ADEQUACY OF PUBLIC SERVICING REPORT
122507-6.2.3

Stonebridge Stage 16

CITY OF OTTAWA

Prepared for MATTAMY HOMES
by IBI Group
October 17, 2019

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1 INTRODUCTION

1.1 Objective

IBI Professional Services Inc. (hereinafter referred to as IBI, or IBI Group) has been retained by Mattamy Homes to prepare this Adequacy of Public Services Report in support of their re-zoning application for their property located at 2701 Longfields Drive. This report will provide stakeholders with a conceptual level layout of the proposal development sufficient to support the re-zoning and draft approval of the subject lands.

1.2 Location

The subject property is approximately 10.65Ha in size and is located in the City of Ottawa, within the former City of Nepean and within the Stonebridge Community. It is bound to the north by residential lands currently under construction, to the east by Longfields Drive with existing residential lands on the east side of Longfields Drive; to the south by vacant lands zoned rural countryside; and immediately to the west by existing recreational use (golf course) lands and further west existing residential. Approximately 1.29Ha is reserved for future Longfields Drive and retained lands on the East side of Future Longfields Drive. Thus the remaining development area is 9.36Ha. Refer to **Figure 1.1** below for key map, and **Appendix A** for draft plan of subdivision.

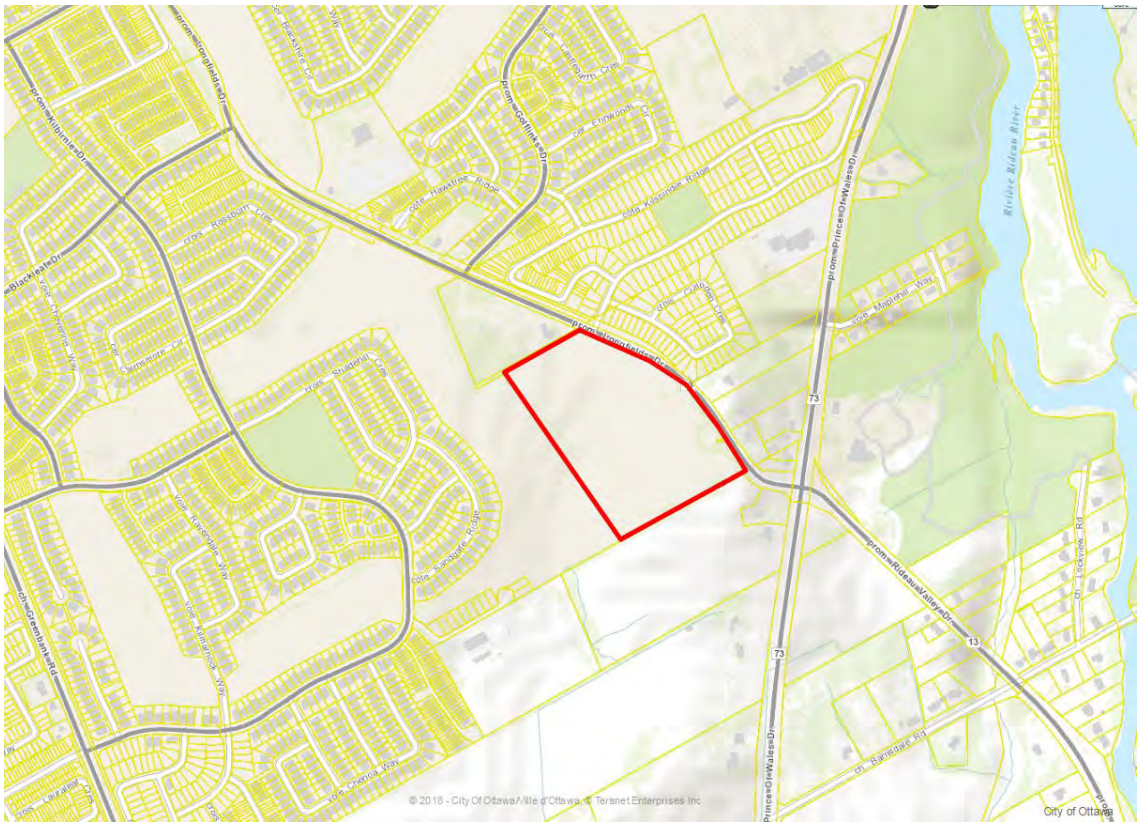

Figure 1.1 – Key Map of Subject Lands

1.3 Proposed Development

Mattamy Homes is proposing to re-zone the subject lands from Open Space Golf Course lands to urban residential lands. The proposed development would combine a mix of low and medium density residential uses.

The current concept plan identifies 93 single family homes, 90 townhouses and a park block; a copy of the plan is included in **Appendix A**.

Vehicular access to the subject lands is proposed off Longfields Drive, opposite to the Kilspindie Ridge intersection. A link to the future development lands to the south has been proposed; until such time as those lands are developed, a secondary emergency vehicular access off Longfields will be required along the southern window street. Pedestrian and cyclist access points will be located at the intersection servicing Longfields and Kilspindie Ridge, at each of the window streets along Longfields, and through a pathway block to the Uniform Urban Developments “Pink House” lands to the north.

1.4 Previous Studies

With respect to the provision of the three principle infrastructure services of water distribution, wastewater disposal and stormwater management, the following is a short list of the pertinent approved studies:

Master Servicing Study

“Jockvale Servicing Study South Nepean Urban Area (Official Plan Area 12A), prepared by CH2M Gore & Storrie Limited and Cumming Cockburn Limited, dated February 1999.

Design Brief

“Pink House Lands 3740 Jockvale Road Site Servicing, Noise, Erosion and Sediment Control Brief”, prepared by Novatech, dated January 30, 2018.

“Apple Orchard Subdivision Design Brief”, prepared by Novatech, dated October 28, 2013

2 WATER DISTRIBUTION

2.1 Existing Conditions

The subject site is located within Pressure Zone 2W of the City of Ottawa's water distribution system. An existing 406mm watermain is located within the Longfields Drive ROW.

2.2 Design Criteria

2.2.1 Water Demands

As previously noted, the proposed development will consist of 93 single family homes and 90 townhomes. Based on projected populations taken from Table 4.1 of the City Design Guidelines, a watermain demand calculation sheet was prepared; a copy is included in **Appendix A** and the total water demands are summarized as follows:

Average Day	2.27 l/s
Maximum Day	5.66 l/s
Peak Hour	12.46 l/s

2.2.2 System Pressure

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 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). Pressure reduction controls may be required for buildings where it is not possible/feasible to maintain the system pressure below 552 kPa

The adjacent "Pink House" development was designed and approved meeting the above standard; it is expected a properly designed network for the subject site will also meet system pressure requirements.

2.2.3 Boundary Conditions

Boundary conditions for the subject lands will be requested prior to detail design, when a full hydraulic model will be prepared in support of the development. The development will contain a looped system with 2 connections to the feedermain on Longfields Drive.

2.2.4 2.2.5 Hydraulic Model

A computer model for the site will be prepared in support of detail design.

2.2.5 Watermain Layout

The conceptual watermain layout for this development is shown on **Figure 2.1** in **Appendix A.** Two connections to the existing 406mm watermain on Longfields Drive are proposed. The connections are anticipated to be 300mm diameter and the internal network will consist of smaller sized branches.

Based on the above, the existing municipal infrastructure is suitably sized to accommodate an expansion to service the proposed development. Detail modeling of the network will be completed at detail design to support final approval.

3 WASTEWATER DISPOSAL

3.1 Existing Conditions

The subject lands are located within the study limits of the Stonebridge Community. The Stonebridge Trunk wastewater disposal system is tributary to the South Nepean Collector. The subject lands are currently zoned as Open Space, Golf Course use lands, and thus are not currently allocated any capacity within the existing wastewater system.

Phase 5 of the Stonebridge Community, which is located on the east side of Longfields Drive, includes a 600mm diameter sanitary trunk sewer in Golflinks Way. This trunk sewer receives flows from Phase 5 and adjacent development lands and is also the outlet for the Manotick Pump Station Forcemain.

The original design of the trunk sewer in Golflinks Drive was based on the City of Ottawa sewer design guidelines at the time, where design parameters included residential flow of 350l/pop/day, and a 0.28l/s/ha infiltration allowance was required. Subsequently, the City of Ottawa modified these design parameters with an update to the Sewer Design Guidelines. The original design by CCL for Stonebridge Phase 5 had a residual design capacity of **33.14l/s** (pipe capacity 378.84l/s less design flow 345.70l/s) at the Phase 5 limits STUB on Golflinks Drive; original design sheet and drainage area plan included in **Appendix B**. Since then, additional flows have been added to the trunk sewer from the “Apple Orchard” and “Pink House” (Mattamy and Uniform) developments. Based on the Novatech “Pink House” Lands Site Servicing Design Brief (January 30, 2018), a total development flow of 26.5l/s was added to the trunk sewer on Golflinks by extending a sewer through the cemetery lands. Based on the former design guidelines, the existing trunk sewer would have a residual capacity of approximately **6.64l**/s (33.14l/s-26.50l/s) after adding these two developments.

3.2 Design Criteria

The sanitary flows for the subject lands are determined based on current City of Ottawa design criteria, which includes, but is not limited to the following:

3.2.1 Design Flow:

Average Residential Flow	-	280 l/cap/day
Average Commercial/Institution Flow	-	28,000 l/Ha/day
Peak Residential Factor	-	Harmon Formula
Peak Commercial/Institution Factor	-	1.0
Infiltration Allowance	-	0.33 l/sec/Ha

3.2.2 Population Density:

Single Family	-	3.4 person/unit
Townhouse Units	-	2.7 person/unit
Apartment Units	-	1.8 person/unit

3.3 Proposed Wastewater Disposal System

It is proposed that the subject lands discharge into the existing wastewater disposal system on Golflinks Drive. This can be accomplished by constructing an outlet sewer along Longfields Drive and a second local level sanitary sewer extending down Longfields Drive and connecting to the

600mm diameter gravity trunk sewer on Golflinks Drive at MH # 305. The connection at this point is necessary to ensure the sewer servicing the proposed development starts at an elevation low enough to service the proposed development and also provide service to potential future lands to the south.

3.3.1 Proposed Population Calculations

As previously noted, the concept development plan proposes 93 single family homes and 90 townhouse units, the total design population is indicated below.

UNIT TYPE	# OF UNITS	POPULATION DENSITY	POPULATION
Single Family Home	93	3.4 pp/unit	316.2
Semi/Townhouse	90	2.7 pp/unit	243.0
TOTAL	**187**	**-**	**559.2**

The proposed population is not accounted for in the existing wastewater infrastructure; below analysis confirms the availability of residual capacity in the sewer to accommodate the proposed development.

3.3.2 Design Flows

Design flows for the proposed development lands are determined in the following table.

POP	280 L/POP/DAY	PEAK FACTOR	PEAK FLOW	AREA	EXT. FLOW	TOTAL FLOW
559.2	280	3.36	6.09/s	9.36ha	3.09l/s	**9.18l/s**

3.3.3 Residual Capacity in downstream sewers

As noted in section 3.1, the theoretical residual capacity in the existing trunk system is approximately **6.64l/s** after the “Pink House” and “Apple Orchard” developments have been considered. This is based on the City of Ottawa Sewer Design Guidelines. In 2018, the City of Ottawa revised their sewer design parameters; the below section identifies the theoretic residual capacity when using the current City of Ottawa standards.

3.3.3.1 Residual Capacity in downstream sewers using new Design Criteria

In 2018, the City released Technical Bulletin ITSD-2018-01 which revised sanitary sewer design flows. These updated parameters were used to evaluate the existing system at the Phase 5 limits stub on Golflinks Drive. The table below is a summary of updated flows, refer to **Appendix B** for a sewer design sheet identifying sanitary sewer flows at the limits of Phase 5.

LOCATION	POP	280 L/POP/DAY	PEAK FACTOR	PEAK FLOW	AREA	EXT. FLOW	TOTAL FLOW
Golflinks (PH5)	9182	280	2.59	77.16	692.51*	228.53	**320.27**
Additional Flows (Novatech)	1266	280	3.19	13.07	25.16	8.30	**21.37**
TOTAL	**10448**	**280**	**2.55**	**86.29**	**717.67**	**236.83**	**337.71**

*Manotick Commercial Area of 45Ha (14.58) not shown in table above.

As previously noted, the existing trunk sewer has a capacity of 378.84l/s. The net residual capacity based on the new sewer design guidelines is **41.13/s** (pipe capacity of 378.84l/s less updated design flow of 337.71/s). This residual capacity is greater than the design flows of the proposed development of **9.18l/s**, therefore the subject lands can be serviced by existing downstream wastewater infrastructure based on current City of Ottawa Sewer Design Criteria.

3.3.4 Proposed Wastewater Plan to Golflinks Drive

As previously noted, downstream trunk sewers have adequate capacity to service the subject lands. The proposed wastewater plan is to connect to the existing local sewers on Golflinks Drive.

Figure 3.1 illustrates the conceptual sanitary sewer layout for the proposed development. This includes a second sanitary sewer along Golf Links Drive, local sewers within the development and an extension to service future development lands to the south. At detail design stage, the sanitary sewer system will be properly sized and designed to meet current City of Ottawa design criteria.

4 STORMWATER MANAGEMENT

4.1 Existing Conditions and Previous Studies

As previously mentioned, the subject lands are currently open space, golf course use lands. The pre-development stormwater from the subject site is captured on-site through sheet drainage and landscaping drains, which outlet to the Stonebridge Golf Course pond network. The golf course drains to the Jockvale SWMF by a series of interconnected pipes and swales between golf course ponds. The golf course pond system adjacent to the subject lands overflows to the Kilroe municipal Drain which was the natural outlet for the lands pre-development of the Stonebridge Golf Course.

The Uniform Urban Developments “Pink House” lands, directly adjacent to the north of the subject site, has an existing approved stormwater outlet to an existing golf course pond located at the northern limits of the subject development site.

4.2 Dual Drainage Design

The subject lands will be designed to be consistent with the findings of the South Nepean Urban Area MSS, City of Ottawa sewer design Guidelines (OSDG October 2012), the OSDG guidelines of September 2016 Technical Bulletin PIEDTB-2016-01, and the February 2014 Technical Bulletin ISDTP-2014-1.

The site will be designed with dual drainage features, accommodating minor and major system flows. During frequent storm events, the effective runoff of a catchment area is directly released via catch basin 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 street segments, and in some cases oversized storm sewers, called the major system.

The streets within the subject lands will consist of a mix of sawtooth and continuous grade profiles. In several areas, continuous grade road profiles are required to deal with existing topography. Where possible, sawtoothing has been implemented to facilitate capture and storage. Inlet control devices (ICD’s) will be proposed across the site to maximize the use of available on-site storage and control surcharge to the minor system.

The final design of the subject lands will demonstrate that minor system capture and major flow conveyance is consistent City of Ottawa design criteria.

4.3 Proposed Stormwater Management Plan

As previously noted, downstream infrastructure was designed to provide capacity and quantity treatment of stormwater runoff from the subject lands as a golf course usage. The proposed development will discharge into a new stormwater management facility. There are two options under considerations for the new stormwater management facility;

Option 1: Discharge into a new SWM pond to be integrated with the re-designed golf course layout, located on the existing golf course property. The pond would have a permanent water level of approximately 98.00, and an approximate 100 year water level of 100.00.

Option 2: Discharge into a new SWM pond located on adjacent vacant rural residential lands. The pond would have a permanent water level of approximately 96.00, and an approximate 100 year water level of 98.00.

Within the proposed development, the public storm sewer system will follow the alignment of the proposed municipal roads to provide service to the limits of the development. In addition, the existing storm outlet for Uniform Urban Developments “Pink House” lands will be accommodated

through a servicing block and connect to the proposed municipal ROW; a schematic of the conceptual storm sewer system to service the proposed development is provided on **Figure 4.1** in **Appendix C.**

5 ROADS AND GRADING

5.1 Site Grading

The existing grades within portions of the proposed development lands vary significantly due to the existing landscaping features associated with the golf course. The final grading plan will require the balancing of various requirements including but not limited to geotechnical constraints, minimum/maximum slopes, overland routing of stormwater, all to ensure the site is graded in accordance with municipal standards. In addition two golf course ponds will be filled in as part of this development, the details on completing those works will be outlined at detail design.

A conceptual macro grading plan has been prepared to reflect the potential grading based on each of the storm water management options. Refer to **figure 5.1 and 5.2** in **Appendix D**.

The conceptual configuration of Longfields Drive consists of a 4 lane major collector road cross section, which has yet to be constructed. The macro grading plan interpolates the preliminary road grades for the Longfields Drive configuration, received from the City of Ottawa via Genivar. There will be a significant grade transition at the southeast corner adjacent to future Longfields. It is anticipated that a 3-5m height retaining wall or combination of terracing will be required in order to accommodate the future road grades. Coordination with the City will be required, as in the interim condition, prior to the construction of Longfields, the retaining wall will not be able to be constructed.

The subject lands are also anticipated to be approximately 0.8-2.5m higher than the ultimate road grade for Longfields Drive at Kilspindie. This will require a grade transition zone at the entrance to the subdivision.

5.2 Road Network

The concept plan delineates the proposed road pattern for the development. The proposed municipal roads within the development are all to be designed to City of Ottawa Standard 18.0m ROW. There will be one cul-de-sac.

There are no proposed bus routes or collector roads within the subject development area.

Sidewalks will be provided as agreed in the draft conditions of subdivision.

5.3 Municipal Consent

Municipal consent application will be required for works along the ROW of Longfields Drive and Golflinks Drive. Intersection improvements will be required as per the Traffic Impact Study and extension of deep servicing infrastructure will require comment and review.

6 SOURCE CONTROLS

6.1 General

Since an end of pipe treatment facility is provided for the development lands, stormwater site management for the subject lands will focus on site level or source control management of runoff. Such controls or mitigative measures are proposed for this development not only for final development but also during construction and build out. Some of these measures are:

- flat site grading where possible;
- vegetation planting; and
- groundwater recharge in landscaped areas.

6.2 Lot Grading

Where possible, all of the proposed blocks within the development will make use gentle surface slopes on hard surfaces such as asphalt and concrete. In accordance with local municipal standards, all grading will be between 0.5 and 5.0 percent for hard surfaces and 2.0 and 7.0 percent for all landscaped areas. Significant grade changes will be accomplished through the use of terracing (3:1 max slope), ramps and/or retaining walls. All street and parking lot catchbasins shall be equipped with 3.0m subdrains on opposite sides of a curbside catchbasin running parallel to the curb, and with 3.0m subdrains extending out from all 4 sides of parking lot catchbasins.

6.3 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 and within the individual blocks provides opportunities to re-create lost vegetation.

6.4 Groundwater Recharge

Perforated sub-drain systems will be implemented at capture locations in all vegetated areas. Roof leaders for pitched roofs are to direct runoff to landscaped areas. This will promote increased infiltration during low flow events before water is collected by the storm sewer system.

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:

- vegetated swales; and
- catchbasin sumps.

7.2 Vegetated Swales

All rearyards within the proposed development make use of relatively vegetated swales. These swales generally employ saw-toothing at regular intervals and encourage infiltration and runoff treatment.

7.3 Catchbasins and Maintenance Hole Sumps

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 to OPSD 705.02. All storm sewer maintenance holes serving 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. A conceptual sediment and erosion control plan has been included in **Figure 6.1**. 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;
- filter cloths will remain on open surface structure such as manholes and catchbasins until these structures are commissioned and put into use; and
- Silt fence on the site perimeter.

8.2 Trench Dewatering

Although little groundwater is expected 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 new manhole constructed within the development that is immediately upstream of an existing sewer a temporary ½ diameter bulkhead will be constructed over the lower half of the outletting 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 and removed prior to top course asphalt being laid.

8.4 Seepage Barriers

The presence of road side ditches along Jockvale necessitate the installation of 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. 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 should be covered in some fashion to prevent sediment from entering the minor storm sewer system. Until rearyards are sodded or until streets are asphalted and curbed, catchbasins and manholes will be constructed with geotextile filter bags or a geotextile filter fabric located between the structure frame and cover

respectively. These will stay in place and be maintained during construction and build until it is appropriate to remove same.

8.6 Stockpile Management

During construction of any development similar to that proposed by the Owner, both imported and native soils are stockpiled. Mitigative measures and proper management to prevent these materials entering the sewer systems is needed. Significant excess material will be generated from the subject lands, and will need to be disposed of off-site in a manner consistent with all MOE regulations.

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 rearyard 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 provided the above noted seepage barriers are installed. These materials are quickly used and the mitigative measures stated previously, especially the ½ diameter sewer bulkheads and 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.

To assist in the control of transporting sediment off-site into municipal roads, mud mats will be employed at the construction entrances.

9 CONCLUSIONS

Water, wastewater and stormwater systems required to accommodate the orderly development of the Mattamy Stonebridge Phase 16 lands are available to the subject site. The attached drawings and supporting analysis illustrate the lands can be developed in an orderly and effective manner and in accordance with the 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.

This report outlined a conceptual servicing scheme to support the rezoning of the proposed development. Should the lands be rezoned, detail design of the infrastructure would be completed and subject to various governmental approvals prior to construction, including but not limited to the following:

- Certificate of Authorization (C of A) for sewers and SWM: Ministry of Environment;
- Commence Work Order: City of Ottawa;
- Municipal Consent: City of Ottawa.
- R.V.C.A permit for in water works associated with the outlet to the new SWM pond.

Report Prepared By:

LICENSED PROFESSIONAL ENGINEER
D.G. Yannoulopoulos
PROVINCE OF ONTARIO

Demetrius Yannoulopoulos, P. Eng.

Ryan Magladry, C.E.T.

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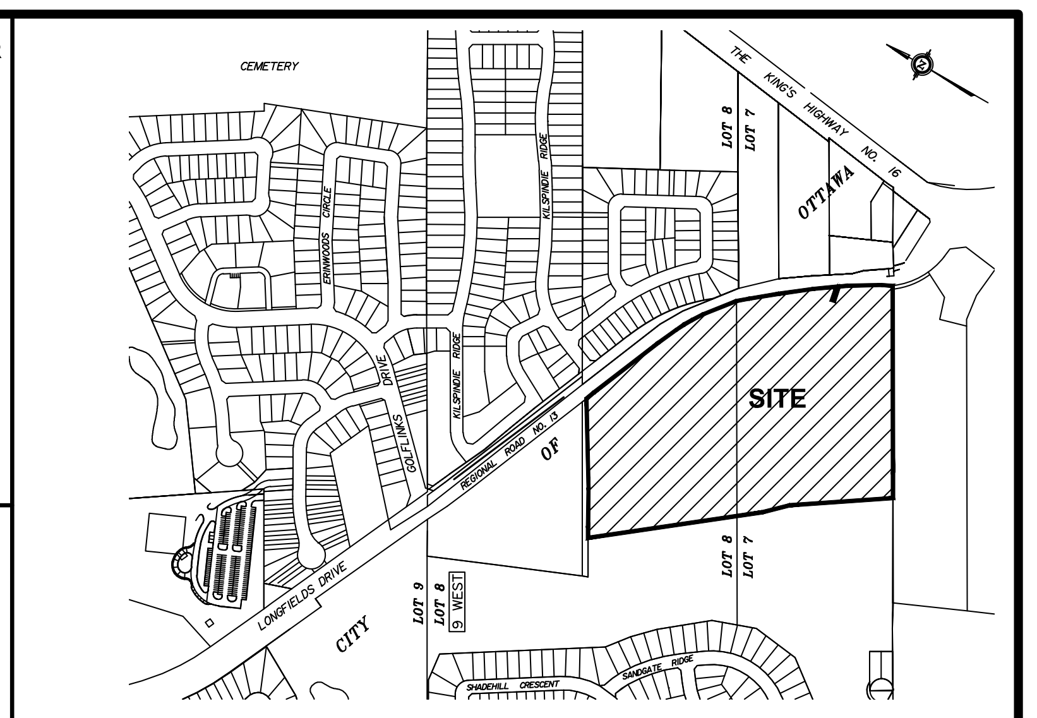
APPENDIX A

SUBJECT TO THE CONDITIONS, IF ANY, SET FORTH IN OUR LETTER DATED

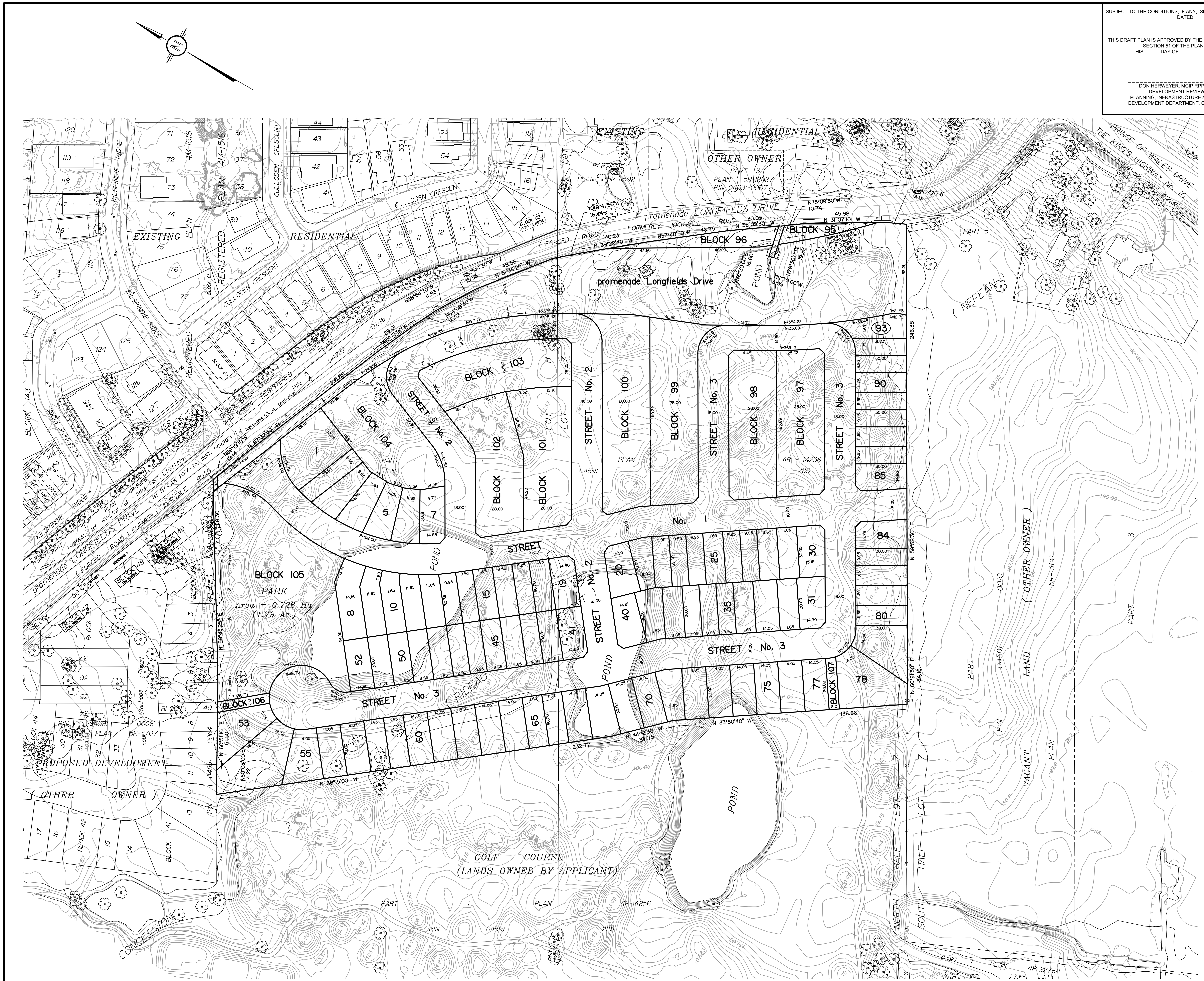
_ _.

THIS DRAFT PLAN IS APPROVED BY THE CITY OF OTTAWA UNDER SECTION 51 OF THE PLANNING ACT.
THIS _ _ _ _ DAY OF _ _ _ _ _ _ _ _ _ _ _ _, 20_ _.

_ _
DON HERWEYER, MCIP RPP, MANAGER
DEVELOPMENT REVIEW-SOUTH
PLANNING, INFRASTRUCTURE AND ECONOMIC
DEVELOPMENT DEPARTMENT, CITY OF OTTAWA



KEY MAP
NOT TO SCALE



DRAFT PLAN OF SUBDIVISION OF

PART OF LOTS 7 And 8
CONCESSION 2 (RIDEAU FRONT)
Geographic Township of Nepean
CITY OF OTTAWA

Prepared by Annis , O'Sullivan , Vollebekk Ltd.

Scale 1 : 1000

40 30 20 10 0 20 40 Metres

Metric

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

SURVEYOR'S CERTIFICATE

I CERTIFY THAT :
The boundaries of the lands to be subdivided and their relationship to adjoining lands have been accurately and correctly shown.

_ _ _ _ _ _ _ _ _ _ _ _ _
Date

_ _
Andre Roy
ONTARIO LAND SURVEYOR

OWNER'S CERTIFICATE

This is to certify that we are the owners of the lands to be subdivided and that this plan was prepared in accordance with our instructions.

_ _ _ _ _ _ _ _ _ _ _ _
Date

_ _
Mattamy (Monarch) Limited
I have authority to bind the corporation.

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51-17 OF THE PLANNING ACT

(a) see plan
(b) see plan
(c) see plan
(d) single and multi-family residential housing, park land and open space
(e) see plan
(f) see plan
(g) see plan
(h) City of Ottawa
(i) see soils report
(j) see plan
(k) sanitary, storm sewers, municipal water, bell, hydro, cable and gas to be available
(l) see plan

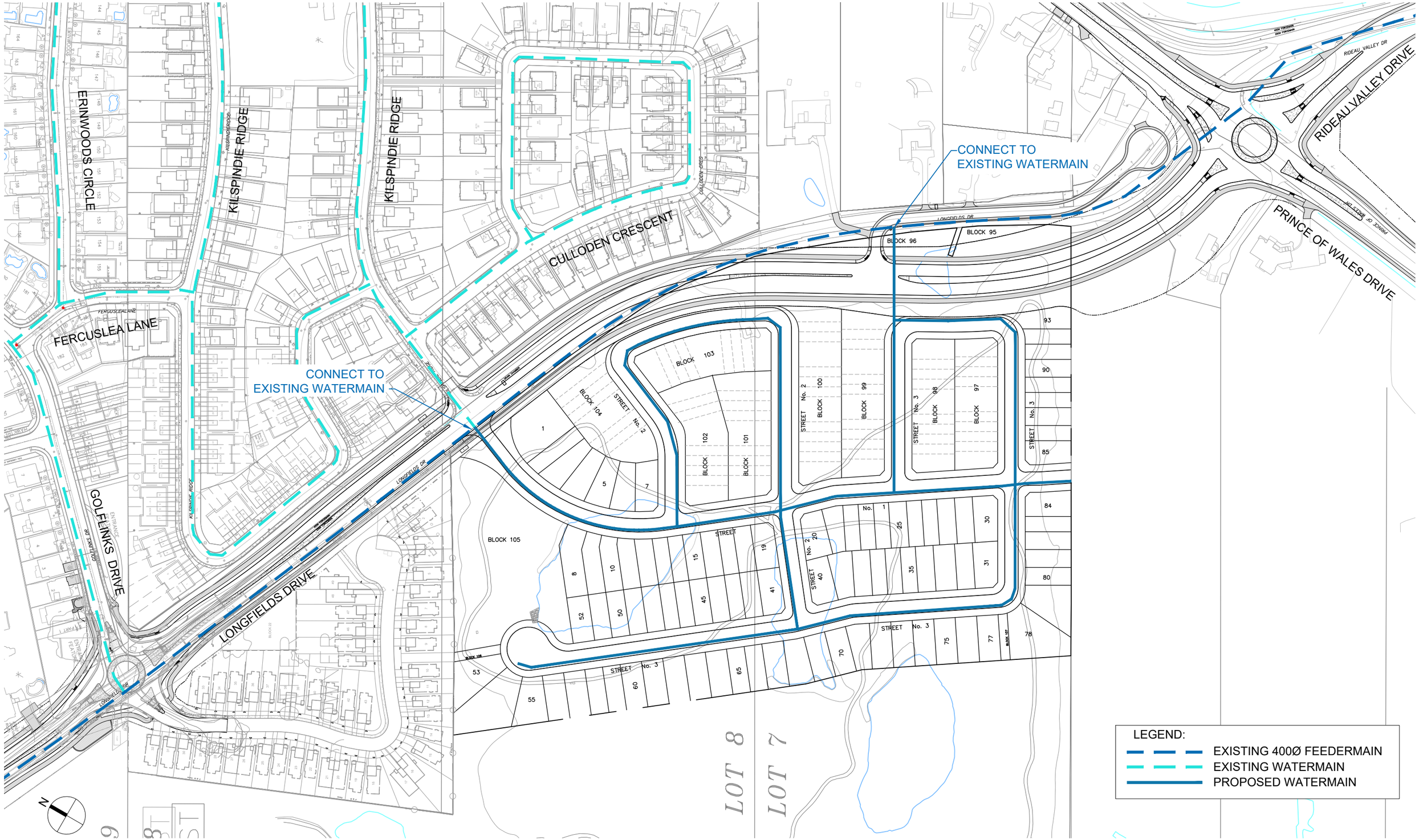
AREA SCHEDULE

PROPOSED USE	LOT\BLOCK	Square Metres
SINGLE FAMILY	1 to 94	38384.2
TOWNHOMES	97 to 104	21125.2
PARK	105	7261.8
WALKWAY	106	365.0
OTHER	95 & 96	1013.2
STREETS	1, 2 & 3	26405.9
	promenade Longfields Drive	11918.7
TOTAL SITE		106 474.0

Ontario Land Surveyors

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 Concourse Gate, Suite 500
Nepean, Ont. K2E 7S6
Phone: (613) 727-0850 / Fax: (613) 727-1079
Email: Nepean@aovltd.com

Job No. 18717-18 Mattamy Pt Lts 7 8 C2 RF NP DPS D7 | N



LEGEND:

- EXISTING 400Ø FEEDERMAIN
- EXISTING WATERMAIN
- PROPOSED WATERMAIN

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Scale	Project Title	Drawing Title	Sheet No.
N.T.S.	STONEBRIDGE PHASE 16	WATERMAINS	FIGURE 2.1

WATERMAIN DEMAND CALCULATION SHEET

IBI GROUP
333 PRESTON STREET
OTTAWA, ONTARIO
K1S 5N4

PROJECT : **Stonebridge Stage 16**
CLIENT : **Mattamy Homes**

FILE: 38847-5.7
DATE PRINTED: 16-Oct-19
DESIGN: RM
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	TOWN HOUSE UNITS	MEDIUM DENSITY (ha)	POPULATION	INDUST. (ha)	COMM. (ha)	INSTIT. (ha)	RESIDENTIAL	ICI	TOTAL	RESIDENTIAL	ICI	TOTAL	RESIDENTIAL	ICI	TOTAL	
Stage 16	93.00	90.00		559.20				2.27		2.27	5.66		5.66	12.46		12.46	10,000

POPULATION DENSITY

Single Family	3.4 persons/unit
Semi Detached & Townhouse	2.7 persons/unit
Medium Density	1.8 persons/unit

WATER DEMAND RATES

Residential	350 l/cap/day

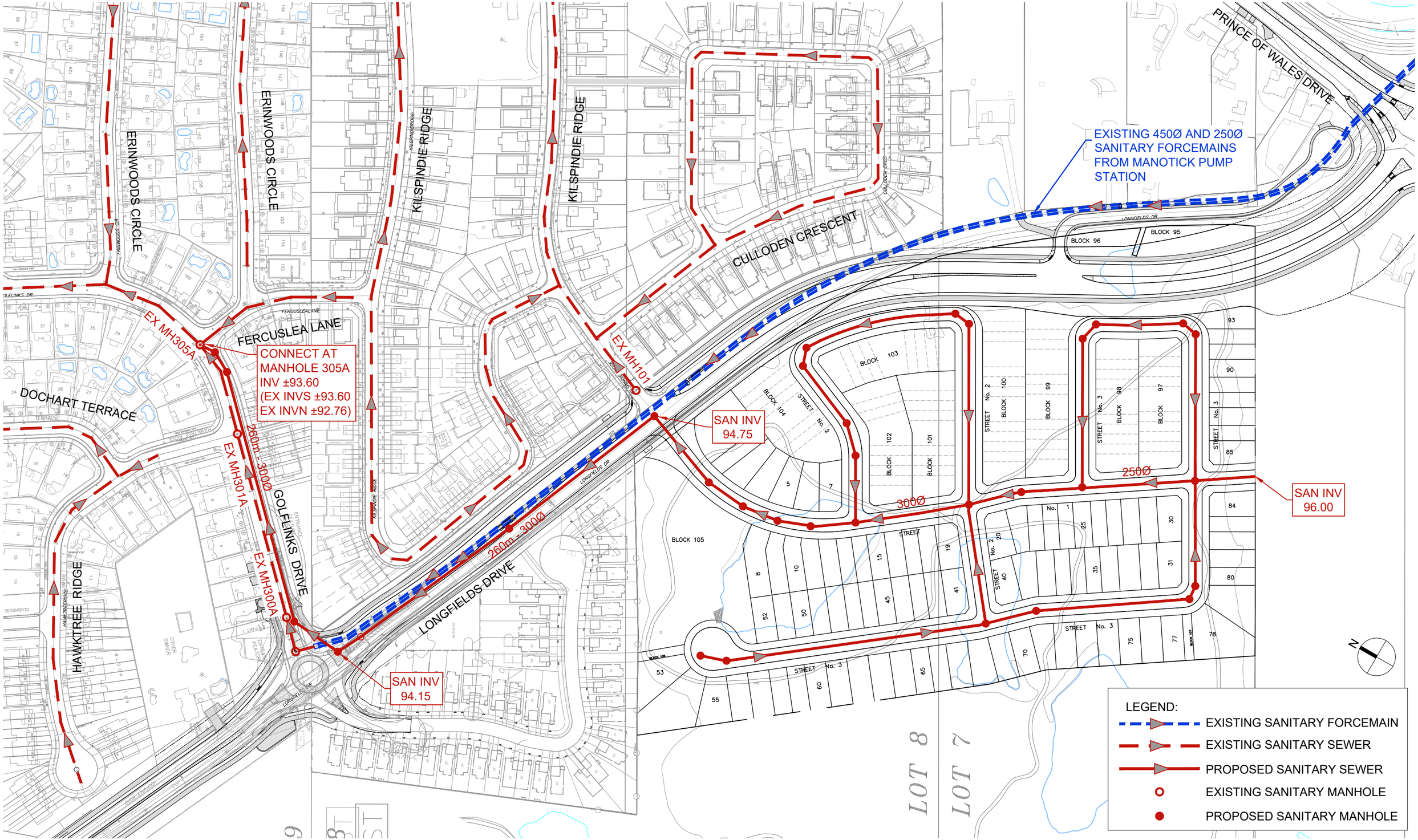
PEAKING FACTORS

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)

APPENDIX B



J:\122507_2701Longflds\7.0_Production\7.3_Design\04_Civil\Sheets\Figures\Figure-3.1.dwg Layout Name: Fig 3.1 Plot Scale: 1:5.13 Plotted At: 10/15/2019 Last Saved By: dsiurna Last Saved At: Oct. 8, 19

Scale	Project Title	Drawing Title	Sheet No.
N.T.S.	STONEBRIDGE PHASE 16	SANITARY SEWERS	FIGURE 3.1

Table 5.1: Sanitary Flow Summary

Development Condition	Population	Peak Res. Flow (L/s)	Peak Ext. Flow (L/s)	Peak Design Flow (L/s)
Pink House Lands	140	2.3	0.8	3.1
Mattamy/Monarch Apple Orchard	197	3.2	1.2	4.4
Future Mattamy/Monarch Lands	162	2.6	0.5	3.1
Uniform Lands Apple Orchard	705	10.1	4.3	14.3
Memorial Gardens	62	1.0	0.6	1.6
Proposed Development Flow	*1266*	*19.2***	*7.1*	*26.5*
**Golflinks Drive*	*9,182*	*151.8*	*193.9*	*345.7*
Total Flow	10,778	171.0	201.0	372.2

** Existing flows*
***Includes parkland, see design sheet for details*

The Cumming Cockburn Ltd. Sanitary design for Stonebridge Phase 5 Subdivision was reviewed to determine available capacity in the 600mm trunk sewer located on Golflinks Drive to accommodate the proposed development serviceable area. According to Cumming Cockburn design sheets it has been determined that the capacity of the 600mm trunk sewer at Golflinks Drive is 378.8 L/s, which is approximately 33 L/s of available free-flow capacity. The Cumming Cockburn design sheets accounted for the future design flows from the Manotick pump station. Refer to Appendix D for Cumming Cockburn Ltd for these design sheets.

The capacity of the 600mm trunk sewer according to Cumming Cockburn design sheets is 378.8 L/s which indicates adequate capacity exists to accommodate the proposed development.

6.0 WATER SUPPLY

A preliminary hydraulic analysis was performed for the Pink House Lands. It is proposed to service the Pink House Lands site with a 200mm pipe with two connections to the existing watermain. The first connection will be made to the 300mm watermain on Golflinks Drive. The second connection will be made to the 400mm watermain on Longfields Drive at the south entrance. **Figure 10 -** Proposed Watermain Layout and High Pressure Locations highlights the proposed works, connection points and high pressure locations. All existing watermain boundary conditions were provided by the City of Ottawa and are included in Appendix E.

Two sets of boundary conditions were provided by the City for 2741 Longfields Drive, the Existing Barrhaven Pressure Zone (EBPZ) and Future Pressure Zone 3C (FPZ 3C). Conservatively, the EBPZ was used for all calculations (worst case) as the boundary conditions will improve in the future. However, the high pressure condition was analyzed for both existing and future pressure zones.

SANITARY SEWER DESIGN SHEET
Pink House Lands Subdivision
Developer: Uniform Urban Developments

NOVATECH
Engineers, Planners & Landscape Architects

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LOCATION				INDIVIDUAL				CUMULATIVE						PROPOSED SEWER											
STREET	FROM MH	TO MH	Area	Single Units	Townhouse Units	Population (in 1000's)	AREA (ha.)	Population (in 1000's)	AREA (ha.)	PEAK FACTOR M	POPULATION FLOW Q(p) (L/s)	PEAK EXTRAN. FLOW Q(i) (L/s)	PEAK DESIGN FLOW Q(d) (L/s)	LENGTH (m)	PIPE SIZE (mm)	PIPE ID (mm)	TYPE OF PIPE	GRADE %	UPSTREAM INVERT (m)	DOWNSTREAM INVERT (m)	HGL (UPSTREAM) (m)	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	Qpeak/ Qcap	d/ D_{full}
MONARCH LANDS																									
CULLODEN CRESCENT	191	189	1	12		0.041	0.71	0.041	0.71	4.0	0.66	0.20	0.86	73.6	200	203.20	DR 35	1.59	102.00	100.83	102.20	43.1	1.33	2%	0.08
CULLODEN CRESCENT	189	187	2	1		0.003	0.10	0.044	0.81	4.0	0.72	0.23	0.94	7.7	200	203.20	DR 35	1.57	100.77	100.65	100.97	42.9	1.32	2%	0.08
CULLODEN CRESCENT	187	185	3	5		0.017	0.33	0.061	1.14	4.0	0.99	0.32	1.31	47.8	200	203.20	DR 35	1.61	100.57	99.80	100.77	43.4	1.34	3%	0.12
CULLODEN CRESCENT	185	183	4	6		0.020	0.39	0.082	1.53	4.0	1.32	0.43	1.75	60.0	200	203.20	DR 35	1.58	99.72	98.75	99.92	43.0	1.33	4%	0.12
CULLODEN CRESCENT	191	193	5	1		0.003	0.13	0.003	0.13	4.0	0.06	0.04	0.09	8.2	200	203.20	DR 35	1.82	101.90	101.74	102.10	46.2	1.42	0%	0.00
CULLODEN CRESCENT	193	195	6	10		0.034	0.74	0.037	0.87	4.0	0.61	0.24	0.85	109.4	200	203.20	DR 35	1.65	101.71	99.91	101.91	44.0	1.36	2%	0.08
CULLODEN CRESCENT	195	197	7	2		0.007	0.22	0.044	1.09	4.0	0.72	0.31	1.02	8.2	200	203.20	DR 35	1.71	99.88	99.73	100.08	44.7	1.38	2%	0.08
CULLODEN CRESCENT	197	199	8	12		0.041	0.86	0.085	1.95	4.0	1.38	0.55	1.92	96.5	200	203.20	DR 35	0.84	99.70	98.91	99.90	31.4	0.97	6%	0.16
CULLODEN CRESCENT	199	183	9	2		0.007	0.21	0.092	2.16	4.0	1.49	0.60	2.09	28.7	200	203.20	DR 35	0.35	98.88	98.78	99.08	20.2	0.62	10%	0.21
CULLODEN CRESCENT	183	103	10	7		0.024	0.47	0.197	4.16	4.0	3.20	1.16	4.36	99.3	200	203.20	DR 35	0.47	98.72	98.32	98.92	23.5	0.72	19%	0.29
PINK HOUSE																									
PINK HOUSE	FUT	101			52	0.140	2.84	0.140	2.84	4.0	2.28	0.80	3.07												
UNIFORM LANDS																									
KILSPINDIE RIDGE	167	169	20		1	0.003	0.08	0.003	0.08	4.0	0.04	0.02	0.07	10.6	200	203.20	DR 35	2.36	100.72	100.47	100.92	52.5	1.62	0%	0.00
KILSPINDIE RIDGE	169	171	21		12	0.032	0.42	0.035	0.50	4.0	0.57	0.14	0.71	98.2	200	203.20	DR 35	2.04	100.44	98.44	100.67	48.8	1.51	1%	0.08
KILSPINDIE RIDGE	171	173	22		1	0.003	0.05	0.038	0.55	4.0	0.61	0.15	0.77	9.7	200	203.20	DR 35	1.75	98.42	98.25	98.25	45.3	1.40	2%	0.08
KILSPINDIE RIDGE	173	175	23		8	0.022	0.25	0.059	0.80	4.0	0.96	0.22	1.19	41.3	200	203.20	DR 35	1.40	98.04	97.46	98.29	40.5	1.25	3%	0.08
KILSPINDIE RIDGE	175	177	24		5	0.014	0.15	0.073	0.95	4.0	1.18	0.27	1.45	20.1	200	203.20	DR 35	0.75	97.45	97.30	97.68	29.6	0.91	5%	0.12
KILSPINDIE RIDGE	177	179	25	1	2	0.009	0.13	0.082	1.08	4.0	1.32	0.30	1.63	25.9	200	203.20	DR 35	0.39	97.29	97.19	97.55	21.2	0.66	8%	0.19
KILSPINDIE RIDGE	179	181	26	1		0.003	0.07	0.085	1.15	4.0	1.38	0.32	1.70	8.7	200	203.20	DR 35	0.69	97.19	97.13	97.41	28.5	0.88	6%	0.16
KILSPINDIE RIDGE	181	105	27	6		0.020	0.43	0.106	1.58	4.0	1.71	0.44	2.15	48.9	200	203.20	DR 35	0.82	97.12	96.72	97.33	31.0	0.95	7%	0.16
KILSPINDIE RIDGE	101	103	11	3		0.010	0.23	0.151	3.07	4.0	2.44	0.86	3.30	42.9	200	203.20	DR 35	1.24	97.18	96.65	97.40	38.0	1.17	9%	0.19
KILSPINDIE RIDGE	103	105	12	1		0.003	0.13	0.351	7.36	4.0	5.69	2.06	7.75	42.0	200	203.20	DR 35	0.48	96.63	96.43	96.84	23.6	0.73	33%	0.38

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LOCATION				INDIVIDUAL				CUMULATIVE						PROPOSED SEWER											
STREET	FROM MH	TO MH	Area	Single Units	Townhouse Units	Population (in 1000's)	AREA (ha.)	Population (in 1000's)	AREA (ha.)	PEAK FACTOR M	POPULATION FLOW Q(p) (L/s)	PEAK EXTRAN. FLOW Q(i) (L/s)	PEAK DESIGN FLOW Q(d) (L/s)	LENGTH (m)	PIPE SIZE (mm)	PIPE ID (mm)	TYPE OF PIPE	GRADE %	UPSTREAM INVERT (m)	DOWNSTREAM INVERT (m)	HGL (UPSTREAM) (m)	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	Qpeak/ Qcap	d/ D_{full}
KILSPINDIE RIDGE	105	107	13	1		0.003	0.10	0.460	9.04	4.0	7.44	2.53	9.97	23.1	200	203.20	DR 35	0.22	96.42	96.37	96.62	15.9	0.49	63%	0.56
KILSPINDIE RIDGE	107	109	14	3		0.010	0.25	0.470	9.29	4.0	7.60	2.60	10.20	23.6	200	203.20	DR 35	0.47	96.37	96.26	96.55	23.4	0.72	44%	0.44
KILSPINDIE RIDGE	109	111	15	4		0.014	0.31	0.484	9.60	4.0	7.80	2.69	10.49	35.1	200	203.20	DR 35	0.20	96.25	96.18	96.47	15.3	0.47	69%	0.58
KILSPINDIE RIDGE	111	113	16	8		0.027	0.63	0.511	10.23	4.0	8.22	2.86	11.08	71.7	200	203.20	DR 35	2.09	96.18	94.68	96.36	49.5	1.53	22%	0.30
KILSPINDIE RIDGE	113	115	17	10		0.034	0.80	0.545	11.03	4.0	8.73	3.09	11.82	117.0	200	203.20	DR 35	3.29	94.67	90.82	94.87	62.1	1.91	19%	0.30
KILSPINDIE RIDGE	115	117	18	9		0.031	0.64	0.576	11.67	3.9	9.19	3.27	12.46	63.6	200	203.20	DR 35	2.95	90.82	88.95	91.04	58.8	1.81	21%	0.30
KILSPINDIE RIDGE	117	119	19	2		0.007	0.15	0.583	11.82	3.9	9.30	3.31	12.60	35.6	200	203.20	DR 35	1.32	88.95	88.48	89.18	39.3	1.21	32%	0.38
KILSPINDIE RIDGE	167	165	28		4	0.011	0.17	0.011	0.17	4.0	0.18	0.05	0.22	20.0	200	203.20	DR 35	1.85	100.72	100.35	100.93	46.5	1.44	0%	0.00
KILSPINDIE RIDGE	165	163	29		16	0.043	0.50	0.054	0.67	4.0	0.88	0.19	1.06	76.0	200	203.20	DR 35	2.66	100.30	98.28	100.54	55.8	1.72	2%	0.08
KILSPINDIE RIDGE	163	161	30	2	13	0.042	0.48	0.096	1.15	4.0	1.55	0.32	1.88	79.8	200	203.20	DR 35	2.84	98.18	95.91	98.38	57.7	1.78	3%	0.12
KILSPINDIE RIDGE	161	159	31	8		0.027	0.55	0.123	1.70	4.0	1.99	0.48	2.47	63.7	200	203.20	DR 35	0.64	95.89	95.48	96.08	27.5	0.85	9%	0.19
KILSPINDIE RIDGE	159	157	32	8		0.027	0.63	0.150	2.33	4.0	2.44	0.65	3.09	58.6	200	203.20	DR 35	0.34	95.31	95.11	95.51	20.0	0.62	15%	0.27
KILSPINDIE RIDGE	157	155	33	7		0.024	0.67	0.174	3.00	4.0	2.82	0.84	3.66	91.8	200	203.20	DR 35	3.49	95.09	91.89	95.32	63.9	1.97	6%	0.16
** PARKLAND	123	155	64				0.91		0.910	1.5	0.06	0.25	0.31	10.3	150	152.40	DR 35	3.20	92.27	91.94	92.24	28.4	1.56	1%	0.08
KILSPINDIE RIDGE	155	153	34	6		0.020	0.51	0.195	3.51	4.0	3.15	0.98	4.45	60.9	200	203.20	DR 35	3.02	91.85	90.01	92.08	59.5	1.83	7%	0.19
KILSPINDIE RIDGE	153	151	35	7		0.024	0.51	0.218	4.02	4.0	3.54	1.13	4.98	53.6	200	203.20	DR 35	1.42	89.75	88.99	89.96	40.8	1.26	12%	0.23
KILSPINDIE RIDGE	151	149	36	5		0.017	0.34	0.235	4.36	4.0	3.81	1.22	5.35	47.2	200	203.20	DR 35	1.08	88.63	88.12	88.82	35.6	1.10	15%	0.27
KILSPINDIE RIDGE	129	127	37		9	0.024	0.33	0.024	0.33	4.0	0.39	0.09	0.49	63.7	200	203.20	DR 35	0.65	89.48	89.07	89.68	27.5	0.85	2%	0.08
FUTURE MONARCH	FUT	127			60	0.162	1.67	0.162	1.67	4.0	2.63	0.47	3.09												
KILSPINDIE RIDGE	127	125	38		2	0.005	0.15	0.192	2.15	4.0	3.11	0.60	3.71	30.4	200	203.20	DR 35	0.33	89.07	88.97	89.27	19.7	0.61	19%	0.29
KILSPINDIE RIDGE	125	121	39	11	1	0.040	0.75	0.232	2.90	4.0	3.76	0.81	4.57	81.3	200	203.20	DR 35	0.32	88.94	88.68	89.14	19.4	0.60	24%	0.30
KILSPINDIE RIDGE	121	119	40	5		0.017	0.33	0.249	3.23	4.0	4.03	0.90	4.94	46.1	200	203.20	DR 35	0.52	88.68	88.44	88.88	24.7	0.76	20%	0.30
LOCHHOUSE WALK	119	149	41	13		0.044	0.78	0.876	15.83	3.8	13.61	4.43	18.04	113.4	250	254.00	DR 35	0.28	88.43	88.11	88.63	32.8	0.65	55%	0.53
KILSPINDIE RIDGE	149	147	42	1		0.003	0.06	1.114	20.25	3.8	17.01	5.67	23.00	14.1	250	254.00	DR 35	0.57	88.06	87.98	88.30	46.7	0.92	49%	0.50

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LOCATION				INDIVIDUAL				CUMULATIVE		PEAK FACTOR M	POPULATION FLOW Q(p) (L/s)	PEAK EXTRAN. FLOW Q(i) (L/s)	PEAK DESIGN FLOW Q(d) (L/s)	PROPOSED SEWER											
STREET	FROM MH	TO MH	Area	Single Units	Townhouse Units	Population (in 1000's)	AREA (ha.)	Population (in 1000's)	AREA (ha.)					LENGTH (m)	PIPE SIZE (mm)	PIPE ID (mm)	TYPE OF PIPE	GRADE %	UPSTREAM INVERT (m)	DOWNSTREAM INVERT (m)	HGL (UPSTREAM) (m)	CAPACITY (L/s)	FULL FLOW VELOCITY (m/s)	Qpeak/ Qcap	d/ D_{full}
KILSPINDIE RIDGE	129	131	43		6	0.016	0.31	0.016	0.31	4.0	0.26	0.09	0.35	63.5	200	203.20	DR 35	0.65	89.49	89.07	89.69	27.6	0.85	1%	0.08
KILSPINDIE RIDGE	131	133	44		2	0.005	0.12	0.022	0.43	4.0	0.35	0.12	0.47	10.0	200	203.20	DR 35	0.32	89.04	89.01	89.24	19.4	0.60	2%	0.08
KILSPINDIE RIDGE	133	135	45		3	0.008	0.16	0.030	0.59	4.0	0.48	0.17	0.65	12.9	200	203.20	DR 35	0.32	88.98	88.94	89.18	19.4	0.60	3%	0.12
KILSPINDIE RIDGE	135	137	46		6	0.016	0.23	0.046	0.82	4.0	0.74	0.23	0.97	30.5	200	203.20	DR 35	0.33	88.91	88.81	89.11	19.7	0.61	5%	0.12
KILSPINDIE RIDGE	137	139	47		3	0.008	0.18	0.054	1.00	4.0	0.88	0.28	1.16	49.4	200	203.20	DR 35	0.32	88.81	88.65	89.01	19.4	0.60	6%	0.16
KILSPINDIE RIDGE	139	141	48		6	0.016	0.23	0.070	1.23	4.0	1.14	0.34	1.48	44.2	200	203.20	DR 35	0.32	88.65	88.51	88.85	19.4	0.60	8%	0.19
KILSPINDIE RIDGE	141	143	49	2	1	0.010	0.24	0.080	1.47	4.0	1.29	0.41	1.70	47.6	200	203.20	DR 35	0.32	88.51	88.36	88.71	19.4	0.60	9%	0.19
KILSPINDIE RIDGE	143	145	50	3		0.010	0.28	0.090	1.75	4.0	1.46	0.49	1.95	34.5	200	203.20	DR 35	0.32	88.36	88.25	88.56	19.4	0.60	10%	0.21
KILSPINDIE RIDGE	145	147	51			0.000	0.04	0.090	1.79	4.0	1.46	0.50	1.96	27.6	200	203.20	DR 35	0.33	88.25	88.16	88.45	19.7	0.61	10%	0.19
OUTLET PIPE	147	205	52			0.000	0.02	1.204	22.06	3.7	18.27	6.18	24.76	45.1	450	457.20	DR 35	0.09	87.81	87.77	88.26	88.6	0.54	28%	0.34
FERGUSLEA LANE	201	203	65	2		0.007	0.18	0.007	0.18	4.0	0.11	0.05	0.16	40.8	200	203.20	DR 35	2.94	95.15	93.95	95.41	58.7	1.81	0%	0.00
FERGUSLEA LANE	203	Ex MH	66	1		0.003	0.09	0.010	0.27	4.0	0.17	0.08	0.24	29.6	200	203.20	DR 35	0.30	93.45	93.36	94.74	18.9	0.58	1%	0.08
OFFSITE SANITARY																									
OUTLET PIPE	205	217	53			0.000	0.14	1.204	22.20	3.7	18.27	6.22	24.81	96.4	450	457.20	DR 35	0.10	87.76	87.66	88.21	95.8	0.58	26%	0.34
Maintenance Building							0.20				0.02	0.06	0.08												
OUTLET PIPE	217	219	54			0.000	0.06	1.204	22.47	3.7	18.29	6.29	24.90	41.9	450	457.20	DR 35	0.14	87.64	87.58	88.07	112.6	0.69	22%	0.30
OUTLET PIPE	219	223	55			0.000	0.11	1.204	22.58	3.7	18.29	6.32	24.93	73.7	450	457.20	DR 35	0.12	87.58	87.49	88.02	103.9	0.63	24%	0.30
OUTLET PIPE	223	225	56			0.000	0.08	1.204	22.66	3.7	18.29	6.34	24.95	52.6	450	457.20	DR 35	0.10	87.47	87.42	87.94	91.7	0.56	27%	0.34
OUTLET PIPE	225	227	57			0.000	0.08	1.204	22.73	3.7	18.29	6.37	24.97	50.4	450	457.20	DR 35	0.10	87.41	87.36	87.88	93.7	0.57	27%	0.34
OUTLET PIPE	227	229	58			0.000	0.06	1.204	22.79	3.7	18.29	6.38	24.99	37.6	450	457.20	DR 35	0.08	87.36	87.33	87.82	84.0	0.51	30%	0.38
OUTLET PIPE	229	231	59			0.000	0.08	1.204	22.87	3.7	18.29	6.40	25.01	56.4	450	457.20	DR 35	0.05	87.32	87.29	87.78	68.6	0.42	36%	0.41
OUTLET PIPE	231	233	60			0.000	0.06	1.204	22.93	3.7	18.29	6.42	25.03	39.1	450	457.20	DR 35	0.13	87.28	87.23	87.72	106.4	0.65	24%	0.30
OUTLET PIPE	233	235	61			0.000	0.08	1.204	23.01	3.7	18.29	6.44	25.05	53.9	450	457.20	DR 35	0.13	87.22	87.15	87.68	107.2	0.65	23%	0.30
RECEPTION CENTRE	REC	235					2.00	0.062	2.00	4.1	1.04	0.56	1.60	316.9	200	203.20	DR 35	0.55	89.52	87.77	89.72	25.4	0.78	6%	0.16
OUTLET PIPE	235	241	62			0.000	0.12	1.266	25.13	3.7	19.16	7.04	26.51	79.8	450	457.20	DR 35	0.09	87.11	87.04	87.56	88.1	0.54	30%	0.38
OUTLET PIPE	241	243	63			0.000	0.03	1.266	25.16	3.7	19.16	7.05	26.52	21.4	450	457.20	DR 35	0.19	87.04	87.00	87.52	128.6	0.78	21%	0.30

CUMMING COCKBURN LIMITED
1770 WOODWARD DRIVE
OTTAWA, ONTARIO
K2C OP8

SANITARY SEWER DESIGN SHEET
PROJECT : STONEBRIDGE DEVELOPMENTS
PHASE 5
DEVELOPER : MONARCH CONSTRUCTION

JOB #: 3516-LD
DATE: JAN 2004
DESIGN: LME

LOCATION			INDIVIDUAL					CUM. RES. FLOW			CUM. COM. & INST. FLOW			INFILTRATION			TOTAL	PROPOSED SEWER					
			RESID. UNITS																				
STREET	FROM MH	TO MH	Singles Semis	Towns	RES. AREA (Ha)	POP.	COM. INST. (Ha)	POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (Ha)	PEAK FACT.	PEAK FLOW (l/s)	INCR. AREA (Ha)	CUM. AREA (Ha)	FLOW (l/s)	DESIGN FLOW (l/s)	CAP. l/s	PIPE (mm)	LGTH. (m)	SLOPE %	VEL. (full) m/s	AVAIL. CAP. (%)
MANOTICK					625.0	7938	45.0	7938	3.05	99.38	45.0	1.50	39.15	670.00	670.00	187.60	326.1						
GOLFLINKS DRIVE	300A	301A	7	5	0.78	44.1		7982	3.05	99.86	45.0	1.50	39.15	0.78	670.78	187.82	326.8	342.26	375	115.0	3.50	3.00	4.51%
GOLFLINKS DRIVE	301A	302A	1	4	0.35	17.8		8000	3.05	100.05	45.0	1.50	39.15	0.35	671.13	187.92	327.1	342.26	375	42.4	3.50	3.00	4.42%
GOLFLINKS DRIVE	302A	305A	1		0.11	3.8		8004	3.05	100.09	45.0	1.50	39.15	0.11	671.24	187.95	327.2	342.26	375	21.9	3.50	3.00	4.40%
FERGUSLEA LANE	STUB	FUT MH			3.00	210.0		210	4.00	3.44				3.00	3.00	0.84	4.28	26.49	200	13.2	0.60	0.82	83.83%
FERGUSLEA LANE	FUT MH	304A	2		0.20	7.6		218	4.00	3.57				0.20	3.20	0.90	4.46	26.49	200	29.6	0.60	0.82	83.15%
FERGUSLEA LANE	304A	305A	1		0.11	3.8		221	4.00	3.63				0.11	3.31	0.93	4.56	30.61	200	39.1	0.80	0.94	85.11%
GOLFLINKS DRIVE	305A	306A	4		0.34	15.2		8240	3.04	102.63	45.0	1.50	39.15	0.34	674.89	188.97	330.7	441.13	450	37.0	2.20	2.69	25.02%
GOLFLINKS DRIVE	306A	314A	3		0.27	11.4		8252	3.04	102.75	45.0	1.50	39.15	0.27	675.16	189.04	330.9	441.13	450	37.4	2.20	2.69	24.98%
ERINWOODS CIRCLE	303A	303C	4		0.30	15.2		15	4.00	0.25				0.30	0.30	0.08	0.33	35.90	200	29.7	1.10	1.11	99.07%
ERINWOODS CIRCLE	303C	307A	10		0.72	38.0		53	4.00	0.87				0.72	1.02	0.29	1.16	35.90	200	89.1	1.10	1.11	96.77%
ERINWOODS CIRCLE	307A	308A	8		0.58	30.4		84	4.00	1.37				0.58	1.60	0.45	1.82	34.21	200	71.8	1.00	1.06	94.68%
ERINWOODS CIRCLE	308A	309A	2		0.22	7.6		91	4.00	1.50				0.22	1.82	0.51	2.01	26.49	200	10.7	0.60	0.82	92.43%
ERINWOODS CIRCLE	309A	310A	9		0.64	34.2		125	4.00	2.06				0.64	2.46	0.69	2.75	39.22	250	69.7	0.40	0.77	93.00%
ERINWOODS CIRCLE	310A	311A	2		0.24	7.6		133	4.00	2.18				0.24	2.70	0.76	2.94	39.22	250	11.9	0.40	0.77	92.51%
ERINWOODS CIRCLE	311A	312A	12		0.85	45.6		179	4.00	2.93				0.85	3.55	0.99	3.92	39.22	250	114.9	0.40	0.77	90.00%
ERINWOODS CIRCLE	312A	313A	10		0.68	38.0		217	4.00	3.55				0.68	4.23	1.18	4.74	39.22	250	80.6	0.40	0.77	87.92%
ERINWOODS CIRCLE	313A	314A			0.03	2.6		219	4.00	3.59				0.03	4.26	1.19	4.79	39.22	250	18.4	0.40	0.77	87.79%
GOLFLINKS DRIVE	314A	317A	4		0.39	15.2		8486	3.03	105.25	45.0	1.50	39.15	0.39	679.81	190.35	334.8	350.82	600	74.1	0.30	1.20	4.58%
SILBRASS PRIVATE	315A	316A		5	0.23	17.5		18	4.00	0.29				0.23	0.23	0.06	0.35	40.47	200	14.2	1.40	1.25	99.13%
SILBRASS PRIVATE	316A	317A		10	0.33	35.0		53	4.00	0.86				0.33	0.56	0.16	1.02	68.43	200	54.5	4.00	2.11	98.51%
GOLFLINKS DRIVE	317A	318A	3		0.36	11.4		8550	3.02	105.93	45.0	1.50	39.15	0.36	680.73	190.60	335.7	350.82	600	50.0	0.30	1.20	4.31%
GOLFLINKS DRIVE	318A	336A				0.0		8550	3.02	105.93	45.0	1.50	39.15	0	680.73	190.60	335.7	350.82	600	35.8	0.30	1.20	4.31%

Where Q = average daily per capita flow (350 l/cap.d.) or (0.0041l/sec./cap)
I = Unit of peak extraneous flow (0.28 l/sec/ha)
M = Peaking factor = Harmon Peaking Factor , M = 1+(14/(4+P^0.5)) , where P = population in thousands
Q(p) = Peak population flow (l/s)
Q(i) = peak extraneous flow (l/s)
Population Density = 3.8 per single family and semi-detached residential unit, 3.5 per Townhnouse unit
Commercial, Office Space and School - Average flow 50,000 l/ha/day (0.58 l/s/ha) with Peaking Factor = 1.5
Undeveloped or Other Lands = 86 persons/gross hectare

Revisions:

CUMMING COCKBURN LIMITED
1770 WOODWARD DRIVE
OTTAWA, ONTARIO
K2C OP8

SANITARY SEWER DESIGN SHEET
PROJECT : STONEBRIDGE DEVELOPMENTS
PHASE 5
DEVELOPER : MONARCH CONSTRUCTION

JOB #: 3516-LD
DATE: JAN 2004
DESIGN: LME

LOCATION			INDIVIDUAL					CUM. RES. FLOW			CUM. COM. & INST. FLOW			INFILTRATION			TOTAL	PROPOSED SEWER					
			RESID. UNITS																				
STREET	FROM MH	TO MH	Singles Semis	Towns	RES. AREA (Ha)	POP.	COM. INST. (Ha)	POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (Ha)	PEAK FACT.	PEAK FLOW (l/s)	INCR. AREA (Ha)	CUM. AREA (Ha)	FLOW (l/s)	DESIGN FLOW (l/s)	CAP. l/s	PIPE (mm)	LGTH. (m)	SLOPE %	VEL. (full) m/s	AVAIL. CAP. (%)
SILBRASS PRIVATE	315A	319A		7	0.22	24.5		25	4.00	0.40				0.22	0.22	0.06	0.46	41.90	200	50.4	1.50	1.29	98.89%
SILBRASS PRIVATE	319A	320A		2	0.10	7.0		32	4.00	0.52				0.10	0.32	0.09	0.61	41.90	200	12.2	1.50	1.29	98.55%
SILBRASS PRIVATE	320A	336A		9	0.32	31.5		63	4.00	1.03				0.32	0.64	0.18	1.21	66.71	200	49.2	3.80	2.06	98.18%
HAWKTREE RIDGE	321A	322A		14	0.62	49.0		49	4.00	0.80				0.62	0.62	0.17	0.98	34.21	200	41.5	1.00	1.06	97.14%
HAWKTREE RIDGE	322A	323A		12	0.46	42.0		91	4.00	1.49				0.46	1.08	0.30	1.79	26.49	200	42.0	0.60	0.82	93.23%
HAWKTREE RIDGE	323A	324A	3	6	0.61	32.4		123	4.00	2.02				0.61	1.69	0.47	2.50	28.64	200	75.4	0.70	0.88	91.28%
HAWKTREE RIDGE	324A	325A	3		0.25	11.4		135	4.00	2.21				0.25	1.94	0.54	2.75	26.49	200	24.6	0.60	0.82	89.61%
HAWKTREE RIDGE	325A	327A	2		0.18	7.6		142	4.00	2.34				0.18	2.12	0.59	2.93	26.49	200	37.6	0.60	0.82	88.95%
HAWKTREE RIDGE	343A	303A	2		0.17	7.6		8	4.00	0.12				0.17	0.17	0.05	0.17	53.02	200	29.0	2.40	1.64	99.68%
DOCHART TERR.	327A	328A	1		0.12	3.8		154	4.00	2.52				0.12	2.41	0.67	3.20	48.38	200	30.7	2.00	1.49	93.39%
DOCHART TERR.	328A	329A	3		0.28	11.4		165	4.00	2.71				0.28	2.69	0.75	3.46	48.38	200	16.5	2.00	1.49	92.84%
DOCHART TERR.	329A	333A	8		0.67	30.4		196	4.00	3.21				0.67	3.36	0.94	4.15	48.38	200	117.3	2.00	1.49	91.43%
CALABAR COURT	330A	331A		7	0.52	24.5		25	4.00	0.40				0.52	0.52	0.15	0.55	48.38	200	23.0	2.00	1.49	98.87%
CALABAR COURT	331A	332A		10	0.53	35.0		60	4.00	0.98				0.53	1.05	0.29	1.27	41.90	200	52.6	1.50	1.29	96.97%
CALABAR COURT	332A	333A		2	0.18	7.0		67	4.00	1.09				0.18	1.23	0.34	1.44	59.28	200	21.9	3.00	1.83	97.58%
CALABAR COURT	333A	334A	4		0.33	15.2		277	4.00	4.55				0.33	4.92	1.38	5.93	28.64	200	43.0	0.70	0.88	79.31%
CALABAR COURT	334A	335A	5		0.46	19.0		296	4.00	4.86				0.46	5.38	1.51	6.37	30.61	200	36.8	0.80	0.94	79.21%
CALABAR COURT	335A	336A	1		0.16	3.8		300	4.00	4.92				0.16	5.54	1.55	6.47	65.83	200	26.9	3.70	2.03	90.17%
GOLFLINKS DRIVE	336A	337A	1		0.17	3.8		8917	3.00	109.82	45.0	1.50	39.15	0.17	687.08	192.38	341.4	350.82	600	48.3	0.30	1.20	2.70%
GOLFLINKS DRIVE	337A	343A	9		0.72	34.2		8951	3.00	110.18	45.0	1.50	39.15	0.72	687.80	192.58	341.9	350.82	600	87.3	0.30	1.20	2.54%

Where Q = average daily per capita flow (350 l/cap.d.) or (0.0041l/sec./cap)
I = Unit of peak extraneous flow (0.28 l/sec/ha)
M = Peaking factor = Harmon Peaking Factor , M = 1+(14/(4+P^0.5)) , where P = population in thousands
Q(p) = Peak population flow (l/s)
Q(i) = peak extraneous flow (l/s).
Population Density = 3.8 per single family and semi-detached residential unit, 3.5 per Towhnhouse unit
Commercial, Office Space and School - Average flow 50,000 l/ha/day (0.58 l/s/ha) with Peaking Factor = 1.5
Undeveloped or Other Lands = 86 persons/gross hectare

Revisions:

CUMMING COCKBURN LIMITED
1770 WOODWARD DRIVE
OTTAWA, ONTARIO
K2C OP8

SANITARY SEWER DESIGN SHEET
PROJECT : STONEBRIDGE DEVELOPMENTS
PHASE 5
DEVELOPER : MONARCH CONSTRUCTION

JOB #: 3516-LD
DATE: JAN 2004
DESIGN: LME

LOCATION			INDIVIDUAL					CUM. RES. FLOW			CUM. COM. & INST. FLOW			INFILTRATION			TOTAL	PROPOSED SEWER					
STREET	FROM MH	TO MH	RESID. UNITS Singles Semis	RESID. UNITS Towns	RES. AREA (Ha)	POP.	COM. INST. (Ha)	POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (Ha)	PEAK FACT.	PEAK FLOW (l/s)	INCR. AREA (Ha)	CUM. AREA (Ha)	FLOW (l/s)	DESIGN FLOW (l/s)	CAP. l/s	PIPE (mm)	LGTH. (m)	SLOPE %	VEL. (full) m/s	AVAIL. CAP. (%)
CASTLEGRATH CR.	338A	339A	5		0.46	19.0		19	4.00	0.31				0.46	0.46	0.13	0.44	34.21	200	67.6	1.00	1.06	98.71%
CASTLEGRATH CR.	339A	340A	1		0.13	3.8		23	4.00	0.37				0.13	0.59	0.17	0.54	26.49	200	10.9	0.60	0.82	97.97%
CASTLEGRATH CR.	340A	341A	11		0.68	41.8		65	4.00	1.06				0.68	1.27	0.36	1.42	26.49	200	73.8	0.60	0.82	94.66%
CASTLEGRATH CR.	341A	342A	3		0.21	11.4		76	4.00	1.25				0.21	1.48	0.41	1.66	26.49	200	20.8	0.60	0.82	93.73%
CASTLEGRATH CR.	342A	343A			0.08	6.9		83	4.00	1.36				0.08	1.56	0.44	1.80	52.44	200	48.8	2.35	1.62	96.57%
GOLFLINKS DRIVE	343A	344A	6		0.45	22.8		9057	3.00	111.30	45.0	1.50	39.15	0.45	689.81	193.15	343.6	350.82	600	45.9	0.30	1.20	2.06%
GOLFLINKS DRIVE	344A	349A	2		0.19	7.6		9064	3.00	111.38	45.0	1.50	39.15	0.19	690.00	193.20	343.7	350.82	600	33.8	0.30	1.20	2.02%
CASTLEGRATH CR.	338A	345A	2		0.26	7.6		8	4.00	0.12				0.26	0.26	0.07	0.20	34.21	200	12.1	1.00	1.06	99.42%
CASTLEGRATH CR.	345A	346A	10		0.64	38.0		46	4.00	0.75				0.64	0.90	0.25	1.00	26.49	200	70.0	0.60	0.82	96.23%
CASTLEGRATH CR.	346A	347A	9		0.57	34.2		80	4.00	1.31				0.57	1.47	0.41	1.72	26.49	200	64.3	0.60	0.82	93.51%
CASTLEGRATH CR.	347A	348A	3		0.25	11.4		91	4.00	1.50				0.25	1.72	0.48	1.98	26.49	200	22.9	0.60	0.82	92.54%
CASTLEGRATH CR.	348A	349A	1		0.13	3.8		95	4.00	1.56				0.13	1.85	0.52	2.08	107.47	250	38.5	3.00	2.12	98.07%
GOLFLINKS DRIVE	349A	350A	2		0.20	7.6		9167	2.99	112.46	45.0	1.50	39.15	0.20	692.05	193.77	345.4	378.84	600	40.5	0.35	1.30	8.83%
GOLFLINKS DRIVE	350A	STUB	4		0.46	15.2		9182	2.99	112.62	45.0	1.50	39.15	0.46	692.51	193.90	345.7	378.84	600	83.3	0.35	1.30	8.76%

Where Q = average daily per capita flow (350 l/cap.d.) or (0.0041l/sec./cap)
I = Unit of peak extraneous flow (0.28 l/sec/ha)
M = Peaking factor = Harmon Peaking Factor , M = 1+(14/(4+P^0.5)) , where P = population in thousands
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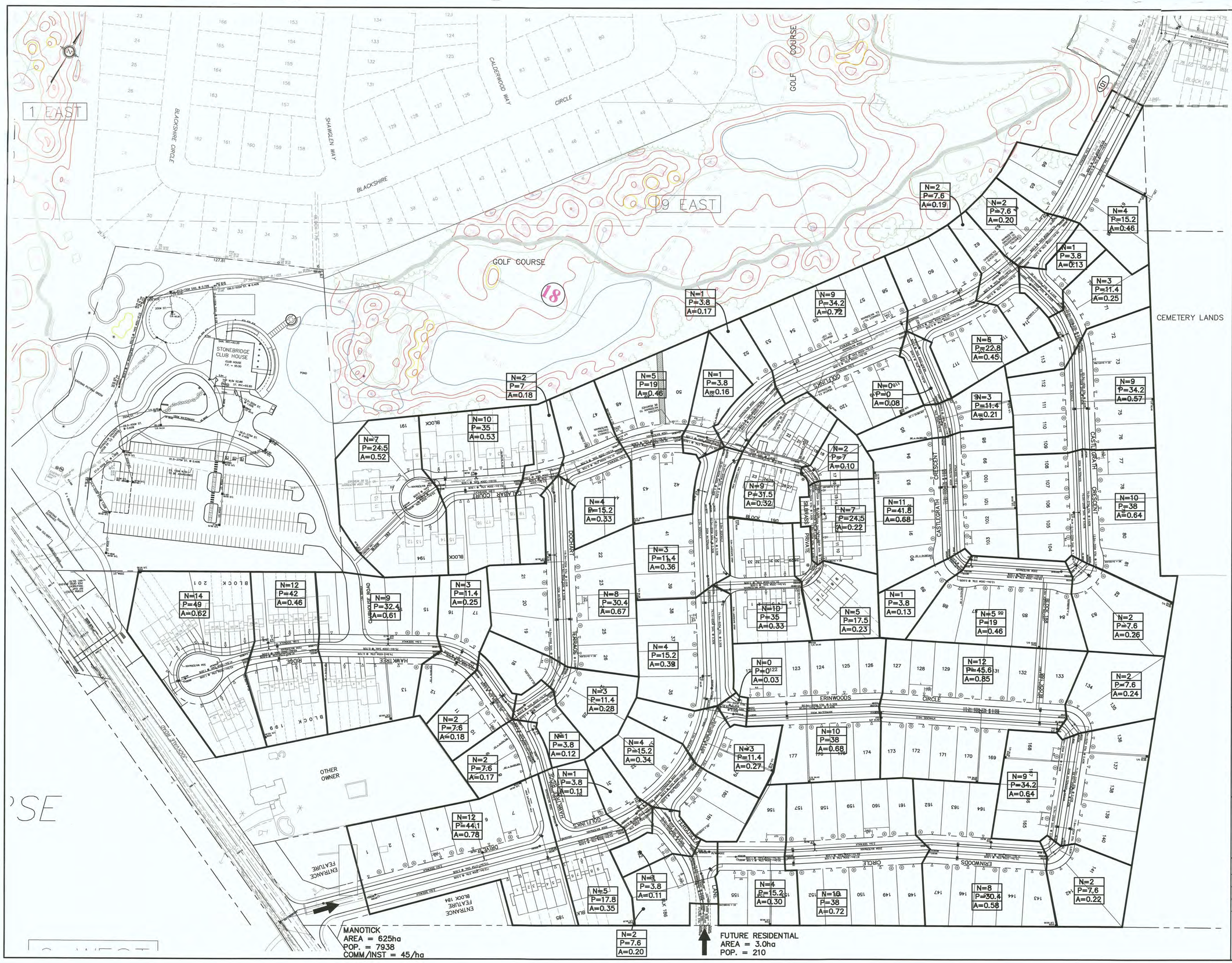
Commercial, Office Space and School - Average flow 50,000 l/ha/day (0.58 l/s/ha) with Peaking Factor = 1.5
Undeveloped or Other Lands = 86 persons/gross hectare

Revisions:
Revised as per new legal and City comments (May 21-03)
Revised as per new legal (July 22-03)



NO.	DATE	BY	REVISION
0.	04/01/23	L.M.E.	ISSUED FOR MOE APPROVAL
1.	04/02/18	L.M.E.	GENERAL REVISIONS
2.	04/06/04		SILBRASS PRIVATE ISSUED FOR MOE

LEGEND:

SANITARY

N=5 — NUMBER OF UNITS
P=17.5 — POPULATION
A=0.36 — AREA IN HECTARES

POPULATION

SINGLE FAMILY = 3.8ppu
TOWNHOUSE = 3.5ppu

MONARCH

Ottawa

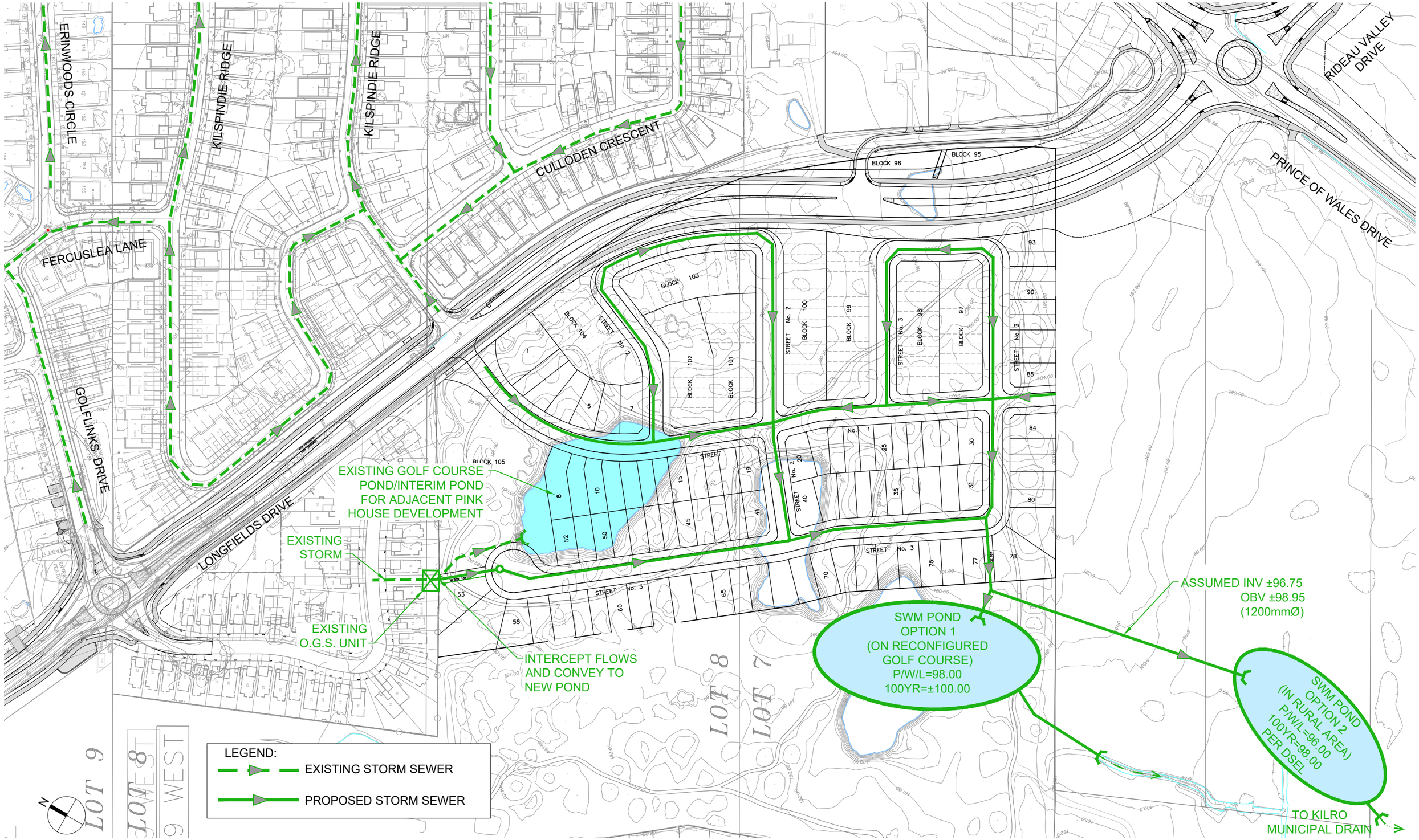
CCL Cumming Cockburn Limited

LICENSED PROFESSIONAL ENGINEER
L. M. ERION
4/06/04
PROVINCE OF ONTARIO

STONEBRIDGE PHASE V
—
SANITARY DRAINAGE AREA PLANS
—

SCALE:	1:1000		
DRAWN:	D.P.S.	DATE:	JAN. '04
DESIGN:	L.M.E.	DATE:	JAN. '04
CHECKED:	L.M.E.	DATE:	JAN. '04
PROJECT NO.	3516-LD	DRAWING NO.	501

APPENDIX C



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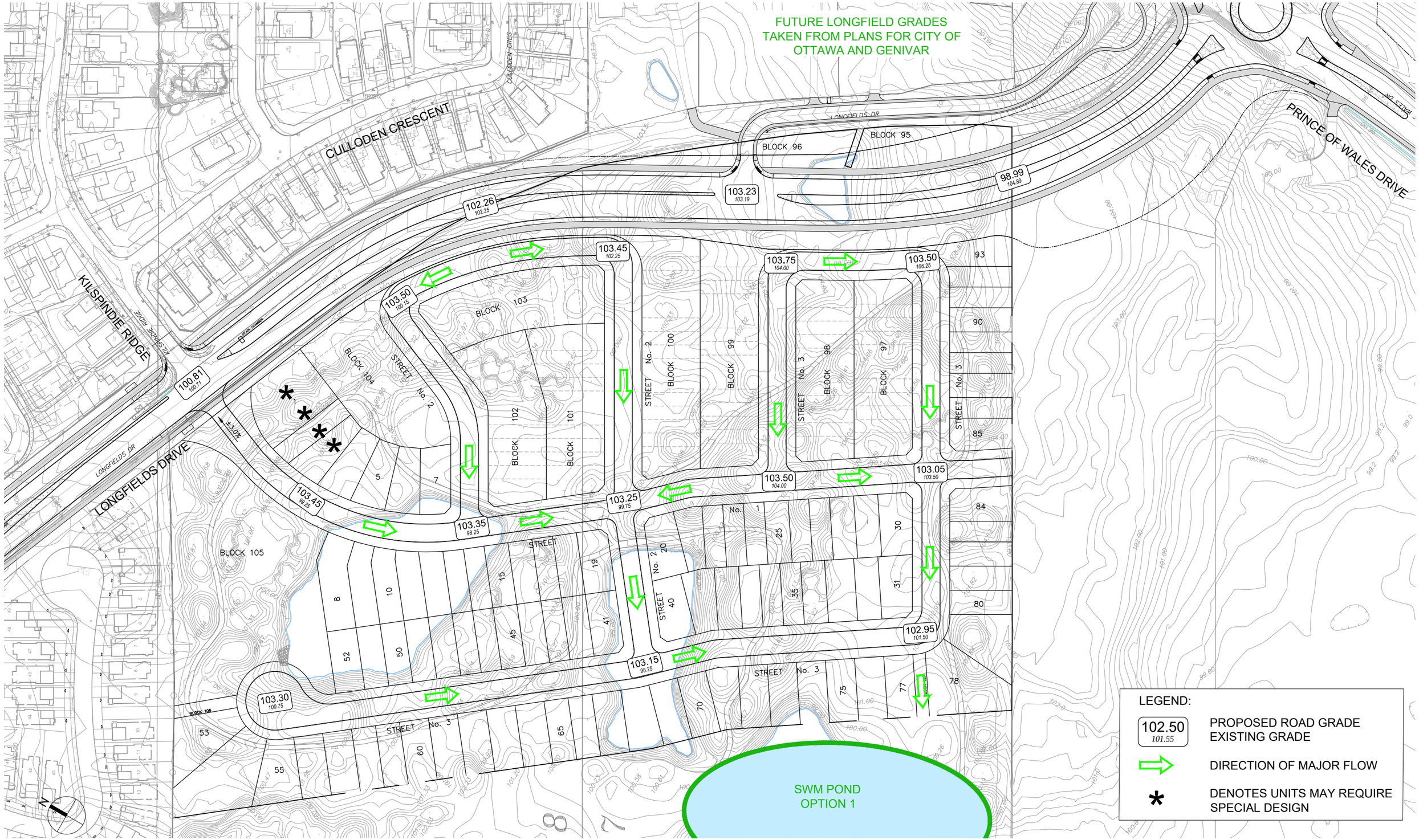
Scale	Project Title	Drawing Title	Sheet No.
N.T.S.	STONEBRIDGE PHASE 16	STORM SEWERS AND SWM	FIGURE 4.1

APPENDIX D



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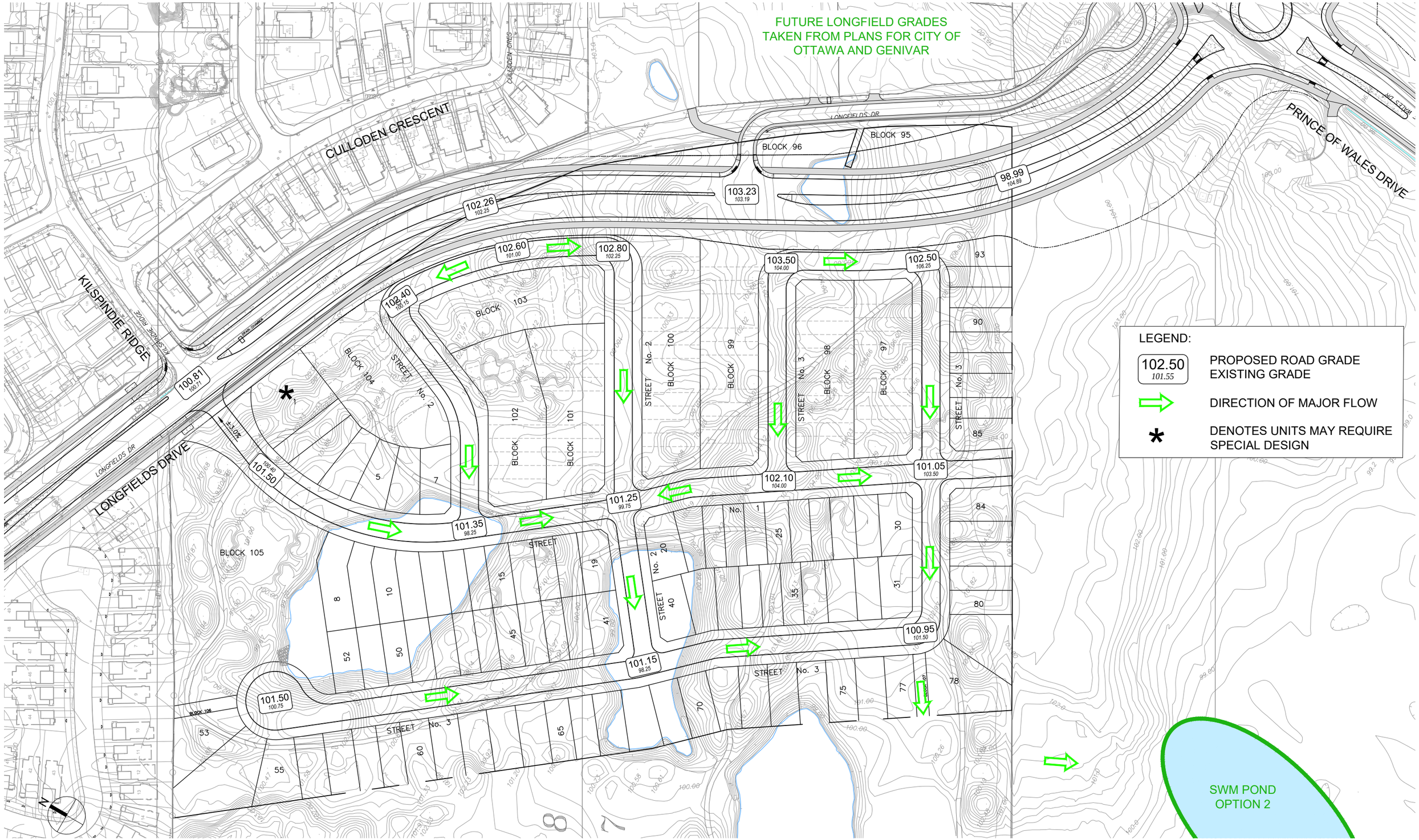
Scale	Project Title	Drawing Title	Sheet No.
N.T.S.	STONEBRIDGE PHASE 16	MACRO GRADING STORM OPTION 1	FIGURE 5.1



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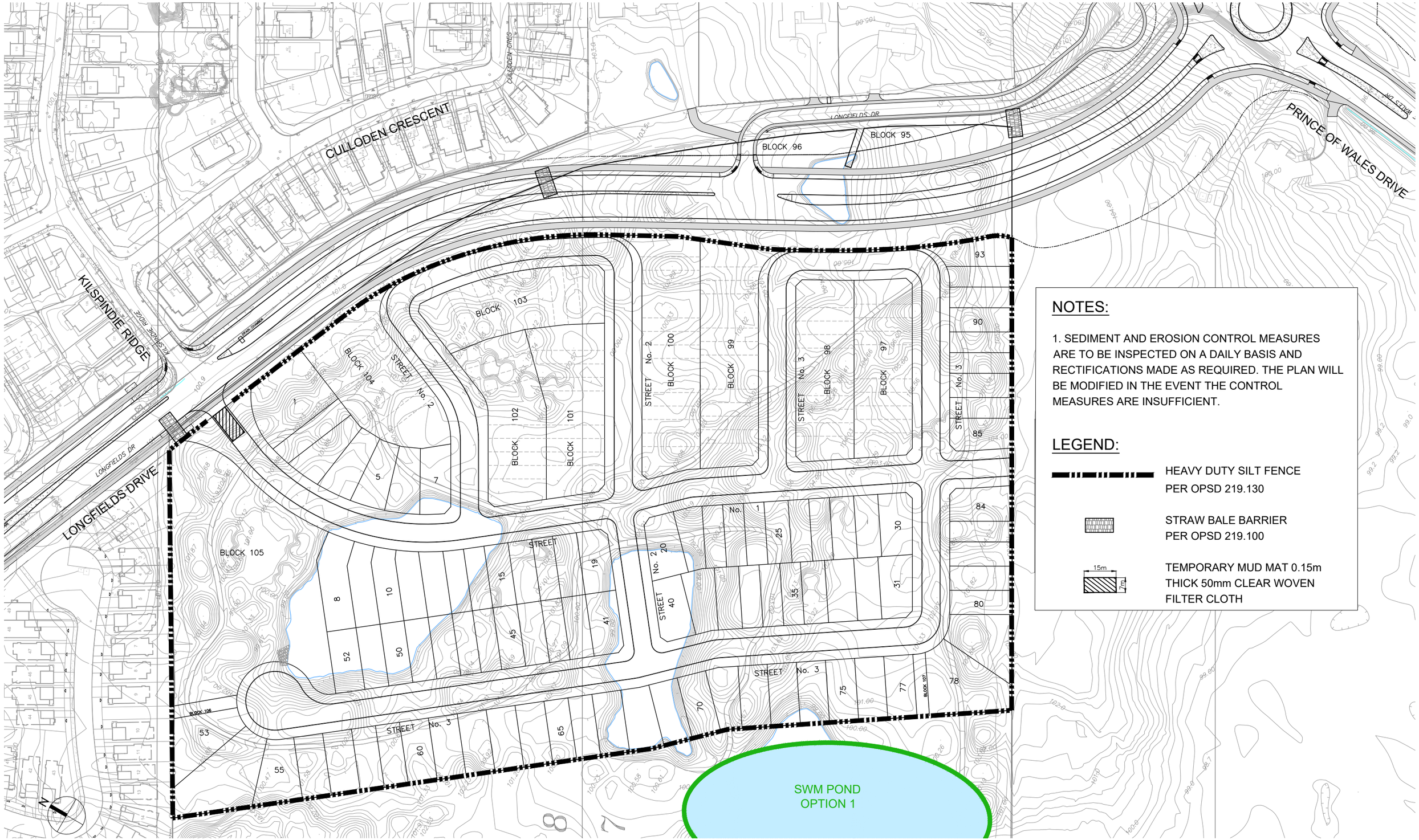
Scale	Project Title	Drawing Title	Sheet No.
N.T.S.	STONEBRIDGE PHASE 16	MACRO GRADING STORM OPTION 2	FIGURE 5.2



NOTES:

1. SEDIMENT AND EROSION CONTROL MEASURES ARE TO BE INSPECTED ON A DAILY BASIS AND RECTIFICATIONS MADE AS REQUIRED. THE PLAN WILL BE MODIFIED IN THE EVENT THE CONTROL MEASURES ARE INSUFFICIENT.

LEGEND:

HEAVY DUTY SILT FENCE PER OPSD 219.130

STRAW BALE BARRIER PER OPSD 219.100

15m 7m TEMPORARY MUD MAT 0.15m THICK 50mm CLEAR WOVEN FILTER CLOTH

J:\122507_2701Longfields\7.0_Production\7.3_Design\04_Civil\Sheets\Figures\Figure-6.1.dwg Layout Name: Fig5.1 Plot Scale: 1:5.13 Plotted At: 10/15/2019 Last Saved By: dsiuma Last Saved At: Oct. 8, 19

Scale	Project Title	Drawing Title	Sheet No.
N.T.S.	STONEBRIDGE PHASE 16	EROSION AND SEDIMENT CONTROL PLAN	FIGURE 6.1