1.67	1.67	21.50	74.72	0.347	3.00	600	0.30	0.336	1.19	1.39	0.04	103.0%
	L89R-67		-	0.00		0.00	1.67	21.54										
	L89R-67	OUTLET	-	0.00		0.00	23.52	75.42	31.63	2.067	54.00	1500	0.30	3.872	2.19	2.21	0.41	53.4%
	OUTLET		-	0.00		0.00	23.52	75.83										
	Cells highlighted in orange are perforated pipe runs - an area of 0.05ha was assigned as the lowest area the spreadsheet would recognize and account for time of concentration starting at top of the run of perforated pipe.																	
	Lengths and slopes of pipes in Phase 1/2/2a are from drawing 6-489 revision 2000.02.24, and are all ASRD. Lengths and slopes of pipes in Phase 3/4a/5 are from drawing 6-478 revision 2000.11.28. Phase 5 is ASRD, the rest are design values.																	
	These documents can be found here: \\CA0004-PPFSS01\WORK_GROUP\01614\active\161414128\design\analysis\Sewers\Storm_Sizing_WAM\Background																	


LEGEND
CITY OF WATERLOO
DEVELOPMENT SERVICES
APPROVED
LAURELWOOD AREA V-A
STORM DRAINAGE PLAN
SCALE : 1:1000
6-489B

Appendix E
Project Correspondence

Marsh, Will

From: Dey, Adam <adam.dey@bell.ca>
Sent: Monday, June 16, 2025 8:37 AM
To: Robb, Brad
Subject: RE: 515 Erbsville Road, Waterloo - Services

Hi Brad

We currently have infrastructure on Erbsville Road that could potentially serve the stacked towns. The SFU lots would be more difficult as we only have copper service on White Birch and Wild Ginger. This copper infrastructure will not be expanded to serve any more development. We would require a new path for our fiber either through the town development or through the existing subdivision. Cost to Bell could be a limiting factor in serving the Single family units.

Bell

Adam Dey (He/Him)
Access Network Implementation Manager
20 Water St N, Kitchener, ON N2H 5A5
M: 519-575-0333

From: Robb, Brad <Brad.Robb@stantec.com>
Sent: June-09-25 10:09 AM
Cc: Wes Lesperance <wes.lesperance@enovapower.com>; 'cheryl.jacob@rci.rogers.com' <cheryl.jacob@rci.rogers.com>; Dey, Adam <adam.dey@bell.ca>; Zaga, Sergio <Sergio.Zaga@stantec.com>
Subject: [EXT]515 Erbsville Road, Waterloo - Services

Good morning,

Stantec is in early engineering design for a new subdivision at 515 Erbsville Road, Waterloo. A plan is attached, but the development is currently expected to be 152 stacked townhouse units and 23 single family homes. Are you able to confirm if your respective utilities have plant in the area to service the development?

Thank you,

Brad Robb C.E.T.
Project Coordinator
Mobile: 902 414-5101
Brad.Robb@stantec.com

Stantec

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Marsh, Will

From: Zaga, Sergio
Sent: Friday, July 18, 2025 11:38 AM
To: Phelps, Claire; Marsh, Will
Subject: FW: Max Street Slope

From: Francis Reyes <Francis.Reyes@waterloo.ca>
Sent: Friday, June 25, 2021 11:08 AM
To: Grubb, Joe <joe.grubb@stantec.com>
Cc: Darren Scott <darren.scott@waterloo.ca>
Subject: RE: Max Street Slope

Hi Joe,

We would like to see 6% as max. However, we can allow an absolute max of 8% provided that it's justified.

Regards,
Francis

From: Grubb, Joe <joe.grubb@stantec.com>
Sent: June 25, 2021 8:22 AM
To: Francis Reyes <Francis.Reyes@waterloo.ca>
Subject: [EXTERNAL] Max Street Slope

Hi Francis, please advise what the max street slope is in Waterloo. Thanks.

Joe Grubb L.E.L., C.E.T.
Senior Associate

Direct: 519 585-7279
Fax: 519 579-6733
joe.grubb@stantec.com

Stantec
100-300 Hagey Boulevard
Waterloo ON N2L 0A4



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Marsh, Will

From: Mat Robson <Mat.Robson@enbridge.com>
Sent: Thursday, June 12, 2025 2:00 PM
To: Robb, Brad
Cc: Zaga, Sergio
Subject: RE: 515 Erbsville Road, Waterloo - Services

Hi Rob,

To service the yellow and blue areas, we would likely tie into our existing end of mains at

- 656 Royal Fern St
- 657 Royal Fern St
- Lot 54 on White Birch Ave (four lots south of 422 White Birch Ave)
- 421 White Birch Ave
- Lot 211 on Ginger Ave (two lots south of 710 Ginger Ave)
- Lot 81 on Ginger Ave (two lots south of 703 Ginger Ave)

To service the red area, we would install a main extension off of our existing main that runs down Erbsville Rd.

Do you know roughly when this development will require gas?

Thank you,

Mat Robson
Sr Analyst New Business Projects
Construction Waterloo

ENBRIDGE
TEL: 416-988-5142 Mat.Robson@Enbridge.com
603 Kumpf Drive, Waterloo, ON N2V 1K3
enbridge.com
Safety. Integrity. Respect. Inclusion.

** Please ensure you have applied for your gas service through GetConnected at least 4 to 6 months prior to requiring them to ensure it is installed on time. If your service requires a complex design or permit, more time may be required **

From: Robb, Brad <Brad.Robb@stantec.com>
Sent: Monday, June 9, 2025 10:08 AM
To: Mat Robson <Mat.Robson@enbridge.com>
Cc: Zaga, Sergio <Sergio.Zaga@stantec.com>
Subject: [External] 515 Erbsville Road, Waterloo - Services

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Good morning Mat,

Stantec is in early engineering design for a new subdivision at 515 Erbsville Road, Waterloo. A plan is attached, but the development is currently expected to be 152 stacked townhouse units and 23 single family homes. Are you able to confirm if Enbridge has plant in the area to service the development?

Normally I would go through Get Connected but we're only trying to forecast a bit and didn't want to get tied up in the Get Connected system yet.

Thank you,

Brad Robb C.E.T.
Project Coordinator
Mobile: 902 414-5101
Brad.Robb@stantec.com



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Marsh, Will

From: Wes Lesperance <wes.lesperance@enovapower.com>
Sent: Friday, June 13, 2025 1:41 PM
To: Robb, Brad
Cc: Wes Lesperance; 'cheryl.jacob@rci.rogers.com'; adam.dey@bell.ca; Zaga, Sergio
Subject: Re: 515 Erbsville Road, Waterloo - Services

Hi Rob,

We currently have 1ph infrastructure on Wild Ginger Ave and 3ph infrastructure on Erbsville.

The 1ph could be used to service the single-family units (23). The 3Ph line could be used to service the Multi Block by Erbsville (96 Units), For the Multiblock with 58 Stacked we would have to see the loading. We may be able to loop it in with the 1ph that is already there at Wild Ginger Ave, but there is potential that we would have to bring another 1ph feed into the subdivision.

Thanks,

Wes Lesperance | Engineering Technologist

Enova Power Corp
Office: 226-896-2200 EXT 5212
wes.lesperance@enovapower.com | enovapower.com

From: Robb, Brad <Brad.Robb@stantec.com>
Sent: Monday, June 9, 2025 10:08 AM
Cc: Wes Lesperance <wes.lesperance@enovapower.com>; 'cheryl.jacob@rci.rogers.com' <cheryl.jacob@rci.rogers.com>; adam.dey@bell.ca <adam.dey@bell.ca>; Zaga, Sergio <Sergio.Zaga@stantec.com>
Subject: 515 Erbsville Road, Waterloo - Services

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Good morning,

Stantec is in early engineering design for a new subdivision at 515 Erbsville Road, Waterloo. A plan is attached, but the development is currently expected to be 152 stacked townhouse units and 23 single family homes. Are you able to confirm if your respective utilities have plant in the area to service the development?

Thank you,

Brad Robb C.E.T.
Project Coordinator
Mobile: 902 414-5101
Brad.Robb@stantec.com

Stantec

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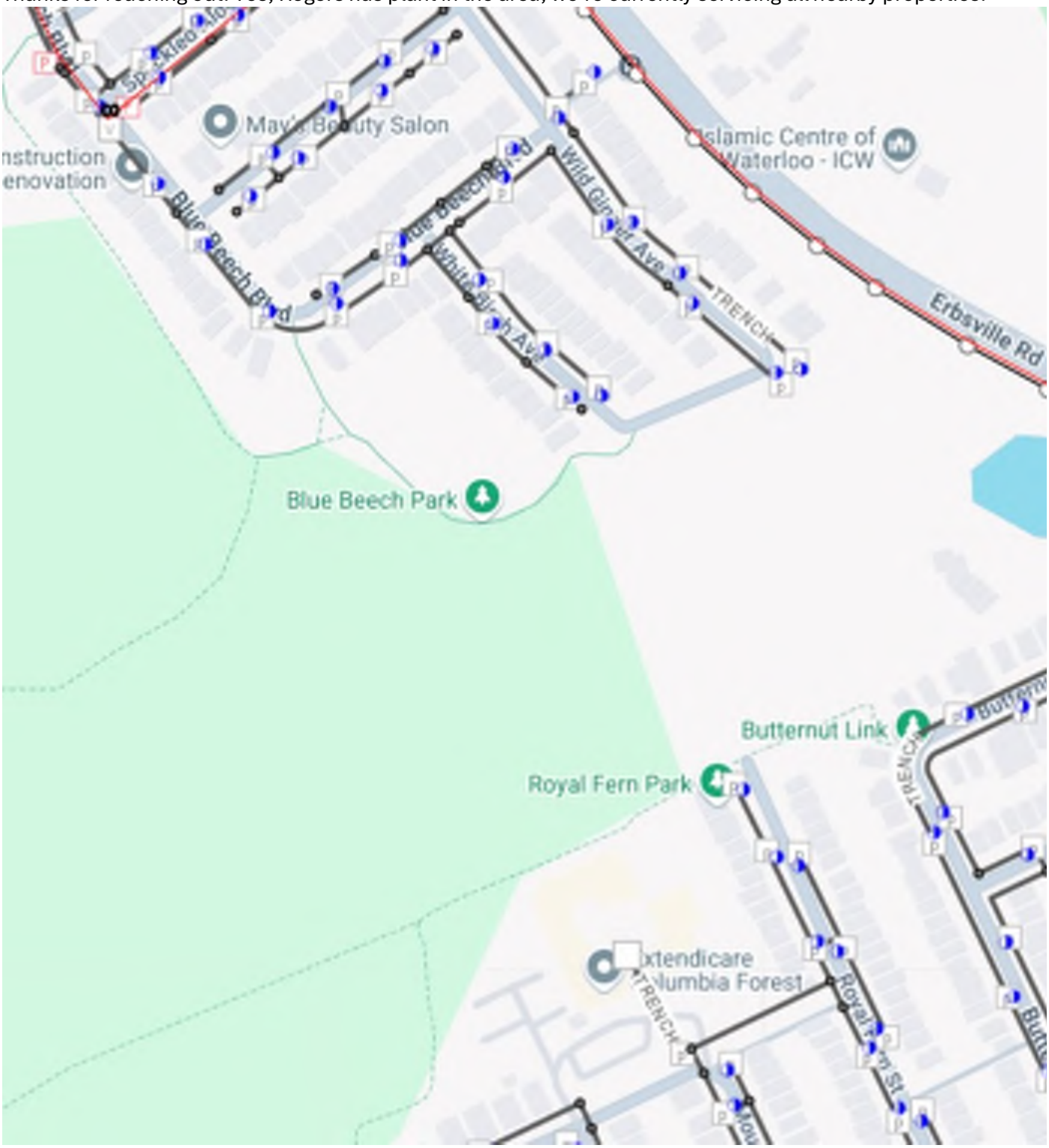
Marsh, Will

From: Alexandra Shier <Alexandra.Shier@rci.rogers.com>
Sent: Wednesday, June 11, 2025 12:07 PM
To: Robb, Brad
Subject: RE: 515 Erbsville Road, Waterloo - Services -G24BR08A01

Good morning Brad,
Thanks for reaching out. Yes, Rogers has plant in the area, we're currently servicing all nearby properties.



Thank you,
Alexandra Shier

System Planner, OPE – SWO
Rogers Communications Canada Inc.
85 Grand Crest Pl, Kitchener ON
e alexandra.shier@rci.rogers.com

From: Cheryl Jacob <Cheryl.Jacob@rci.rogers.com>
Sent: June 9, 2025 10:14 AM
To: Brad.Robb@stantec.com; Alexandra Shier <Alexandra.Shier@rci.rogers.com>
Subject: FW: 515 Erbsville Road, Waterloo - Services

Good Morning Brad,

I have copied Alexandra who is the Rogers planner for this area.

Thank you,
Cheryl

From: Robb, Brad <Brad.Robb@stantec.com>
Sent: June 9, 2025 10:09 AM
Cc: Wes Lesperance <wes.lesperance@enovapower.com>; Cheryl Jacob <Cheryl.Jacob@rci.rogers.com>; adam.dey@bell.ca; Zaga, Sergio <Sergio.Zaga@stantec.com>
Subject: 515 Erbsville Road, Waterloo - Services

Good morning,

Stantec is in early engineering design for a new subdivision at 515 Erbsville Road, Waterloo. A plan is attached, but the development is currently expected to be 152 stacked townhouse units and 23 single family homes. Are you able to confirm if your respective utilities have plant in the area to service the development?

Thank you,

Brad Robb C.E.T.
Project Coordinator
Mobile: 902 414-5101
Brad.Robb@stantec.com

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