Report
Project: 139185-6.04.03

1650 SHEA ROAD

SERVICING BRIEF

Prepared for Davidson Co-Tenancy (Tartan Land Corporation)
by IBI GROUP

September 2022

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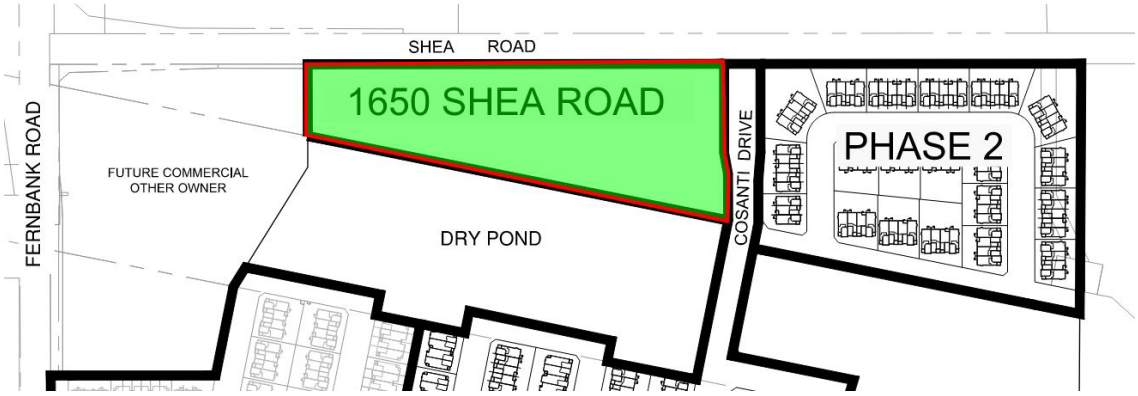
1 INTRODUCTION

1650 Shea Road is located in the north-eastern portion of the Davidson Lands Development Area (DLDA) and is a block within the Davidson Lands subdivision. IBI Group Professional Services Inc. (IBI Group) has been retained by Davidson Co-Tenancy to provide professional engineering services for 1650 Shea Road. The subject site is approximately 2.33 ha and consists of 116 townhouse units. The site area is inclusive of 0.25Ha of private road located within the HydroOne Networks Inc. (HONI) corridor.

The site consists of freehold frontage onto 8.5m and a 6.0m wide private lanes. There will be a common elements agreement in place for the shared elements of the site.

1650 Shea Road is bounded by Shea Road to the North-East, Cosanti Drive to the South-East, Dry pond to the South-West and agricultural to the North-West. Refer to key plan below for block location.



The proposed servicing design conforms to current City of Ottawa and MECP design criteria, and no pre-consultation meetings were requested from the South Nation Conservation (SNC) or the Ontario Ministry of Environment, Conservation and Parks (MECP).

1.1 Guidelines and Standards

This evaluation takes into consideration the City of Ottawa Sewer Design Guidelines (OSDG) (October 2012), and the February 2014 Technical Bulletin ISDTB-2014-01, the September 2016 Technical Bulletin PIEDTB-2016-01, the June 2018 Technical Bulletin ISTB-2018-04, October 2019 Technical Bulletin 2019-01, and the July Technical Bulletin 2019-02.

It also considers the City of Ottawa Water Distribution Design Guidelines (OWDDG), and the 2010 Technical Bulletin 2010-02, the 2014 Technical Bulletin 2014-02, and the 2018 Technical Bulleting 2018-02.

All specifications are as per current City of Ottawa standards and specifications, and Province of Ontario (OPSS/D) standards, specifications and drawings.

1.2 Pre-Consultation Meeting

The City of Ottawa hosted a virtual pre-consultation meeting on February 18th, 2022. Notes of the meeting are provided in **Appendix A**. There were no major engineering concerns flagged in

this meeting. The City of Ottawa Servicing Study Checklist has also been included in **Appendix A**.

1.3 Environmental Issues

There are no environmental issues related to this site, as all environmental concerns were dealt with as part of the applicants 1650 Shea Road subdivision approval.

An existing watercourse was noted on the City of Ottawa's Geomapping website. This water course is being diverted by others (Stantec design for the Fernbank Road pond outlet). While at the time of making this application the servicing works have not been completed, it is anticipated that they will be completed in advanced of the 1650 Shea Road site plan servicing works. The servicing infrastructure diversion, as designed by Stantec, has been shown on the servicing drawings as existing infrastructure.

1.4 Geotechnical Concerns

Gemtec was retained by Davidson Co-Tenancy to review the grading plan to ensure that the recommendations with its original report for the subject area. A detailed review will be provided with second submission to the City of Ottawa.

1.5 Hydro One Networks Inc. Transmission Corridor

A portion of the proposed site is located within the HydroOne Networks Inc. transmission corridor. Additionally, as a result of the private road located partially within the HONI corridor, a portion of the Davidson Lands stormwater management dry pond is required to be filled in. As a result, the drypond configuration must also be reconfigured to provide an equal storage volume, below the designated 100year storage level. Additionally, as a result of the private road works, positive drainage to the ditch inlet CB can no longer be maintained. An extension of the CB lead, along with 3 new inlets is proposed in order to maintain adequate drainage within the dry pond and the HONI corridor.

2 WATER DISTRIBUTION

2.1 Existing Conditions

There is an existing 250mm watermain stub on 1650 Shea Road property to the South-East of the site, as well as an existing 200mm watermain stub immediately east of Jardiniere Street in Phase 1. The proposed development was considered in the water model analysis for the Davidson Lands Phase 1 and Phase 2 development.

2.2 Design Criteria

2.2.1 Water Demands

1650 Shea Road consists of 116 townhouse units. Per unit population density and consumption rates are taken from **Tables 4.1** and **4.2** of the Ottawa Design Guidelines – Water Distribution and are summarized as follows:

- Semi Detach/Townhouse 2.7 person per unit
- Average Day Demand 280 l/cap/day
- Peak Daily Demand 700 l/cap/day
- Peak Hour Demand 1,540 l/cap/day

A water demand calculation sheet is included in **Appendix B** and the total water demands are summarized as follows:

- Average Day 1.02 l/s
- Maximum Day 2.54 l/s
- Peak Hour 5.58 l/s

2.2.2 System Pressures

The 2010 City of Ottawa Water Distribution Guidelines states that the preferred practice for design of a new distribution system is to have normal operating pressures range between 345 kPa (50 psi) and 552 kPa (80 psi) under maximum daily flow conditions. Other pressure criteria identified in the guidelines are as follows:

Minimum Pressure	Minimum system pressure under peak hour demand conditions shall not be less than 276 kPa (40 psi).
Fire Flow	During the period of maximum day demand, the system pressure shall not be less than 140 kPa (20 psi) during a fire flow event.
Maximum Pressure	Maximum pressure at any point in the distribution system in unoccupied areas shall not exceed 689 kPa (100 psi). In accordance with the Ontario Building/Plumbing Code the maximum pressure should not exceed 552 kPa (80 psi) in occupied areas. Pressure reduction controls may be required for buildings where it is not possible/feasible to maintain the system pressure below 552 kPa.

2.2.3 Fire Flow Rate

The site consists of 13 stacked townhouse blocks. All the blocks within the site are 3-storey back-to-back townhouse buildings. A Fire Underwriters Survey has been carried out to determine the fire flow for the site. Due to restriction of existing watermain system, this site can only provide approximately 11,000 to 12,000 L/min of fire flow. Internal fire walls will be installed for all the building blocks to meet the fire flow requirements. The calculations result in a fire flow of 11,000 L/min; a copy of the FUS calculation is included in **Appendix B**. Refer to the general plan of services **Drawing C-001** in **Appendix A** for fire wall locations.

2.2.4 Boundary Conditions

The City of Ottawa has provided the hydraulic boundary conditions at two locations for 1650 Shea Road Development, including Connection 1 at Jardiniere Street and Connection 2 at Cosanti Drive. A copy of the Boundary Condition is included in **Appendix B** and summarized as follows:

CRITERIA	HYDRAULIC HEAD	
	CONNECTION 1 @ Cosanti Drive	CONNECTION 2 @ Jardiniere Street
Max HGL (Basic Day)	160.7 m	160.7 m
Peak Hour	154.9 m	154.9 m
Max Day + Fire (11,000 l/m)	132.9 m	132.4 m

2.2.5 Hydraulic Model

A computer model for the 1650 Shea Road water distribution system has been developed using the InfoWater program by Innovyze. The model includes the boundary conditions at Jardiniere Street and Cosanti Drive.

2.3 Proposed Water Plan

2.3.1 Hydraulic Analysis

A 250 mm watermain is proposed with the first connection to the existing 250mm watermain stub at Cosanti Drive, and extends through the site with a second connection to the existing 200mm watermain at Jardiniere Street to provide a looped watermain to service the site. The rest of the watermains will be 200mm. Refer to the general plan of services **Drawing C-001** for detailed watermain layout for the subject site.

The hydraulic model was run under basic day conditions under the existing boundary condition to determine the maximum pressure for the site. The minimum pressure for the site is determined in the peak hour condition. There are 11 fire hydrants in the site; the model was run under the max day plus fire flow (11,000 l/min) condition to determine the design fire flow at the hydrant locations. Results of the analysis for the 1650 Shea Road site are summarized in Section 2.3.2 and the water model schematic and model results are included in **Appendix B**.

2.3.2 Summary of Results

Results of the hydraulic analysis for 1650 Shea Road are summarized as follows:

SCENARIO	EXISTING
Basic Day Pressure (kPa)	524.16 – 528.18
Peak Hour Pressure (kPa)	467.30 – 471.32
Minimum Residual Pressure (kPa)	142.8

A comparison of the results and design criteria is summarized as follows:

Maximum Pressure — All nodes have basic day pressure below 552 kPa for existing conditions; therefore, pressure reducing control is not required for this site.

Minimum Pressure — All nodes exceed the minimum requirement of 276 kPa during peak hour conditions under the existing boundary conditions.

Fire Flow — The model was run with a fire flow of 11,000 l/min under the existing boundary conditions. The residual pressures at fire hydrant locations all exceed the minimum requirement of 140 kPa.

3 WASTEWATER

3.1 Existing Conditions

A pump station was constructed south of Aridus Crescent adjacent to the stormwater management facility which serves as the sanitary outlet for this project. As part of the pump station construction, a dual forcemain was constructed in Phase 1 and Phase 2 lands. The forcemains are located in the boulevards of the streets. Drawing 501A shows the location of existing sanitary sewers placed as part of the Phase 2 works. The Davidson Lands Phase 2 report prepared by IBI Group dated July 2020 confirmed that the existing sewer systems have sufficient capacity for the 1650 Shea Road development.

3.1.1 Verification of Existing Sanitary Sewer Capacity

There is an existing 200mm sanitary sewer in Cosanti Drive, which connects to the 300 mm diameter sewer in Edenwylde Drive. In the previous Davidson Lands Phase 2 report, the design for 1650 Shea Road was assumed a density of 66 people per hectare, with an allocated population of 137.3 people, a site area of 2.08 and a total flow of 2.81 L/s, see **Appendix C** for excerpts from the Phase 2 report.

For the subject development, it is proposed to build a total of 116 back-to-back townhouse units, comprising of 2 bedrooms each. The City of Ottawa Sewer Design Guideline population density of 2.1 people per unit for 2-bedroom apartments was used for this site. The new total proposed population is 254.4 people, an area of 2.33 Ha and a total peak flow of 3.64L/s. This represents a total peaking flow increase of **0.83L/s** when compared to the Phase 2 allocation. The sanitary sewers downstream of the subject site has sufficient residual flow capacities. Therefore, the increase in flow on the existing system from the subject development is considered negligible and will have no negative impacts on downstream infrastructure.

3.2 Proposed Sewers

The proposed sanitary sewer system is shown on **Figure 4.2**. A sanitary sewer stub was extended from MH186A at Cosanti Drive to service the future residential block. Due to the configuration of the new proposed site plan the existing sewer stub cannot be utilitized, and its to be capped at the property line and abandoned. A new location to service the future residential block at MH12A is proposed NW of existing MH187A at Cosanti Drive.

All on-site sewers have been designed to City of Ottawa and MOE design criteria which include but are not limited to the below listed criteria. A copy of the detailed sanitary tributary area plan 400 and the sanitary sewer design sheets are included in **Appendix C** illustrate the population densities and sewers which provide the necessary outlets.

3.2.1 Design Flow:

Average Residential Flow	-	280 l/cap/day
Peak Residential Factor	-	Harmon Formula
Infiltration Allowance	-	0.33 l/sec/Ha
Minimum Pipe Size	-	200mm diameter

3.2.2 Population Density:

Back-to-back Townhouse (2Bed)	-	2.1 person/unit

4 MINOR STORM SEWERS

4.1 Existing Conditions

Prior to the construction of Phase 1 and Phase 2, the majority of the site is cultivated farmland which drains in a southeast direction towards the Faulkner Drain through a series of farm ditches. The existing pattern is shown on **Figure 4.1**. A stormwater management facility was constructed south of Aridus Crescent as part of Phase 1; this facility is the storm sewer outlet for Phase 2 and 1650 Shea Road.

4.2 Serviceability Report

The 2014 Design Brief by Novatech Engineering recommended that the Davidson Lands be serviced by local sewers to discharge to a separate off-line Stormwater Management Facility. The 2016 Conceptual Site Servicing Study for the Davidson Lands provided some preliminary details of that facility which is proposed to be located south of the site extending into the Hydro One corridor. The minor storm servicing scheme for the Davidson Lands will follow the recommendations of the 2016 preliminary report. Details of the proposed Davidson Lands stormwater management facility will be the subject of a separate design report by others.

4.3 Design Criteria

In accordance with the City of Ottawa Sewer Design Guidelines, the following design criteria was used to size storm sewers using the rational method:

- Design return period: 1:2 year (subdivision)
  1:5 year (subdivision)
  1:10 year (arterial road)
- Time of Concentration: 10 minutes
- Minimum velocity: 0.8 m/s
- Maximum velocity: 3.0 m/s
- Mannings roughness coefficient: 0.013
- Minimum allowable slopes listed below:

DIAMETER (MM)	SLOPE (%)
250	0.432
300	0.340
375	0.250
450	0.195
525	0.160
600	0.132
675	0.113
750 and larger	0.100

4.4 Proposed Minor Storm Plan

The proposed minor storm sewer system is shown on **Figure 4.2**. A storm sewer stub was extended from MH186 at Cosanti Drive to service the future residential block. Due to a new proposed site plan, a new location to service the future residential block at MH12 is proposed NW of existing MH187 at Cosanti Drive. The existing storm sewer stub will be decommissioned.

4.5 Sewer Calculations

The Storm Drainage Area Plans (Drawings 139185-500) and the detailed storm sewer design sheets, using City of Ottawa and Ministry of the Environment criteria, are provided in **Appendix D**. Detailed calculations for determining the various runoff coefficients are also included in **Appendix D**.

4.6 Hydro One Corridor Dry Pond

As discussed in section 1.5 of this report, the existing dry pond constructed as part of the Davidson Lands development will require modification to maintain its level of service. The configuration of the site plan block requires grading works within the dry pond limits, resulting in 1036.71m^3 of lost storage below the 100year elevation of 104.71. To maintain the level of service, additional depth in the dry ponds is required to compensate for the loss of storage. By lowering the dry ponds, 1636.57m^3 of additional ponding capacity has been provided, for a net gain in ponding volume of **599.86m^3**. Additionally, the infilled areas will prevent positive drainage of the 3 dry pond cells, therefore, a piped extension of the existing CB has been provided, inclusive of 3 new inlets. Details of the hydraulic function of the dry pond are provided in Section 5.4.2.2.

4.7 External Conveyance

4.7.1 Existing Drainage Feature

The existing swale that runs between Fernbank Rd. and Shea Road is currently conveyed by the Shea Road westside ditch. This drainage system is proposed to be altered by adjacent development. Stantec was commissioned by the adjacent landowners to design an entombment system for its stormwater management facility, inclusive of Fernbank Rd, undeveloped lands, and Shea Rd local drainage.

4.7.2 Shea Road Roadside Ditch

The existing west side Shea Road roadside ditch drains from north to south along the subject lands frontage. The Stantec entombment works discussed in the preceding section provide inlets for roadside drainage at the north-east corner of the subject development site, as well as at the south-east corner of the subject development site.

The roadside ditch along the Shea Road frontage is to be maintained, however as a result of the inlets provided in the Stantec design, there are no upstream flows to be considered in this ditch. The 2 site entrances are provided with 500mm diameter culverts, which is the minimum size as recommended in the OSDG.

5 STORMWATER MANAGEMENT

5.1 Background

The subject site is tributary to the Faulkner Drain. Under existing conditions, the West Wind in-line stormwater management facility located south of the subject site routes flows to the Faulkner Drain from several locations including the West Wind Farm residential development, other existing residential properties, farm fields, and rural estate lots.

The overall stormwater management strategy for Davidson Lands was initially outlined in the "Stittsville South – Area 6 Master Servicing Report & Stormwater Management Design Plan" (Novatech/DSEL, December 2013). The stormwater management strategy was further updated in the "Stittsville South Subdivision, City of Ottawa Servicing and Stormwater Management Report" (Cavanagh and Regional, October 2014, Novatech). As noted in **Section 1.2**, areas 6b and 6c, which are located to the west of the subject site, will be serviced by a separate off-line stormwater management facility. As per the recommendations of the above noted October 2014 report, the subject site will also be serviced by a separate off-line SWM facility. The new facility will outlet to the West Wind ditch facility at the upper limit of the Faulkner Drain. The existing West Wind in-line stormwater management facility will continue to remain in service.

The stormwater management strategy for Davidson Lands was outlined in greater detail in the "Conceptual Site Servicing Study, Davidson Lands - OPA 76 Area 6a, Stittsville South," prepared by IBI Group, 2016.

In November of 2017, DSEL/JFSA finalized the report "Design Brief for the Stormwater Management Pond for the Davidson Lands." That report outlined the detailed design of the SWM facility.

The detailed design of the Phase 1 development was outlined within the report "Davidson Lands – OPA 76 Area 6a, Phase 1," prepared by IBI Group, 2018. In July of 2020, the detailed design of Phase 2 was outlined within the report "Davidson Lands – OPA 76 Area 6a, Phase 2," also prepared by IBI Group, referred to in this report as the Phase 2 Design Brief.

The existing site topography and drainage patterns are shown on **Figure 4.1**. There are two distinct sub-drainage areas on the Davidson Lands. Most of the site drains from the northwest to the east and eventually outlets to the west side ditch along Shea Road. The southwest portion of the site drains southeast towards the hydro easement and eventually drains to the north side road ditch along Flewellyn Road.

5.2 Objective

The purpose of this evaluation is to prepare the dual drainage design, including the minor and major system, of the proposed development. The design includes the sizing of inlet control devices, maximum depth and velocity of flow on the surface and hydraulic grade line analysis. The stormwater system concept is discussed in subsequent sections and has been developed based on the October 2012 City of Ottawa Sewer Design Guidelines, February 2014 City of Ottawa Technical Bulletin ISDTB-2014-01, and the September 2016 City of Ottawa Technical Bulletin PIEDTB-2016-01.

Subsequent guidelines have been published to the aforementioned. The newest guidelines include the following changes: minor system design using capture rate of 2 years for local streets (previously 5 years), an increase in ponding depth to 0.35 m on streets (previously 0.30 m), flow parameters which use lower per capita flow rates for HGL.

5.3 System Concept

The stormwater management system for the site incorporates standard urban drainage design and stormwater management features that can be summarized as follows:

- a dual drainage concept;
- routing of surface runoff; and,
- an end-of-pipe SWM facility (designed by others).

The stormwater management system has been developed based on the MOE *Stormwater Management Planning and Design Manual* (March 2003) and the *City of Ottawa Sewer Design Guidelines* (October 2012), as well as subsequent City of Ottawa Technical Bulletins.

5.3.1 Scope

The evaluation has been completed to support the detailed design of the dual drainage for the site. The drainage area considered in the evaluation is presented on **Drawings 139185-700**.

5.3.2 Dual Drainage Design

The site was designed with dual drainage features, accommodating minor and major system flow. During frequent storm events, the effective runoff of a catchment area is directly released via catchbasin inlets to the network of storm sewers, called the minor system. During less frequent storm events, the balance of the flow (in excess of the minor flow) is accommodated by a system of rear yard swales and street segments, called the major system.

The streets within site feature a mix of sawtooth and continuous grade profiles. The sawtooth profile facilitates surface storage on subdivision streets. Inlet control devices (ICDs) are proposed across the site to maximize the use of available on-site storage and control surcharge of the minor system during infrequent storm events. The dual drainage system has been evaluated using the DDSWMM hydrological model, while the minor system hydraulic grade line analysis has been evaluated using the XPSWMM dynamic model.

The DDSWMM model technique offers single storm event flow generation and routing. ICDs were initially sized based on the 5 year 3 hour Chicago design storm event. In some instances, the proposed ICD release rates and minor system sewer sizing were optimized to protect lots from surface flooding. This was accomplished by increasing ICD release rates above the 5 year storm event. These locations are noted in **Table 5.1** and discussed further in **Section 5.4.1**.

The major system flow pattern outlets primarily to the Hydro One corridor north of Cosanti Drive, which is provided with a dry pond. The dry pond collects and temporarily stores surface runoff north of Cosanti Drive. The captured runoff in the dry pond is released to the storm sewer on Cosanti Drive. Further information regarding the detail design of the dry pond is provided in Section 5.4.2.2. Major flow from development immediately adjacent to Shea Road cascades to the Shea Road ditch. The drainage area plan is presented on **Drawings 37533-700**. Model files are enclosed on CD in **Appendix D**.

5.4 Stormwater Evaluation

5.4.1 Hydrological Evaluation

Land use, selected modeling routines, and input parameters for the model of the site are discussed in the following sections.

Land Use

The site will be developed with back to back townhouses.

Storms and Drainage Area Parameters

The main hydrology parameters are summarized below and in **Table 5-1**.

- **Design storms:** The site was evaluated using the following storms:
    - 2 year 3 hour Chicago storm event with a 10 minute time step, applied for the dual drainage evaluation, specifically the minor system;
    - 100 year 3 hour Chicago storm event with a 10 minute time step applied for the dual drainage evaluation;
    - 100 year 3 hour Chicago storm event with a 10 minute time step plus 20% increase in intensity, applied as a stress test;
- **Infiltration:** The selected infiltration losses are consistent with the City of Ottawa Sewer Design Guidelines. The Horton values are as follows: f_o = 76.2 mm/h, f_c = 13.2 mm/h, k = 0.00115 s^{-1}.
- **Area:** The total 2.4 ha drainage area was divided into sub-drainage areas based on the proposed minor system network of storm sewers. Respecting the existing site topography, major system surface flows from the majority of the site are proposed to be directed toward the hydro corridor.
- **Imperviousness:** The imperviousness values are based on the runoff coefficients, which were determined by obtaining the footprint of the model units intended for the site and placing the applying a typical footprint to the lots.
- **Width:** The catchment width was based on the conveyance route length of the drainage area and multiplied by two. The multiplier of two was only used if the drainage area had runoff contribution from both sides of the drainage area.
- **Slope:** The ground slope was based upon the average slope for both impervious and pervious area. Generally, the slope is approximately 2% (0.02 m/m). This assumes a slope of approximately 1% for impervious or road surfaces and 3% for pervious surfaces (lot grading).
- **Detention storage depth:** Detention storage depths of 1.57 mm and 4.67 mm were used for impervious and pervious areas, respectively.
- **Manning's roughness:** Manning's roughness coefficients of 0.013 and 0.25 were used for impervious and pervious areas, respectively.
- **Baseflow:** No baseflow components were assumed for any of the areas contributing runoff to the minor system.
- **Major system storage and routing:** The subject site is comprised of both continuous grade and sawtooth road profiles. For drainage areas with sawtoothing, available surface storage has been calculated based on the grading plan. Flow is attenuated within low points with potential overflow cascading to the next segment downstream. The total volume at each low point, up to the overflow depth, is the maximum static storage. Rear yard segments have a sawtooth pattern with some storage available, but the storage is not accounted for as part of the analysis.

  For street segments with ponding, minor system capture is set to fully utilize storage during the 100 year design storm, while minimizing ponding during the 5 year event. Cascading

overflow from a low point to a downstream segment utilizes the static storage available plus an additional amount of storage equivalent to the depth required for the flow to cascade over the downstream high point. The attenuation in street sags was evaluated to account for static storage and, if overflow occurs, dynamic storage. Within this report it is referred to as double routing.

DDSWMM does not have a direct way of coding double routing since it does not allow the user to code dynamic storage over the high point. For this analysis, the method employed is that recommended in the February 2014 City of Ottawa Technical Bulletin ISDTB-2014-01. It accounts for overflow from a street segment (regular static storage at a sag) being conveyed to a downstream dummy segment. In other words, a regular low point segment is provided with a downstream dummy segment for further flow attenuation to account for the dynamic ponding during overflow.

There are no drainage area attributes associated with the dummy segment since it is a segment solely for routing. In addition, there is no inflow to the minor system from these dummy segments. The overflow hydrograph from the upstream catchment is routed in the dummy segment to the next “real” downstream segment. The dummy segments have the following specific characteristics:

- Segment Length: Equivalent to the length of the maximum static storage from the street segment contributing to it.

- Road Type: Equivalent to the right-of-way characteristics from the segment contributing to it, but with a longitudinal slope of 0.01% (0.0001 m/m).

The dummy segments for major system routing have been applied to the analysis of the subject site. The segments are referenced as D1, D2, D3, etc. within the DDSWMM modelling file. The drainage area plan presented on **Drawings 37533-700** does not show the dummy segments, but the DDSWMM output file shows the dummy segments immediately following the corresponding major segment which cascades into that dummy segment.

For street segments with continuous grade, simulations were based on the approach-capture characteristics of the catchbasin with the constraint that during the 100 year design storm the maximum cascading flow does not exceed 0.35 m.

For street segments with sawtoothing, simulations were based on the constraint that during the 100 year design storm the maximum depth of ponding (including cascading flow where applicable) does not exceed 0.35 m. Where surface storage is available, the storage-outflow characteristics for each low point were taken into consideration. The evaluation was undertaken assuming static conditions. The ponding plan for the subject site is presented on **Drawing 139185-600**.

- **Minor system capture:** The minor system capture is based on the 5 year 3 hour Chicago storm event for maximum ponding conditions. ICDs are incorporated into the design to protect the minor system from surcharge during infrequent storm events and to utilize the available on-site storage.

  Seven standard ICD sizes are proposed for the site to control the surcharge in the minor system during infrequent storm events. The minimum minor system capture of ICDs is based on DDSWMM generated flows for individual areas for the 5 year storm event. The size of the inlet control devices (ICDs) was optimized using DDSWMM. Further information on the ICDs can be found in the catchbasin table on **Drawing 139185-010**.

The minor system inflow rate was optimized to account for continuous grade. Specifically, the model incorporates the actual flow entering the minor system on continuous grade based on approach-capture curves derived from the 1984 MTO Drainage Manual (specifically, Charts E4-7D and Chart E4-7H). Based on the approach-capture curve, the actual capture during the 5 year event may be less than the 5 year simulated flow, resulting in cascading flow. For segments on continuous grade, minor system capture was set to the closest standard ICD size that is equivalent or greater than the CB capture during the 5 year event. Therefore, at receiving low points, ICDs have been sized to fully capture the cascading flow from upstream street segments on continuous grade during the 5 year event, while minimizing ponding at the low point. Catchbasin leads have been upsized where necessary, a summary in the catchbasin table on **Drawing 139185-010**.

The main hydrological parameters used in the DDSWWM model are summarized in **Table 5.1**.

Table 5-1 Hydrological Parameters

AREA ID	AREA (HA)	D/S SEGMENT	RE-CEIVING MH	IMP. (%)	LENGTH (M)	WIDTH (M)	AVAIL. PONDING (CU-M)	2 YEAR SIMULATED FLOW (L/S) 139185-3CHI2.OUT	ICD RESTRICTION (L/S)	STORAGE USED DURING 2 YEAR EVENT (CU-M)
S1	0.08	S3	MH1	0.81	34	34	3.1	11	12	0.01
S3	0.07	S4	MH3	0.81	43	43	5.6	10	12	0.01
S22	0.07	S20	MH22	0.81	42	42	0.7	11	12	0.01
S20	0.15	S4	MH20	0.81	43	86	3.5	23	25	0.01
S4	0.07	S5	MH4	0.81	40	40	4.2	10	12	0.01
S21A	0.10	OSHEA	MH21	0.81	27	54	0.0	15	12	N/A
S21	0.13	S5	MH21	0.81	36	72	0.6	19	25	0.01
S5	0.06	S6	MH5	0.81	39	39	4.1	10	12	0.01
S30	0.20	S6	MH30	0.81	55	110	3.9	30	33	0.01
S6	0.07	S8	MH6	0.81	38	38	5.6	10	12	0.01
S32	0.11	S31	MH32	0.81	49	49	14.4	17	25	0.01
S31	0.22	S8	MH31	0.81	61	122	6.6	33	38	0.01
S8	0.06	OUTDP	MH8	0.81	37	37	1.9	10	12	0.01
S40A	0.14	OSHEA	MH40	0.81	38	76	0.0	21	12	N/A
S40B	0.15	S8	MH40	0.81	43	86	7.4	23	25	0.01
S50A	0.14	S10	MH50	0.81	114	114	10.4	22	24	0.01
S50B	0.15	S9	MH50	0.81	114	114	10.4	23	24	0.01
S54	0.11	S9	MH54	0.81	42	42	0.3	16	25	0.01
S10	0.07	S9	MH51	0.81	69	69	0.1	12	19	0.01
S9	0.13	S8	MH9	0.81	67	67	0.7	20	25	0.01
UNC1	0.05	OCD	PDUM	0.81	25	25	0.0	2	0	N/A

There is no storage utilized during the 2 year event (design event). There are locations at which the computer output indicates 0.01 cu-m utilized for a short duration of time (such as 10 minutes); however this is considered below the threshold of recognition.

5.4.2 Results of the Hydrological Evaluation

Minor system hydrographs generated by DDSWMM were exported to XPSWMM for the hydraulic grade line analysis (refer to **Section 5.4.3**). The results of the DDSWMM major system evaluation are summarized in the following sections.

5.4.2.1 Overland Flow on Street Segments

A summary of cascading overland flow on street segments is presented in Table 5-3 for the 100 year 3 hour Chicago storm event and the 100 year Chicago storm increased by 20%. The cascading overflow is the flow exiting a drainage area when maximum minor system inflow and maximum available ponding has been utilized. For the areas representing the future development, the major system should be re-confirmed at the detail design stage.

The cascading flow across the site was evaluated to confirm that depth and velocity are in accordance with City guidelines. To determine velocity of cascading overflow at critical locations, SWMHYMO was used. The applicable right-of-way (ROW) sections were entered into the model with the corresponding longitudinal slopes to obtain the maximum velocity of flow using the Route Channel routine. The resulting depths were also applied for street segments with continuous grade. To determine depth of the cascading overflow for street segments with ponding, the calculation sheet from the February 2014 City of Ottawa Technical Bulletin ISDTB-2014-01 was employed. The major system flow results are summarized in the tables below and presented in full in **Appendix D**, along with supporting model files.

Table 5-2 Summary of Cascading Flow during the 100 year 3 hour Chicago Storm

AREA ID (DUMMY SEGMENT IF APPLICABLE)	LONGITUDINAL SLOPE (%)	OVERFLOW (L/S)	VELOCITY (M/S)	MAX. STATIC PONDING DEPTH (WHERE APPLICABLE) (M)	DEPTH (DYNAMIC, WHERE APPLICABLE) (M)	MAX. DEPTH (STATIC + DYNAMIC, WHERE APPLICABLE) (M)	VXD (M^2/S)
S1	D1	0.014	0.250	0.1	0.04	0.14	0.010
S3	D2	0.019	0.274	0.11	0.04	0.15	0.012
S22	D3	0.014	0.243	0.06	0.04	0.10	0.010
S20	D4	0.036	0.521	0.1	0.06	0.16	0.032
S4	D5	0.058	0.376	0.1	0.07	0.17	0.025
S21A		0.030	0.825	0	0.03	0.032	0.026
S21	D6	0.022	0.762	0.05	0.05	0.100	0.038
S5	D7	0.074	0.397	0.1	0.07	0.17	0.030
S30	D8	0.036	0.533	0.1	0.06	0.16	0.032
S6	D9	0.095	0.421	0.11	0.08	0.19	0.034
S32	D10	0.000	0.000	0.16	0.00	0.16	0.000
S31	D11	0.035	0.530	0.11	0.06	0.17	0.032
S8	D12	0.182	0.779	0.08	0.04	0.118	0.030
S40A		0.043	0.927	0	0.04	0.04	0.035
S40B	D13	0.027	0.839	0.12	0.05	0.17	0.045
S50A	D14	0.010	0.568	0.22	0.06	0.28	0.034
S50B	D15	0.023	0.568	0.22	0.06	0.28	0.034
S54	D16	0.013	0.445	0.06	0.04	0.10	0.019
S10	D17	0.010	0.605	0.04	0.07	0.11	0.044
S9	D18	0.048	0.319	0.05	0.07	0.12	0.023
UNC1		0.019	0.558	0	0.03	0.03	0.018

Table 5-3 Summary of Cascading Flow during the 100 year 3 hour Chicago Storm + 20%

AREA ID (DUMMY SEGMENT IF APPLICABLE)	LONGITUDINAL SLOPE (%)	OVERFLOW (L/S)	VELOCITY (M/S)	MAX. STATIC PONDING DEPTH (WHERE APPLICABLE) (M)	DEPTH (DYNAMIC, WHERE APPLICABLE) (M)	MAX. DEPTH (STATIC + DYNAMIC, WHERE APPLICABLE) (M)	VXD (M^2/S)
S1	D1	0.02	0.275	0.10	0.05	0.15	0.013
S3	D2	0.031	0.310	0.11	0.05	0.164	0.017
S22	D3	0.02	0.266	0.06	0.05	0.11	0.012
S20	D4	0.054	0.582	0.10	0.07	0.171	0.041
S4	D5	0.086	0.414	0.10	0.08	0.18	0.033
S21A		0.038	0.888	0.00	0.04	0.036	0.032
S21	D6	0.034	0.856	0.05	0.06	0.109	0.051
S5	D7	0.116	0.445	0.10	0.09	0.188	0.039
S30	D8	0.052	0.590	0.10	0.07	0.17	0.041
S6	D9	0.152	0.473	0.11	0.10	0.21	0.046
S32	D10	0.005	0.170	0.16	0.03	0.19	0.005
S31	D11	0.053	0.592	0.11	0.07	0.18	0.042
S8	D12	0.316	0.896	0.08	0.05	0.127	0.042
S40A		0.057	0.982	0.00	0.04	0.04	0.041
S40B	D13	0.039	0.932	0.12	0.06	0.182	0.058
S50A	D14	0.03	0.688	0.22	0.08	0.299	0.054
S50B	D15	0.041	0.688	0.22	0.08	0.30	0.054
S54	D16	0.023	0.520	0.06	0.05	0.11	0.027
S10	D17	0.032	0.748	0.04	0.10	0.14	0.076
S9	D18	0.104	0.395	0.05	0.10	0.15	0.040
UNC1		0.024	0.593	0.00	0.03	0.03	0.021

During the 100 year 3 hour Chicago design storm, the maximum depth of cascading flow on the street is less than the maximum allowable 350 mm, and the velocity by depth product is less than the allowable 0.6 m^2/s. Also, during the 100 year Chicago design storm event increased by 20%, the maximum depth of cascading flow is less than 0.35 m across the site.

5.4.3 Hydraulic Evaluation

The approved XPSWMM hydraulic model from the Phase 2 Design Brief was updated to include the subject site. Minor system hydrographs generated from the DDSWMM model were exported to the XPSWMM model. Minor system losses were accounted for in accordance with Appendix 6-B of the City of Ottawa Sewer Design Guidelines (October 2012).

Simulations were performed for various storms to confirm the hydraulic grade line (HGL) through the Davidson Lands development.

5.4.4 Results of Hydraulic Evaluation

The hydraulic grade line (HGL) was analyzed using the XPSWMM dynamic model for the 100 year 3 hour Chicago storm. The corresponding stress test (100 year 3 hour Chicago storm + 20% increase in intensity) was also simulated.

The HGL elevations are presented in the following **Table 5-7**, along with a comparison of underside of footing (USF) elevations. Results for all storm events as well as XPSWMM model output files are provided in **Appendix D**.

Table 5-4 Storm HGL Elevations

XPSWMM NODE	USF ELEV. (M)	STORM EVENTS			
		100 YEAR 3 HOUR CHICAGO(1)		100 YEAR 3 HOUR CHICAGO + 20%(2)	
		HGL (M)	USF [OR PG] - HGL (M)	HGL (M)	USF [OR PG] -HGL (M)
MH1	104.89	104.40	0.49	104.47	0.42
MH2	N/A	104.28	N/A	104.46	N/A
MH3	N/A	104.28	N/A	104.45	N/A
MH22	104.89	104.44	0.45	104.49	0.41
MH20	104.65	104.33	0.32	104.48	0.17
MH4	N/A	104.27	N/A	104.44	N/A
MH21	104.65	104.28	0.37	104.44	0.22
MH5	N/A	104.26	N/A	104.43	N/A
MH30	104.73	104.27	0.46	104.43	0.30
MH6	N/A	104.24	N/A	104.40	N/A
MH32	104.94	104.39	0.55	104.55	0.39
MH31	104.77	104.35	0.42	104.51	0.26
MH7	N/A	104.22	N/A	104.38	N/A
MH8	N/A	104.20	N/A	104.36	N/A
MH40	104.73	104.21	0.52	104.36	0.37
MH9	N/A	104.18	N/A	104.33	N/A
MH52	104.85	104.26	0.59	104.41	0.44
MH53	104.94	104.26	0.68	104.41	0.53
MH54	104.94	104.26	0.68	104.41	0.53
MH50	104.73	104.29	0.44	104.45	0.28
MH51	104.71	104.25	0.46	104.41	0.30
MH10	104.94	104.15	0.79	104.29	0.65
MH11	104.94	104.13	0.81	104.27	0.67
MH12	N/A	104.09	N/A	104.22	N/A

(1) Model file: STM_0909-100CH_2022-08-29.OUT
(2) Model file: STM_0909-120CH_2022-08-29.OUT

The above tables indicate that minimum 0.3 m clearance between the USF and HGL is maintained across the subject site during the 100 year 3 hour Chicago storm event. It should be noted that the above results also indicate that there would be no severe flooding to properties during the 100 year 3 hour Chicago storm with a 20% increase in intensity. The output files are presented in **Appendix D**.

5.4.4.1 Hydro Corridor Dry Pond

As outlined within the above Section 4.6, the existing dry pond constructed as part of the Davidson Lands development will require modification to maintain its level of service. The configuration of the site plan block requires grading works within the dry pond limits. The Hydro Corridor outlet receives major system flows from various portions of the Davidson Lands development. The dry pond will attenuate flows routed to the Hydro Corridor north of Cosanti drive. The hydraulic function of the dry pond has been confirmed in XPSWMM using the 100 year 3 hour Chicago storm as well as the stress test 100 year Chicago + 20% increase in intensity. The total available dry pond storage is approximately 3300 cu-m at ponding depth of 0.5 m (elevation of 105 m). The outflow

to the minor system is via a 450 mm diameter pipe to MH187 at the intersection of Cosanti Dr and Ocala St. The pond plan view is provided on **Drawing 139185-751** and detail design is presented on **37533-HC**. The functioning of the dry pond during the design storms is presented in **Table 5-9**.

Table 5-5: Functioning of the Dry Pond

PARAMETER	100 YEAR CHICAGO		100 YEAR CHICAGO + 20%	
	PREVIOUSLY APPROVED	CURRENT ANALYSIS	PREVIOUSLY APPROVED	CURRENT ANALYSIS
Storage Utilised (cu. m)	576	505	1940	1948
Outflow (l/s)	492	471	545	544
Water Level (m)	104.55	104.47	104.73	104.73
Drawdown Time (hr)	<3	<3	<4	<3

The above results indicate that the function of the SWM system and dry pond closely correspond with the previous analysis presented within the approved Design Brief.

5.5 Summary of Model Output Files

The following is a reference list of the model output files including file names and storm event evaluated. The files are included on the CD enclosed in **Appendix D**.

DDSWMM:

- 5 year 3 hour Chicago: 37533-5CH.OUT, EXT37533-5CH.OUT
- 100 year 3 hour Chicago: 37533-100CH.OUT, EXT37533-100CH.OUT
- 100 year 3 hour Chicago + 20%: 37533-120CH.OUT, EXT37533-120CH.OUT

SWMHYMO:

- 139185VXD.OUT

XPSWMM:

- 100 year 3 hour Chicago: STM_0909-100CH_2022-08-29.OUT
- 100 year 3 hour Chicago + 20%: STM_0909-120CH_2022-08-29.OUT

6 SOURCE CONTROLS

6.1 General

On site level or source control management of runoff will be provided to provide quality control for the subject lands. Such controls or mitigative measures are proposed for the development not only for final development but also during construction and build out. Some of these measures are:

- flat lot grading;
- split lot drainage;
- Roof-leaders to vegetated areas;
- vegetation planting.

6.2 Lot Grading

There is an elevation difference of approximately 0.8m from north to south in 1650 Shea Road. In accordance with local municipal standards, the private roads will be graded northeast between 0.5% and 5.0%. Most landscaped area drainage will be directed to the storm sewer system. Copies of the grading plans have been included in **Appendix E.**

Along the perimeter of the site, smooth grading transitions were not possible. A large retaining wall is required along Shea Road. 3:1 terracing is required along the northern and western property lines in order to transition down to existing grade.

6.3 Roof Leaders

This development will consist of back to back townhomes. It is proposed that roof leaders from these units be constructed such that runoff is directed to grass areas adjacent to the units. This will promote water quality treatment through settling, absorption, filtration and infiltration and a slow release rate to the conveyance network.

6.4 Vegetation

As with most subdivision agreements, the developer will be required to complete a vegetation and planting program. Vegetation throughout the development including planting along roadsides where possible.

7 CONVEYANCE CONTROLS

7.1 General

Besides source controls, the development also proposes to use several conveyance control measures to improve runoff quality. These will include:

- catchbasin and maintenance hole sumps; and

7.2 Catchbasins

All catchbasins within the development, either rear yard or street, will be constructed with minimum 600 mm deep sumps. These sumps trap pollutants, sand, grit and debris which can be mechanically removed prior to being flushed into the minor pipe system. Both rear yard and street catchbasins will be fabricated to OPSD 705.010 or 705.020. All storm sewer maintenance holes servicing local sewers less than 900 mm diameter shall be constructed with a 300 mm sump as per City standards.

8 SEDIMENT AND EROSION CONTROL PLAN

8.1 General

During construction, existing stream and conveyance systems can be exposed to significant sediment loadings. Although construction is only a temporary situation, it is proposed to introduce a number of mitigative construction techniques to reduce unnecessary construction sediment loadings. These will include:

- groundwater in trench will be pumped into a filter mechanism prior to release to the environment;
- bulkhead barriers will be installed at the nearest downstream manhole in each sewer which connects to an existing downstream sewer;
- seepage barriers will be constructed in any temporary drainage ditches; and
- silt sacks will remain on open surface structure such as manholes and catchbasins until these structures are commissioned and put into use.

8.2 Trench Dewatering

During construction of municipal services, any trench dewatering using pumps will be discharged into a filter trap made up of geotextile filters and straw bales similar in design to the OPSD 219.240 Dewatering Trap. These will be constructed in a bowl shape with the fabric forming the bottom and the straw bales forming the sides. Any pumped groundwater will be filtered prior to release to the existing surface runoff. The contractor will inspect and maintain the filters as needed including sediment removal and disposal and material replacement as needed.

8.3 Bulkhead Barriers

At the first manhole constructed immediately upstream of an existing sewer, a ½ diameter bulkhead will be constructed over the lower half of the out-letting sewer. This bulkhead will trap any sediment carrying flows, thus preventing any construction –related contamination of existing sewers. The bulkheads will be inspected and maintained including periodic sediment removal as needed.

8.4 Seepage Barriers

These barriers will consist of both the Light Duty Straw Bale Barrier as per OPSD 219.100 or the Light Duty Silt Fence Barrier as per OPSD 219.110 and will be installed in accordance with the sediment and erosion control drawing. The barriers are typically made of layers of straw bales or geotextile fabric staked in place. All seepage barriers will be inspected and maintained as needed.

8.5 Surface Structure Filters

All catchbasins, and to a lesser degree, manholes, convey surface water to sewers. However, until the surrounding surface has been completed these structures will be covered to prevent sediment from entering the minor storm sewer system. Until rear yards are sodded or until streets are asphalted and curbed, all catchbasins and manholes will be equipped with geotextile filter socks. These will stay in place and be maintained during construction and build until it is appropriate to remove them.

8.6 Stockpile Management

During construction of any development similar to that being proposed both imported and native soils are stockpiled. Mitigative measures and proper management to prevent these materials entering the sewer systems is needed.

During construction of the deeper municipal services, water, sewers and service connections, imported granular bedding materials are temporarily stockpiled on site. These materials are however quickly used up and generally before any catchbasins are installed. Street catchbasins are installed at the time of roadway construction and rear-yard catchbasins are usually installed after base course asphalt is placed.

Contamination of the environment as a result of stockpiling of imported construction materials is generally not a concern since these materials are quickly used and the mitigative measures stated previously, especially the use of filter fabric in catchbasins and manholes help to manage these concerns.

The roadway granular materials are not stockpiled on site. They are immediately placed in the roadway and have little opportunity of contamination. Lot grading sometimes generates stockpiles of native materials. However, this is only a temporary event since the materials are quickly moved off site.

The construction of this development will involve a substantial rock blasting, breaking and crushing operation. Given the existing topography, a substantial cut and fill operation is required in order to construction a development that meets City Standards. As part of this operation, materials will be manipulated onsite, and provided the sediment and erosion control measures are in place, are generally inconsequential to the surrounding environment.

9 ROADS AND NOISE ATTENUATION

Vehicular access to 1650 Shea Road is provided by three private entrances, two from Shea Road and one from Cosanti Drive.

There are no sidewalks or pathways proposed within the development. Pedestrian access to the site will be via the private roadway.

The site has been designed to provide curbside municipal waste disposal.

There are no bus routes proposed within 1650 Shea Road.

Environmental Noise measures and/or clauses will be required for the majority of units adjacent to Shea Road and Cosanti. There are no outdoor living areas, therefore no attenuation barriers will be required.

9.1 Aircraft Sound Levels

As stated in Section 2.1, the site is within the Airport Vicinity Development Zone (AVDZ), the limit of the AVCZ is shown on Figure 2. The site however is outside of the 25 NEF/NEP contour line, so the building components and ventilation requirements of Part 6 Prescribed Measures for Aircraft Noise of the Guidelines do not apply. A warning clause is required for the residential units inside the AVDZ.

Warning clause for aircraft noise is as follows:

“Purchasers/tenants are advised that due to the proximity of the airport, noise from the airport and individual aircraft may at times interfere with outdoor or indoor activities”.

10 SOILS

GEMTEC Consulting Ltd. was retained to prepare a geotechnical investigation for the proposed mixed use development for the 1650 Shea Road. The objectives of the investigation were to prepare a report to:

- Determine the subsoil and groundwater conditions at the site by means of test pits and boreholes and;
- To provide geotechnical recommendations pertaining to design of the proposed development including construction considerations.

The geotechnical report 63900.02-LET.01 was prepared by GEMTEC Consulting Ltd. in July 2020. The report contains recommendations which include but are not limited to the following:

- The maximum permissible grade raise is 3.5m
- In areas where finished grade exceeds grade raise limits, geotechnical reviews are required
- Fill placed below the foundations to meet OPSS Granular 'A' or Granular 'B' Type II placed in 300 mm lifts compacted to 98% SPMDD.
- Fill for roads to be suitable native material in 300mm lifts compared to 95% SPMDD

Pavement Structure:

LOCAL ROAD	THICKNESS
Asphaltic Concrete	90mm
OPSS Granular A Base	150mm
OPSS Granular B Type II Subbase	400mm

- Pipe bedding and cover; bedding to be minimum 150 mm OPSS Granular 'A' up to spring line of pipe. Cover to be 300 mm OPSS A (PUC and concrete pipes) or sand for concrete pipes. Both bedding and cover to be placed in maximum 225 mm lifts compacted to 95% SPMDD.

In general, the grading plan for 1650 Shea Road adheres to the grade raise constraints noted above. A copy of the grading plans is included in **Appendix E**. The site does not pose any significant grade raise; thus, a grading plan review letter is not required for this development.

11 RECOMMENDATIONS

Water, wastewater and stormwater systems required to develop 1650 Shea Road will be designed in accordance with MOE and City of Ottawa's current level of service requirements.

The use of lot level controls, conveyance controls and end of pipe controls outlined in the report will result in effective treatment of surface stormwater runoff from the site. Adherence to the proposed sediment and erosion control plan during construction will minimize harmful impacts on surface water.

Final detail design will be subject to governmental approval prior to construction, including but not limited to the following:

- 1650 Shea Road Commence Work Order: City of Ottawa
- ECA for Sewage Works: MOECP Transfer of Review by City of Ottawa
- 1650 Shea Road Watermain Approval: City of Ottawa

Report prepared by:

Demetrius Yannoulopoulos, P.Eng.
Director

Ryan Magladry, C.E.T.
Project Manager

Anton Chetrar, EIT
Engineering Intern

https://ibigroup.sharepoint.com/sites/Projects2/139185/Internal Documents/6.0_Technical/6.04_Civil/03_Reports/Submission No. 1/CTR-Servicing Brief_2022-09-15.docx

APPENDIX A

AOV Plan of Subdivision for Davidson Lands Phase 2
Site Plan for 1650 Shea Road
139185-001 - General Plan of Services
City of Ottawa Pre-Consultation Meeting Notes

APPROVED UNDER SECTION 51 OF THE PLANNING ACT BY THE CITY OF OTTAWA THIS ____ DAY OF ________________ ,20___

STEPHEN WILLIS, MCIP, RPP. GENERAL MANAGER
PLANNING, INFRASTRUCTURE AND ECONOMIC DEVELOPMENT DEPARTMENT, CITY OF OTTAWA

PLAN 4M-

I CERTIFY THAT THIS PLAN IS REGISTERED IN THE LAND REGISTRY OFFICE FOR THE LAND TITLES DIVISION OF OTTAWA-CARLETON No.4 AT_____ O'CLOCK ON THE______ DAY OF _____________, 2019 AND ENTERED IN THE PARCEL REGISTER FOR PROPERTY IDENTIFIER 04449-2603, 04449-2604, 0449-2605, 04492606, AND THE REQUIRED CONSENTS ARE REGISTERED AS PLAN DOCUMENT NUMBER OC-___________.

REPRESENTATIVE FOR LAND REGISTRAR

THIS PLAN COMPRISES ALL OF PINS 04449-2603, 04449-2604, 04449-2605 AND 04449-2606.

PART OF LOT 82 : SUBJECT TO EASEMENT OVER PART 41 ON PLAN 4R-32499 AS IN OC2191082.
PART OF LOT 113 : SUBJECT TO EASEMENT OVER PART 42 ON PLAN 4R-32499 AS IN OC2188358.
PART OF BLOCK 135 : SUBJECT TO EASEMENT OVER PART 48 ON PLAN 4R-32499 AS IN OC2188358.
PART OF BLOCK 136 : SUBJECT TO EASEMENT OVER PART 47 ON PLAN 4R-32499 AS IN OC2191082.
PART OF BLOCK 143 : SUBJECT TO EASEMENT OVER PART 46 ON PLAN 4R-32499 AS IN OC2188358.
PART OF BLOCK 144 : SUBJECT TO EASEMENT OVER PART 45 ON PLAN 4R-32499 AS IN OC2191082.
PART OF BLOCK 151 : SUBJECT TO EASEMENT OVER PART 44 ON PLAN 4R-32499 AS IN OC2191082.
: SUBJECT TO EASEMENT OVER PART 43 ON PLAN 4R-32499 AS IN OC2188358..
ALL OF BLOCK 174 : SUBJECT TO EASEMENT OVER PART 3 ON PLAN 4R-30450 AS IN OC1951500.
ALL OF BLOCK 175 : SUBJECT TO EASEMENT OVER PARTS 4,11 & 12 ON PLAN 4R-30450 AS IN OC1951500.
ALL OF BLOCK 176 : SUBJECT TO EASEMENT OVER PART 6 ON PLAN 4R-30450 AS IN OC1951500.
PART OF voie Maygrass Way AND rue Kayenta Street : SUBJECT TO EASEMENT OVER PART 2 ON PLAN 4R-30450 AS IN OC1951500.
PART OF voie Sendero Way : SUBJECT TO EASEMENT OVER PART 5 ON PLAN 4R-30450 AS IN OC1951500.
ALL OF BLOCKS 178 AND 179, PART OF croissant Taliesin Crescent, voie Orvieto Way, rue Ocala Street and promenade Crosanti Drive : SUBJECT TO EASEMENT OVER PART 2 ON PLAN 4R-30317 AS IN N391074.
PART OF BLOCKS 117, 118, 119 and 127, PART OF rue Kayenta Street and voie Maygrass Way : SUBJECT TO EASEMENT OVER PARTS 1 AND 2 ON PLAN 4R-32500 AS IN OC2185069.

PLAN OF SUBDIVISION of

PART OF LOT 25
CONCESSION 9
(GEOGRAPHIC TOWNSHIP OF GOULBOURN)
CITY OF OTTAWA

Scale 1:1000
20 0 20 40 60 METRES

METRIC CONVERSION

DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

GRID SCALE CONVERSION

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99991.

BEARING NOTE

BEARINGS ARE GRID, DERIVED FROM CAN-NET VRS NETWORK GPS OBSERVATIONS ON NCC HORIZONTAL CONTROL MONUMENTS 19773035 AND 19680191, CENTRAL MERIDIAN, 76° 30' WEST LONGITUDE MTM ZONE 9, NAD83 (ORIGINAL).

19773035 N:5006060.42 E:324888.04
19680191 N:5033564.26 E:388064.94

OBSERVED REFERENCE POINTS DERIVED FROM THE CAN-NET VRS NETWORK GPS OBSERVATIONS ON NCC HORIZONTAL CONTROL MONUMENTS 19773035 AND 19680191, CENTRAL MERIDIAN, 76° 30' WEST LONGITUDE MTM ZONE 9, NAD83 (ORIGINAL).
COORDINATES TO URBAN ACCURACY PER SEC 14(2) OF O.REG. 216/10

ORP ID	NORTHING	EASTING
Ⓐ	5012870.78	352146.93
Ⓑ	5012647.05	351766.91

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

LEGEND

■	DENOTES	FOUND MONUMENTS
□	"	SET MONUMENTS (IB) UNLESS OTHERWISE STATED
IB	"	IRON BAR
IBø	"	ROUND IRON BAR
SIB	"	STANDARD IRON BAR
SSIB	"	SHORT STANDARD IRON BAR
CC	"	CUT CROSS
CP	"	CONCRETE PIN
WIT	"	WITNESS
PIN	"	PROPERTY IDENTIFICATION NUMBER
MEAS	"	MEASURED
PROP	"	PROPORTIONED
OU	"	ORIGIN UNKNOWN
SG	"	STANTEC GEOMATICS LTD.
ORP	"	OBSERVED REFERENCE POINT
S/T	"	SUBJECT TO EASEMENT
P1	"	REGISTERED PLAN 4M-1647
P2	"	PLAN 4R-30317

ALL OF PIN 04449-2603
ALL OF PIN 04449-2604
ALL OF PIN 04449-2605
ALL OF PIN 04449-2606

OWNER'S CERTIFICATE

THIS IS TO CERTIFY THAT :

1. LOTS 1 TO 114, BOTH INCLUSIVE, BLOCKS 115 TO 173 BOTH INCLUSIVE, THE STREETS, NAMELY rue Kayenta Street, voie Maygrass Way, voie Sendero Way, voie Painted Sky Way, croissant Taliesin Crescent, voie Orvieto Way, promenade Crosanti Drive rue Ocala Street and croissant Maverick Crescent, AND WALKWAYS NAMELY BLOCKS 174, 175 AND 176 HAVE BEEN LAID OUT IN ACCORDANCE WITH OUR INSTRUCTIONS.
2. THE STREETS AND STREET WIDENINGS ARE DEDICATED TO CITY OF OTTAWA AS PUBLIC HIGHWAYS.

DAVIDSON SHEA PROPERTIES INC.

DATE

R. DOUGLAS LAZIER, PRESIDENT
I HAVE THE AUTHORITY TO BIND THE CORPORATION

SURVEYOR'S CERTIFICATE

I CERTIFY THAT :

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.

THE SURVEY WAS COMPLETED ON THE DAY OF , 2020

DATE

BRIAN J. WEBSTER
ONTARIO LAND SURVEYOR

Stantec Geomatics Ltd.
CANADA LANDS SURVEYORS
ONTARIO LAND SURVEYORS
1331 CLYDE AVENUE, SUITE 400
OTTAWA, ONTARIO, K2C 3G4
TEL. 613.722.4420 FAX. 613.722.2799
stantec.com

DRAWN: CEC/ME	CHECKED: *	PM: FL	FIELD: -	PROJECT No.: 161614049-132

Project Title
DESIGN BRIEF
DAVIDSON LANDS-OPA 76 AREA 6a
PHASE 2
STITTSVILLE SOUTH

Scale
N.T.S.

Drawing Title
DRAFT PLAN

Sheet No.
FIGURE 1.2

August 12, 2022

SITE PLAN OF

BLOCK 175
AND PART OF BLOCK 176
REGISTERED PLAN 4M-1689

CITY OF OTTAWA

PIN 04449-3211 (ALL OF BLOCK 175)
PIN 04449-3212 (PART OF BLOCK 176)

Scale 1:400

3 0 10 20 30 METRES

BLOCK	NO. UNITS	LOT AREA (m2)	BUILDING AREA(m2)	LOT COVERAGE	ASPHALT (m2)
1	10	1322.1	496.2	37.5%	210.0
2	6	912.6	379.0	41.5%	108.6
3	8	911.4	486.4	53.3%	161.1
4	8	1069.8	399.1	37.3%	173.1
5	8	897.2	399.1	44.4%	173.9
6	8	1084.3	399.1	36.8%	173.8
7	8	899.3	399.1	44.4%	174.0
8	10	1248.2	496.2	39.7%	212.9
9	10	1117.5	496.2	44.4%	212.7
10	10	1322.9	594.0	45.1%	201.2
11	10	1211.6	594.0	49.0%	201.2
12	10	1452.8	594.0	40.9%	294.6
13	10	1100.7	594.0	54.0%	201.6

TOTAL NO. UNITS= 116
SITE AREA= 2.3971 Ha
ASPHALT AREA= 7926.4 m2

SHEA ROAD (ROAD ALLOWANCE BETWEEN LOTS 25 AND 26)

PART 12 4R-28248

LOT 25 CONCESSION 9 (GOULBOURN)

PART 5 4R-28248

PART 4 4R-28248

N45°53'50"E 61.72

N41°02'00"W 270.32

3M PLANTING BUFFER

PRIVATE LANE 1

PRIVATE LANE 2

PRIVATE LANE 3

PRIVATE LANE 4

PRIVATE LANE 5

PRIVATE LANE 6

BLOCK 1 BLOCK 2 BLOCK 3 BLOCK 4 BLOCK 5 BLOCK 6 BLOCK 7 BLOCK 8 BLOCK 9 BLOCK 10 BLOCK 11 BLOCK 12

BACK TO BACK

N29°40'20"W 166.65

N39°27'40"W 29.65

N31°36'25"W 34.16

N41°02'00"W 20.21

N03°58'00"E 7.07

N48°58'05"E 53.61

N36°24'25"E 34.30

N48°58'05"E 30.59

N60°19'45"E 5.28

R=50.00 A=8.54 C=8.53 N34°34'00"W

R=50.00 A=6.85 C=6.85 N35°32'01"W

R=64.00 A=10.53 C=10.52 N36°19'11"W

REGISTERED BLOCK 176

promenade Cosanti Drive

Stantec

Stantec Geomatics Ltd.
CANADA LANDS SURVEYORS
ONTARIO LAND SURVEYORS
1331 CLYDE AVENUE, SUITE 300
OTTAWA, ONTARIO, K2C 3G4
TEL. 613.722.4420
stantec.com

DRAWN: ME	CHECKED:	PM:	FIELD:	PROJECT No.: 161614228-112

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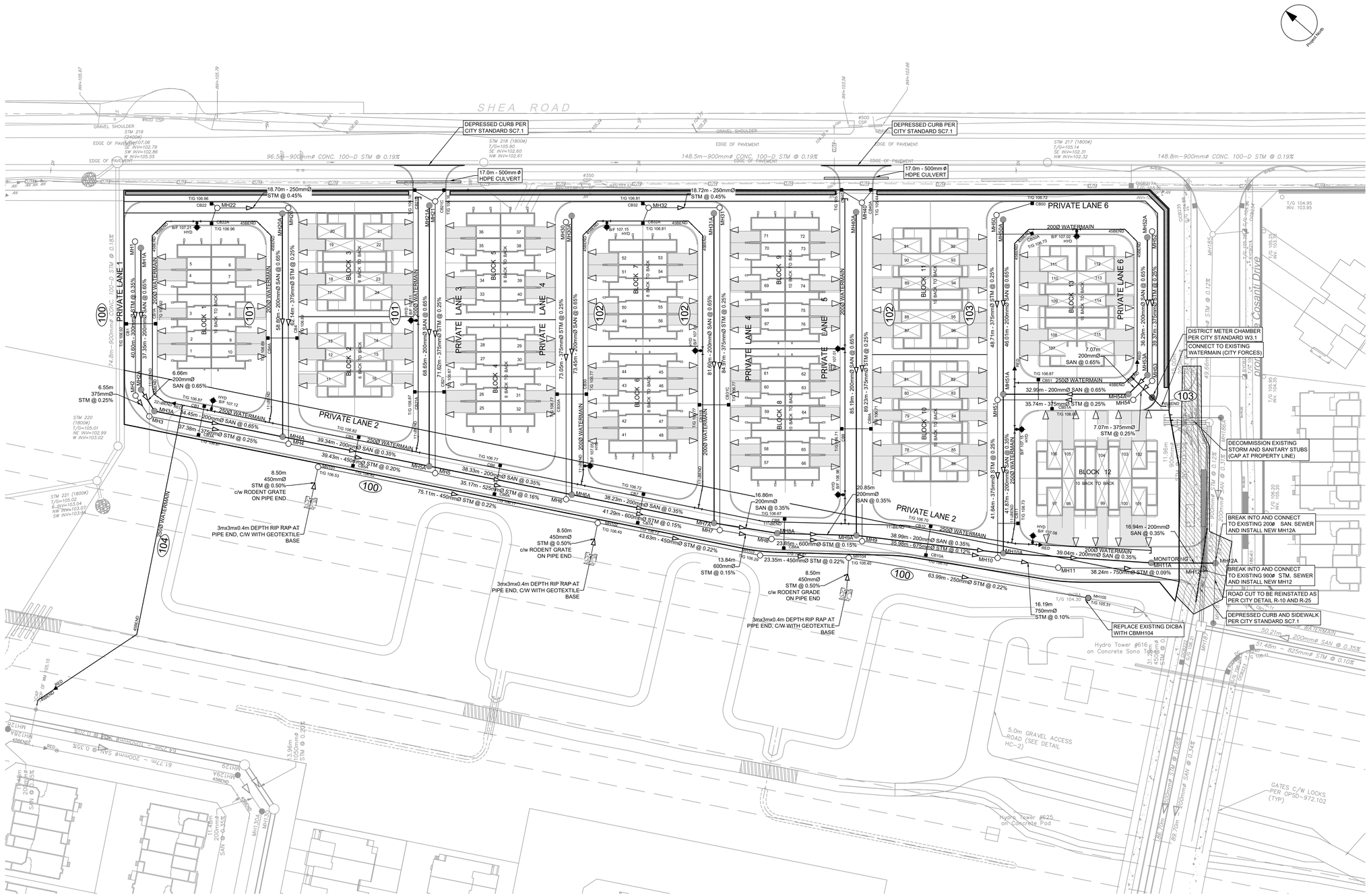


CLIENT

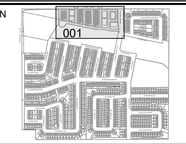
DAVIDSON SHEA PROPERTY INC.

ISSUES

No.	DESCRIPTION	DATE
1	SUBMISSION NO.1 FOR CITY REVIEW	2022-09-15
2		
3		
4		
5		
6		
7		
8		

SEE 010, 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS

KEY PLAN



CONSULTANTS

1:500 0 5 15 25m

SEAL

LICENSED PROFESSIONAL ENGINEER
L.D. G. Yannoulopoulos
2022/09/15
PROVINCE OF ONTARIO

IBI GROUP
400 – 333 Preston Street
Ottawa ON K1S 5N4 Canada
tel 613 225 1311 fax 613 225 9868
ibigroup.com

PROJECT

1650 SHEA ROAD

(OTTAWA, ON)

PROJECT NO: 139185	
DRAWN BY: **M.M.**	CHECKED BY: **A.C./A.B.**
PROJECT MGR: **R.M.**	APPROVED BY: **D.G.Y.**

SHEET TITLE

GENERAL PLAN

SHEET NUMBER	ISSUE
001	1

SCALE CHECK

CITY FILE No. D07-__-__-____

CITY PLAN No. xxxxx

File Location: J:\139185_1650_Shea_Rd\7.0_Production\7.03_Design\04_Civil\Sheets\001-GENERAL PLAN.dwg Last Saved: September 14, 2022, by stefan geisser Plotted: Thursday, September 15, 2022 8:23:44 AM by Stefan Geisser

Pre-Application Consultation Meeting Minutes

1650 Shea Road, Ottawa

1:00 PM to 2:00 PM, February 18, 2022

MS Teams

Attendees:

Molly Smith - Planner (File Lead), City of Ottawa
Eric Surprenant - Project Manager (Engineering), City of Ottawa
Adrian Van Wyk - Planner (Urban Design), City of Ottawa
Mike Giampa - Project Manager (Transportation), City of Ottawa
Matthew Hayley - Planner (Environmental Planning), City of Ottawa
Mark Richardson - Planning Forester (Forestry), City of Ottawa
Ashvinya Moorthy - Student Planner, City of Ottawa

Applicant Team:
Melissa Cote (Taggart)
Ryan Magladry (Engineer)
David Hook (Transportation Engineer)
Tyer Ferguson (Cardel Homes)
Peter Hume (Applicant)

Site-Wide Overview:

1. Pre-application consultation meeting for a Site Plan Control (Complex) and a Plan of Condo. The subject site size is 2.08 hectares and is registered as Block 175 on the phase 2 plan registration for the Edenwylde Subdivision. The site will provide back-to-back townhomes with 270 m frontage meters on Shea Road and 100 m frontage on Cosanti Drive and a hydro corridor to the west of the site. to the north of the site is a future commercial space.

2. 116 back-to-back townhouse units will be provided with two accesses to the site, one off Shea Road and the other off Cosanti Drive. Internal roads will be available throughout the site as private laneways that are either 6 metres or 8.5 metres in width, the 8.5 metre width is for on street parking. A turning radiuses of 20m with a minimum width of 12 m will allow fire services and garbage trucks around the site.

3. The lane along the west boundary of the site is along the Hydro 1 Corridor, connecting to Cosanti Drive.

4. The narrow block along Shea Road and Cosanti Drive is 3 m in width and it is there for a retaining wall.

Preliminary comments and questions

Parks

1. With the proposed development at 1650 Shea Road, the total density in the Edenwylde Subdivision area (e.g. D07-16-15-0008) is 784 units. As the subdivision approvals – including development at 1650 Shea Road – and parkland dedication was associated with 731 units, cash-in-lieu of parkland is owed for the increase in density of 53 units.

   - CIL requirement: 1 ha/500 units
   - 53 units = **1,060 sq.m.**

   The cash-in-lieu of parkland dedication shall be directed 60% towards the Ward 21 cash-in-lieu of parkland reserve and 40% towards the City-wide cash-in-lieu of parkland reserve. The Owner further agrees to pay the cost of preparing a land valuation appraisal. The value of the land shall be determined as of the day before Site Plan approval.

2. There is no delegated authority for waiving the requirements of the Parkland Dedication By-law 2009-95, as amended. Only City Council has the authority to waive any requirements of the Parkland Dedication By-law.

3. Parks and Facilities Planning is currently undertaking a legislated review for the replacement of the Parkland Dedication By-law, with the new by-law to be considered by City Council in early July 2022. To ensure you are aware of parkland dedication requirements for your proposed development, we encourage you to familiarize yourself with the existing Parkland Dedication By-law and to sign up for project notifications on the Engage Ottawa project page or by emailing the project lead at Kersten.Nitsche@ottawa.ca

Please contact Kersten Nitsche, Parks Planner, at kersten.nitsche@ottawa.ca, if you have any questions or require additional information relating to the comments above.

Environmental Planning

1. The GeoOttawa mapping for this site shows a watercourse and an unevaluated wetland. These features should have been addressed in the subdivision however the EIS doesn't indicate they are present. Please confirm presence/absence of the mapped watercourse and confirm with the Conservation Authority. If the watercourse is indeed present, and its realignment wasn't addressed in the subdivision then the policies of the New OP Section 4.9.3 will apply.

Please contact Matthew Hayley, Environmental Planner, at Matthew.Hayley@ottawa.ca, if you have any questions or require additional information relating to the comments above.

Forestry

TCR requirements (if any trees identified):

1. A Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City
   a. an approved TCR is a requirement of Site Plan approval.

    b. The TCR may be combined with the LP provided all information is supplied
2. Any removal of privately-owned trees 10cm or larger in diameter, or city-owned trees of any diameter requires a tree permit issued under the Tree Protection Bylaw (Bylaw 2020 – 340); the permit will be based on an approved TCR and made available at or near plan approval.
3. The Planning Forester from Planning and Growth Management as well as foresters from Forestry Services will review the submitted TCR
    a. If tree removal is required, both municipal and privately-owned trees will be addressed in a single permit issued through the Planning Forester
    b. Compensation may be required for city owned trees – if so, it will need to be paid prior to the release of the tree permit
4. the TCR must list all trees on site, as well as off-site trees if the CRZ extends into the developed area, by species, diameter and health condition
5. please identify trees by ownership – private onsite, private on adjoining site, city owned, co-owned (trees on a property line)
6. If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained
7. All retained trees must be shown, and all retained trees within the area impacted by the development process must be protected as per City guidelines available at Tree Protection Specification or by searching Ottawa.ca
    a. the location of tree protection fencing must be shown on the plan
    b. show the critical root zone of the retained trees
    c. if excavation will occur within the critical root zone, please show the limits of excavation
8. the City encourages the retention of healthy trees; if possible, please seek opportunities for retention of trees that will contribute to the design/function of the site.
9. For more information on the process or help with tree retention options, contact Mark Richardson mark.richardson@ottawa.ca or on City of Ottawa

LP tree planting requirements:

For additional information on the following please contact tracy.smith@Ottawa.ca

Minimum Setbacks

- Maintain 1.5m from sidewalk or MUP/cycle track.
- Maintain 2.5m from curb
- Coniferous species require a minimum 4.5m setback from curb, sidewalk or MUP/cycle track/pathway.
- Maintain 7.5m between large growing trees, and 4m between small growing trees. Park or open space planting should consider 10m spacing, except where otherwise approved in naturalization / afforestation areas. Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.

Tree specifications

- Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.
- Maximize the use of large deciduous species wherever possible to maximize future canopy coverage

- Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; and include watering and warranty as described in the specification (can be provided by Forestry Services).
- Plant native trees whenever possible
- No root barriers, dead-man anchor systems, or planters are permitted.
- No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)

Hard surface planting

- Curb style planter is highly recommended
- No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.
- Trees are to be planted at grade

Soil Volume

- Please ensure adequate soil volumes are met:

Tree Type/Size	Single Tree Soil Volume (m3)	Multiple Tree Soil Volume (m3/tree)
Ornamental	15	9
Columnar	15	9
Small	20	12
Medium	25	15
Large	30	18
Conifer	25	15

Please note that these soil volumes are not applicable in cases with Sensitive Marine Clay.

Sensitive Marine Clay

- Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines

Tree Canopy Cover

- The landscape plan shall show how the proposed tree planting will replace and increase canopy cover on the site over time, to support the City's 40% urban forest canopy cover target.
- At a site level, efforts shall be made to provide as much canopy cover as possible, through tree planting and tree retention, with an aim of 40% canopy cover at 40 years, as appropriate.
- Indicate on the plan the projected future canopy cover at 40 years for the site.

Please contact Mark Richardson, Planning Forester, at Mark.Richardson@ottawa.ca, if you have any questions or require additional information relating to the comments above.

Infrastructure

1. Site Plan should not proceed until such time as there is an approved plan for the off-site stormwater management channel.
2. The roads should all be private (operations are not willing to take on maintenance of such streets due to very problematic maintenance).
3. The (public) road as shown on the concept plan is 1/2 private and 1/2 public where it intersects with Cossanti Dr. , which would be unacceptable.
4. Hydro sign off would be required with specific recognition of street located parallel to Hydro circuits and inside corridor.
5. Subdivision drawings and design still outstanding and implementation of street inside HONI corridor would need to be reflected on all subdivision drawings to assess impacts on (Stormwater Management, Grading, Dry Pond etc.. and would need to be recirculated to Stormwater Operations Group).
6. Major Flows would need to respect Subdivision design.
7. Boundary conditions to be requested.
8. FUS and Hydrant coverage calcs to reflect back to back units.
9. Shea Road widening to be provided and shown.
10. Retaining walls to be located onto private property.
11. Full geotechnical design to be provided.
12. Ditch cleaning along Shea Road to be completed.

Please contact Eric Surprenant, Infrastructure Project Manager, at eric.surprenant@ottawa.ca, if you have any questions or require additional information relating to the comments above.

Urban Design

1. An Urban Design Brief will be required. Please see the attached Terms of Reference.
2. The proposed street layout is circuitous. It is strongly recommended that the western side street be extended to Cosanti Drive and aligned with Ocala Street – please see attached illustrations.
3. The buildings located closest to Cosanti Drive should have frontage on that street – please see attached illustration.
4. Tree planting should be provided within the PUD and along Shea Road and Cosanti Drive, taking into account the requirements for marine clay soils.
5. Impervious asphalt should be kept to a minimum. The applicant should consider sustainable design measures such as permeable paving, bulb outs, bioswales and opportunities to introduce soft landscaping wherever possible.
6. Please consider pedestrian circulation throughout the site and provide some sidewalks in appropriate locations.

Transportation

1. Submit a screening form. If a TIA is warranted proceed to scoping.
2. The application will not be deemed complete until the submission of the draft step 2-4, including the functional draft RMA package (if applicable) and/or monitoring report (if applicable). Although a full review of the TIA Strategy report (Step 4) is not required prior to an application, it is strongly recommended.
3. Synchro files are required at Step 4.

4. As identified in the Fernbank Community Design Plan, Shea Road has a 26m ROW, please ensure the site plan accommodates.
5. Corner sight triangle: 5m x 5m.
6. A Road Noise Impact Study is required.
7. For the Shea Road access, ensure that the clear throat requirement is per TAC guidelines.

Please contact Mike Giampa, Project Manager (Transportation), at Mike.Giampa@ottawa.ca, if you have any questions or require additional information relating to the comments above.

Planning

1. In the period between Council approval of the New Official Plan and the Ministry's approval of the New Official Plan, City staff will apply whichever provision, as between the Current and New Official Plan, is more restrictive. However, both of the Official Plan documents must be reviewed in the planning rationale. It should be noted that the Current Official Plan designates the property under '*General Urban Area*' and '*Developing Community (Expansion Area)*'. The New Official Plan designates the property '*Suburban*' under schedule B5 - Suburban (West) Transect.
2. The site is currently zoned R4Z[2415] (Residential Fourth Density Zone, Subzone Z, Exception 2415).
    - Exception 2415 lists additional permitted and prohibited uses. Please refer to the exception table to examine the requirements further.
3. As per the Zoning-Bylaw, full analysis of the relevant sections will be required since this site would be considered a PUD. Please note the zoning requirements in Section 131 in terms of the building separation; in the case that the maximum height is being met, the building separation would be 1.3 m from each building.
4. Please provide architectural articulation on building facades abutting a street or walkway.
5. Opportunities for tree planting and landscaping throughout the site is strongly encouraged.
6. Provide a safe pedestrian/cycling connection to Cosanti Drive.
7. Please ensure that the proposed driveways meet the requirements of the minimum width that is permitted.
8. Shea Road has a ROW of 26m, please accommodate.
9. In the Planning Rationale, please explain how maintenance and operations works with the hydro easement and road maintenance.
10. Reaching out to ward councilor Scott Moffatt is encouraged.

Please contact Molly Smith, Planner, at molly.smith@ottawa.ca, if you have any questions or require additional information relating to the comments above.

Next Steps

Please refer to the links to Guide to preparing studies and plans and fees for further information. Additional information is available related to building permits, development charges, and the Accessibility Design Standards. Be aware that other fees and permits may be required, outside of the development review process. You may obtain background drawings by contacting informationcentre@ottawa.ca.

These pre-consultation comments are valid for one year. If you submit a development application(s) after this time, you may be required to meet for another pre-consultation meeting and/or the submission requirements may change. You are as well encouraged to contact us for a follow-up meeting if the plan/concept will be further refined.

Please do not hesitate to contact Molly Smith, at molly.smith@ottawa.ca if you have any questions.

APPENDIX B

Boundary Conditions
Water Demand Calculation Sheet
Fire Flow Calculations
Water Distribution Model

Boundary Conditions
1650 Shea Road

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	61	1.02
Maximum Daily Demand	152	2.54
Peak Hour	335	5.58
Fire Flow Demand #1	11,000	183.33
Fire Flow Demand #2	14,000	233.33

Location

Results

Connection 1 – Jardiniere St.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	160.7	79.0
Peak Hour	154.9	70.9
Max Day plus Fire 1 (11,000 L/min)	132.9	39.6
Max Day plus Fire 2 (14,000 L/min)	120.2	21.4

Ground Elevation = 105.1 m

Connection 2 – Cosanti Dr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	160.7	80.2
Peak Hour	154.9	72.1
Max Day plus Fire 1	132.4	39.9
Max Day plus Fire 2	119.3	21.4

Ground Elevation = 104.3 m

Notes

1. A 250mm watermain was added for modeling purposes between Connection 1 and Connection 2, as internal looping is required to meet minimum fire flow requirements.
2. As per the Ontario Building Code in areas that may be occupied, the static pressure at any fixture shall not exceed 552 kPa (80 psi.) Pressure control measures to be considered are as follows, in order of preference:
    a. If possible, systems to be designed to residual pressures of 345 to 552 kPa (50 to 80 psi) in all occupied areas outside of the public right-of-way without special pressure control equipment.
    b. Pressure reducing valves to be installed immediately downstream of the isolation valve in the home/ building, located downstream of the meter so it is owner maintained.

Disclaimer

The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation. Fire Flow analysis is a reflection of available flow in the watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.

WATERMAIN DEMAND CALCULATION SHEET

IBI GROUP
333 PRESTON STREET
OTTAWA, ONTARIO
K1S 5N4

PROJECT : 1650 Shea Road
LOCATION City of Ottawa
CLIENT : Taggart

FILE: 139185-6.4.4
DATE PRINTED: 08-Sep-22
DESIGN: WZ
PAGE: 1 OF 1

NODE	RESIDENTIAL				NON-RESIDENTIAL (ICI)			AVERAGE DAILY DEMAND (l/s)			MAXIMUM DAILY DEMAND (l/s)			MAXIMUM HOURLY DEMAND (l/s)			FIRE DEMAND (l/min)
	SINGLE FAMILY UNITS	TOWNHOUSE / BACK TO BACK UNITS	MEDIUM DENSITY UNITS	POPULATION	INDUST. (ha)	COMM. (ha)	INSTIT. (ha)	RESIDENTIAL	ICI	TOTAL	RESIDENTIAL	ICI	TOTAL	RESIDENTIAL	ICI	TOTAL	
Node 1		3		8.1				0.03		0.03	0.07		0.07	0.14		0.14	11,000
Node 2		7		18.9				0.06		0.06	0.15		0.15	0.34		0.34	11,000
Node 3		7		18.9				0.06		0.06	0.15		0.15	0.34		0.34	
Node 4		2		5.4				0.02		0.02	0.04		0.04	0.10		0.10	
Node 5		5		13.5				0.04		0.04	0.11		0.11	0.24		0.24	11,000
Node 6		8		21.6				0.07		0.07	0.18		0.18	0.39		0.39	
Node 7		8		21.6				0.07		0.07	0.18		0.18	0.39		0.39	11,000
Node 8		8		21.6				0.07		0.07	0.18		0.18	0.39		0.39	11,000
Node 9		9		24.3				0.08		0.08	0.20		0.20	0.43		0.43	11,000
Node 10		9		24.3				0.08		0.08	0.20		0.20	0.43		0.43	
Node 11		8		21.6				0.07		0.07	0.18		0.18	0.39		0.39	11,000
Node 12		6		16.2				0.05		0.05	0.13		0.13	0.29		0.29	
Node 13		4		10.8				0.04		0.04	0.09		0.09	0.19		0.19	11,000
Node 14		5		13.5				0.04		0.04	0.11		0.11	0.24		0.24	
Node 15		11		29.7				0.10		0.10	0.24		0.24	0.53		0.53	11,000
Node 16		5		13.5				0.04		0.04	0.11		0.11	0.24		0.24	11,000
Node 17		5		13.5				0.04		0.04	0.11		0.11	0.24		0.24	
Node 18		6		16.2				0.05		0.05	0.13		0.13	0.29		0.29	11,000
Total		**116**		**313.2**				**1.02**		**1.02**	**2.54**		**2.54**	**5.58**		**5.58**	**11,000**

POPULATION DENSITY

Single Family	3.4 persons/unit
Semi Detached & Townhouse	2.7 persons/unit
2 Bedroom Unit	2.1 persons/unit
Medium Density	1.8 persons/unit

WATER DEMAND RATES

Residential	280 l/cap/day

PEAKING FACTORS

Maximum Daily Residential	2.5 x avg. day
Maximum Hourly Residential	2.2 x max. day

FIRE DEMANDS

Single Family	10,000 l/min (166.7 l/s)
Semi Detached & Townhouse	10,000 l/min (166.7 l/s)
Medium Density	15,000 l/min (250 l/s)

ICI Areas

INST	28,000 L/Ha/day
COM	28,000 L/Ha/day
IND	35,000 L/Ha/day
	17000 L/Ha/day

Fire Flow Requirement from Fire Underwriters Survey

1650 Shea Road - Block 1 (TAMARACK 10 unit Gallery)

Building Floor Area

width	18.06	m
depth	19.59	m
stories	3	
Area	965.1	m^2

$F = 220C\sqrt{A}$

C	1.5	
A	965	m^2
F	10,252	l/min
use	10,300	l/min

C =

1.5	wood frame
1.0	ordinary
0.8	non-combustile
0.6	fire-resistive

Occupancy Adjustment

Use	-15%	
Adjustment	-1545	l/min
Fire flow	8,755	l/min

-25%	non-combustile
-15%	limited combustile
0%	combustile
+15%	free burning
+25%	rapid burning

Sprinkler Adjustment

Use	0%	
Adjustment	0	l/min

Exposure Adjustment

Building Face	Separation (m)	Adjacent Exposed Wall			Exposure Charge *
		Length	Stories	L*H Factor	
north	0.00	0.00	0	0	0%
east	18.85	29.71	3	89	14%
south		2 - Hour Fire Rated Wall			10%
west	0.00	0.00	0	0	0%
Total					24%

Adjustment	2,101	l/min
Total adjustments	2,101	l/min
Fire flow	10,856	l/min
Use	11,000	**l/min**
	183.3	**l/s**

* Exposure charges from Techinical Bulletin ISTB 2018-02 Appendix H (ISO Method)

Fire Flow Requirement from Fire Underwriters Survey

1650 Shea Road - Block 2 (CARDEL 6 unit Gallery)

Building Floor Area

width	19.8	m
depth	12.9	m
stories	3	
Area	704.8	m^2

$F = 220C\sqrt{A}$

C	1.5	
A	705	m^2
F	8,761	l/min
use	8,800	l/min

C =

1.5	wood frame
1.0	ordinary
0.8	non-combustile
0.6	fire-resistive

Occupancy Adjustment

Use	-15%	
Adjustment	-1320	l/min
Fire flow	7,480	l/min

-25%	non-combustile
-15%	limited combustile
0%	combustile
+15%	free burning
+25%	rapid burning

Sprinkler Adjustment

Use	0%	
Adjustment	0	l/min

Exposure Adjustment

Building Face	Separation (m)	Adjacent Exposed Wall			Exposure Charge *
		Length	Stories	L*H Factor	
north	3.1	19.8	3	59	18%
east	19.5	18.5	3	56	13%
south	0.0	0.0	0	0	0%
west	18.9	12.5	3	38	13%
Total					44%

Adjustment	3,291	l/min
Total adjustments	3,291	l/min
Fire flow	10,771	l/min
Use	**11,000**	**l/min**
	183.3	**l/s**

* Exposure charges from Techinical Bulletin ISTB 2018-02 Appendix H (ISO Method)

Fire Flow Requirement from Fire Underwriters Survey

1650 Shea Road - Block 3 (CARDEL 8 unit Gallery)

Building Floor Area

width	17.1	m
depth	12.7	m
stories	3	
Area	612.2	m^2

$F = 220C\sqrt{A}$

C	1.5		C =	1.5 wood frame
A	612	m^2		1.0 ordinary
				0.8 non-combustile
F	8,165	l/min		0.6 fire-resistive
use	9,100	l/min		

Occupancy Adjustment

		-25%	non-combustile
		-15%	limited combustile
Use	-15%	0%	combustile
		+15%	free burning
Adjustment	-1365 l/min	+25%	rapid burning
Fire flow	7,735 l/min		

Sprinkler Adjustment

Use	0%
Adjustment	0 l/min

Exposure Adjustment

Building Face	Separation (m)	Adjacent Exposed Wall			Exposure Charge *
		Length	Stories	L*H Factor	
north		2 - Hour Fire Rated Wall			10%
east	20.3	12.7	3	38	8%
south	3.1	19.8	3	59	18%
west	20.1	12.7	3	38	8%
Total					44%

Adjustment	3,403	l/min
Total adjustments	3,403	l/min
Fire flow	11,138	l/min
Use	**11,000**	**l/min**
	183.3	**l/s**

* Exposure charges from Techinical Bulletin ISTB 2018-02 Appendix H (ISO Method)

Fire Flow Requirement from Fire Underwriters Survey

1650 Shea Road - Block 4, 5, 6 & 7 (TAMARACK 8 unit Gallery)

Building Floor Area

width	13.20	m
depth	18.05	m
stories	3	
Area	676.3	m^2

$F = 220C\sqrt{A}$

C	1.5	
A	676	m^2
F	8,582	l/min
use	8,600	l/min

C =

1.5	wood frame
1.0	ordinary
0.8	non-combustile
0.6	fire-resistive

Occupancy Adjustment

Use	-15%	
Adjustment	-1290	l/min
Fire flow	7,310	l/min

-25%	non-combustile
-15%	limited combustile
0%	combustile
+15%	free burning
+25%	rapid burning

Sprinkler Adjustment

Use	0%	
Adjustment	0	l/min

Exposure Adjustment

Building Face	Separation (m)	Adjacent Exposed Wall			Exposure Charge *
		Length	Stories	L*H Factor	
north		2 - Hour Fire Rated Wall			10%
east	19.43	13.20	3	40	13%
south	3.57	18.05	3	54	18%
west	19.52	13.20	3	40	13%
Total					54%

Adjustment	3,947	l/min
Total adjustments	3,947	l/min
Fire flow	11,257	l/min
Use	11,000	**l/min**
	183.3	**l/s**

* Exposure charges from Techinical Bulletin ISTB 2018-02 Appendix H (ISO Method)

Fire Flow Requirement from Fire Underwriters Survey

1650 Shea Road - Block 8 & 9 (TAMARACK 10 unit Gallery)

Building Floor Area

width	18.05	m
depth	13.04	m
stories	3	
Area	648.4	m^2

$F = 220C\sqrt{A}$

C	1.5	
A	648	m^2
F	8,403	l/min
use	8,400	l/min

C =

1.5	wood frame
1.0	ordinary
0.8	non-combustile
0.6	fire-resistive

Occupancy Adjustment

Use	-15%	
Adjustment	-1260	l/min
Fire flow	7,140	l/min

-25%	non-combustile
-15%	limited combustile
0%	combustile
+15%	free burning
+25%	rapid burning

Sprinkler Adjustment

Use	0%	
Adjustment	0	l/min

Exposure Adjustment

Building Face	Separation (m)	Adjacent Exposed Wall			Exposure Charge *
		Length	Stories	L*H Factor	
north		2 - Hour Fire Rated Wall			10%
east	19.17	19.59	3	59	13%
south	3.00	18.05	3	54	23%
west	19.41	19.59	3	59	13%
Total					59%

Adjustment	4,213	l/min
Total adjustments	4,213	l/min
Fire flow	11,353	l/min
Use	11,000	**l/min**
	183.3	**l/s**

* Exposure charges from Techinical Bulletin ISTB 2018-02 Appendix H (ISO Method)

Fire Flow Requirement from Fire Underwriters Survey

1650 Shea Road - Block 10 & 11 (CARDEL 10 unit Gallery)

Building Floor Area

width	13.1	m
depth	18.1	m
stories	3	
Area	650.5	m^2

$F = 220C\sqrt{A}$

C	1.5	
A	651	m^2
F	8,417	l/min
use	8,400	l/min

C =

1.5	wood frame
1.0	ordinary
0.8	non-combustile
0.6	fire-resistive

Occupancy Adjustment

Use	-15%	
Adjustment	-1260	l/min
Fire flow	7,140	l/min

-25%	non-combustile
-15%	limited combustile
0%	combustile
+15%	free burning
+25%	rapid burning

Sprinkler Adjustment

Use	0%	
Adjustment	0	l/min

Exposure Adjustment

Building Face	Separation (m)	Adjacent Exposed Wall			Exposure Charge *
		Length	Stories	L*H Factor	
north	3.0	19.8	3	59	23%
east	18.9	1.8	3	5	12%
south		2 - Hour Fire Rated Wall			10%
west	19.2	18.5	3	55	13%
Total					58%

Adjustment	4,141	l/min
Total adjustments	4,141	l/min
Fire flow	11,281	l/min
Use	11,000	**l/min**
	183.3	**l/s**

* Exposure charges from Techinical Bulletin ISTB 2018-02 Appendix H (ISO Method)

Fire Flow Requirement from Fire Underwriters Survey

1650 Shea Road - Block 12 (CARDEL 10 unit Gallery)

Building Floor Area

width	18.4	m
depth	19.8	m
stories	3	
Area	1,038.1	m^2

$F = 220C\sqrt{A}$

C	1.5	
A	1,038	m^2
F	10,633	l/min
use	10,600	l/min

C =

1.5	wood frame
1.0	ordinary
0.8	non-combustile
0.6	fire-resistive

Occupancy Adjustment

Use	-15%	
Adjustment	-1590	l/min
Fire flow	9,010	l/min

-25%	non-combustile
-15%	limited combustile
0%	combustile
+15%	free burning
+25%	rapid burning

Sprinkler Adjustment

Use	0%	
Adjustment	0	l/min

Exposure Adjustment

Building Face	Separation (m)	Adjacent Exposed Wall			Exposure Charge *
		Length	Stories	L*H Factor	
north	16.7	19.8	3	59	13%
east	0.0	0.0	0	0	0%
south	0.0	0.0	0	0	0%
west	2 - Hour Fire Rated Wall				10%
Total					23%

Adjustment	2,072	l/min
Total adjustments	2,072	l/min
Fire flow	11,082	l/min
Use	11,000	**l/min**
	183.3	**l/s**

* Exposure charges from Techinical Bulletin ISTB 2018-02 Appendix H (ISO Method)

Fire Flow Requirement from Fire Underwriters Survey

1650 Shea Road - Block 13 (CARDEL 10 unit Gallery)

Building Floor Area

width	18.5	m
depth	19.8	m
stories	3	
Area	1,038.7	m^2

$F = 220C\sqrt{A}$

C	1.5	
A	1,039	m^2
F	10,636	l/min
use	10,600	l/min

C =

1.5	wood frame
1.0	ordinary
0.8	non-combustile
0.6	fire-resistive

Occupancy Adjustment

Use	-15%	
Adjustment	-1590	l/min
Fire flow	9,010	l/min

-25%	non-combustile
-15%	limited combustile
0%	combustile
+15%	free burning
+25%	rapid burning

Sprinkler Adjustment

Use	0%	
Adjustment	0	l/min

Exposure Adjustment

Building Face	Separation (m)	Adjacent Exposed Wall			Exposure Charge *
		Length	Stories	L*H Factor	
north	0.0	0.0	0	0	0%
east	0.0	0.0	0	0	0%
south	2 - Hour Fire Rated Wall				10%
west	18.9	18.5	3	55	13%
Total					23%

Adjustment	2,072	l/min
Total adjustments	2,072	l/min
Fire flow	11,082	l/min
Use	11,000	**l/min**
	183.3	**l/s**

* Exposure charges from Techinical Bulletin ISTB 2018-02 Appendix H (ISO Method)

Nodes and Pipes Layout

Legend

Junction

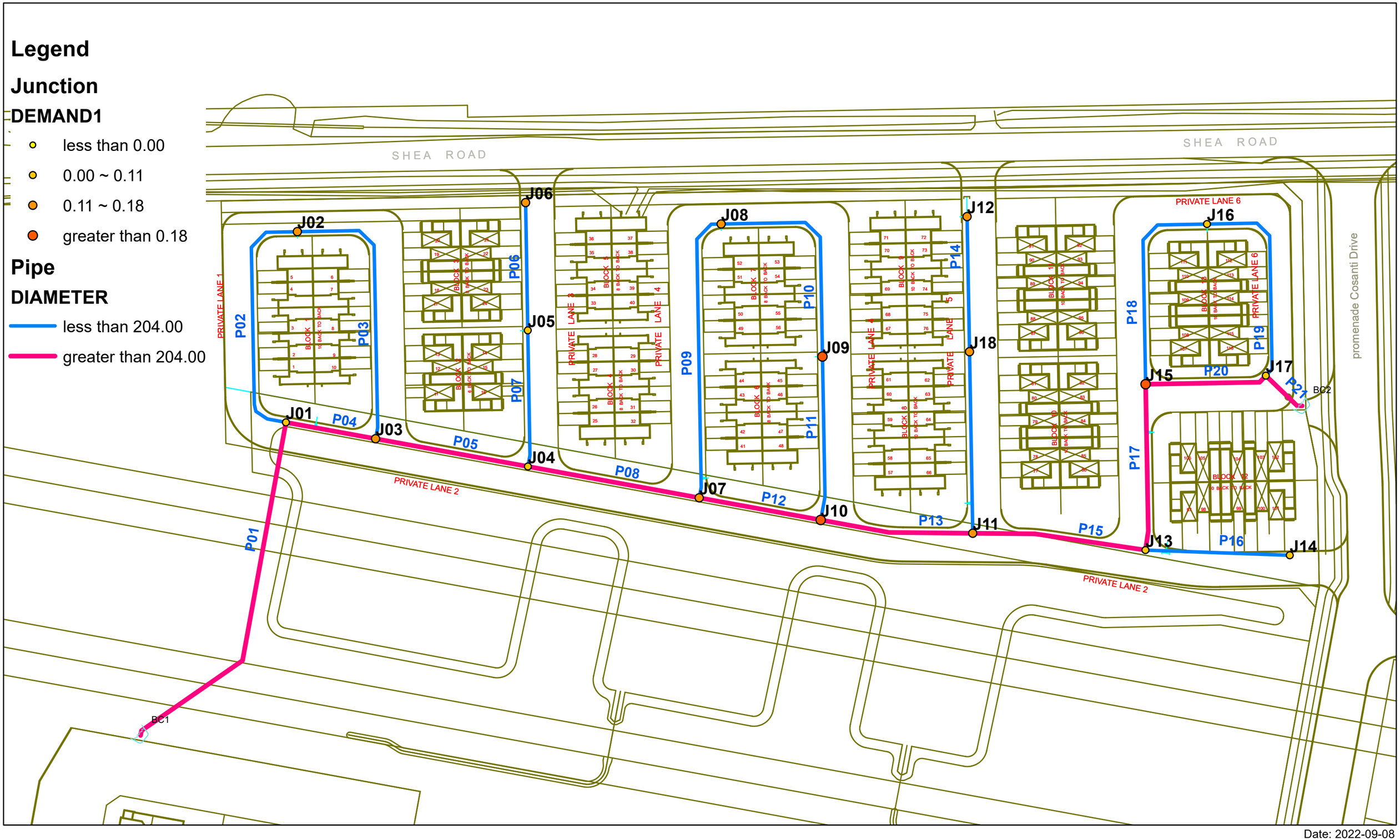
DEMAND1

- less than 0.00
- 0.00 ~ 0.11
- 0.11 ~ 0.18
- greater than 0.18

Pipe

DIAMETER

- less than 204.00
- greater than 204.00



Date: 2022-09-08

Basic Day Pressures (kPa)

Legend

AVERAGEDAY

Junction

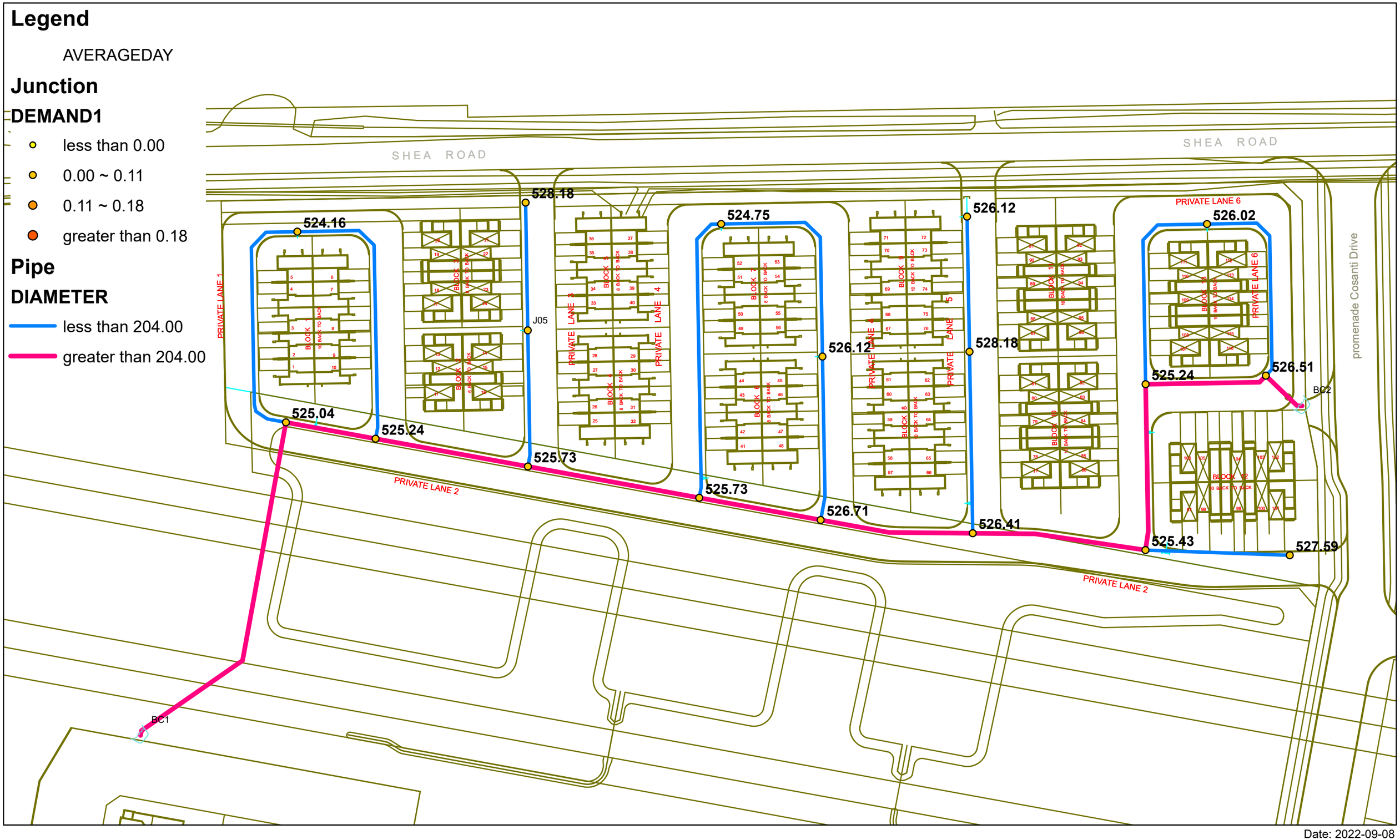
DEMAND1

- less than 0.00
- 0.00 ~ 0.11
- 0.11 ~ 0.18
- greater than 0.18

Pipe

DIAMETER

- less than 204.00
- greater than 204.00



Date: 2022-09-08

Basic Day Pressures (kPa)

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	☐	J01	0.03	107.12	160.70	525.04
2	☐	J02	0.06	107.21	160.70	524.16
3	☐	J03	0.06	107.10	160.70	525.24
4	☐	J04	0.02	107.05	160.70	525.73
5	☐	J05	0.04	107.11	160.70	525.14
6	☐	J06	0.07	106.80	160.70	528.18
7	☐	J07	0.07	107.05	160.70	525.73
8	☐	J08	0.07	107.15	160.70	524.75
9	☐	J09	0.08	107.01	160.70	526.12
10	☐	J10	0.08	106.95	160.70	526.71
11	☐	J11	0.07	106.98	160.70	526.41
12	☐	J12	0.05	107.01	160.70	526.12
13	☐	J13	0.04	107.08	160.70	525.43
14	☐	J14	0.04	106.86	160.70	527.59
15	☐	J15	0.10	107.10	160.70	525.24
16	☐	J16	0.04	107.02	160.70	526.02
17	☐	J17	0.04	106.97	160.70	526.51
18	☐	J18	0.05	106.80	160.70	528.18

Peak Hour Pressures (kPa)

Legend

PEAKHOUR

Junction

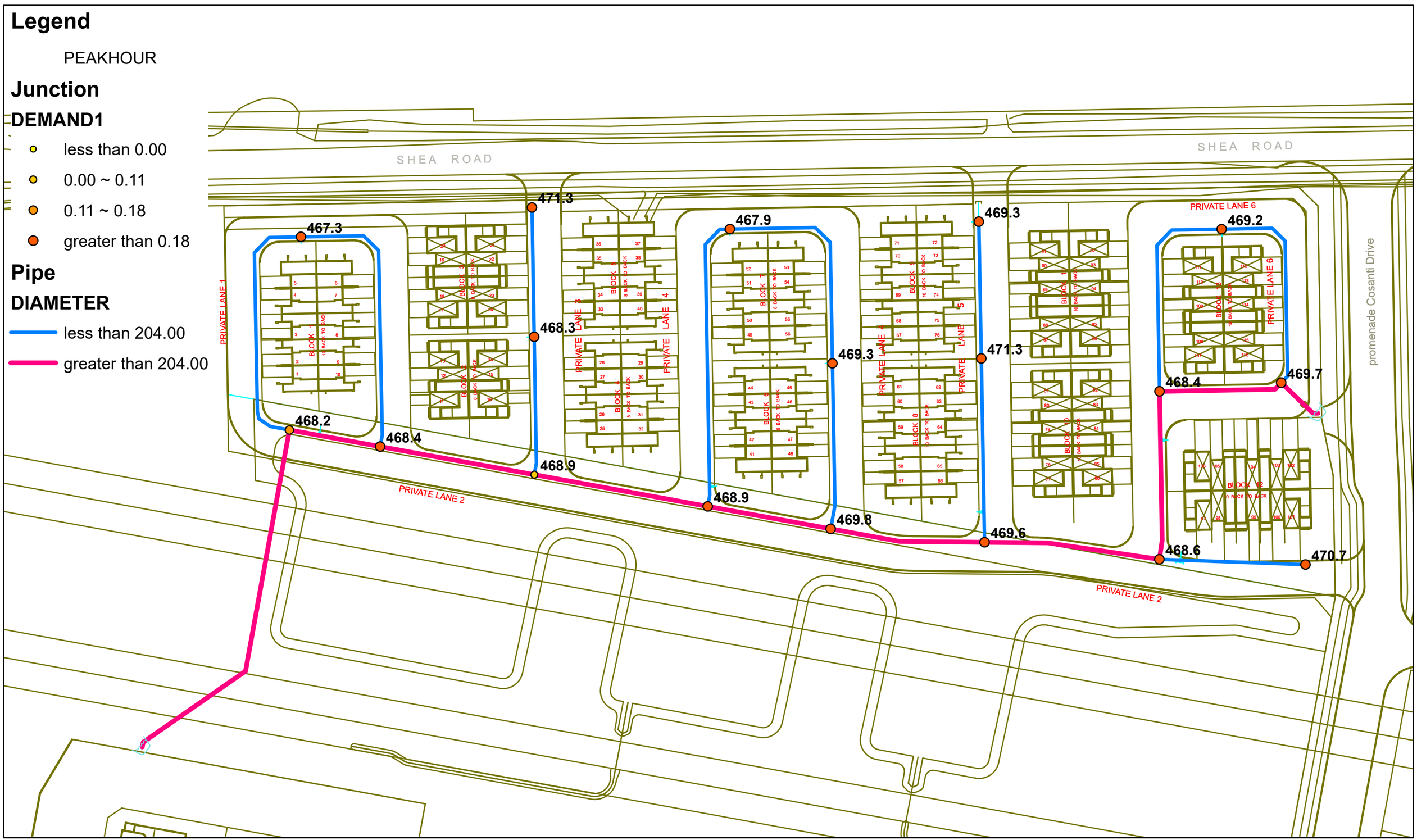
DEMAND1

- less than 0.00
- 0.00 ~ 0.11
- 0.11 ~ 0.18
- greater than 0.18

Pipe

DIAMETER

- less than 204.00
- greater than 204.00



Date: 2022-09-08

Peak Hour Pressures (kPa)

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	☐	J01	0.14	107.12	154.90	468.19
2	☐	J02	0.34	107.21	154.90	467.30
3	☐	J03	0.34	107.10	154.90	468.38
4	☐	J04	0.10	107.05	154.90	468.87
5	☐	J05	0.24	107.11	154.90	468.28
6	☐	J06	0.39	106.80	154.90	471.32
7	☐	J07	0.39	107.05	154.90	468.87
8	☐	J08	0.39	107.15	154.90	467.89
9	☐	J09	0.43	107.01	154.90	469.26
10	☐	J10	0.43	106.95	154.90	469.85
11	☐	J11	0.39	106.98	154.90	469.55
12	☐	J12	0.29	107.01	154.90	469.26
13	☐	J13	0.19	107.08	154.90	468.58
14	☐	J14	0.24	106.86	154.90	470.74
15	☐	J15	0.53	107.10	154.90	468.39
16	☐	J16	0.24	107.02	154.90	469.18
17	☐	J17	0.24	106.97	154.90	469.67
18	☐	J18	0.29	106.80	154.90	471.32

Max Day + 183 L/s Fire Flow

Legend

MAXDAYFIREFLOW

Junction

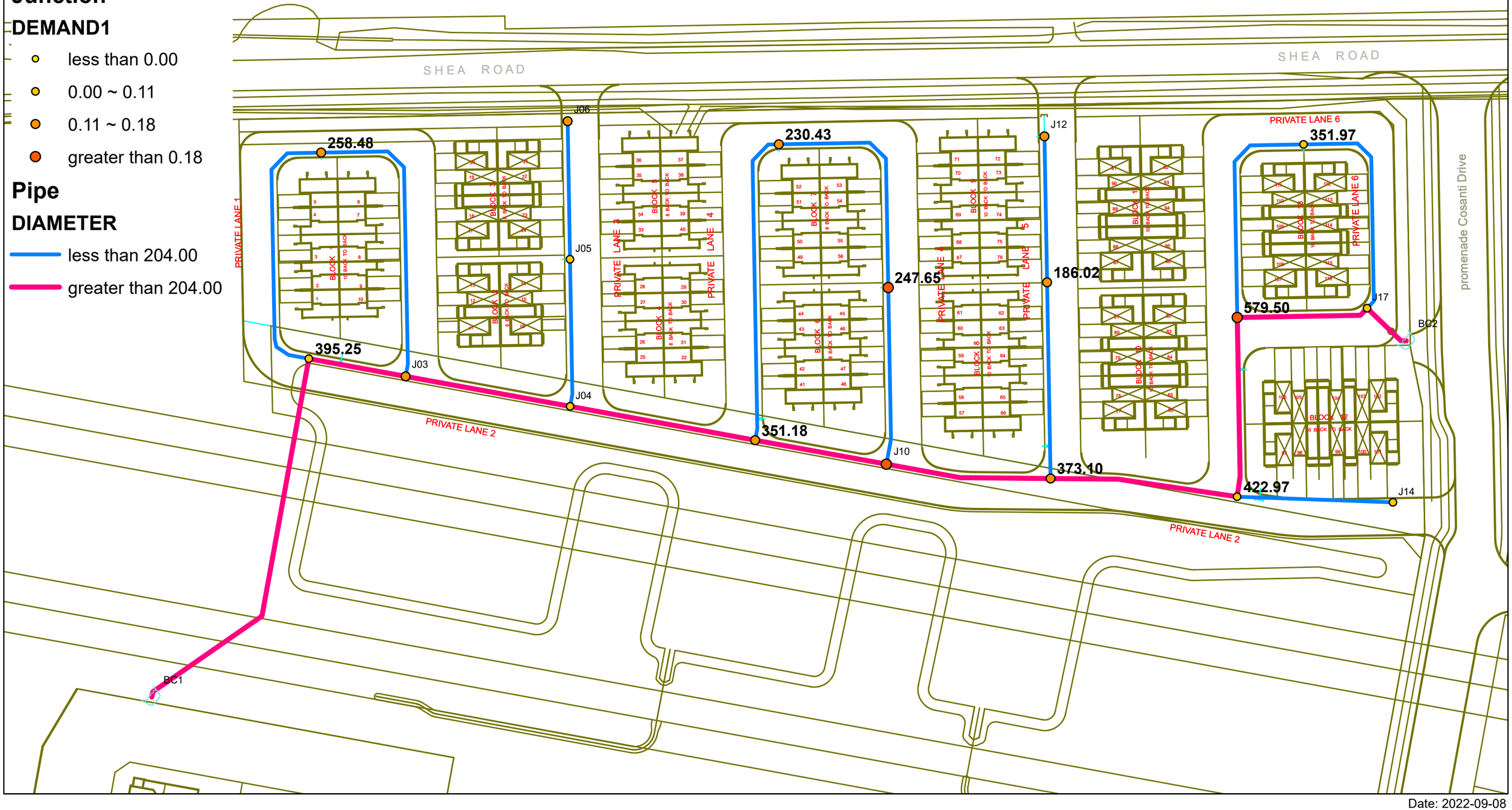
DEMAND1

- less than 0.00
- 0.00 ~ 0.11
- 0.11 ~ 0.18
- greater than 0.18

Pipe

DIAMETER

- less than 204.00
- greater than 204.00



Date: 2022-09-08

Max Day + 183 L/min Fire Flow

		ID	Static Demand (L/s)	Static Pressure (kPa)	Static Head (m)	Fire-Flow Demand (L/s)	Residual Pressure (kPa)	Hydrant Available Flow (L/s)	Hydrant Pressure at Available Flow (kPa)
1	☐	J01	0.07	251.3	132.8	183.3	223.9	395.2	140.0
2	☐	J02	0.15	250.3	132.8	183.3	191.5	258.5	140.0
3	☐	J05	0.11	250.6	132.7	183.3	157.9	202.0	140.0
4	☐	J07	0.18	250.6	132.6	183.3	217.2	351.2	140.0
5	☐	J08	0.18	249.5	132.6	183.3	177.6	230.4	140.0
6	☐	J09	0.20	250.8	132.6	183.3	187.1	247.6	140.0
7	☐	J11	0.18	250.5	132.5	183.3	220.9	373.1	140.0
8	☐	J13	0.09	249.0	132.5	183.3	226.1	423.0	140.0
9	☐	J15	0.24	248.3	132.4	183.3	235.8	579.5	140.0
10	☐	J16	0.11	249.0	132.4	183.3	216.6	352.0	140.0
11	☐	J18	0.13	252.3	132.5	183.3	142.8	186.0	140.0

APPENDIX C

Sanitary Sewer Design Sheet
139185-400 - Sanitary Drainage Plan
Davidson Lands Phase 2 Sanitary Design Sheet
Davidson Lands Phase 2 Sanitary Drainage Area Plan

IBI GROUP
400-333 Preston Street
Ottawa, Ontario K1S 5N4 Canada
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SANITARY SEWER DESIGN SHEET

139185 - 1650 Shea Road
CITY OF OTTAWA
Davidson Shea Properties Inc.

LOCATION				RESIDENTIAL										ICI AREAS								INFILTRATION ALLOWANCE			FIXED FLOW (L/s)		TOTAL FLOW	PROPOSED SEWER DESIGN						
				AREA	UNIT TYPES				AREA	POPULATION		RES	PEAK	AREA (Ha)						ICI	PEAK	AREA (Ha)		FLOW				CAPACITY	LENGTH	DIA	SLOPE	VELOCITY	AVAILABLE CAPACITY	
STREET	AREA ID	FROM MH	TO MH	w/ Units (Ha)	SF	TH/SD	1 Bed APT	2 Bed TH	w/o Units (Ha)	IND	CUM	PEAK FACTOR	FLOW (L/s)	INSTITUTIONAL IND	INSTITUTIONAL CUM	COMMERCIAL IND	COMMERCIAL CUM	INDUSTRIAL IND	INDUSTRIAL CUM	PEAK FACTOR	FLOW (L/s)	IND	CUM	(L/s)	IND	CUM	(L/s)	(L/s)	(m)	(mm)	(%)	(full) (m/s)	L/s	(%)
Private Lane 1	S2A	MH1A	MH2A	0.12				5		10.5	10.5	3.73	0.13		0.00		0.00		0.00	1.00	0.00	0.12	0.12	0.04		0.00	0.17	27.59	37.35	200	0.65	0.851	27.42	99.40%
Private Lane 2		MH2A	MH3A						0.00	0.0	10.5	3.73	0.13		0.00		0.00		0.00	1.00	0.00	0.00	0.12	0.04		0.00	0.17	27.59	6.66	200	0.65	0.851	27.42	99.40%
Private Lane 2	S3A	MH3A	MH4A						0.03	1.8	12.3	3.72	0.15		0.00		0.00		0.00	1.00	0.00	0.03	0.15	0.05		0.00	0.20	27.59	34.45	200	0.65	0.851	27.39	99.28%
Private Lane 1	S20A	MH20A	MH4A	0.23				12		25.2	25.2	3.69	0.30		0.00		0.00		0.00	1.00	0.00	0.23	0.23	0.08		0.00	0.38	27.59	58.80	200	0.65	0.851	27.21	98.63%
Private Lane 2	S4A	MH4A	MH5A						0.03	1.8	39.3	3.67	0.47		0.00		0.00		0.00	1.00	0.00	0.03	0.41	0.14		0.00	0.60	20.24	39.34	200	0.35	0.624	19.64	97.02%
Private Lane 3	S21A	MH21A	MH5A	0.26				15		31.5	31.5	3.68	0.38		0.00		0.00		0.00	1.00	0.00	0.26	0.26	0.09		0.00	0.46	27.59	70.71	200	0.65	0.851	27.12	98.33%
Private Lane 2	S5A	MH5A	MH6A						0.03	1.8	72.6	3.62	0.85		0.00		0.00		0.00	1.00	0.00	0.03	0.70	0.23		0.00	1.08	20.24	38.33	200	0.35	0.624	19.16	94.65%
Private Lane 4	S30A	MH30A	MH6A	0.28				16		33.6	33.6	3.68	0.40		0.00		0.00		0.00	1.00	0.00	0.28	0.28	0.09		0.00	0.49	27.59	73.45	200	0.65	0.851	27.09	98.21%
Private Lane 2	S7A	MH6A	MH7A						0.03	1.8	108.0	3.59	1.26		0.00		0.00		0.00	1.00	0.00	0.03	1.01	0.33		0.00	1.59	20.24	38.23	200	0.35	0.624	18.65	92.15%
Private Lane 4	S31A	MH31A	MH7A	0.31				18		37.8	37.8	3.67	0.45		0.00		0.00		0.00	1.00	0.00	0.31	0.31	0.10		0.00	0.55	27.59	81.60	200	0.65	0.851	27.03	98.00%
Private Lane 2		MH7A	MH8A						0.00	0.0	145.8	3.56	1.68		0.00		0.00		0.00	1.00	0.00	0.00	1.32	0.44		0.00	2.12	20.24	16.86	200	0.35	0.624	18.13	89.55%
Private Lane 2	S9A	MH8A	MH9A						0.03	1.8	147.6	3.55	1.70		0.00		0.00		0.00	1.00	0.00	0.03	1.35	0.45		0.00	2.15	20.24	20.85	200	0.35	0.624	18.10	89.40%
Private Lane 5	S40A	MH40A	MH9A	0.33				20		42.0	42.0	3.66	0.50		0.00		0.00		0.00	1.00	0.00	0.33	0.33	0.11		0.00	0.61	27.59	85.19	200	0.65	0.851	26.98	97.80%
Private Lane 2	S10A	MH9A	MH10A						0.03	1.8	191.4	3.52	2.19		0.00		0.00		0.00	1.00	0.00	0.03	1.71	0.56		0.00	2.75	20.24	38.99	200	0.35	0.624	17.49	86.41%
Private Lane 6	S52A	MH52A	MH53A	0.11				5		10.5	10.5	3.73	0.13		0.00		0.00		0.00	1.00	0.00	0.11	0.11	0.04		0.00	0.16	27.59	36.29	200	0.65	0.851	27.42	99.41%
Private Lane 6	S53A	MH53A	MH54A	0.03				1		2.1	12.6	3.72	0.15		0.00		0.00		0.00	1.00	0.00	0.03	0.14	0.05		0.00	0.20	27.59	7.07	200	0.65	0.851	27.39	99.28%
Private Lane 6	S54A	MH54A	MH51A	0.08				4		8.4	21.0	3.70	0.25		0.00		0.00		0.00	1.00	0.00	0.08	0.22	0.07		0.00	0.32	27.59	32.99	200	0.65	0.851	27.26	98.82%
Private Lane 6	S50A	MH50A	MH51A	0.20				12		25.2	25.2	3.69	0.30		0.00		0.00		0.00	1.00	0.00	0.20	0.20	0.07		0.00	0.37	27.59	46.01	200	0.65	0.851	27.22	98.67%
Private Lane 6	S51A	MH51A	MH10A	0.09				3		6.3	52.5	3.65	0.62		0.00		0.00		0.00	1.00	0.00	0.09	0.51	0.17		0.00	0.79	20.24	41.87	200	0.35	0.624	19.45	96.10%
Private Lane 2	S11A	MH10A	MH11A	0.03				1		2.1	246.0	3.49	2.78		0.00		0.00		0.00	1.00	0.00	0.03	2.25	0.74		0.00	3.53	20.24	16.29	200	0.35	0.624	16.72	82.58%
Private Lane 2	S12A	MH11A	MH12A	0.08				4		8.4	254.4	3.49	2.87		0.00		0.00		0.00	1.00	0.00	0.08	2.33	0.77		0.00	3.64	20.24	39.80	200	0.35	0.624	16.60	82.00%

Design Parameters:

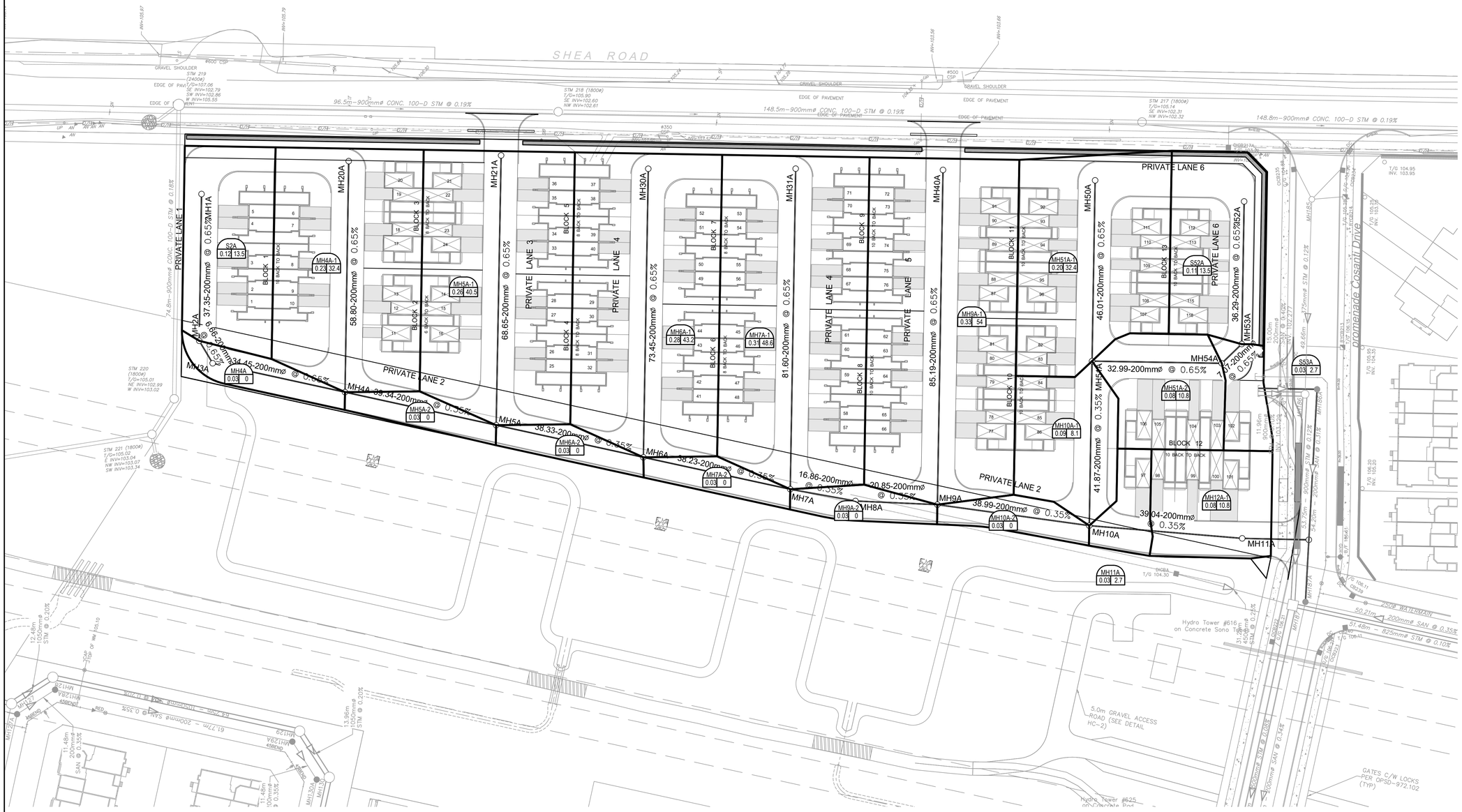
Residential			ICI Areas		
SF	3.4	p/p/u	INST	28,000	L/Ha/day
TH/SD	2.7	p/p/u	COM	28,000	L/Ha/day
1 Bed	1.4	p/p/u	IND	35,000	L/Ha/day
2 Bed	2.1	p/p/u			MOE Chart
Other	60	p/p/Ha		17000	L/Ha/day

Notes:
1. Mannings coefficient (n) = 0.013
2. Demand (per capita): 280 L/day 200 L/day
3. Infiltration allowance: 0.33 L/s/Ha
4. Residential Peaking Factor:
Harmon Formula = 1+(14/(4+(P/1000)^0.5))0.8
where K = 0.8 Correction Factor
5. Commercial and Institutional Peak Factors based on total area, 1.5 if greater than 20%, otherwise 1.0

Designed: AB
Checked: AC, RM
Dwg. Reference: 139185-400

No.	Revision	Date
1.	Submission No. 1 for City Review	2022-09-09

File Reference: 139185-6.04.04
Date: 2022-08-31
Sheet No: 1 of 1



CLIENT

DAVIDSON SHEA PROPERTY INC.

ISSUES

No.	DESCRIPTION	DATE
1	SUBMISSION NO.1 FOR CITY REVIEW	2022-07-_
2		
3		
4		
5		
6		
7		
8		

SEE 010, 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS

KEY PLAN

1:500 0 5 15 25m

CONSULTANTS

SEAL

LICENSED PROFESSIONAL ENGINEER
L.D. (S. Yannoulopoulos
2022/07/__
PROVINCE OF ONTARIO

IBI GROUP
400 – 333 Preston Street
Ottawa ON K1S 5N4 Canada
tel 613 225 1311 fax 613 225 9868
ibigroup.com

PROJECT

1650 SHEA ROAD

(OTTAWA, ON)

PROJECT NO: 139185

DRAWN BY:	CHECKED BY:
M.M.	**A.C./A.B**
PROJECT MGR: **R.M.**	APPROVED BY: **D.G.Y.**

SHEET TITLE

SANITARY DRAINAGE AREA PLAN

SHEET NUMBER	ISSUE
400	1

SCALE CHECK | ISSUE

CITY FILE No. D07-__-__-____

CITY PLAN No. xxxxx

File Location: J:\139185_1650_Shea_Rd\7.0_Production\7.03_Design\04_Civil\Sheets\400-SANITARY DRAINAGE AREA PLAN.dwg Last Saved: September 14, 2022, by stefan.geisser Plotted: Wednesday, September 14, 2022 2:50:35 PM by Stefan Geisser

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Ottawa, Ontario K1S 5N4 Canada
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ibigroup.com

SANITARY SEWER DESIGN SHEET

Davidson Lands
City of Ottawa
Name of Clien/Developer

LOCATION				RESIDENTIAL										ICI AREAS							INFILTRATION ALLOWANCE			FIXED FLOW	TOTAL FLOW	PROPOSED SEWER DESIGN						
				AREA	UNIT TYPES				AREA	POPULATION		PEAK	PEAK	AREA (Ha)						PEAK	AREA (Ha)		FLOW			CAPACITY	LENGTH	DIA	SLOPE	VELOCITY	AVAILABLE CAPACITY	
														INSTITUTIONAL		COMMERCIAL		INDUSTRIAL													
STREET	AREA ID	FROM MH	TO MH	w/ Units (Ha)	SF	SD	TH	APT	w/o Units (Ha)	IND	CUM	FACTOR	FLOW (L/s)	IND	CUM	IND	CUM	IND	CUM	FLOW (L/s)	IND	CUM	(L/s)	(L/s)	(L/s)	(L/s)	(m)	(mm)	(%)	(full) (m/s)	L/s	(%)
PHASE 2																																
Kayenta Street	142A	MH142A	MH143A	0.40	4	4				24.4	24.4	4.00	0.40								0.4	0.40	0.11		0.51	48.39	83.80	200	2.00	1.492	47.88	98.95%
Maygrass Way	146A	MH146A	MH143A	0.29	1	4				14.2	14.2	4.00	0.23								0.29	0.29	0.08		0.31	64.01	39.65	200	3.50	1.974	63.70	99.51%
Maygrass Way	143A	MH143A	MH144A	0.41		6	4			27.0	65.6	4.00	1.06								0.41	1.10	0.31		1.37	60.24	60.76	200	3.10	1.858	58.87	97.72%
Kayenta Street	139A	MH139A	MH140A	0.20		4				10.8	10.8	4.00	0.18								0.2	0.20	0.06		0.23	59.26	40.89	200	3.00	1.827	59.03	99.61%
	140A	MH140A	MH141A	0.07	1					3.4	14.2	4.00	0.23								0.07	0.27	0.08		0.31	51.89	9.57	200	2.30	1.600	51.59	99.41%
	141A	MH141A	MH144A	0.38		6	3			24.3	38.5	4.00	0.62								0.38	0.65	0.18		0.81	51.89	78.46	200	2.30	1.600	51.09	98.45%
Kayenta Street	144A	MH144A	MH145A	0.05			1			2.7	106.8	4.00	1.73								0.05	1.80	0.50		2.23	47.16	13.99	200	1.90	1.454	44.93	95.26%
PHASE 1																																
Kayenta Street	145A	MH145A	MH155A	0.24	1		4			14.2	121.0	4.00	1.96								0.24	2.04	0.57		2.53	47.16	54.00	200	1.90	1.454	44.63	94.63%
Kayenta Street	159A	MH159A	MH153A	0.35	1	2	5			22.3	22.3	4.00	0.36								0.35	0.35	0.10		0.46	51.89	35.93	200	2.30	1.600	51.43	99.11%
	153A	MH153A	MH154A	0.52	2	8	3			36.5	58.8	4.00	0.95								0.52	0.87	0.24		1.20	51.89	69.86	200	2.30	1.600	50.70	97.69%
	154A	MH154A	MH155A	0.25	2					6.8	65.6	4.00	1.06								0.25	1.12	0.31		1.38	54.10	13.93	200	2.50	1.668	52.72	97.46%
Block 159	155A	MH155A	MH156A	0.03						0.0	186.6	4.00	3.02								0.03	3.19	0.89		3.92	45.26	40.50	200	1.75	1.396	41.35	91.35%
	156A	MH156A	MH103A	0.03						0.0	186.6	4.00	3.02								0.03	3.22	0.90		3.93	45.26	41.32	200	1.75	1.396	41.34	91.33%
Edenwylde Drive	100A	MH100A	MH101A	0.63	3		16			53.4	53.4	4.00	0.87								0.63	0.63	0.18		1.04	43.28	68.32	200	1.60	1.335	42.24	97.59%
	101A	MH101A	MH102A	0.23	1		3			11.5	64.9	4.00	1.05								0.23	0.86	0.24		1.29	28.63	29.78	200	0.70	0.883	27.34	95.49%
	102A	MH102A	MH103A	0.34	2		8			28.4	93.3	4.00	1.51								0.34	1.20	0.34		1.85	48.39	43.19	200	2.00	1.492	46.54	96.18%
Edenwylde Drive	103A	MH103A	MH104A	0.23			7			18.9	298.8	4.00	4.84								0.23	4.65	1.30		6.14	45.26	30.98	200	1.75	1.396	39.12	86.43%
Jardiniere Street	122A	MH122A	MH120A	0.21			5			13.5	13.5	4.00	0.22								0.21	0.21	0.06		0.28	28.63	40.37	200	0.70	0.883	28.35	99.03%
	120A	MH120A	MH121A	0.05			1			2.7	16.2	4.00	0.26								0.05	0.26	0.07		0.34	28.63	9.56	200	0.70	0.883	28.29	98.83%
	121A	MH121A	MH126A	0.41			12			32.4	48.6	4.00	0.79								0.41	0.67	0.19		0.98	35.89	86.22	200	1.10	1.107	34.91	97.28%
Jardiniere Street	123A	MH123A	MH124A	0.36			11			29.7	29.7	4.00	0.48								0.36	0.36	0.10		0.58	32.46	67.99	200	0.90	1.001	31.88	98.21%
	124A	MH124A	MH125A	0.17			3			8.1	37.8	4.00	0.61								0.17	0.53	0.15		0.76	21.64	12.58	200	0.40	0.667	20.88	96.48%
	125A	MH125A	MH126A	0.31			10			27.0	64.8	4.00	1.05								0.31	0.84	0.24		1.29	21.64	43.85	200	0.40	0.667	20.36	94.06%
Jardiniere Street	126A	MH126A	MH127A	0.47			14			37.8	151.2	4.00	2.45								0.47	1.98	0.55		3.00	26.50	97.91	200	0.60	0.817	23.50	88.66%
External Commercial	135A	MH135A	MH127A							0.0	0.0	4.00	0.00			2.73	2.73			2.37	2.73	2.73	0.76		3.13	26.50	12.08	200	0.60	0.817	23.37	88.17%
Jardiniere Street	127A	MH127A	MH128A	0.02						0.0	151.2	4.00	2.45				2.73			2.37	0.02	4.73	1.32		6.14	20.24	11.48	200	0.35	0.624	14.10	69.65%
	128A	MH128A	MH129A	0.09						0.0	151.2	4.00	2.45				2.73			2.37	0.09	4.82	1.35		6.17	20.24	61.77	200	0.35	0.624	14.07	69.52%
	129A	MH129A	MH130A	0.03						0.0	151.2	4.00	2.45				2.73			2.37	0.03	4.85	1.36		6.18	20.24	11.48	200	0.35	0.624	14.07	69.48%
	130A	MH130A	MH131A	0.70			26			70.2	221.4	4.00	3.59				2.73			2.37	0.7	5.55	1.55		7.51	20.24	91.95	200	0.35	0.624	12.73	62.89%
	131A	MH131A	MH132A	0.48			15			40.5	261.9	4.00	4.24				2.73			2.37	0.48	6.03	1.69		8.30	20.24	71.17	200	0.35	0.624	11.94	58.99%
	132A	MH132A	MH104A	0.04						0.0	261.9	4.00	4.24				2.73			2.37	0.04	6.07	1.70		8.31	20.24	28.10	200	0.35	0.624	11.93	58.93%
Edenwylde Drive	104A	MH104A	MH105A	0.44			11			29.7	590.4	3.94	9.41				2.73			2.37	0.44	11.16	3.12		14.91	55.26	67.20	300	0.30	0.757	40.35	73.02%
	105A	MH105A	MH106A							0.0	590.4	3.94	9.41				2.73			2.37	0	11.16	3.12		14.91	55.26	11.41	300	0.30	0.757	40.35	73.02%
PHASE 2																																
Maygrass Way	147A	MH147A	CAP	0.43	7					23.8	23.8	4.00	0.39								0.43	0.43	0.12		0.51	56.95	60.75	200	2.77	1.756	56.45	99.11%
PHASE 1																																
Maygrass Way		CAP	MH148A							0.0	23.8	4.00	0.39								0	0.43	0.12		0.51	56.95	12.00	200	2.77	1.756	56.44	99.11%
	148B	MH148A	MH149A	0.40	6					20.4	44.2	4.00	0.72								0.4	0.83	0.23		0.95	50.75	69.93	200	2.20	1.565	49.80	98.13%
	149A	MH149A	MH150A	0.18	2					6.8	51.0	4.00	0.83								0.18	1.01	0.28		1.11	50.75	11.43	200	2.20	1.565	49.64	97.81%
	150A	MH150A	MH151A	0.51	1	1	12			38.5	89.5	4.00	1.45								0.51	1.52	0.43		1.88	41.91	68.53	200	1.50	1.292	40.03	95.52%
	151A	MH151A	MH152A	0.55		9	7			43.2	132.7	4.00	2.15								0.55	2.07	0.58		2.73	41.91	65.09	200	1.50	1.292	39.18	93.49%
	152A	MH152A	MH157A	0.63	1	10	5			43.9	176.6	4.00	2.86								0.63	2.70	0.76		3.62	37.48	87.29	200	1.20	1.156	33.86	90.35%
	---	MH157A	MH106A							0.0	176.6	4.00	2.86								0	2.70	0.76		3.62	100.85	8.35	300	1.00	1.382	97.24	96.41%
PHASE 2																																
Taliesin Crescent	200A	MH200A	MH201A	0.56			18			48.6	48.6	4.00	0.79								0.56	0.56	0.16		0.94	27.59	59.89	200	0.65	0.851	26.64	96.58%
	201A	MH201A	MH202A	0.46			16			43.2	91.8	4.00	1.49								0.46	1.02	0.29		1.77	21.64	63.75	200	0.40	0.667	19.87	91.81%
		MH202A	CAP106AE							0.0	91.8	4.00	1.49								0	1.02	0.29		1.77	21.64	9.65	200	0.40	0.667	19.87	91.81%
	202A	CAP106AE	MH106A	0.08			1			2.7	94.5	4.00	1.53								0.08	1.10	0.31		1.84	21.64	16.50	200	0.40	0.667	19.80	91.50%
PHASE 1																																
Edenwylde Drive	106A	MH106A	MH107A	0.28			6			16.2	877.7	3.84	13.64				2.73			2.37	0.28	15.24	4.27		20.28	50.44	79.17	300	0.25	0.691	30.17	59.80%
PHASE 2																																
Taliesin Crescent	203A	MH203A	MH204A	0.57			18			48.6	48.6	4.00	0.79								0.57	0.57	0.16		0.95	27.59	61.41	200	0.65	0.851	26.64	96.57%
	204A	MH204A	MH205A	0.37			14			37.8	86.4	4.00	1.40								0.37	0.94	0.26		1.66	21.64	50.66	200	0.40	0.667	19.98	92.31%
		MH205A	CAP 107AE							0.0	86.4	4.00	1.40								0	0.94	0.26		1.66	21.64	6.89	200	0.40	0.667	19.98	92.31%
	205A	CAP 107AE	MH107A	0.11			2			5.4	91.8	4.00	1.49								0.11	1.05	0.29		1.78	21.64	16.00	200	0.40	0.667	19.86	91.77%
PHASE 1																																
Edenwylde Drive	107A	MH107A	MH108A	0.39			11			29.7	999.2	3.80	15.38				2.73			2.37	0.39	16.68	4.67		22.42	50.44	81.58	300	0.25	0.691	28.02	55.55%

Design Parameters:

Residential			ICI Areas		
SF	3.4	p/p/u			Peak Factor
TH/SD	2.7	p/p/u	INST	50,000 L/Ha/day	1.5
APT	1.8	p/p/u	COM	50,000 L/Ha/day	1.5
Other	66	p/p/Ha	IND	35,000 L/Ha/day	MOE Chart
				17000 L/Ha/day	

Notes:
1. Mannings coefficient (n) = 0.013
2. Demand (per capita): 350 L/day 300 L/day
3. Infiltration allowance: 0.28 L/s/Ha
4. Residential Peaking Factor:
Harmon Formula = 1+(14/(4+P^0.5))
where P = population in thousands

Designed: LME

Checked:

Dwg. Reference: 37533-501

No.	Revision	Date
1.	City submission No. 1	2019-10-30
2.	City submission No. 2	2020-02-07
3.	City submission No. 3	2020-04-09

File Reference: 37533.5.7.1 **Date:** 2020-04-08 **Sheet No:** 1 of 2

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SANITARY SEWER DESIGN SHEET

Davidson Lands
City of Ottawa
Name of Clien/Developer

LOCATION				RESIDENTIAL										ICI AREAS							INFILTRATION ALLOWANCE			FIXED FLOW	TOTAL FLOW	PROPOSED SEWER DESIGN						
				AREA w/ Units (Ha)	UNIT TYPES				AREA w/o Units (Ha)	POPULATION		PEAK FACTOR	PEAK FLOW (L/s)	AREA (Ha)						PEAK FLOW (L/s)	AREA (Ha)		FLOW (L/s)			CAPACITY (L/s)	LENGTH (m)	DIA (mm)	SLOPE (%)	VELOCITY (full) (m/s)	AVAILABLE CAPACITY	
														INSTITUTIONAL		COMMERCIAL		INDUSTRIAL													
STREET	AREA ID	FROM MH	TO MH		SF	SD	TH	APT		IND	CUM			IND	CUM	IND	CUM	IND	CUM		IND	CUM								L/s	(%)
PHASE 2																																
Block 170	320A	MH320A	MH186A						2.08	137.3	137.3	4.00	2.22								2.08	2.08	0.58		2.81	21.64	12.44	200	0.40	0.667	18.83	87.03%
Crosanti Drive	186A	MH186A	MH187A	0.10						0.0	137.3	4.00	2.22								0.1	2.18	0.61		2.83	20.24	45.53	200	0.35	0.624	17.41	86.00%
Maverick Crescent	300A	MH300A	MH301A	0.20			4			10.8	10.8	4.00	0.18								0.2	0.20	0.06		0.23	27.56	11.47	200	0.65	0.850	27.33	99.16%
	301A	MH301A	MH302A	1.01			31			83.7	94.5	4.00	1.53								1.01	1.21	0.34		1.87	20.24	116.48	200	0.35	0.624	18.37	90.76%
	302A	MH302A	MH303A	0.07			2			5.4	99.9	4.00	1.62								0.07	1.28	0.36		1.98	20.24	11.48	200	0.35	0.624	18.27	90.23%
	303A	MH303A	MH304A	0.35			9			24.3	124.2	4.00	2.01								0.35	1.63	0.46		2.47	20.24	61.29	200	0.35	0.624	17.77	87.80%
	304A	MH304A	MH305A	0.01						0.0	124.2	4.00	2.01								0.01	1.64	0.46		2.47	20.24	14.00	200	0.35	0.624	17.77	87.79%
Maverick Crescent	300A1	MH300A	MH306A	0.75			26			70.2	70.2	4.00	1.14								0.75	0.75	0.21		1.35	27.59	92.03	200	0.65	0.851	26.24	95.12%
	306A	MH306A	MH307A	0.08						0.0	70.2	4.00	1.14								0.08	0.83	0.23		1.37	20.24	12.96	200	0.35	0.624	18.87	93.23%
Ocala Street	307A	MH307A	MH308A	0.24			5			13.5	83.7	4.00	1.36								0.24	1.07	0.30		1.66	20.24	68.00	200	0.35	0.624	18.59	91.82%
	308A	MH308A	MH305A	0.26			7			18.9	102.6	4.00	1.66								0.26	1.33	0.37		2.03	20.24	59.95	200	0.35	0.624	18.21	89.95%
Ocala Street	305A	MH305A	MH187A	0.06						0.0	226.8	4.00	3.68								0.06	3.03	0.85		4.52	20.24	50.21	200	0.35	0.624	15.72	77.65%
Crosanti Drive	187A	MH187A	MH188A	0.19						0.0	364.1	4.00	5.90								0.19	5.40	1.51		7.41	20.24	89.74	200	0.35	0.624	12.83	63.39%
	188A	MH188A	MH189A	0.80			27			72.9	437.0	4.00	7.08								0.8	6.20	1.74		8.82	20.24	103.64	200	0.35	0.624	11.43	56.45%
		MH189A	CAP	0.12			2			5.4	442.4	4.00	7.17								0.12	6.32	1.77		8.94	21.64	7.33	200	0.40	0.667	12.70	58.70%
	189A	CAP	MH108A							0.0	442.4	4.00	7.17								0	6.32	1.77		8.94	21.64	16.00	200	0.40	0.667	12.70	58.70%
PHASE 1																																
Edenwylde Drive	108A	MH108A	MH109A	0.26			5			13.5	1455.1	3.69	21.74				2.73			2.37	0.26	23.26	6.51		30.63	50.44	75.91	300	0.25	0.691	19.81	39.28%
PHASE 2																																
Orvieto Way	211A	MH211A	CAP210AE	0.65			13			35.1	35.1	4.00	0.57								0.65	0.65	0.18		0.75	27.59	86.14	200	0.65	0.851	26.84	97.28%
		CAP210AE	MH210A							0.0	35.1	4.00	0.57								0	0.65	0.18		0.75	27.59	4.00	200	0.65	0.851	26.84	97.28%
		MH210A	MH109A							0.0	35.1	4.00	0.57								0	0.65	0.18		0.75	27.59	11.31	200	0.65	0.851	26.84	97.28%
PHASE 1																																
Hickstead Way	109A	MH109A	MH110A	0.32	5					17.0	1507.2	3.68	22.46				2.73			2.37	0.32	24.23	6.78		31.61	50.44	76.01	300	0.25	0.691	18.83	37.33%
PHASE 2																																
FRIENDLY CRESCENT	EXTERNAL	EXMH181	MH230A	4.66	70					238.0	238.0	4.00	3.86								4.66	4.66	1.30		5.16	49.58	10.88	200	2.10	1.529	44.42	89.59%
Block 169		MH230A	MH231A							0.0	238.0	4.00	3.86								0	4.66	1.30		5.16	49.58	45.03	200	2.10	1.529	44.42	89.59%
Sendero Way	231A	MH231A	MH221A	0.59	10					34.0	272.0	4.00	4.41								0.59	5.25	1.47		5.88	34.22	67.09	200	1.00	1.055	28.34	82.82%
	221A	MH221A	MH222A	0.64	15					51.0	323.0	4.00	5.23								0.64	5.89	1.65		6.88	26.50	80.39	200	0.60	0.817	19.62	74.03%
	222A	MH222A	MH223A	0.17	2					6.8	329.8	4.00	5.34								0.17	6.06	1.70		7.04	34.22	11.46	200	1.00	1.055	27.18	79.42%
	223A	MH223A	MH224A	0.40	8					27.2	357.0	4.00	5.78								0.4	6.46	1.81		7.59	21.64	69.88	200	0.40	0.667	14.05	64.91%
Sendero Way	235A	MH235A	MH232A	0.56	8					27.2	27.2	4.00	0.44								0.56	0.56	0.16		0.60	34.22	61.94	200	1.00	1.055	33.62	98.25%
	232A	MH232A	MH233A	0.13	1					3.4	30.6	4.00	0.50								0.13	0.69	0.19		0.69	48.39	11.34	200	2.00	1.492	47.70	98.58%
	233A	MH233A	MH234A	0.45	10					34.0	64.6	4.00	1.05								0.45	1.14	0.32		1.37	21.64	57.60	200	0.40	0.667	20.27	93.69%
	234A	MH234A	MH224A	0.59	13					44.2	108.8	4.00	1.76								0.59	1.73	0.48		2.25	21.64	83.39	200	0.40	0.667	19.39	89.61%
Sendero Way	224A	MH224A	CAP 225AN	0.17	3					10.2	476.0	3.99	7.68								0.17	8.36	2.34		10.03	26.50	37.03	200	0.60	0.817	16.48	62.18%
		CAP 225AN	MH225A							0.0	476.0	3.99	7.68								0	8.36	2.34		10.03	26.50	6.50	200	0.60	0.817	16.48	62.18%
	225A	MH225A	MH226A	0.03						0.0	476.0	3.99	7.68								0.03	8.39	2.35		10.03	26.50	15.56	200	0.60	0.817	16.47	62.14%
	226A	MH226A	MH110A	0.02						0.0	476.0	3.99	7.68								0.02	8.41	2.35		10.04	26.50	21.49	200	0.60	0.817	16.46	62.12%
Painted Sky Way	215A	MH215A	MH216A	0.62	14					47.6	47.6	4.00	0.77								0.62	0.62	0.17		0.94	24.19	83.61	200	0.50	0.746	23.25	96.09%
	216A	MH216A	CAP 110AE	0.75	18					61.2	108.8	4.00	1.76								0.75	1.37	0.38		2.15	49.58	84.93	200	2.10	1.529	47.44	95.67%
		CAP 110AE	MH110A							0.0	108.8	4.00	1.76								0	1.37	0.38		2.15	49.58	15.00	200	2.10	1.529	47.44	95.67%
Hickstead Way	110A	MH110A	MH111A	0.36	6					20.4	2112.4	3.57	30.52				2.73			2.37	0.36	34.37	9.62		42.52	50.44	78.00	300	0.25	0.691	7.92	15.71%
Hickstead Way	176A	MH176A	MH111A	0.36	6					20.4	20.4	4.00	0.33								0.36	0.36	0.10		0.43	34.22	64.00	200	1.00	1.055	33.79	98.74%
Aridus Crescent	111A	MH111A	MH112A	0.47	10					34.0	2166.8	3.56	31.23				2.73			2.37	0.47	35.20	9.86		43.46	91.46	68.97	375	0.25	0.802	48.00	52.48%
	112A	MH112A	MH113A	0.51	10					34.0	2200.8	3.55	31.68				2.73			2.37	0.51	35.71	10.00		44.05	91.46	66.19	375	0.25	0.802	47.41	51.84%
	113A	MH113A	MH114A	0.12	1					3.4	2204.2	3.55	31.72				2.73			2.37	0.12	35.83	10.03		44.12	91.46	13.49	375	0.25	0.802	47.33	51.75%
	114A	MH114A		0.52	9					30.6	2234.8	3.55	32.12				2.73			2.37	0.52	36.35	10.18		44.67	91.46	55.98	375	0.25	0.802	46.79	51.16%
		Structure - (325	MH148A																								12.00	200	2.77			
			EXMH181																								35.00	250	0.54			
		EXMH181																									16.74	250	0.54			
		MH189A	Structure - (328																								7.33	200	0.40			
WORKS DESIGNED BY NOVATECH																																
STITTSVILLE SOUTH	EXTERNAL			32.94						2182.0	2182.0										32.94	32.94									
	175A	111	109 (0)	0.23	3					10.2	2192.2	3.55	31.57								0.23	33.17	9.29		*40.85*	141.68	*115.7*	*375*	*0.60*	1.243	100.83	71.17%
STREET NO. 11	176B	109 (0)	107 (0)	0.54	11					37.4	2229.6	3.55	32.05								0.54	33.71	9.44		*41.49*	91.46	*71.7*	*375*	*0.25*	0.802	49.97	54.63%
STREET NO. 11	177A	107 (0)	105 (0)	0.49	10					34.0	2263.6	3.54	32.49								0.49	34.20	9.58		*42.07*	91.46	*62.1*	*375*	*0.25*	0.802	49.39	54.00%
STREET NO. 11	178A	105 (0)	MH115A	0.19	1					3.4	2267.0	3.54	32.54								0.19	34.39	9.63		*42.16*	258.68	*11.0*	*375*	*2.00*	2.269	216.51	83.70%
BLOCK 263		MH115A	99 (1800)							0.0	4501.8	3.29	59.94				2.73			2.37	0	70.74	19.81		82.12	320.35	*73.3*	*450*	*1.16*	1.951	238.23	74.37%
BLOCK 263		99 (1800)	PS							0.0	4501.8	3.29	59.94				2.73			2.37	0	70.74	19.81		82.12	474.96	*4.8*	*450*	*2.55*	2.893	392.84	82.71%

Design Parameters:

Residential			ICI Areas		
SF	3.4	p/p/u			Peak Factor
TH/SD	2.7	p/p/u	INST	50,000 L/Ha/day	1.5
APT	1.8	p/p/u	COM	50,000 L/Ha/day	1.5
Other	66	p/p/Ha	IND	35,000 L/Ha/day	MOE Chart
				17000 L/Ha/day	

Notes:
1. Mannings coefficient (n) = 0.013
2. Demand (per capita): 350 L/day 300 L/day
3. Infiltration allowance: 0.28 L/s/Ha
4. Residential Peaking Factor:
Harmon Formula = 1+(14/(4+P^0.5))
where P = population in thousands

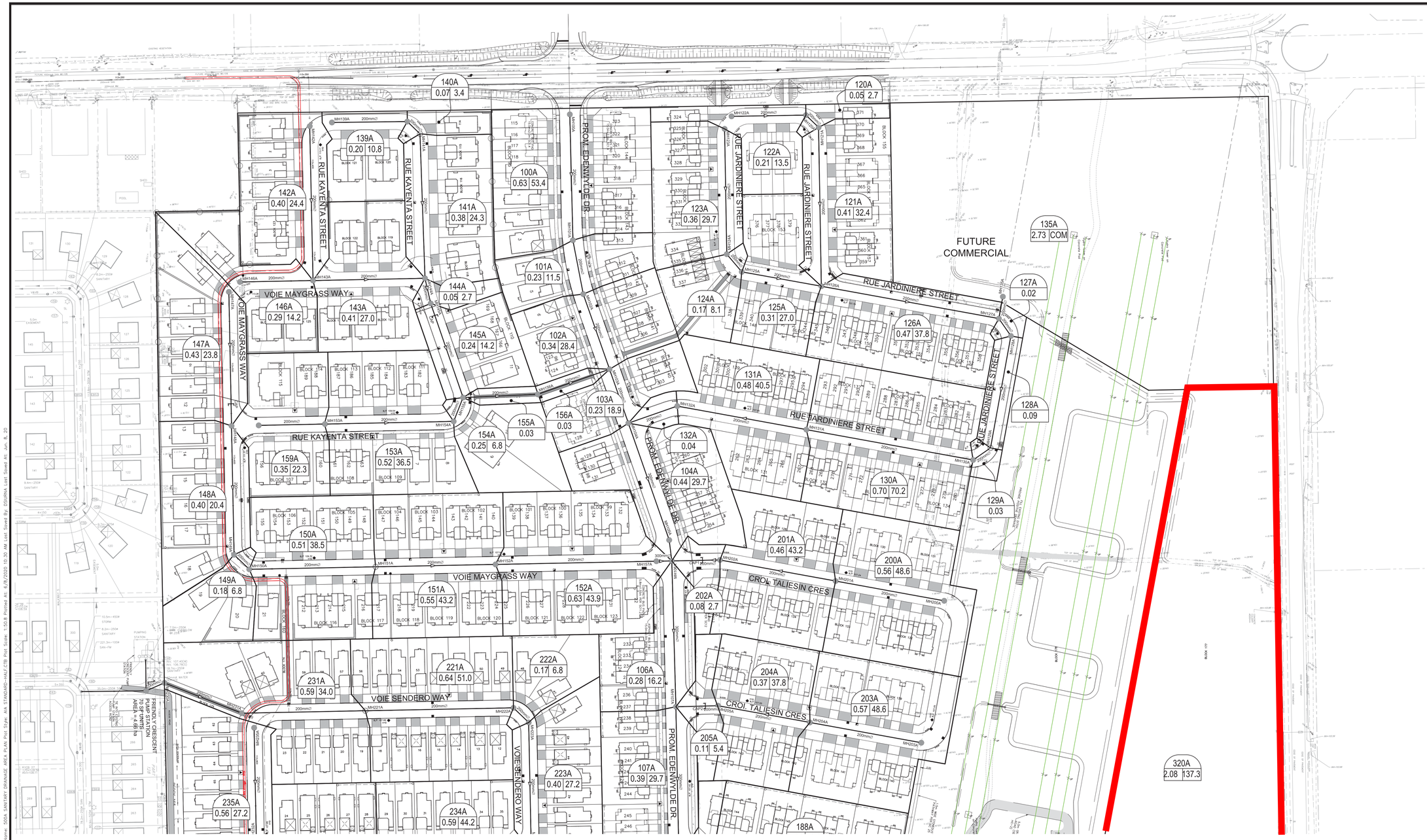
Designed: LME

Checked:

Dwg. Reference: 37533-501

No.	Revision	Date
1.	City submission No. 1	2019-10-30
2.	City submission No. 2	2020-02-07
3.	City submission No. 3	2020-04-09

File Reference: 37533.5.7.1 **Date:** 2020-04-08 **Sheet No:** 2 of 2



REVIEWED BY
DEVELOPMENT REVIEW SERVICES BRANCH

Signed _____

Date _____ 2018

Plan Number _____

LEGEND :

126A
0.47 37.8

AREA NUMBER
POPULATION
AREA IN HECTARES

No.	REVISIONS	By	Date
14			
13			
12	REVISED PHASE 2 PER CITY COMMENTS	L.M.E.	2020:06:05
11	REVISED PHASE 2 PER CITY COMMENTS	L.M.E.	2020:04:09
10	REVISED PHASE 2 AS PER CITY COMMENTS AND NEW LEGAL	L.M.E.	2020:02:07
9	PHASE 2 SUBMISSION 1 FOR CITY REVIEW	L.M.E.	2019:10:30
8	REVISED BLOCK 147	L.M.E.	2018:10:05
7	REVISED PER CITY COMMENTS	L.M.E.	2018:06:04
6	ISSUED FOR TENDER	L.M.E.	2018:05:30
5	REVISED PER NEW LEGAL	L.M.E.	2018:04:06
4	REVISED PER CITY COMMENTS	L.M.E.	2018:02:09
3	REVISED PER CITY COMMENTS	L.M.E.	2017:10:25
2	ISSUED FOR MOE APPROVAL (BY OTHERS)	L.M.E.	2017:03:10
1	SUBMISSION 1 FOR CITY REVIEW	L.M.E.	2017:02:27

IBI GROUP
400 – 333 Preston Street
Ottawa ON K1S 5N4 Canada
tel 613 225 1311 fax 613 225 9868
ibigroup.com

Project Title

DAVIDSON LANDS

PHASE 1 & 2

PROFESSIONAL ENGINEER
L. M. ERNST
13379508
2020/06/05
PROVINCE OF ONTARIO

Drawing Title

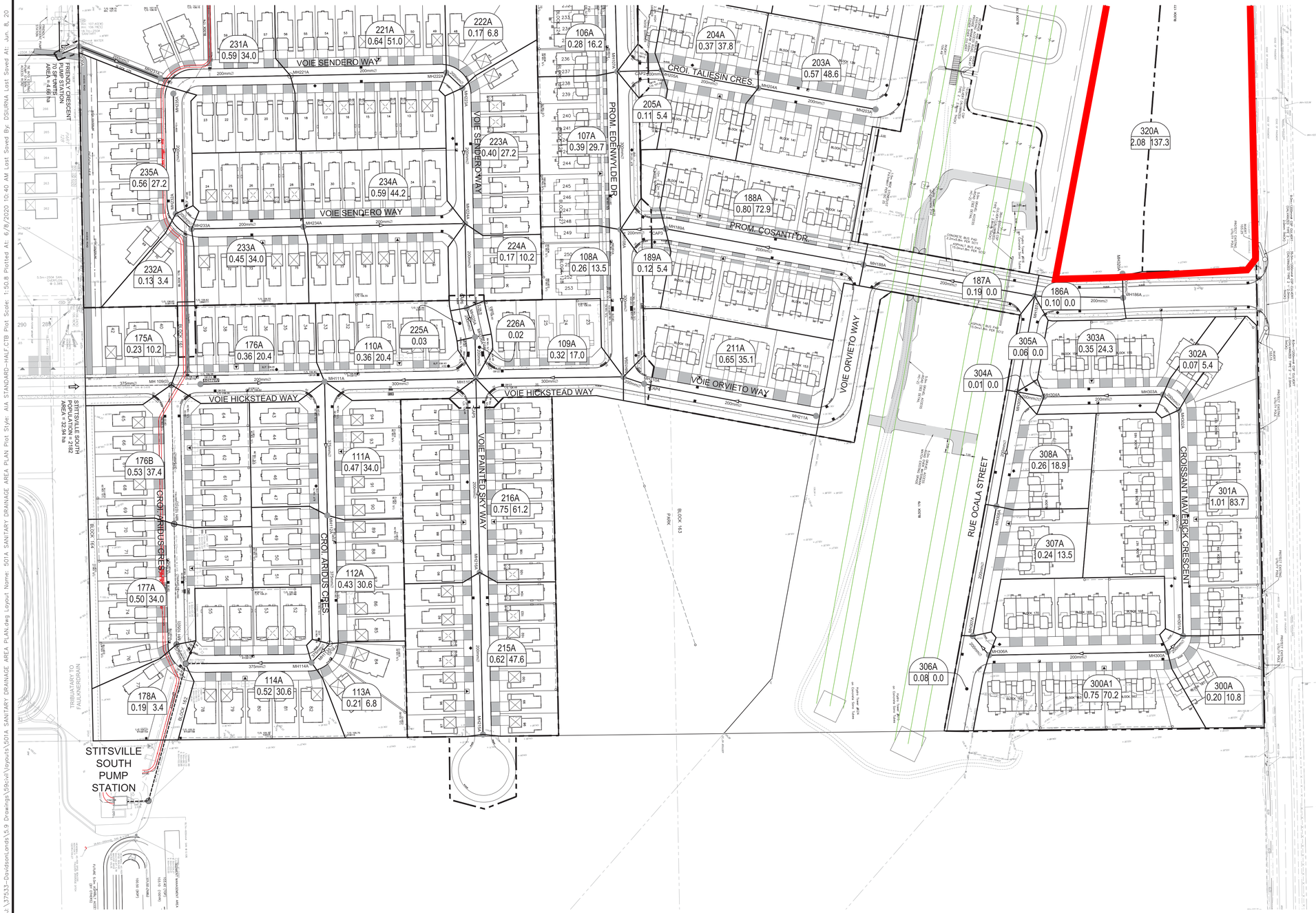
SANITARY DRAINAGE AREA PLAN

Scale
1:1000

Design	Date
L.E.	DEC 2016
Drawn	Checked
D.D. / C.C.	J.I.M.
Project No.	Drawing No.
37533	500A

D07-16-15-0008

#17769



REVIEWED BY
DEVELOPMENT REVIEW SERVICES BRANCH

Signed _____

Date _____ 2018

Plan Number _____

LEGEND :

107A
0.41 | 32.4

- AREA NUMBER
- POPULATION
- AREA IN HECTARES

No.	REVISIONS	By	Date
14			
13			
12	REVISED PHASE 2 PER CITY COMMENTS	L.M.E.	2020:06:05
11	REVISED PHASE 2 PER CITY COMMENTS	L.M.E.	2020:04:09
10	REVISED PHASE 2 AS PER CITY COMMENTS AND NEW LEGAL PLAN	L.M.E.	2020:02:07
9	PHASE 2 SUBMISSION 1 FOR CITY REVIEW	L.M.E.	2019:10:30
8	REVISED LOT NUMBERS	L.M.E.	2018:09:11
7	REVISED PER CITY COMMENTS	L.M.E.	2018:06:04
6	ISSUED FOR TENDER	L.M.E.	2018:05:30
5	REVISED PER NEW LEGAL	L.M.E.	2018:04:06
4	REVISED PER CITY COMMENTS	L.M.E.	2018:02:09
3	REVISED PER CITY COMMENTS	L.M.E.	2017:10:25
2	ISSUED FOR MOE APPROVAL (BY OTHERS)	L.M.E.	2017:03:10
1	SUBMISSION 1 FOR CITY REVIEW	L.M.E.	2017:02:27

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Project Title
DAVIDSON LANDS
PHASE 1 & 2

LICENSED PROFESSIONAL ENGINEER
M. LENAL
13379508
2020/06/05
PROVINCE OF ONTARIO

Drawing Title
SANITARY DRAINAGE AREA PLAN

Scale
1 : 500

Design	Date
L.E.	DEC 2016
Drawn	Checked
D.D. / C.C.	J.I.M.
Project No.	Drawing No.
37533	501A

D07-16-15-0008

#17769

J:\37533-DavidsonLands\5.9 Drawings\59civil\layouts\501A SANITARY DRAINAGE AREA PLAN.dwg Layout Name: 501A SANITARY DRAINAGE AREA PLAN Plot Style: AIA STANDARD-HALF.CTB Plot Scale: 1:50.8 Plotted At: 6/8/2020 10:40 AM Last Saved By: DSURNA Last Saved At: Jun 8, 20

IBI GROUP
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ibigroup.com

PROJECT:	1650 Shea Road
DATE:	2022-08-31
FILE:	139185.6.04
REV #:	1
DESIGNED BY:	Anton Chetrar
CHECKED BY:	Ryan Magladry

TEMPORARY ICD ORIFICE SIZING

Orifice coefficients	
Cv =	0.60
Cv =	0.65

							Theoretical		Recommended	
	Invert	Diameter	Centre ICD	Max. Pond Elevation	Hydraulic Slope	Target Flow	Orifice	Actual Flow	Orifice	Actual Flow
	(m)	(mm)	(m)	(m)	(m)	(l/s)	(m)	(l/s)	(m)	(l/s)
SANITARY MH	102.123	200	102.223	106.50	2.000	4.39	0.0342	4.39	0.075	21.14
STORM MH	103.191	750	103.566	106.50	2.000	367.27	0.3127	367.51	0.310	361.19

* minimum orifice size to be 0.075m

APPENDIX D

Storm Sewer Design Sheet
139185-500 - Storm Drainage Plan
139185-600 - Ponding Plan
Davidson Lands Phase 2 Storm Design Sheet
Davidson Lands Phase 2 Storm Drainage Area Plan
Temporary Orifice Sizing
Sample Runoff Coefficient Calculations

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STORM SEWER DESIGN SHEET

139185 - 1650 Shea Road
CITY OF OTTAWA
Davidson Shea Properties Inc.

LOCATION				AREA (Ha)										RATIONAL DESIGN FLOW														SEWER DATA								
STREET	AREA ID	FROM	TO	C= 0.20	C= 0.25	C= 0.40	C= 0.50	C= 0.57	C= 0.65	C= 0.69	C= 0.70	C= 0.77	C= 0.80	IND 2.78AC	CUM 2.78AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (2) (mm/hr)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	2yr PEAK FLOW (L/s)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	FIXED FLOW IND	FIXED FLOW CUM	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm) DIA	PIPE SIZE (mm) W	PIPE SIZE (mm) H	SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (2yr) (L/s)	AVAIL CAP (2yr) (%)
Private Lane 1	S1	MH1	MH2									0.08		0.17	0.17	10.00	0.83	10.83	76.81	104.19	122.14	178.56	13.15	17.84	20.92	30.58	0.00	0.00	13.15	59.68	40.60	300			0.35	0.818	46.53	77.96%
Private Lane 2		MH2	MH3									0.00		0.00	0.17	10.83	0.14	10.96	73.77	100.02	117.22	171.33	12.63	17.13	20.07	29.34	0.00	0.00	12.63	91.46	6.55	375			0.25	0.802	78.82	86.19%
Private Lane 2	S2	MH3	MH4									0.07		0.15	0.32	10.96	0.78	11.74	73.29	99.37	116.46	170.21	23.53	31.91	37.39	54.65	0.00	0.00	23.53	91.46	37.38	375			0.25	0.802	67.92	74.27%
Private Lane 1	S22	MH22	MH20									0.07		0.15	0.15	10.00	0.38	10.38	76.81	104.19	122.14	178.56	11.51	15.61	18.30	26.76	0.00	0.00	11.51	41.62	18.70	250			0.45	0.821	30.11	72.35%
Private Lane 1	S20	MH20	MH4									0.15		0.32	0.47	10.38	1.29	11.67	75.38	102.23	119.83	175.16	35.50	48.14	56.43	82.49	0.00	0.00	35.50	91.46	62.14	375			0.25	0.802	55.96	61.19%
Private Lane 2	S4	MH4	MH5									0.07		0.15	0.94	11.74	0.82	12.56	70.71	95.82	112.28	164.08	66.60	90.25	105.75	154.54	0.00	0.00	66.60	131.34	39.43	450			0.20	0.800	64.74	49.29%
Private Lane 3	S21	MH21	MH5									0.23		0.49	0.49	10.00	1.49	11.49	76.81	104.19	122.14	178.56	37.81	51.30	60.14	87.91	0.00	0.00	37.81	91.46	71.62	375			0.25	0.802	53.64	58.65%
Private Lane 2	S5	MH5	MH6									0.06		0.13	1.56	12.56	0.73	13.29	68.19	92.36	108.21	158.10	106.56	144.33	169.10	247.06	0.00	0.00	106.56	179.46	35.17	525			0.16	0.803	72.90	40.62%
Private Lane 4	S30	MH30	MH6									0.20		0.43	0.43	10.00	1.52	11.52	76.81	104.19	122.14	178.56	32.88	44.61	52.29	76.44	0.00	0.00	32.88	91.46	73.05	375			0.25	0.802	58.57	64.05%
Private Lane 2	S6	MH6	MH7									0.06		0.13	2.12	13.29	0.81	14.10	66.12	89.52	104.86	153.19	140.12	189.71	222.23	324.63	0.00	0.00	140.12	248.09	41.29	600			0.15	0.850	107.97	43.52%
Private Lane 4	S32	MH32	MH31									0.11		0.24	0.24	10.00	0.38	10.38	76.81	104.19	122.14	178.56	18.08	24.53	28.76	42.04	0.00	0.00	18.08	41.62	18.72	250			0.45	0.821	23.53	56.54%
Private Lane 4	S31	MH31	MH7									0.22		0.47	0.71	10.38	1.77	12.15	75.38	102.23	119.83	175.16	53.25	72.21	84.65	123.73	0.00	0.00	53.25	91.46	84.97	375			0.25	0.802	38.21	41.78%
Private Lane 2		MH7	MH8									0.00		0.00	2.83	14.10	0.27	14.37	63.97	86.58	101.41	148.11	180.77	244.64	286.54	418.51	0.00	0.00	180.77	248.09	13.84	600			0.15	0.850	67.32	27.14%
Private Lane 2	S8	MH8	MH9									0.06		0.13	2.95	14.37	0.47	14.84	63.29	85.64	100.30	146.49	186.96	252.99	296.30	432.75	0.00	0.00	186.96	248.09	23.85	600			0.15	0.850	61.13	24.64%
Private Lane 5	S40A, S40B	MH40	MH9									0.29		0.62	0.62	10.00	1.85	11.85	76.81	104.19	122.14	178.56	47.68	64.68	75.82	110.84	0.00	0.00	47.68	91.46	89.23	375			0.25	0.802	43.78	47.87%
Private Lane 2	S9	MH9	MH10									0.13		0.28	3.85	14.84	0.73	15.57	62.15	84.08	98.47	143.79	239.46	323.96	379.40	554.05	0.00	0.00	239.46	303.78	35.98	675			0.12	0.822	64.32	21.17%
Private Lane 6		MH52	MH53									0.00		0.00	0.00	10.00	0.82	10.82	76.81	104.19	122.14	178.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	91.46	39.37	375			0.25	0.802	91.46	100.00%
Private Lane 6		MH53	MH54									0.00		0.00	0.00	10.82	0.15	10.96	73.80	100.06	117.28	171.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	91.46	7.07	375			0.25	0.802	91.46	100.00%
Private Lane 6	S54	MH54	MH51									0.11		0.24	0.24	10.96	0.74	11.71	73.29	99.36	116.45	170.19	17.26	23.40	27.42	40.07	0.00	0.00	17.26	91.46	35.74	375			0.25	0.802	74.20	81.13%
Private Lane 6	S50	MH50	MH51									0.29		0.62	0.62	10.00	1.01	11.01	76.81	104.19	122.14	178.56	47.68	64.68	75.82	110.84	0.00	0.00	47.68	91.46	48.71	375			0.25	0.802	43.78	47.87%
Private Lane 6	S10	MH51	MH10									0.07		0.15	1.01	11.71	0.87	12.57	70.82	95.96	112.45	164.32	71.25	96.55	113.13	165.32	0.00	0.00	71.25	91.46	41.64	375			0.25	0.802	20.21	22.10%
Private Lane 2		MH10	MH11									0.00		0.00	4.86	15.57	0.34	15.90	60.46	81.76	95.74	139.80	293.77	397.30	465.23	679.30	0.00	0.00	293.77	367.27	16.19	750			0.10	0.805	73.50	20.01%
Private Lane 2	S11	MH11	MH12									0.04		0.09	4.94	15.90	0.75	16.65	59.71	80.75	94.55	138.04	295.27	399.27	467.51	682.60	0.00	0.00	295.27	367.27	36.11	750			0.10	0.805	72.00	19.60%
																															900						

Definitions:
Q = 2.78CiA, where:
Q = Peak Flow in Litres per Second (L/s)
A = Area in Hectares (Ha)
i = Rainfall intensity in millimeters per hour (mm/hr)
[i = 732.951 / (TC+6.199)^0.810] 2 YEAR
[i = 998.071 / (TC+6.053)^0.814] 5 YEAR
[i = 1174.184 / (TC+6.014)^0.816] 10 YEAR
[i = 1735.688 / (TC+6.014)^0.820] 100 YEAR

Notes:
1. Mannings coefficient (n) = 0.013

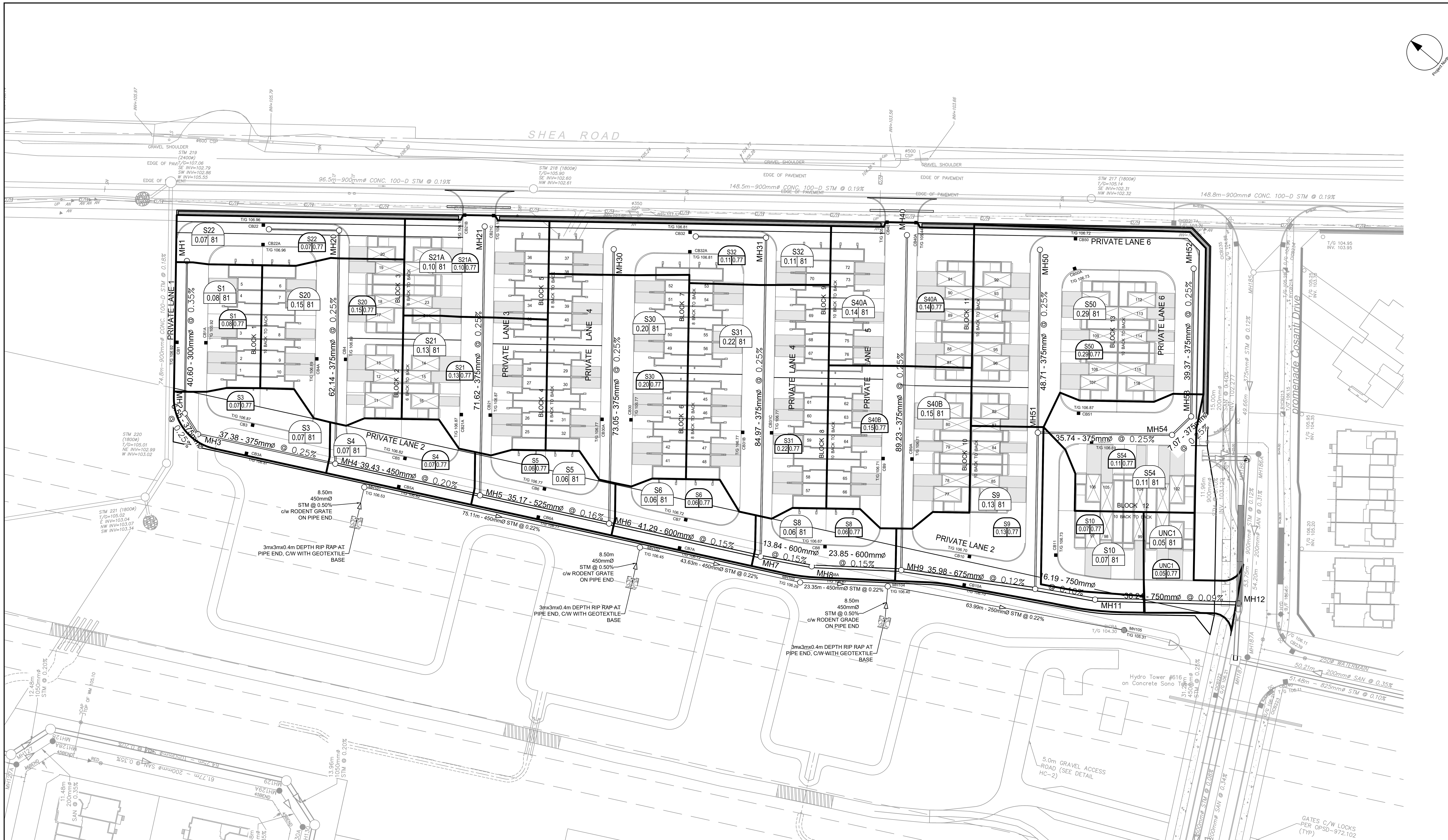
Designed: AB

Checked: AC
RM

Dwg. Reference: 139185 - 500

No.	Revision	Date
1.	Submission No. 1 for City Review	2022-08-31

File Reference: 139185-6.04.04
Date: 2022-08-31
Sheet No: 1 of 1



CLIENT

DAVIDSON SHEA PROPERTY INC.

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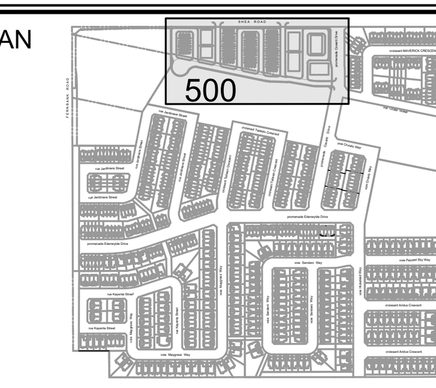
ISSUES

No.	DESCRIPTION	DATE
1	SUBMISSION NO.1 FOR CITY REVIEW	2022-07-__
2		
3		
4		
5		
6		
7		
8		

SEE 010, 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS

KEY PLAN



CONSULTANTS

SEAL

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Ottawa ON K1S 5N4 Canada
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ibigroup.com

PROJECT

1650 SHEA ROAD

(OTTAWA, ON)

PROJECT NO: 139185	
DRAWN BY: M.M.	CHECKED BY: A.C./A.B.
PROJECT MGR: R.M.	APPROVED BY: D.G.Y.

SHEET TITLE

STORM DRAINAGE AREA PLAN

SHEET NUMBER	ISSUE
500	1

CITY FILE No. D07-_-_-_

CITY PLAN No. xxxxx

File Location: J:\139185_1650_Shea_Rd\7.0_Production\7.03_Design\04_Civil\Sheets\500-STORM DRAINAGE AREA PLAN.dwg Last Saved: September 14, 2022 by stefan.geisser Plotted: Wednesday, September 14, 2022 2:50:54 PM by Stefan Geisser

PONDING LEGEND

- PROPOSED DITCH C/W FLOW DIRECTION AND SLOPE
- SLOPE C/W FLOW DIRECTION
- MAJOR OVERLAND FLOW ROUTE
- PROPOSED SPOT GRADE
- PROPOSED SWALE GRADE
- PROPOSED SWALE HIGH POINT GRADE
- LOT CORNER GRADE C/W EXISTING GRADE
- FULL STATIC PONDING GRADE
- RETAINING WALL C/W TOP OF WALL AND GRASS GRADE
- TERRACING 3:1 MAXIMUM UNLESS NOTED OTHERWISE
- PRESSURE REDUCING VALVE
- FINISHED FLOOR ELEVATION
- TOP OF FOUNDATION ELEVATION
- UNDERSIDE OF FOOTING ELEVATION
- MINIMUM UNDERSIDE OF FOOTING (Based on the higher of the sewer obverts, or hydraulic grade line)
- MINIMUM GARAGE GRADE
- WU — WALKUP UNIT
- WO — WALKOUT UNIT
- NS — NON-STANDARD FOUNDATION (Frost cover not provided for standard unit)
- HB — HIGHBACK UNIT (1.5m frost cover on footings)
- NOISE BARRIER LOCATION
- NOISE BARRIER GATE
- RIP-RAP
- TOWN HOUSE SPLITS

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ISSUES

No.	DESCRIPTION	DATE
1	SUBMISSION NO.1 FOR CITY REVIEW	2022-07-__
2		
3		
4		
5		
6		
7		
8		

SEE 010, 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS

KEY PLAN

600

CONSULTANTS

1:500

SEAL

LICENSED PROFESSIONAL ENGINEER
D. G. Yannoulopoulos
2022/07/__
PROVINCE OF ONTARIO

IBI

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PROJECT

1650 SHEA ROAD

(OTTAWA, ON)

PROJECT NO:
139185

DRAWN BY:	CHECKED BY:
M.M.	A.C./A.B.
PROJECT MGR:	APPROVED BY:
R.M.	D.G.Y.

SHEET TITLE

PONDING PLAN

SHEET NUMBER	ISSUE
600	1

CITY FILE No. D07-__-__-__

CITY PLAN No. xxxxx

File Location: J:\139185_1650_Shea_Rd\7.0_Production\7.03_Design\04_Civil\Sheets\600-PONDING PLAN.dwg Last Saved: September 14, 2022 by stefan.geisser Plotted: Wednesday, September 14, 2022 3:11:47 PM by Stefan Geisser

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STORM SEWER DESIGN SHEET

Davidson Lands
City of Ottawa
Name of Client/Developer

LOCATION				RATIONAL DESIGN FLOW																			SEWER DATA									
						SINGLE FAM		TOWN/SEMI																								
STREET	AREA ID	FROM	TO	C= 0.20	C= 0.30	C= 0.49	C= 0.70	C= 0.52	C= 0.68	C= 0.76	C= 0.90	IND 2.78AC	CUM 2.78AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	FIXED FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm) DIA	W	H	SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (5yr) (L/s)	(%)
PHASE 2																															
Kayenta Street	S142	MH142	MH143				0.39					0.76	0.76	10.00	0.68	10.68	104.19	122.14	178.56	79.08				79.08	142.67	80.20	300			2.00	1.955	63.59	44.57%
Maygrass Way	R146, S146	MH146	MH143			0.19			0.09			0.43	0.43	10.00	0.29	10.29	104.19	122.14	178.56	44.69				44.69	116.06	39.45	250			3.50	2.291	71.37	61.49%
Maygrass Way	S143	MH143	MH144						0.30			0.57	1.76	10.68	0.38	11.06	100.72	118.05	172.54	176.76				176.76	322.05	63.95	375			3.10	2.825	145.29	45.11%
Kayenta Street		MH139	MH140									0.00	0.00	10.00	0.32	10.32	104.19	122.14	178.56	0.00				0.00	107.45	40.72	250			3.00	2.121	107.45	100.00%
		MH140	MH141									0.00	0.00	10.32	0.09	10.41	102.53	120.19	175.69	0.00				0.00	94.09	9.77	250			2.30	1.857	94.09	100.00%
	R141, S141A&B	MH141	MH144					0.15	0.36			0.90	0.90	10.41	0.62	11.03	102.09	119.66	174.92	91.61				91.61	152.99	78.31	300			2.30	2.097	61.38	40.12%
Kayenta Street		MH144	MH145									0.00	2.65	11.06	0.13	11.19	98.90	115.91	169.41	262.33				262.33	409.98	19.87	450			1.90	2.497	147.65	36.01%
PHASE 1																															
Kayenta Street	R145	MH145	MH155					0.27				0.39	3.04	11.19	0.34	11.54	98.28	115.18	168.34	299.05				299.05	409.98	51.61	450			1.90	2.497	110.93	27.06%
Kayenta Street	S148B	MH159	MH153				0.08					0.16	0.16	10.00	0.36	10.36	104.19	122.14	178.56	16.22				16.22	94.09	40.00	250			2.30	1.857	77.87	82.76%
	S153	MH153	MH154						0.25			0.47	0.63	10.36	0.62	10.98	102.33	119.95	175.34	64.29				64.29	94.09	69.45	250			2.30	1.857	29.79	31.66%
	S154	MH154	MH155						0.22			0.42	1.04	10.98	0.09	11.07	99.28	116.35	170.05	103.66				103.66	289.21	13.93	375			2.50	2.537	185.55	64.16%
Block 159	S155	MH155	MH156				0.38					0.74	4.83	11.54	0.22	11.76	96.72	113.34	165.62	466.78				466.78	847.38	38.64	600			1.75	2.903	380.60	44.91%
	R156A&B	MH156	MH103			0.12		0.21				0.47	5.29	11.76	0.23	11.99	95.73	112.18	163.93	506.76				506.76	847.38	39.60	600			1.75	2.903	340.62	40.20%
Edenwylde Drive	S100	MH100	MH101						0.24			0.45	0.45	10.00	0.75	10.75	104.19	122.14	178.56	47.27				47.27	78.47	69.61	250			1.60	1.549	31.20	39.76%
	R101	MH101	MH102					0.34				0.49	0.95	10.75	0.37	11.12	100.40	117.67	171.99	94.89				94.89	153.03	30.09	375			0.70	1.342	58.14	37.99%
	S102	MH102	MH103						0.37			0.70	1.64	11.12	0.33	11.46	98.61	115.57	168.91	162.19				162.19	258.68	45.33	375			2.00	2.269	96.49	37.30%
Edenwylde Drive	S103	MH103	MH104						0.15			0.28	7.22	11.99	0.27	12.26	94.75	111.02	162.23	684.25				684.25	899.63	32.00	750			0.60	1.973	215.37	23.94%
Jardiniere Street		MH122	MH120									0.00	0.00	10.00	0.65	10.65	104.19	122.14	178.56	0.00				0.00	51.91	40.20	250			0.70	1.024	51.91	100.00%
		MH120	MH121									0.00	0.00	10.65	0.16	10.81	100.86	118.22	172.79	0.00				0.00	51.91	9.80	250			0.70	1.024	51.91	100.00%
	R121, S121A&B	MH121	MH126					0.10	0.42			0.94	0.94	10.81	1.07	11.89	100.08	117.30	171.45	93.93				93.93	153.03	86.32	375			0.70	1.342	59.10	38.62%
Jardiniere Street	S123	MH123	MH124						0.17			0.32	0.32	10.00	0.94	10.94	104.19	122.14	178.56	33.48				33.48	58.86	65.17	250			0.90	1.162	25.37	43.11%
	R124	MH124	MH125					0.51				0.74	1.06	10.94	0.18	11.12	99.50	116.61	170.44	105.33				105.33	188.11	12.67	450			0.40	1.146	82.78	44.01%
	R125, S125	MH125	MH126					0.29	0.40			1.18	2.23	11.12	0.74	11.86	98.63	115.59	168.94	220.34				220.34	286.47	43.82	600			0.20	0.982	66.13	23.08%
Jardiniere Street	R126, S126	MH126	MH127					0.14	0.32			0.81	3.98	11.89	1.45	13.34	95.19	111.54	162.98	378.83				378.83	517.55	98.97	750			0.20	1.135	138.71	26.80%
External Commercial	135	MH135	MH127								2.73	6.83	6.83	10.00	0.09	10.09	104.19	122.14	178.56	711.69				711.69	944.10	8.00	900			0.25	1.438	232.42	24.62%
Jardiniere Street		MH127	MH128									0.00	10.81	13.34	0.15	13.48	89.34	104.65	152.88	965.78				965.78	1,273.98	12.48	1050			0.20	1.425	308.20	24.19%
	R128, S128	MH128	MH129					0.14	0.34			0.85	11.66	13.48	0.75	14.24	88.80	104.01	151.94	1,034.95				1,034.95	1,273.97	64.25	1050			0.20	1.425	239.02	18.76%
		MH129	MH130									0.00	11.66	14.24	0.16	14.40	86.11	100.85	147.30	1,003.64				1,003.64	1,273.93	13.96	1050			0.20	1.425	270.29	21.22%
	R130A&B, S130	MH130	MH131					0.31	0.35			1.11	12.77	14.40	1.07	15.47	85.55	100.20	146.33	1,092.05				1,092.05	1,274.01	91.57	1050			0.20	1.425	181.95	14.28%
	R131	MH131	MH132					0.18				0.26	13.03	15.47	1.09	16.56	82.07	96.10	140.33	1,068.98				1,068.98	1,286.16	72.00	1200			0.10	1.102	217.18	16.89%
	S132	MH132	MH104						0.37			0.70	13.72	16.56	0.46	17.02	78.84	92.30	134.75	1,082.01				1,082.01	1,286.26	30.31	1200			0.10	1.102	204.25	15.88%
Edenwylde Drive	R104, S104	MH104	MH105			0.18			0.25			0.72	21.66	17.02	0.76	17.77	77.56	90.80	132.54	1,680.24				1,680.24	2,332.02	57.99	1500			0.10	1.278	651.78	27.95%
		MH105	MH106									0.00	21.66	17.77	0.25	18.03	75.55	88.44	129.08	1,636.71				1,636.71	2,332.02	19.55	1500			0.10	1.278	695.31	29.82%
PHASE 2																															
Maygrass Way	R147	MH147	CAP			0.07						0.10	0.10	10.00	0.52	10.52	104.19	122.14	178.56	9.94				9.94	103.80	63.75	250			2.80	2.049	93.87	90.43%
PHASE 1																															
Maygrass Way		CAP	MH148									0.00	0.10	10.52	0.10	10.62	101.53	119.01	173.95	9.68				9.68	103.80	12.00	250			2.80	2.049	94.12	90.67%
	R148, S148A	MH148	MH149			0.20	0.18					0.62	0.72	10.62	0.64	11.26	101.05	118.44	173.11	72.56				72.56	92.02	69.76	250			2.20	1.816	19.46	21.15%
		MH149	MH150									0.00	0.72	11.26	0.11	11.36	97.99	114.84	167.83	70.37				70.37	92.02	11.69	250			2.20	1.816	21.65	23.53%
	R150, S150	MH150	MH151			0.31	0.32					1.05	1.76	11.36	0.58	11.94	97.50	114.26	166.98	171.90				171.90	224.02	67.97	375			1.50	1.965	52.12	23.26%
	R151A&B, S151	MH151	MH152			0.65	0.32					1.51	3.27	11.94	0.46	12.40	94.95	111.26	162.58	310.61				310.61	549.49	68.52	525			1.50	2.459	238.88	43.47%
	R152, S152A&B	MH152	MH106			0.25	0.72					1.74	5.01	12.40	0.63	13.04	93.00	108.96	159.21	466.21				466.21	701.70	91.12	600			1.20	2.404	235.49	33.56%
PHASE 2																															
Taliesin Crescent	S200	MH200	MH201				0.47					0.91	0.91	10.00	1.07	11.07	104.19	122.14	178.56	95.30				95.30	162.91	63.65	450			0.30	0.992	67.61	41.50%
		MH201	MH202									0.00	0.91	11.07	1.00	12.07	98.87	115.87	169.34	90.42				90.42	162.91	59.30	450			0.30	0.992	72.49	44.49%
	S202	MH202	CAP106E				0.24					0.47	1.38	12.07	0.18	12.25	94.42	110.63	161.65	130.45				130.45	245.74	12.00	525			0.30	1.100	115.29	46.91%
		CAP106E	MH106									0.00	1.38	12.25	0.29	12.53	93.65	109.73	160.33	129.40				129.40	245.74	19.00	525			0.30	1.100	116.34	47.34%
PHASE 1																															
Edenwylde Drive	R106, S106	MH106	MH107			0.28	0.21					0.79	28.85	18.03	0.95	18.98	74.90	87.67	127.96	2,160.71				2,160.71	3,006.86	77.67	1650			0.10	1.362	846.15	28.14%
PHASE 2																															
Taliesin Crescent	R203, S203A&B	MH203	MH204			0.37	0.65					1.77	1.77	10.00	0.98	10.98	104.19	122.14	178.56	184.31				184.31	245.74	64.35	525			0.30	1.100	61.43	25.00%
		MH204	MH205									0.00	1.77	10.98	0.72	11.70	99.31	116.39	170.11	175.67				175.67	245.74	47.79	525			0.30	1.100	70.07	28.51%
	S205	MH205	CAP 107E				0.08					0.16	1.92	11.70	0.15	11.85	96.00	112.49	164.38	184.76				184.76	256.22	7.71	600			0.16	0.878	71.47	27.89%
		CAP 107E	MH107									0.00	1.92	11.85	0.36	12.21	95.36	111.74	163.28	183.53				183.53	256.22	19.00	600			0.16	0.878	72.70	28.37%
PHASE 1																															
Edenwylde Drive	S107	MH107	MH108				0.27					0.53	31.30	18.98	0.94	19.92	72.57	84.94	123.95	2,271.51				2,271.51	3,006.86	77.08	1650			0.10	1.362	735.35	24.46%

Definitions:
Q = 2.78CiA, where:
Q = Peak Flow in Litres per Second (L/s)
A = Area in Hectares (Ha)
i = Rainfall intensity in millimeters per hour (mm/hr)
[i = 998.071 / (TC+6.053)^0.814] 5 YEAR
[i = 1174.184 / (TC+6.014)^0.816] 10 YEAR
[i = 1735.688 / (TC+6.014)^0.820] 100 YEAR

Notes:
1. Mannings coefficient (n) = 0.013

Designed: MB
Checked: LE
Dwg. Reference: 37533-500

No.	Revision	Date
1.	City submission No. 1	2019-10-30
2.	City submission No. 2	2020-02-07
3.	City submission No. 3	2020-04-09
4.	City submission No. 4	2020-06-08

File Reference: 37533.5.7.1
Date: 2020-06-07
Sheet No: 1 of 2

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STORM SEWER DESIGN SHEET

Davidson Lands
City of Ottawa
Name of Client/Developer

LOCATION				RATIONAL DESIGN FLOW																				SEWER DATA									
						SINGLE FAM		TOWN/SEMI																									
STREET	AREA ID	FROM	TO	C= 0.20	C= 0.30	C= 0.49	C= 0.70	C= 0.52	C= 0.68	C= 0.76	C= 0.90	IND 2.78AC	CUM 2.78AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	FIXED FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm) DIA	W	H	SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (5yr) (L/s)	(%)
PHASE 2																																	
Crosanti Drive	S185, R185A&B	MH185	MH186			0.27	0.16					0.68	0.68	10.00	1.25	11.25	104.19	122.14	178.56	70.76				70.76	91.46	60.00	375			0.25	0.802	20.69	22.63%
Block 170	320	MH320	MH186							2.08		4.39	4.39	12.00	0.17	12.17	94.70	110.96	162.13	416.15				416.15	597.22	9.02	900			0.10	0.909	181.07	30.32%
Crosanti Drive	S186	MH186	MH187				0.09					0.18	5.25	12.17	0.81	12.97	94.00	110.13	160.92	493.38				493.38	586.99	43.41	900			0.10	0.894	93.61	15.95%
Maverick Crescent		MH300	MH301									0.00	0.00	10.00	0.24	10.24	104.19	122.14	178.56	0.00				0.00	59.68	11.71	300			0.35	0.818	59.68	100.00%
	S301, R301A&B	MH301	MH302			0.54	0.41					1.53	1.53	10.24	2.34	12.57	102.95	120.68	176.41	157.87				157.87	248.09	119.14	600			0.15	0.850	90.22	36.37%
		MH302	MH303									0.00	1.53	12.57	0.23	12.80	92.31	108.15	158.01	141.55				141.55	248.09	11.72	600			0.15	0.850	106.53	42.94%
	S303, R303	MH303	MH304			0.33	0.33					1.09	2.63	12.80	1.28	14.08	91.39	107.07	156.43	239.92				239.92	367.27	61.81	750			0.10	0.805	127.35	34.67%
		MH304	MH305									0.00	2.63	14.08	0.33	14.41	86.64	101.48	148.22	227.44				227.44	367.27	16.00	750			0.10	0.805	139.83	38.07%
Maverick Crescent	R300, S300 A&B	MH300	MH306			0.22	0.55					1.37	1.37	10.00	1.97	11.97	104.19	122.14	178.56	142.74				142.74	179.46	94.71	525			0.16	0.803	36.72	20.46%
	S306	MH306	MH307				0.04					0.08	1.45	11.97	0.28	12.24	94.84	111.13	162.39	137.32				137.32	239.68	13.56	600			0.14	0.821	102.36	42.71%
Ocala Street		MH307	MH308									0.00	1.45	12.24	1.42	13.66	93.68	109.76	160.38	135.63				135.63	239.68	70.00	600			0.14	0.821	104.04	43.41%
	S308	MH308	MH305				0.29					0.56	2.01	13.66	1.24	14.90	88.15	103.25	150.82	177.37				177.37	239.68	60.94	600			0.14	0.821	62.31	26.00%
Ocala Street	S305	MH305	MH187				0.08					0.16	4.79	14.41	1.00	15.42	85.50	100.13	146.24	409.79				409.79	473.55	51.58	825			0.10	0.858	63.76	13.46%
Dry pond	187	DICB A	MH187	2.86								1.59	1.59	25.00	0.33	25.33	60.90	71.22	103.85	96.83				96.83	148.72	18.06	450			0.25	0.906	51.88	34.89%
Crosanti Drive	S187A&B	MH187	MH188				0.24					0.47	12.10	15.42	1.12	16.54	82.24	96.30	140.61	994.98				994.98	2,352.00	86.75	1500			0.10	1.289	1357.02	57.70%
	R188A&B, S188A&B	MH188	MH189			0.61	0.39					1.59	13.69	16.54	1.37	17.91	78.90	92.37	134.85	1,080.03				1,080.03	2,332.02	105.44	1500			0.10	1.278	1252.00	53.69%
		MH189	CAP									0.00	13.69	17.91	0.10	18.01	75.19	88.02	128.47	1,029.32				1,029.32	2,332.02	7.64	1500			0.10	1.278	1302.70	55.86%
	S189	CAP	MH108				0.23					0.45	14.14	17.91	0.25	18.16	75.19	88.02	128.47	1,062.98				1,062.98	2,332.02	19.00	1500			0.10	1.278	1269.05	54.42%
PHASE 1																																	
Edenwylde Drive	R108A&B, S108	MH108	MH109			0.31	0.28					0.97	46.40	19.92	0.94	20.86	70.42	82.41	120.25	3,267.80				3,267.80	3,792.06	81.41	1800			0.10	1.444	524.26	13.83%
Park Block 163	P109	MH195	MH109		1.99							1.66	1.66	10.00	0.15	10.15	104.19	122.14	178.56	172.93				172.93	283.76	11.11	525			0.40	1.270	110.83	39.06%
PHASE 2																																	
Orvieto Way	S211A&B	MH211	CAP 109E				0.42					0.82	0.82	10.00	1.04	11.04	104.19	122.14	178.56	85.16				85.16	230.39	87.90	450			0.60	1.403	145.23	63.04%
		CAP 109E	MH109									0.00	0.82	11.04	0.20	11.25	98.98	116.01	169.55	80.90				80.90	230.39	17.00	450			0.60	1.403	149.49	64.89%
PHASE 1																																	
Hickstead Way	S109	MH109	MH110				0.22					0.43	49.31	20.86	0.77	21.63	68.41	80.05	116.79	3,373.35				3,373.35	4,694.35	70.05	1950			0.10	1.523	1321.00	28.14%
PHASE 2																																	
Sendero Way		MH220	MH221									0.00	0.00	10.00	0.88	10.88	104.19	122.14	178.56	0.00				0.00	55.49	58.00	250			0.80	1.095	55.49	100.00%
	S221	MH221	MH222				0.44					0.86	0.86	10.88	0.94	11.83	99.75	116.91	170.87	85.41				85.41	230.39	79.46	450			0.60	1.403	144.98	62.93%
		MH222	MH223									0.00	0.86	11.83	0.17	12.00	95.44	111.84	163.43	81.72				81.72	188.11	11.70	450			0.40	1.146	106.39	56.56%
	R223, S223	MH223	MH224			0.11	0.52					1.16	2.02	12.00	0.90	12.90	94.71	110.97	162.16	191.13				191.13	300.97	72.71	525			0.45	1.347	109.84	36.50%
Sendero Way	S231	MH231	MH232				0.27					0.53	0.53	10.00	0.74	10.74	104.19	122.14	178.56	54.75				54.75	100.88	61.77	300			1.00	1.383	46.14	45.73%
		MH232	MH233									0.00	0.53	10.74	0.14	10.88	100.42	117.69	172.03	52.76				52.76	100.88	11.58	300			1.00	1.383	48.12	47.70%
	R233, S233	MH233	MH234			0.27	0.38					1.11	1.63	10.88	0.92	11.81	99.74	116.90	170.86	162.85				162.85	245.74	60.84	525			0.30	1.100	82.89	33.73%
	S234	MH234	MH224				0.36					0.70	2.33	11.81	1.16	12.97	95.53	111.94	163.58	222.90				222.90	265.43	82.96	525			0.35	1.188	42.53	16.02%
Sendero Way		MH224	CAP 225N									0.00	4.35	12.97	0.35	13.32	90.74	106.31	155.31	394.85				394.85	496.18	35.50	600			0.60	1.700	101.32	20.42%
	R225	CAP 225N	MH225			0.03						0.04	4.39	13.32	0.01	13.33	89.42	104.74	153.01	392.72				392.72	496.18	1.50	600			0.60	1.700	103.45	20.85%
	S226	MH225	MH226				0.24					0.47	4.86	13.33	0.20	13.54	89.36	104.68	152.91	434.22				434.22	496.18	20.78	600			0.60	1.700	61.96	12.49%
		MH226	MH110									0.00	4.86	13.54	0.24	13.78	88.60	103.79	151.61	430.54				430.54	496.18	24.50	600			0.60	1.700	65.64	13.23%
Painted Sky Way	R215, S215	MH215	MH216			0.13	0.62					1.38	1.38	10.00	1.05	11.05	104.19	122.14	178.56	144.16				144.16	210.32	80.40	450			0.50	1.281	66.16	31.45%
	R216, S216	MH216	CAP 110E			0.14	0.32					0.81	2.20	11.05	1.14	12.19	98.97	116.00	169.53	217.45				217.45	283.76	87.18	525			0.40	1.270	66.30	23.37%
		CAP 110E	MH110									0.00	2.20	12.19	0.16	12.35	93.89	110.01	160.74	206.28				206.28	283.76	12.00	525			0.40	1.270	77.47	27.30%
PHASE 1																																	
Hickstead Way	R110	MH110	MH111			0.21						0.29	56.65	21.63	0.85	22.48	66.87	78.24	114.12	3,788.05				3,788.05	4,694.47	77.86	1950			0.10	1.523	906.41	19.31%
Hickstead Way	RI76A&B, S176A&B	MH176				0.51	0.43					1.53	1.53	10.00	0.45	10.45	104.19	122.14	178.56	159.57				159.57	182.91	43.57	375			1.00	1.604	23.34	12.76%
			MH111									0.00	1.53	10.45	0.69	11.14	101.86	119.40	174.52	156.00				156.00	182.91	65.99	375			1.00	1.604	26.91	14.71%
Aridus Crescent	S111	MH111	MH112				0.31					0.60	58.78	22.48	0.71	23.19	65.24	76.32	111.32	3,834.97				3,834.97	5,720.16	68.07	2100			0.10	1.600	1885.18	32.96%
	R112, S112	MH112	MH113			0.25	0.46					1.24	60.02	23.19	0.68	23.87	63.95	74.81	109.10	3,838.13				3,838.13	5,720.16	65.34	2100			0.10	1.600	1882.03	32.90%
	R113	MH113	MH114			0.28						0.38	60.40	23.87	0.16	24.03	62.76	73.41	107.05	3,790.85				3,790.85	5,720.16	15.17	2100			0.10	1.600	1929.31	33.73%
	R114	MH114	MH115			0.21						0.29	60.69	24.03	0.58	24.61	62.49	73.10	106.59	3,792.51				3,792.51	5,997.36	58.19	2100			0.11	1.677	2204.85	36.76%
Aridus Crescent	S176C	MH176C	MH177				0.28					0.54	0.54	10.00	0.89	10.89	104.19	122.14	178.56	56.77				56.77	63.80	46.53	300			0.40	0.874	7.03	11.02%
	R177A&B&C, S177	MH177	MH178			0.42	0.21					0.98	1.53	10.89	1.07	11.96	99.73	116.89	170.84	152.16				152.16	188.11	73.73	450			0.40	1.146	35.96	19.11%
	S178	MH178	MH179				0.18					0.35	1.88	11.96	0.13	12.09	94.87	111.16	162.43	177.97				177.97	283.76	9.74	525			0.40	1.270	105.79	37.28%
	S179	MH179	MH115				0.28					0.54	2.42	12.09	0.08	12.16	94.33	110.52	161.49	228.35				228.35	283.76	5.91	525			0.40	1.270	55.41	19.53%
Block 162	R115A&B	MH115	MH900			0.27						0.37	63.48	24.61	0.86	25.46	61.53	71.97	104.94	3,905.78				3,905.78	5,720.16	82.18	2100			0.10	1.600	1814.38	31.72%
		MH900										0.00	63.48	25.46	0.19	25.66	60.17	70.37	102.59	3,819.20				3,819.20	5,720.16	18.44	2100			0.10	1.600	1900.96	33.23%

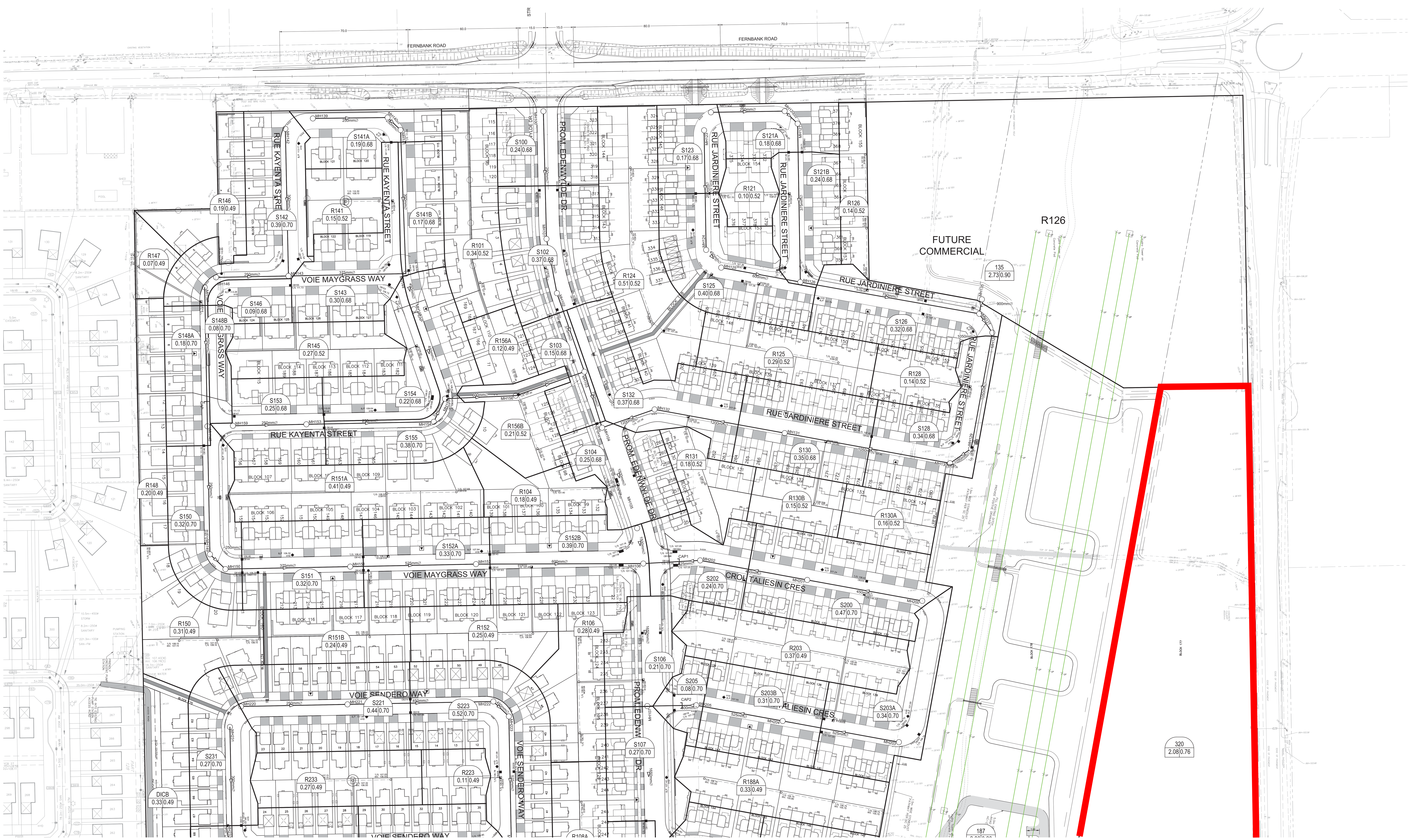
Definitions:
Q = 2.78CiA, where:
Q = Peak Flow in Litres per Second (L/s)
A = Area in Hectares (Ha)
i = Rainfall intensity in millimeters per hour (mm/hr)
[i = 998.071 / (TC+6.053)^0.814] 5 YEAR
[i = 1174.184 / (TC+6.014)^0.816] 10 YEAR
[i = 1735.688 / (TC+6.014)^0.820] 100 YEAR

Notes:
1. Mannings coefficient (n) = 0.013

Designed: MB
Checked: LE
Dwg. Reference: 37533-500

No.	Revision	Date
1.	City submission No. 1	2019-10-30
2.	City submission No. 2	2020-02-07
3.	City submission No. 3	2020-04-09
4.	City submission No. 4	2020-06-08

File Reference: 37533.5.7.1
Date: 2020-06-07
Sheet No: 2 of 2



REVIEWED BY
DEVELOPMENT REVIEW SERVICES BRANCH

Signed ______________________

Date ______________________ 2018

Plan Number ______________________

LEGEND :

R126 0.14 0.52
- AREA NUMBER
- RUNOFF COEFFICIENT
- AREA IN HECTARES

No.	REVISIONS	By	Date
14			
13	REVISED PHASE 2 PER CITY COMMENTS	L.M.E.	2020:06:05
12	REVISED PHASE 2 PER CITY COMMENTS	L.M.E.	2020:04:09
11	REVISED PHASE 2 AS PER CITY COMMENTS AND NEW LEGAL PLAN	L.M.E.	2020:02:05
10	PHASE 2 SUBMISSION 1 FOR CITY REVIEW	L.M.E.	2019:10:30
9	REVISED BLOCK 147	L.M.E.	2018:10:05
8	REVISED LOT NUMBERS	L.M.E.	2018:09:11
7	REVISED PER CITY COMMENTS	L.M.E.	2018:06:04
6	ISSUED FOR TENDER	L.M.E.	2018:05:30
5	REVISED PER NEW LEGAL	L.M.E.	2018:04:06
4	REVISED PER CITY COMMENTS	L.M.E.	2018:02:09
3	REVISED PER CITY COMMENTS	L.M.E.	2017:10:25
2	ISSUED FOR MOE APPROVAL (BY OTHERS)	L.M.E.	2017:03:10
1	SUBMISSION 1 FOR CITY REVIEW	L.M.E.	2017:02:27

IBI GROUP
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Project Title

DAVIDSON LANDS

PHASE 1 & 2

LICENSED PROFESSIONAL ENGINEER
L. M. ERION
13379508
2020/06/05
PROVINCE OF ONTARIO

Drawing Title

STORM DRAINAGE
AREA PLAN

Scale

1:1000

Design	Date
L.E.	DEC 2016
Drawn	**Checked**
D.D. / C.C.	J.I.M.
Project No.	**Drawing No.**
37533	500

D07-16-15-0008

#17769

REVIEWED BY
DEVELOPMENT REVIEW SERVICES BRANCH

Signed _____

Date _____ 2018

Plan Number _____

LEGEND :

R126 | 0.14 | 0.52
- AREA NUMBER
- RUNOFF COEFFICIENT
- AREA IN HECTARES

No.	REVISIONS	By	Date
14			
13			
12	REVISED PHASE 2 PER CITY COMMENTS	L.M.E.	2020:06:05
11	REVISED PHASE 2 PER CITY COMMENTS	L.M.E.	2020:04:09
10	REVISED PHASE 2 AS PER CITY COMMENTS AND NEW LEGAL PLAN	L.M.E.	2020:02:07
9	PHASE 2 SUBMISSION 1 FOR CITY REVIEW	L.M.E.	2019:10:30
8	REVISED LOT NUMBERS	L.M.E.	2018:09:11
7	REVISED PER CITY COMMENTS	L.M.E.	2018:06:04
6	ISSUED FOR TENDER	L.M.E.	2018:05:30
5	REVISED PER NEW LEGAL	L.M.E.	2018:04:06
4	REVISED PER CITY COMMENTS	L.M.E.	2018:02:09
3	REVISED PER CITY COMMENTS	L.M.E.	2017:10:25
2	ISSUED FOR MOE APPROVAL (BY OTHERS)	L.M.E.	2017:03:10
1	SUBMISSION 1 FOR CITY REVIEW	L.M.E.	2017:02:27

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Project Title
DAVIDSON LANDS
PHASE 1 & 2

L. E. ENGEL
100 PROFESSIONAL ENGINEER
M. ENGEL
13379508
2020/06/05
PROVINCE OF ONTARIO

Drawing Title
STORM DRAINAGE AREA PLAN

Scale
1:1000

Design	Date
L.E.	DEC 2016
Drawn	Checked
D.D. / C.C.	J.I.M.
Project No.	Drawing No.
37533	501

D07-16-15-0008

#17769

J:\37533-DavidsonLands\3.0 Drawing\3Dcad\layouts\501 STORM DRAINAGE PLAN.dwg Layout Name: 501 STORM DRAINAGE PLAN Plot Style: AIA STANDARD-HALF.CTB Plot Scale: 1:50.8 Plotted At: 6/8/2020 10:37 AM Last Saved By: DSURNA Last Saved At: Jun 8, 20

IBI GROUP
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PROJECT:	1650 Shea Road
DATE:	2022-08-31
FILE:	139185.6.04
REV #:	1
DESIGNED BY:	Anton Chetrar
CHECKED BY:	Ryan Magladry

TEMPORARY ICD ORIFICE SIZING

Orifice coefficients	
Cv =	0.60
Cv =	0.65

							Theoretical		Recommended	
	Invert	Diameter	Centre ICD	Max. Pond Elevation	Hydraulic Slope	Target Flow	Orifice	Actual Flow	Orifice	Actual Flow
	(m)	(mm)	(m)	(m)	(m)	(l/s)	(m)	(l/s)	(m)	(l/s)
SANITARY MH	102.123	200	102.223	106.50	2.000	4.39	0.0342	4.39	0.075	21.14
STORM MH	103.191	750	103.566	106.50	2.000	367.27	0.3127	367.51	0.310	361.19

* minimum orifice size to be 0.075m

IBI Group
400-333 Preston Street
Ottawa, Ontario
K1S 5N4

Run-off Coefficients

PROJECT: 1650 Shea Road
DATE: 2022-08-31
CLIENT: Davidson Co-Tennancy
FILE: 139185.6.4

									BACK TO BACK		
									GRASS	ROOF	ASPHALT
									255.00	1121.00	
TOTAL (m^2)									255.00	1121.00	
									1376.00		
Runoff Coefficient (C) :									0.2	0.9	0.9
Ave. Runoff Coefficient (C):									0.77		

Runoff Coefficient Used(C):	**0.77**

Velocity x Depth Calculation - Davidson Lands - Phase 2

Iteration equation:

Velocity:

$$v_x = v_{min} + \frac{Q_x - Q_{min}}{Q_{max} - Q_{min}}(v_{max} - v_{min})$$

Depth:

$$d_x = d_{min} + \frac{Q_x - Q_{min}}{Q_{max} - Q_{min}}(d_{max} - d_{min})$$

100 Year 3 Hour Chicago Storm

Area ID (Dummy Segment, if applicable)	Road ROW Section	Longitudinal Slope (%)	Overflow Flowrate		SWMHYMO (37533vd.out)					Calculation Sheet: Overflow for Typical Road Ponding Area					SWMHYMO (37533vd.out)			Velocity x Depth	Maximum Static Ponding Depth	Total Depth (Static + Dynamic)
					Flowrate (cms)		Velocity (m/s)			Flowrate (cms)		Depth (m)			Depth (m)					
			Qx (l/s)	Qx (cms)	Qmin	Qmax	vmin	vmax	vx	Qmin	Qmax	dmin	dmax	dx	dmin	dmax	dx	(m^2/s)	(m)	(m)
S106	22	1.00	**0**	0.000	0.000	0.002	0.000	0.271	**0.000**	0.000	0.001	0.000	0.001	**0.000**	N/A	N/A	**0.000**	**0.000**	0.19	0.19
S202	18	0.60	**0**	0.000	0.000	0.001	0.000	0.199	**0.000**	0.000	0.001	0.000	0.001	**0.000**	N/A	N/A	**N/A**	**0.000**	0.24	0.24
S200	18	0.60	**0**	0.000	0.000	0.001	0.000	0.199	**0.000**	0.000	0.001	0.000	0.001	**0.000**	N/A	N/A	**N/A**	**0.000**	0.23	0.23
S205	18	0.60	**0**	0.000	0.000	0.001	0.000	0.199	**0.000**	0.000	0.001	0.000	0.001	**0.000**	N/A	N/A	**N/A**	**0.000**	0.10	0.10
S203B	18	0.60	**83**	0.083	0.076	0.123	0.583	0.658	**0.594**	N/A	N/A	N/A	N/A	**N/A**	0.063	0.075	**0.065**	**0.038**	0.00	0.06
S203A	18	2.00	**88**	0.088	0.081	0.116	0.594	0.649	**0.605**	0.078	0.091	0.080	0.085	**N/A**	0.033	0.038	**0.034**	**0.021**	0.22	0.25
S300A	18	0.60	**26**	0.026	0.019	0.042	0.414	0.502	**0.441**	0.021	0.027	0.050	0.055	**0.054**	N/A	N/A	**N/A**	**0.024**	0.12	0.17
S308	14.75	1.60	**8**	0.008	0.006	0.017	0.445	0.583	**0.470**	0.006	0.009	0.030	0.035	**0.034**	N/A	N/A	**N/A**	**0.016**	0.17	0.20
S301	18	0.60	**0**	0.000	0.000	0.001	0.000	0.199	**0.000**	0.000	0.001	0.000	0.001	**0.000**	N/A	N/A	**N/A**	**0.000**	0.23	0.23
S300B	18	0.60	**0**	0.000	0.000	0.001	0	0.199	**0.000**	0.000	0.001	0.000	0.001	**0.000**	N/A	N/A	**N/A**	**0.000**	0.30	0.30
S303	18	1.60	**90**	0.090	0.068	0.124	0.82	0.951	**0.871**	0.078	0.091	0.080	0.085	**0.085**	N/A	N/A	**N/A**	**0.074**	0.14	0.22
R300	3.6	1.50	**27**	0.027	0.017	0.036	0.619	0.75	**0.688**	N/A	N/A	N/A	N/A	**N/A**	0.095	0.126	**0.111**	**0.077**	0.00	0.11
R303	3.6	1.50	**60**	0.060	0.036	0.065	0.75	0.87	**0.849**	N/A	N/A	N/A	N/A	**N/A**	0.126	0.158	**0.152**	**0.130**	0.00	0.15
R301A	3.6	1.50	**23**	0.023	0.017	0.036	0.619	0.75	**0.660**	N/A	N/A	N/A	N/A	**N/A**	0.095	0.126	**0.105**	**0.069**	0.00	0.10
S187A	22	2.00	**83**	0.083	0.040	0.117	0.352	0.462	**0.413**	N/A	N/A	N/A	N/A	**N/A**	0.013	0.019	**0.016**	**0.007**	0.16	0.18
S187B S188B	20	0.80	**11**	0.011	0.005	0.014	0.387	0.507	**0.467**	0.008	0.012	0.035	0.040	**0.039**	0.027	0.041	**N/A**	**0.018**	0.03	0.07
S185	24	2.00	**111**	0.111	0.097	0.177	0.977	1.134	**1.004**	N/A	N/A	N/A	N/A	**N/A**	0.055	0.068	**0.057**	**0.058**	0.00	0.06
S107	22	0.80	**70**	0.070	0.061	0.11	0.612	0.71	**0.630**	N/A	N/A	N/A	N/A	**N/A**	0.055	0.068	**0.057**	**0.036**	0.00	0.06
S188B S187B	20	0.60	**11**	0.011	0.004	0.012	0.335	0.439	**0.426**	0.008	0.011	0.035	0.040	**0.039**	N/A	N/A	**N/A**	**0.017**	0.11	0.15
S188A	22	0.60	**0**	0.000	0.000	0.001	0	0.21	**0.000**	0.000	0.001	0.000	0.001	**0.000**	N/A	N/A	**0.000**	**0.000**	0.24	0.24
S189	22	0.80	**0**	0.000	0.000	0.002	0	0.243	**0.000**	0.000	0.001	0.000	0.001	**0.000**	N/A	N/A	**0.000**	**0.000**	0.19	0.19
S108	22	0.60	**0**	0.000	0	0.001	0	0.21	**0.000**	0.000	0.001	0.000	0.001	**0.000**	N/A	N/A	**0.000**	**0.000**	0.21	0.21
S211A	20	0.60	**0**	0.000	0	0.001	0	0.211	**0.000**	0.000	0.001	0.000	0.001	**0.000**	N/A	N/A	**N/A**	**0.000**	0.16	0.16
S211B	20	0.60	**10**	0.010	0.008	0.024	0.335	0.439	**0.348**	0.008	0.011	0.035	0.040	**0.038**	N/A	N/A	**N/A**	**0.013**	0.18	0.22
S109	20	0.50	**33**	0.033	0.022	0.048	0.401	0.486	**0.437**	0.027	0.034	0.055	0.060	**0.059**	N/A	N/A	**N/A**	**0.026**	0.19	0.25
S221	18	1.00	**115**	0.115	0.098	0.159	0.752	0.849	**0.779**	N/A	N/A	N/A	N/A	**N/A**	0.063	0.075	**0.066**	**0.052**	0.00	0.07
S223	18	1.00	**132**	0.132	0.098	0.159	0.752	0.849	**0.806**	0.119	0.136	0.095	0.100	**0.099**	N/A	N/A	**N/A**	**0.080**	0.22	0.32
S231	18	0.82	**63**	0.063	0.049	0.089	0.587	0.681	**0.620**	N/A	N/A	N/A	N/A	**N/A**	0.05	0.063	**0.055**	**0.034**	0.00	0.05
S233	18	0.90	**8**	0.008	0.008	0.024	0.387	0.508	**0.387**	0.006	0.008	0.030	0.035	**0.034**	N/A	N/A	**N/A**	**0.013**	0.20	0.23
S234	18	1.00	**43**	0.043	0.025	0.054	0.535	0.648	**0.605**	0.035	0.043	0.060	0.065	**0.065**	N/A	N/A	**N/A**	**0.039**	0.12	0.18
S226 S216	18	0.50	**229**	0.229	0.17	0.242	0.666	0.728	**0.717**	0.215	0.240	0.120	0.125	**0.123**	N/A	N/A	**N/A**	**0.088**	0.20	0.32
S176B	20	0.70	**202**	0.202	0.181	0.247	0.912	0.987	**0.936**	0.192	0.215	0.115	0.120	**0.117**	N/A	N/A	**N/A**	**0.110**	0.13	0.25
S215	18	0.80	**0**	0.000	0	0.001	0	0.23	**0.000**	0.000	0.001	0.000	0.001	**0.000**	N/A	N/A	**N/A**	**0.000**	0.25	0.25
S216 S226	18	0.50	**229**	0.229	0.17	0.242	0.666	0.728	**0.717**	0.215	0.240	0.120	0.125	**0.123**	N/A	N/A	**N/A**	**0.088**	0.20	0.32
S111	18	0.60	**106**	0.106	0.076	0.123	0.583	0.658	**0.631**	0.100	0.115	0.090	0.095	**0.092**	N/A	N/A	**N/A**	**0.058**	0.24	0.33
S112	18	0.65	**61**	0.061	0.043	0.079	0.523	0.606	**0.565**	0.051	0.061	0.070	0.075	**0.075**	N/A	N/A	**N/A**	**0.042**	0.24	0.31
S176A	20	2.00	**7**	0.007	0.002	0.015	0.386	0.612	**0.473**	0.006	0.009	0.030	0.035	**0.032**	N/A	N/A	**N/A**	**0.015**	0.06	0.09
S176C	20	0.60	**11**	0.011	0.008	0.024	0.335	0.439	**0.355**	0.008	0.011	0.035	0.040	**0.039**	N/A	N/A	**N/A**	**0.014**	0.21	0.25
S177	20	0.60	**69**	0.069	0.053	0.096	0.532	0.617	**0.564**	N/A	N/A	N/A	N/A	**N/A**	0.055	0.068	**0.060**	**0.034**	0.00	0.06
S178	18	1.50	**83**	0.083	0.06	0.097	0.921	1.04	**0.995**	0.078	0.091	0.080	0.085	**0.082**	0.063	0.075	**N/A**	**0.082**	0.17	0.25
S179	18	1.50	**83**	0.083	0.051	0.109	0.735	0.89	**0.821**	N/A	N/A	N/A	N/A	**N/A**	0.036	0.048	**0.043**	**0.035**	0.17	0.21
R203	3.6	1.50	**54**	0.054	0.036	0.065	0.75	0.87	**0.824**	N/A	N/A	N/A	N/A	**N/A**	0.126	0.158	**0.146**	**0.120**	0.00	0.15
R188A	3.6	1.50	**42**	0.042	0.036	0.065	0.75	0.87	**0.775**	N/A	N/A	N/A	N/A	**N/A**	0.126	0.158	**0.133**	**0.103**	0.00	0.13
R188B	3.6	1.50	**29**	0.029	0.017	0.036	0.619	0.75	**0.702**	N/A	N/A	N/A	N/A	**N/A**	0.095	0.126	**0.115**	**0.080**	0.00	0.11
R215	3.6	1.50	**15**	0.015	0.006	0.017	0.473	0.619	**0.592**	N/A	N/A	N/A	N/A	**N/A**	0.063	0.095	**0.089**	**0.053**	0.00	0.09
R216	3.6	1.50	**32**	0.032	0.017	0.036	0.619	0.75	**0.722**	N/A	N/A	N/A	N/A	**N/A**	0.095	0.126	**0.119**	**0.086**	0.00	0.12
R233	3.6	1.50	**27**	0.027	0.017	0.036	0.619	0.75	**0.688**	N/A	N/A	N/A	N/A	**N/A**	0.095	0.126	**0.111**	**0.077**	0.00	0.11
R223	3.6	1.50	**37**	0.037	0.036	0.065	0.75	0.87	**0.754**	N/A	N/A	N/A	N/A	**N/A**	0.126	0.158	**0.127**	**0.096**	0.00	0.13
S142	18	4.00	**75**	0.075	0.05	0.108	1.07	1.296	**1.167**	0.067	0.080	0.075	0.080	**0.078**	N/A	N/A	**N/A**	**0.091**	0.13	0.21
S146	18	4.00	**17**	0.017	0.017	0.050	0.817	1.070	**0.817**	N/A	N/A	N/A	N/A	**N/A**	0.025	0.038	**0.025**	**0.020**	0.00	0.03
S141A	14.75	2.30	**38**	0.038	0.021	0.044	0.699	0.847	**0.808**	N/A	N/A	N/A	N/A	**N/A**	0.030	0.040	**0.037**	**0.030**	0.00	0.04
S141B	18	2.00	**72**	0.072	0.069	0.112	1.064	1.201	**1.074**	N/A	N/A	N/A	N/A	**N/A**	0.063	0.075	**0.064**	**0.069**	0.00	0.06
S143	18	2.00	**176**	0.176	0.170	0.242	1.331	1.455	**1.341**	N/A	N/A	N/A	N/A	**N/A**	0.088	0.100	**0.089**	**0.119**	0.00	0.09
R147	3.6	1.50	**0**	0.000	0.000	0.001	0.000	0.298	**0.000**	N/A	N/A	N/A	N/A	**N/A**	0.000	0.032	**0.000**	**0.000**	0.00	0.00
R146	3.6	1.50	**22**	0.022	0.017	0.036	0.619	0.750	**0.653**	N/A	N/A	N/A	N/A	**N/A**	0.095	0.126	**0.103**	**0.067**	0.00	0.10
R141	3.6	1.50	**13**	0.013	0.006	0.017	0.473	0.619	**0.566**	N/A	N/A	N/A	N/A	**N/A**	0.063	0.095	**0.083**	**0.047**	0.00	0.08
S305	14.75	0.60	**84**	0.084	0.067	0.100	0.567	0.628	**0.598**	0.073	0.086	0.080	0.085	**0.084**	0.060	0.070	**0.065**	**0.039**	0.26	0.34
R301B	3.6	1.50	**63**	0.063	0.036	0.065	0.750	0.870	**0.862**	N/A	N/A	N/A	N/A	**N/A**	0.126	0.158	**0.156**	**0.134**	0.00	0.16

Same as before (+0.002m)

Rounds to 0.35+0.008m)

Velocity x Depth Calculation - Davidson Lands - Phase 2

Iteration equation:

Velocity:

$$v_x = v_{min} + \frac{Q_x - Q_{min}}{Q_{max} - Q_{min}}(v_{max} - v_{min})$$

Depth:

$$d_x = d_{min} + \frac{Q_x - Q_{min}}{Q_{max} - Q_{min}}(d_{max} - d_{min})$$

100 Year 3 Hour Chicago Storm + 20%

					SWMHYMO (37533vd.out)					Calculation Sheet: Overflow for Typical Road Ponding Area					SWMHYMO (37533vd.out)			Velocity x Depth	Maximum Static Ponding Depth	Total Depth (Static + Dynamic)
Area ID (Dummy Segment, if applicable)	Road ROW Section	Longitudinal Slope (%)	Overflow Flowrate		Flowrate (cms)		Velocity (m/s)			Flowrate (cms)		Depth (m)			Depth (m)					
			Qx (l/s)	Qx (cms)	Qmin	Qmax	vmin	vmax	vx	Qmin	Qmax	dmin	dmax	dx	dmin	dmax	dx	(m^2/s)	(m)	(m)
S106	22	1.00	**0**	0.000	0.000	0.002	0.000	0.271	**0.000**	0.000	0.001	0.000	0.001	**0.000**	N/A	N/A	**0.000**	**0.000**	0.19	0.19
S202	18	0.60	**537**	0.537	0.481	0.645	0.925	1.031	**0.961**	0.500	0.544	0.160	0.165	**0.164**	N/A	N/A	**N/A**	**0.158**	0.24	0.40
S200	18	0.60	**468**	0.468	0.363	0.481	0.862	0.925	**0.918**	0.458	0.500	0.155	0.160	**0.156**	N/A	N/A	**N/A**	**0.143**	0.23	0.39
S205	18	0.60	**0**	0.000	0.000	0.001	0.000	0.199	**0.000**	0.000	0.001	0.000	0.001	**0.000**	N/A	N/A	**N/A**	**0.000**	0.10	0.10
S203B	18	0.60	**111**	0.111	0.076	0.123	0.583	0.658	**0.639**	N/A	N/A	N/A	N/A	**N/A**	0.063	0.075	**0.072**	**0.046**	0.00	0.07
S203A	18	2.00	**440**	0.440	0.424	0.517	0.897	0.943	**0.905**	0.402	0.443	0.145	0.150	**N/A**	0.062	0.066	**0.063**	**0.057**	0.22	0.28
S300A	18	0.60	**43**	0.043	0.042	0.076	0.502	0.583	**0.504**	0.042	0.051	0.065	0.070	**0.066**	N/A	N/A	**N/A**	**0.033**	0.12	0.19
S308	14.75	1.60	**38**	0.038	0.037	0.067	0.706	0.820	**0.710**	0.036	0.045	0.060	0.065	**0.061**	N/A	N/A	**N/A**	**0.043**	0.17	0.23
S301	18	0.60	**35**	0.035	0.019	0.042	0.414	0.502	**0.475**	0.034	0.042	0.060	0.065	**0.061**	N/A	N/A	**N/A**	**0.029**	0.23	0.29
S300B	18	0.60	**0**	0.000	0.000	0.001	0	0.199	**0.000**	0.000	0.001	0.000	0.001	**0.000**	N/A	N/A	**N/A**	**0.000**	0.30	0.30
S303	18	1.60	**164**	0.164	0.124	0.201	0.951	1.074	**1.015**	0.160	0.181	0.105	0.110	**0.106**	N/A	N/A	**N/A**	**0.107**	0.14	0.25
R300	3.6	1.50	**45**	0.045	0.036	0.065	0.75	0.87	**0.787**	N/A	N/A	N/A	N/A	**N/A**	0.126	0.158	**0.136**	**0.107**	0.00	0.14
R303	3.6	1.50	**101**	0.101	0.065	0.106	0.87	0.983	**0.969**	N/A	N/A	N/A	N/A	**N/A**	0.158	0.189	**0.185**	**0.180**	0.00	0.19
R301A	3.6	1.50	**40**	0.040	0.036	0.065	0.75	0.87	**0.767**	N/A	N/A	N/A	N/A	**N/A**	0.126	0.158	**0.130**	**0.100**	0.00	0.13
S187A	22	2.00	**196**	0.196	0.117	0.254	0.462	0.563	**0.520**	N/A	N/A	N/A	N/A	**N/A**	0.019	0.025	**0.022**	**0.012**	0.16	0.18
S187B S188B	20	0.80	**14**	0.014	0.014	0.03	0.507	0.614	**0.507**	0.012	0.016	0.040	0.045	**0.043**	0.041	0.055	**N/A**	**0.022**	0.03	0.07
S185	24	2.00	**179**	0.179	0.177	0.287	1.134	1.28	**1.137**	N/A	N/A	N/A	N/A	**N/A**	0.068	0.082	**0.068**	**0.078**	0.00	0.07
S107	22	0.80	**93**	0.093	0.061	0.11	0.612	0.71	**0.676**	N/A	N/A	N/A	N/A	**N/A**	0.055	0.068	**0.063**	**0.043**	0.00	0.06
S188B S187B	20	0.60	**14**	0.014	0.012	0.026	0.439	0.532	**0.452**	0.011	0.016	0.040	0.045	**0.043**	N/A	N/A	**N/A**	**0.019**	0.11	0.15
S188A	22	0.60	**22**	0.022	0.008	0.024	0.334	0.437	**0.424**	0.021	0.027	0.050	0.055	**0.051**	N/A	N/A	**N/A**	**0.022**	0.24	0.29
S189	22	0.80	**0**	0.000	0.000	0.002	0	0.243	**0.000**	0.000	0.001	0.000	0.001	**0.000**	N/A	N/A	**0.000**	**0.000**	0.19	0.19
S108	22	0.60	**0**	0.000	0	0.001	0	0.21	**0.000**	0.000	0.001	0.000	0.001	**N/A**	N/A	N/A	**0.000**	**0.000**	0.21	0.21
S211A	20	0.60	**7**	0.007	0.001	0.008	0.211	0.335	**0.317**	0.005	0.008	0.030	0.035	**0.033**	N/A	N/A	**N/A**	**0.010**	0.16	0.19
S211B	20	0.60	**24**	0.024	0.024	0.053	0.439	0.532	**0.439**	0.021	0.027	0.050	0.055	**0.053**	N/A	N/A	**N/A**	**0.023**	0.18	0.23
S109	20	0.50	**179**	0.179	0.142	0.214	0.636	0.705	**0.671**	0.170	0.192	0.110	0.115	**0.112**	N/A	N/A	**N/A**	**0.075**	0.19	0.30
S221	18	1.00	**155**	0.155	0.098	0.159	0.752	0.849	**0.843**	N/A	N/A	N/A	N/A	**N/A**	0.063	0.075	**0.074**	**0.063**	0.00	0.07
S223	18	1.00	**231**	0.231	0.159	0.24	0.849	0.941	**0.931**	0.222	0.247	0.120	0.125	**0.122**	N/A	N/A	**N/A**	**0.113**	0.22	0.34
S231	18	0.82	**86**	0.086	0.049	0.089	0.587	0.681	**0.674**	N/A	N/A	N/A	N/A	**N/A**	0.05	0.063	**0.062**	**0.042**	0.00	0.06
S233	18	0.90	**89**	0.089	0.051	0.093	0.615	0.714	**0.705**	0.088	0.103	0.085	0.090	**0.085**	N/A	N/A	**N/A**	**0.060**	0.20	0.29
S234	18	1.00	**138**	0.138	0.098	0.159	0.752	0.849	**0.816**	0.136	0.155	0.100	0.105	**0.100**	N/A	N/A	**N/A**	**0.082**	0.12	0.22
S226 S216	18	0.50	**677**	0.677	0.589	0.763	0.941	1.043	**0.993**	0.638	0.687	0.175	0.180	**0.179**	N/A	N/A	**N/A**	**0.178**	0.20	0.38
S176B	20	0.70	**613**	0.613	0.582	0.729	1.345	1.432	**1.363**	0.590	0.638	0.170	0.175	**0.172**	N/A	N/A	**N/A**	**0.235**	0.13	0.30
S215	18	0.80	**29**	0.029	0.022	0.048	0.479	0.58	**0.506**	0.028	0.035	0.055	0.060	**0.056**	N/A	N/A	**N/A**	**0.028**	0.25	0.31
S216 S226	18	0.50	**677**	0.677	0.589	0.763	0.941	1.043	**0.993**	0.638	0.687	0.175	0.180	**0.179**	N/A	N/A	**N/A**	**0.178**	0.20	0.38
S111	18	0.60	**527**	0.527	0.481	0.645	0.925	1.031	**0.955**	0.500	0.544	0.160	0.165	**0.163**	N/A	N/A	**N/A**	**0.156**	0.24	0.40
S112	18	0.65	**452**	0.452	0.378	0.5	0.897	0.963	**0.937**	0.417	0.458	0.150	0.155	**0.154**	N/A	N/A	**N/A**	**0.145**	0.24	0.39
S176A	20	2.00	**22**	0.022	0.015	0.045	0.612	0.802	**0.656**	0.017	0.022	0.045	0.050	**0.050**	N/A	N/A	**N/A**	**0.033**	0.06	0.11
S176C	20	0.60	**68**	0.068	0.053	0.096	0.532	0.617	**0.562**	0.061	0.073	0.075	0.080	**0.078**	N/A	N/A	**N/A**	**0.044**	0.21	0.29
S177	20	0.60	**144**	0.144	0.096	0.155	0.617	0.697	**0.682**	N/A	N/A	N/A	N/A	**N/A**	0.068	0.082	**0.079**	**0.054**	0.00	0.08
S178	18	1.50	**397**	0.427	0.38	0.509	1.462	1.628	**1.522**	0.402	0.443	0.145	0.150	**0.148**	0.125	0.138	**N/A**	**0.225**	0.17	0.32
S179	18	1.50	**427**	0.427	0.321	0.484	1.166	1.293	**1.249**	N/A	N/A	N/A	N/A	**N/A**	0.073	0.085	**0.081**	**0.101**	0.17	0.25
R203	3.6	1.50	**90**	0.090	0.065	0.106	0.87	0.983	**0.939**	N/A	N/A	N/A	N/A	**N/A**	0.158	0.189	**0.177**	**0.166**	0.00	0.18
R188A	3.6	1.50	**70**	0.070	0.065	0.106	0.87	0.983	**0.884**	N/A	N/A	N/A	N/A	**N/A**	0.158	0.189	**0.162**	**0.143**	0.00	0.16
R188B	3.6	1.50	**54**	0.054	0.036	0.065	0.75	0.87	**0.824**	N/A	N/A	N/A	N/A	**N/A**	0.126	0.158	**0.146**	**0.120**	0.00	0.15
R215	3.6	1.50	**26**	0.026	0.017	0.036	0.619	0.75	**0.681**	N/A	N/A	N/A	N/A	**N/A**	0.095	0.126	**0.110**	**0.075**	0.00	0.11
R216	3.6	1.50	**55**	0.055	0.036	0.065	0.75	0.87	**0.829**	N/A	N/A	N/A	N/A	**N/A**	0.126	0.158	**0.147**	**0.122**	0.00	0.15
R233	3.6	1.50	**50**	0.050	0.036	0.065	0.75	0.87	**0.808**	N/A	N/A	N/A	N/A	**N/A**	0.126	0.158	**0.141**	**0.114**	0.00	0.14
R223	3.6	1.50	**69**	0.069	0.065	0.106	0.87	0.983	**0.881**	N/A	N/A	N/A	N/A	**N/A**	0.158	0.189	**0.161**	**0.142**	0.00	0.16
S142	18	4.00	**125**	0.125	0.108	0.196	1.296	1.504	**1.336**	0.109	0.126	0.090	0.095	**0.095**	N/A	N/A	**N/A**	**0.126**	0.13	0.22
S146	18	4.00	**23**	0.023	0.017	0.05	0.817	1.07	**0.863**	N/A	N/A	N/A	N/A	**N/A**	0.025	0.038	**0.027**	**0.024**	0.00	0.03
S141A	14.75	2.30	**55**	0.055	0.044	0.08	0.847	0.983	**0.889**	N/A	N/A	N/A	N/A	**N/A**	0.04	0.05	**0.043**	**0.038**	0.00	0.04
S141B	18	2.00	**104**	0.104	0.069	0.112	1.064	1.201	**1.176**	N/A	N/A	N/A	N/A	**N/A**	0.063	0.075	**0.073**	**0.086**	0.00	0.07
S143	18	2.00	**267**	0.267	0.242	0.331	1.455	1.574	**1.488**	N/A	N/A	N/A	N/A	**N/A**	0.1	0.113	**0.104**	**0.154**	0.00	0.10
R147	3.6	1.50	**3**	0.003	0.001	0.006	0.298	0.473	**0.368**	N/A	N/A	N/A	N/A	**N/A**	0.032	0.063	**0.044**	**0.016**	0.00	0.04
R146	3.6	1.50	**39**	0.039	0.036	0.065	0.75	0.87	**0.762**	N/A	N/A	N/A	N/A	**N/A**	0.126	0.158	**0.129**	**0.099**	0.00	0.13
R141	3.6	1.50	**24**	0.024	0.017	0.036	0.619	0.75	**0.667**	N/A	N/A	N/A	N/A	**N/A**	0.095	0.126	**0.106**	**0.071**	0.00	0.11
S305	14.75	0.60	**193**	0.193	0.176	0.241	0.841	0.91	**0.859**	0.192	0.215	0.115	0.120	**0.115**	0.08	0.09	**0.083**	**0.071**	0.26	0.38
R301B	3.6	1.50	**107**	0.107	0.106	0.16	0.983	1.089	**0.985**	N/A	N/A	N/A	N/A	**N/A**	0.189	0.221	**0.190**	**0.187**	0.00	0.19
R185A	3.6	1.50	**16**	0.016	0.006	0.017	0.473	0.619	**0.606**	N/A	N/A	N/A	N/A	**N/A**	0.063	0.095	**0.092**	**0.056**	0.00	0.09

Same as before (+0.002m)

Same as before (+0.004m)

Velocity x Depth Calculation - 1650 Shea Rd

Iteration equation:

Velocity:

$$v_x = v_{min} + \frac{Q_x - Q_{min}}{Q_{max} - Q_{min}} (v_{max} - v_{min})$$

Depth:

$$d_x = d_{min} + \frac{Q_x - Q_{min}}{Q_{max} - Q_{min}} (d_{max} - d_{min})$$

100 Year 3 Hour Chicago Storm

Area ID (Dummy Segment, if applicable)	Road ROW Section	Longitudinal Slope (%)	Overflow Flowrate		SWMHYMO (139185vd.out)					Calculation Sheet: Overflow for Typical Road Ponding Area					SWMHYMO (139185vd.out)			Velocity x Depth	Maximum Static Ponding Depth	Total Depth (Static + Dynamic)
					Flowrate (cms)		Velocity (m/s)			Flowrate (cms)		Depth (m)			Depth (m)					
			Qx (l/s)	Qx (cms)	Qmin	Qmax	vmin	vmax	vx	Qmin	Qmax	dmin	dmax	dx	dmin	dmax	dx	(m^2/s)	(m)	(m)
S1	8.9	0.74	**14**	0.014	0.009	0.016	0.224	0.260	**0.250**	0.011	0.016	0.040	0.045	**N/A**	0.034	0.042	**0.040**	**0.010**	0.10	0.14
S3	8.9	0.76	**19**	0.019	0.016	0.026	0.264	0.298	**0.274**	0.016	0.021	0.045	0.050	**N/A**	0.042	0.051	**0.045**	**0.012**	0.11	0.15
S22	11.75	0.67	**14**	0.014	0.008	0.015	0.213	0.248	**0.243**	0.011	0.016	0.040	0.045	**N/A**	0.034	0.042	**0.041**	**0.010**	0.06	0.10
S20	18	0.76	**36**	0.036	0.022	0.047	0.466	0.565	**0.521**	0.035	0.043	0.060	0.065	**0.061**	0.038	0.050	**N/A**	**0.032**	0.10	0.16
S4	8.9	0.82	**58**	0.058	0.057	0.078	0.375	0.405	**0.376**	0.053	0.063	0.070	0.075	**N/A**	0.067	0.076	**0.067**	**0.025**	0.10	0.17
S21A	18	3.00	**30**	0.030	0.015	0.043	0.707	0.927	**0.825**	N/A	N/A	N/A	N/A	**N/A**	0.025	0.038	**0.032**	**0.026**	0.00	0.03
S21	18	0.82	**22**	0.022	0.015	0.043	0.707	0.927	**0.762**	0.021	0.028	0.050	0.055	**0.050**	0.025	0.038	**N/A**	**0.038**	0.05	0.10
S5	8.9	0.81	**74**	0.074	0.057	0.078	0.373	0.403	**0.397**	0.063	0.075	0.075	0.080	**N/A**	0.067	0.076	**0.074**	**0.030**	0.10	0.17
S30	18	0.81	**36**	0.036	0.023	0.049	0.482	0.583	**0.533**	0.035	0.043	0.060	0.065	**0.061**	0.038	0.050	**N/A**	**0.032**	0.10	0.16
S6	8.9	0.80	**95**	0.095	0.077	0.103	0.4	0.43	**0.421**	0.088	0.103	0.085	0.090	**N/A**	0.076	0.084	**0.082**	**0.034**	0.11	0.19
S32	11.75	0.51	**0**	0.000	0.000	0.001	0	0.074	**0.000**	0.000	0.001	0.000	0.001	**N/A**	0	0.008	**0.000**	**0.000**	0.16	0.16
S31	18	0.80	**35**	0.035	0.022	0.048	0.479	0.58	**0.530**	0.035	0.043	0.060	0.065	**0.060**	0.038	0.050	**N/A**	**0.032**	0.11	0.17
S8	8.9	2.00	**182**	0.182	0.162	0.232	0.759	0.829	**0.779**	0.181	0.204	0.110	0.115	**N/A**	0.037	0.042	**0.038**	**0.030**	0.08	0.12
S40A	18	3.00	**43**	0.043	0.043	0.093	0.927	1.123	**0.927**	N/A	N/A	N/A	N/A	**N/A**	0.038	0.050	**0.038**	**0.035**	0.00	0.04
S40B	18	3.40	**27**	0.027	0.016	0.046	0.753	0.987	**0.839**	0.022	0.029	0.050	0.055	**0.054**	0.025	0.038	**N/A**	**0.045**	0.12	0.17
S50A S50B	18	0.62	**33**	0.033	0.021	0.038	0.51	0.592	**0.568**	0.027	0.034	0.055	0.060	**0.059**	0.050	0.063	**N/A**	**0.034**	0.22	0.28
S50B S50A	18	0.62	**33**	0.033	0.021	0.038	0.51	0.592	**0.568**	0.027	0.034	0.055	0.060	**0.059**	0.050	0.063	**N/A**	**0.034**	0.22	0.28
S54	18	0.62	**13**	0.013	0.010	0.021	0.421	0.51	**0.445**	0.011	0.016	0.040	0.045	**0.042**	0.038	0.050	**N/A**	**0.019**	0.06	0.10
S10 S9	18	0.50	**58**	0.058	0.056	0.085	0.601	0.666	**0.605**	0.051	0.061	0.070	0.075	**0.073**	0.075	0.088	**N/A**	**0.044**	0.04	0.11
S9 S10	8.9	0.53	**58**	0.058	0.046	0.063	0.301	0.326	**0.319**	0.051	0.061	0.070	0.075	**N/A**	0.067	0.076	**0.073**	**0.023**	0.05	0.12
UNC1	8.9	5.00	**19**	0.019	0.010	0.022	0.481	0.583	**0.558**	N/A	N/A	N/A	N/A	**N/A**	0.025	0.034	**0.032**	**0.018**	0.00	0.03

Velocity x Depth Calculation - 1650 Shea Rd

Iteration equation:

Velocity:

$$v_x = v_{min} + \frac{Q_x - Q_{min}}{Q_{max} - Q_{min}} (v_{max} - v_{min})$$

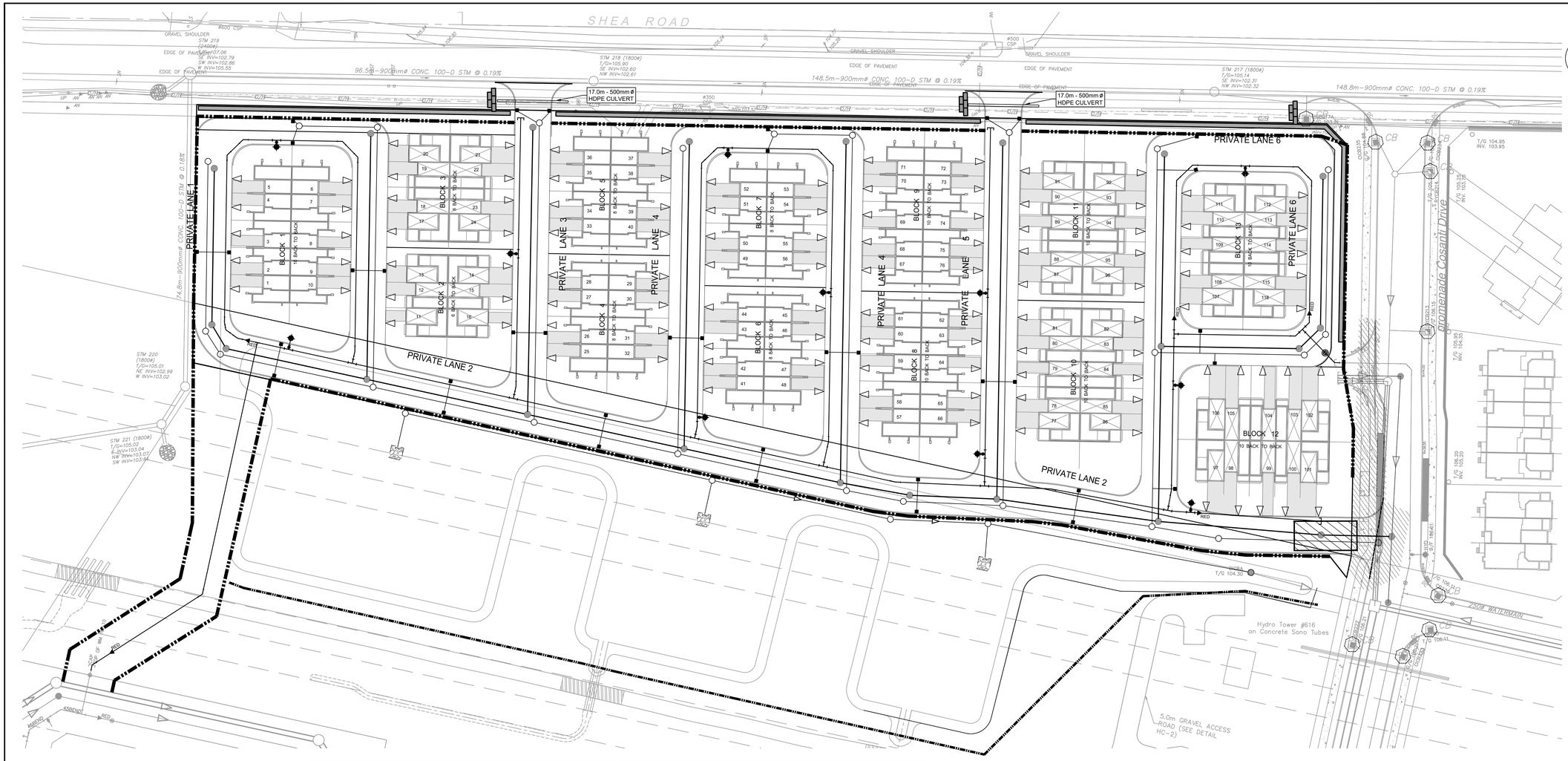
Depth:

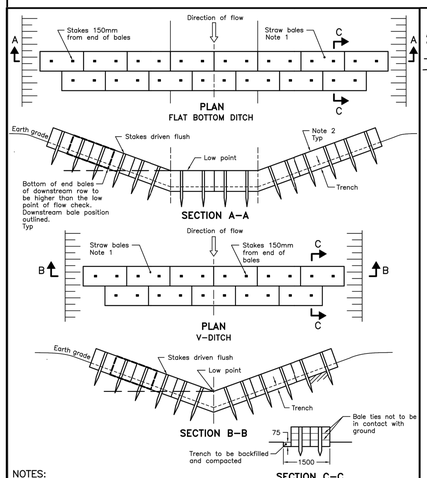
$$d_x = d_{min} + \frac{Q_x - Q_{min}}{Q_{max} - Q_{min}} (d_{max} - d_{min})$$

100 Year 3 Hour Chicago Storm + 20%																				
					SWMHYMO (139185vd.out)					Calculation Sheet: Overflow for Typical Road Ponding Area					SWMHYMO (139185vd.out)			Velocity x Depth	Maximum Static Ponding Depth	Total Depth (Static + Dynamic)
Area ID (Dummy Segment, if applicable)	Road ROW Section	Longitudinal Slope (%)	Overflow Flowrate		Flowrate (cms)		Velocity (m/s)			Flowrate (cms)		Depth (m)			Depth (m)					
			Qx (l/s)	Qx (cms)	Qmin	Qmax	vmin	vmax	vx	Qmin	Qmax	dmin	dmax	dx	dmin	dmax	dx	(m^2/s)	(m)	(m)
S1	8.9	0.74	**20**	0.020	0.016	0.025	0.260	0.294	**0.275**	0.016	0.021	0.045	0.050	**N/A**	0.042	0.051	**0.046**	**0.013**	0.10	0.15
S3	8.9	0.76	**31**	0.031	0.026	0.039	0.298	0.330	**0.310**	0.028	0.035	0.055	0.060	**N/A**	0.051	0.059	**0.054**	**0.017**	0.11	0.16
S22	11.75	0.67	**20**	0.020	0.015	0.024	0.248	0.280	**0.266**	0.016	0.021	0.045	0.050	**N/A**	0.042	0.051	**0.047**	**0.012**	0.06	0.11
S20	18	0.76	**54**	0.054	0.047	0.085	0.565	0.656	**0.582**	0.053	0.063	0.070	0.075	**0.071**	0.050	0.063	**N/A**	**0.041**	0.10	0.17
S4	8.9	0.82	**86**	0.086	0.078	0.104	0.405	0.435	**0.414**	0.075	0.088	0.080	0.085	**N/A**	0.076	0.084	**0.078**	**0.033**	0.10	0.18
S21A	18	3.00	**38**	0.038	0.015	0.043	0.707	0.927	**0.888**	N/A	N/A	N/A	N/A	**N/A**	0.025	0.038	**0.036**	**0.032**	0.00	0.04
S21	18	0.82	**34**	0.034	0.015	0.043	0.707	0.927	**0.856**	0.028	0.035	0.055	0.060	**0.059**	0.025	0.038	**N/A**	**0.051**	0.05	0.11
S5	8.9	0.81	**116**	0.116	0.103	0.133	0.432	0.461	**0.445**	0.103	0.119	0.090	0.095	**N/A**	0.084	0.093	**0.088**	**0.039**	0.10	0.19
S30	18	0.81	**52**	0.052	0.049	0.088	0.583	0.677	**0.590**	0.043	0.053	0.065	0.070	**0.070**	0.050	0.063	**N/A**	**0.041**	0.10	0.17
S6	8.9	0.80	**152**	0.152	0.132	0.167	0.458	0.485	**0.473**	0.136	0.155	0.100	0.105	**N/A**	0.093	0.101	**0.098**	**0.046**	0.11	0.21
S32	11.75	0.51	**5**	0.005	0.003	0.007	0.154	0.186	**0.170**	0.003	0.005	0.025	0.030	**N/A**	0.025	0.034	**0.030**	**0.005**	0.16	0.19
S31	18	0.80	**53**	0.053	0.048	0.087	0.580	0.673	**0.592**	0.053	0.063	0.070	0.075	**0.070**	0.050	0.063	**N/A**	**0.042**	0.11	0.18
S8	8.9	2.00	**316**	0.316	0.232	0.317	0.829	0.897	**0.896**	0.287	0.323	0.130	0.135	**N/A**	0.042	0.047	**0.047**	**0.042**	0.08	0.13
S40A	18	3.00	**57**	0.057	0.043	0.093	0.927	1.123	**0.982**	N/A	N/A	N/A	N/A	**N/A**	0.038	0.050	**0.041**	**0.041**	0.00	0.04
S40B	18	3.40	**39**	0.039	0.016	0.046	0.753	0.987	**0.932**	0.036	0.045	0.060	0.065	**0.062**	0.025	0.038	**N/A**	**0.058**	0.12	0.18
S50A S50B	18	0.62	**71**	0.071	0.063	0.094	0.669	0.741	**0.688**	0.061	0.073	0.075	0.080	**0.079**	0.075	0.088	**N/A**	**0.054**	0.22	0.30
S50B S50A	18	0.62	**71**	0.071	0.063	0.094	0.669	0.741	**0.688**	0.061	0.073	0.075	0.080	**0.079**	0.075	0.088	**N/A**	**0.054**	0.22	0.30
S54	18	0.62	**23**	0.023	0.021	0.038	0.510	0.592	**0.520**	0.021	0.027	0.050	0.055	**0.052**	0.050	0.063	**N/A**	**0.027**	0.06	0.11
S10 S9	18	0.50	**136**	0.136	0.121	0.166	0.728	0.787	**0.748**	0.132	0.150	0.100	0.105	**0.101**	0.100	0.113	**N/A**	**0.076**	0.04	0.14
S9 S10	8.9	0.53	**136**	0.136	0.136	0.168	0.395	0.417	**0.395**	0.132	0.150	0.100	0.105	**N/A**	0.101	0.109	**0.101**	**0.040**	0.05	0.15
UNC1	8.9	5.00	**24**	0.024	0.022	0.040	0.583	0.677	**0.593**	N/A	N/A	N/A	N/A	**N/A**	0.034	0.042	**0.035**	**0.021**	0.00	0.03

APPENDIX E

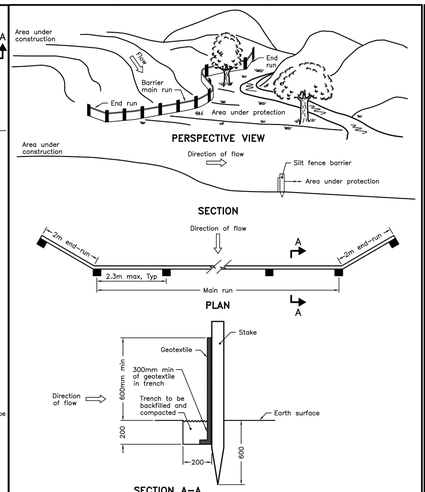
139185-900 - Erosion and Sediment Control Plan
139185-200 - Grading Plan
139185-201 - Dry Pond Compensation Cut/Fill Analysis





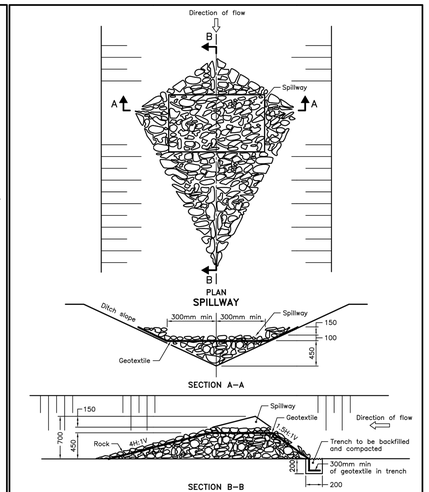
NOTES:
1 Number of bales varies to suit ditch.
2 Straw bales to be butted tightly against adjoining bales and shaped to conform to the sides of the ditch to prevent water flow through barrier.
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2006	Rev 1
STRAW BALE FLOW CHECK DAM		OPSD 219.180



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

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2006	Rev 1
LIGHT–DUTY SILT FENCE BARRIER		OPSD 219.110



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

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2006	Rev 1
ROCK FLOW CHECK DAM V–DITCH		OPSD 219.210

NOTES:

THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY,

1. SILT FENCE TO BE ERECTED PRIOR TO EARTH WORKS BEING COMMENCED. SILT FENCE TO BE MAINTAINED UNTIL VEGETATION IS ESTABLISHED OR UNTIL START OF SUBSEQUENT PHASE.
2. STRAW BALE SEDIMENT TRAPS TO BE CONSTRUCTED IN EXISTING ROAD SIDE DITCHES. TRAPS TO REMAIN AND BE MAINTAINED UNTIL VEGETATION IS ESTABLISHED.
3. SILT SACK TO BE PLACED AND MAINTAINED UNDER COVER OF ALL CATCHBASINS. GEOTEXTILE SILT SACK IN STREET CBs TO REMAIN UNTIL ALL CURBS ARE CONSTRUCTED. GEOTEXTILE FABRIC IN RYCBs TO REMAIN UNTIL VEGETATION IS ESTABLISHED. ALL CATCHBASINS TO BE REGULARLY INSPECTED AND CLEANED, AS NECESSARY, UNTIL SOD AND CURBS ARE CONSTRUCTED.
4. CONTRACTOR TO PROVIDE DETAILS ON LOCATION(S) AND DESIGN OF DEWATERING TRAP(S) PRIOR TO COMMENCING WORK. CONTRACTOR ALSO RESPONSIBLE FOR MAINTAINING TRAP(S) AND ADJUSTING SIZE(S) IF DEEMED REQUIRED BY THE ENGINEER DURING CONSTRUCTION.
5. CONTRACTOR TO PROTECT EXISTING CATCHBASINS WITH FILTER CLOTH UNDER THE COVERS TO TRAP SEDIMENTATION. REFER TO IDENTIFIED STRUCTURES.
6. WORKS NOTED ABOVE ARE TO BE INSTALLED, INSPECTED, MAINTAINED AND ULTIMATELY REMOVED BY SERVICING CONTRACTOR.
7. THIS IS A "LIVING DOCUMENT" AND MAY BE MODIFIED IN THE EVENT THE PROPOSED CONTROL MEASURES ARE INSUFFICIENT

LEGEND :

- LIGHT DUTY SILT FENCE AS PER OPSD-219.110
- SNOW FENCE
- STRAW BALE CHECK DAM AS PER OPSD-219.180
- ROCK CHECK DAM AS PER OPSD-219.210
- CB — SILT SACK PLACED UNDER EXISTING CB COVER
- TEMPORARY MUD MAT 0.15m THICK 50mm CLEAR STONE ON NON WOVEN FILTER CLOTH (7.0 x 15.0)

CLIENT

DAVIDSON SHEA PROPERTY INC.

ISSUES

No.	DESCRIPTION	DATE
1	SUBMISSION NO.1 FOR CITY REVIEW	2022-07-_
2		
3		
4		
5		
6		
7		
8		

SEE 010, 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS

KEY PLAN

CONSULTANTS

1:500 0 5 15 25m

SEAL

LICENSED PROFESSIONAL ENGINEER
L.D. A.S. Yannoulopoulos
2022/07/__
PROVINCE OF ONTARIO

IBI GROUP
400 – 333 Preston Street
Ottawa ON K1S 5N4 Canada
tel 613 225 1311 fax 613 225 9868
ibigroup.com

PROJECT

1650 SHEA ROAD

(OTTAWA, ON)

PROJECT NO: 139185	
DRAWN BY: M.M.	CHECKED BY: A.C./A.B.
PROJECT MGR: R.M.	APPROVED BY: D.G.Y.

SHEET TITLE

SEDIMENT AND EROSION CONTROL PLAN

SHEET NUMBER	ISSUE
900	1

SCALE CHECK

CITY FILE No. D07-_ _-_ _ _ _

CITY PLAN No. xxxxx

File Location: J:\139185_1650_Shea_Rd\7.0_Production\7.03_Design\04_Civil\Sheets\900-SEDIMENT AND EROSION CONTROL PLAN.dwg Last Saved: September 14, 2022 2:51:10 PM by Stefan Gesser Plotted: Wednesday, September 14, 2022

GRADING LEGEND

- PROPOSED DITCH C/W FLOW DIRECTION AND SLOPE
- SLOPE C/W FLOW DIRECTION
- MAJOR OVERLAND FLOW ROUTE
- PROPOSED SPOT GRADE
- PROPOSED SWALE GRADE
- PROPOSED SWALE HIGH POINT GRADE
- LOT CORNER GRADE C/W EXISTING GRADE
- FULL STATIC PONDING GRADE
- RETAINING WALL C/W TOP OF WALL AND GRASS GRADE
- TERRACING 3:1 MAXIMUM UNLESS NOTED OTHERWISE
- PRESSURE REDUCING VALVE
- FINISHED FLOOR ELEVATION
- TOP OF FOUNDATION ELEVATION
- UNDERSIDE OF FOOTING ELEVATION
- MINIMUM UNDERSIDE OF FOOTING (Based on the higher of the sewer obverts, or hydraulic grade line)
- MINIMUM GARAGE GRADE
- WALKUP UNIT
- WALKOUT UNIT
- NON-STANDARD FOUNDATION (Frost cover not provided for standard unit)
- HIGHBACK UNIT (1.5m frost cover on footings)
- NOISE BARRIER LOCATION
- NOISE BARRIER GATE
- RIP-RAP
- TOWN HOUSE SPLITS

CLIENT

DAVIDSON SHEA PROPERTY INC.

IBI Group Professional Services (Canada) Inc.
is a member of the IBI Group of companies

ISSUES

No.	DESCRIPTION	DATE
1	SUBMISSION NO.1 FOR CITY REVIEW	2022-07-_
2		
3		
4		
5		
6		
7		
8		

SEE 010, 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS

KEY PLAN

CONSULTANTS

1:500 0 5 15 25m

SEAL

LICENCED PROFESSIONAL ENGINEER
L.D. G. Yannoulopoulos
2022/07/__
PROVINCE OF ONTARIO

IBI GROUP
400 – 333 Preston Street
Ottawa ON K1S 5N4 Canada
tel 613 225 1311 fax 613 225 9868
ibigroup.com

PROJECT

1650 SHEA ROAD

(OTTAWA, ON)

PROJECT NO: 139185

DRAWN BY:	CHECKED BY:
M.M.	A.C./A.B.
PROJECT MGR:	APPROVED BY:
R.M.	D.G.Y.

SHEET TITLE

GRADING PLAN

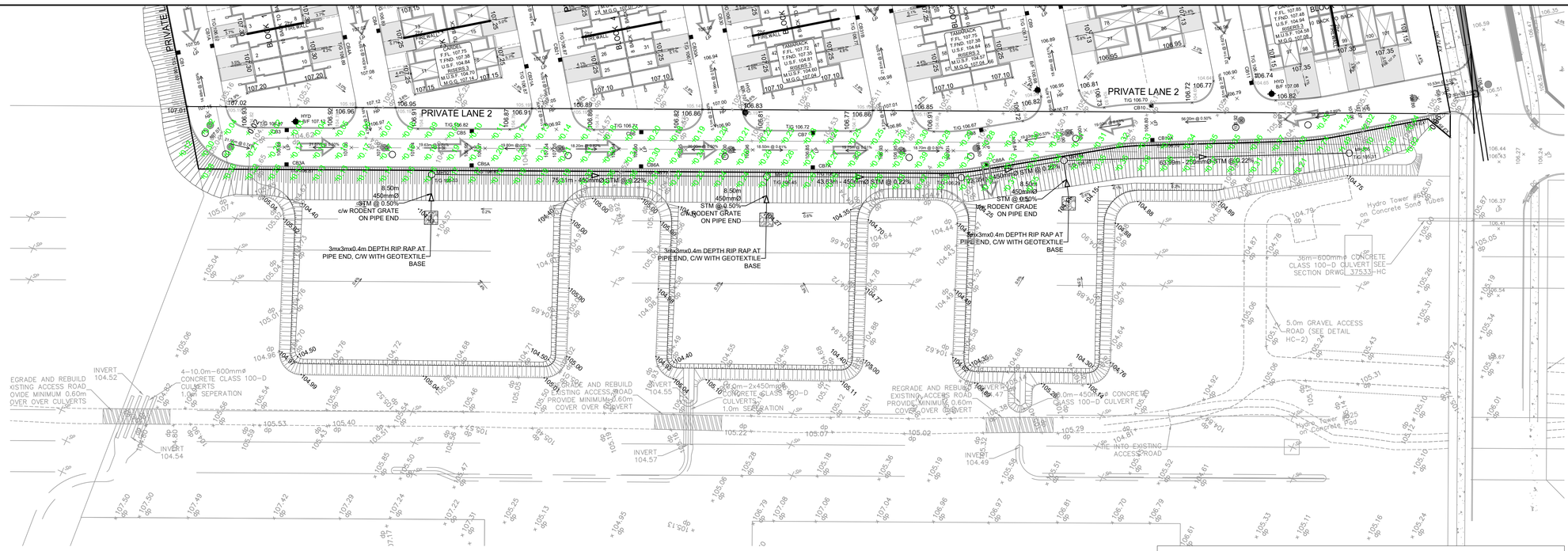
SHEET NUMBER	ISSUE
200	1

SCALE CHECK

CITY FILE No. D07- __ - __

CITY PLAN No. xxxxx

File Location: J:\139185_1650_Shea_Rd\7.0_Production\7.03_Design\04_Civil\Sheets\200-GRADING PLAN.dwg Last Saved: September 14, 2022 by stefan.geisser Plotted: Wednesday, September 14, 2022 4:32:03 PM by Stefan Geisser



DRY POND FILL AREA

Cut/Fill Summary

Name	Cut Factor	Fill Factor	2d Area	Cut	Fill	Net
Volume Lost Pond Area	1.000	1.000	3839.51sq.m	7.98 Cu. M.	1036.71 Cu. M.	1028.73 Cu. M.<Fill>
Totals			3839.51sq.m	7.98 Cu. M.	1036.71 Cu. M.	1028.73 Cu. M.<Fill>

DRY POND CUT AREA

Cut/Fill Summary

Name	Cut Factor	Fill Factor	2d Area	Cut	Fill	Net
Dry Pond Added Cell 1	1.000	1.000	2030.96sq.m	567.41 Cu. M.	0.00 Cu. M.	567.41 Cu. M.<Cut>
Dry Pond Added Cell 2	1.000	1.000	1413.60sq.m	524.98 Cu. M.	0.00 Cu. M.	524.98 Cu. M.<Cut>
Dry Pond Added Cell 3	1.000	1.000	1097.49sq.m	544.17 Cu. M.	0.00 Cu. M.	544.17 Cu. M.<Cut>
Totals			4542.05sq.m	1636.57 Cu. M.	0.00 Cu. M.	1636.56 Cu. M.<Cut>

CLIENT

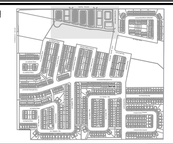
DAVIDSON SHEA PROPERTY INC.

ISSUES

No.	DESCRIPTION	DATE
1	SUBMISSION NO.1 FOR CITY REVIEW	2022-09-15
2		
3		
4		
5		
6		
7		
8		

SEE 010, 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS

KEY PLAN



CONSULTANTS

1:500 0 5 10 15 25m

SEAL

LICENSED PROFESSIONAL ENGINEER
L.D. G. Yannoulopoulos
2022/09/15
PROVINCE OF ONTARIO

IBI GROUP
400 – 333 Preston Street
Ottawa ON K1S 5N4 Canada
tel 613 225 1311 fax 613 225 9868
ibigroup.com

PROJECT

1650 SHEA ROAD

(OTTAWA, ON)

PROJECT NO: 139185	
DRAWN BY: D.D.	CHECKED BY: A.C./A.B.
PROJECT MGR: R.M.	APPROVED BY: D.G.Y.

SHEET TITLE

DRY POND COMPENSATION

SHEET NUMBER	ISSUE
201	1

CITY FILE No. D07-__-__-____

CITY PLAN No. xxxxx

SCALE CHECK 1:500mm

File Location: J:\139185_1650_Shea_Rd\7.0_Production\7.03_Design\04_Civil\Sheets\201-DRY POND COMPENSATION.dwg Last Saved: September 15, 2022, by stefan geisser Plotted: Thursday, September 15, 2022 9:05:32 AM by Stefan Geisser