REPORT
PROJECT: 105205-5.2.2

ASSESSMENT OF ADEQUACY OF PUBLIC SERVICES
CLARIDGE HOMES
MAPLE GROVE LANDS
1981 MAPLE GROVE ROAD
KANATA WEST

Prepared for CLARIDGE HOMES
by IBI GROUP

FEBRUARY 2018
REVISED OCTOBER 2018
REVISED FEBRUARY 2021

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1 INTRODUCTION

1.1 Purpose

The purpose of this report is to investigate and confirm the adequacy of public services for the proposed site. This report will review major municipal infrastructure including water supply, wastewater collection and disposal and management of stormwater. This report will also include a Sedimentation and Erosion Control Plan. A review of traffic components will be the subject of a separate report.

This report is being prepared as a technical document in support of the subdivision submission, and was prepared in accordance with the November 2009 “Servicing Study Guidelines for Development Applications” in the City of Ottawa. **Appendix A** contains a customized copy of those guidelines which can be used as a quick reference for the location of each of the guideline items within the study report.

1.2 Subject Property

The subject property is located in the Kanata West Community in the City of Ottawa as shown on the Location Plan **Figure 1.1**. The site is located north of Maple Grove Road at Alon Street and north of the Stittsville Main Street which is currently dead-ended at the southwest corner of the site. Along the east, west and north, the site is bounded by undeveloped land. There is an existing residential lot at the east corner of the site.

A Draft Plan for this development is shown on **Figure 1.2**. The residential site consists of 51 single family lots, 104 street townhouse units and 32 back to back townhouse units. A park is located at the north corner of the site. The collector road, Stittsville Main Street, will be extended along the west side of the site.

1.3 Previous Studies

The following reports were reviewed prior to completion of this assessment:

- Kanata West Master Servicing Study (KWMSS) prepared by Stantec Consulting Ltd. and CCL/IBI Group, June 2006.
- Design Brief – Pond 4, Kanata West, Mattamy Homes, City of Ottawa prepared by DSEL & JFSA, December 2014.
- Geotechnical Investigation, Proposed Residential Development, Maple Grove Road, Ottawa, Ontario, prepared by Golder Associates, December, 2017.

1.4 Existing Infrastructure

Figure 1.3 shows the existing infrastructure in the area that will service the subject site. A 300 mm diameter watermain has been extended along the Maple Grove Road right-of-way from Johnwoods Street to connect to a 300 mm diameter watermain on Stittsville Main Street. An existing 375 mm diameter sanitary sewer is located on Maple Grove Road at Johnwoods Street which flows east along Maple Grove Road. A 200 mm diameter high level sanitary sewer is provided to service the houses along Maple Grove. Along with the sanitary sewer, an existing 2100 mm diameter storm sewer is located at Maple Grove Road and Johnwoods Street. The sewer flows west and is tributary to Pond 4 and a diversion sewer. This will be further discussed in Section 4. As with the sanitary, a 375 mm diameter high level storm sewer is provided.

1.5 Pre-Consultation

There was a pre-application consultation meeting held at the City of Ottawa for the subject site, 1981 Maple Grove Road on November 9, 2016. The formal meeting notes are provided in **Appendix A**. The topics discussed at this meeting included the following:

- Engineering
- Conservation Authority
- Environmental/Tree
- Transportation/Noise/OC Transpo
- Urban Design
- Parks

1.6 Geotechnical Considerations

As mentioned in Section 1.3, a Geotechnical Report has been completed by Golder Associates for the subject site. Subsoil and groundwater conditions were determined by means of test pits. The investigation revealed that bedrock was encountered at all test pits ranging in depth from 0.3 to 2.1 meters below the existing ground surface.

The report has provided geotechnical design and construction considerations which includes the following:

- Site grading
- Foundation design
- Sewer and watermain construction
- Pavement design

Due to the shallow bedrock there is no practical limit to the amount of grade raise fill.

2 WATER SUPPLY

2.1 Existing Conditions

The subject property is located within the City of Ottawa's 3W pressure zone. Water to the entire Kanata West development is pressurized and stored at the Glen Cairn Pump Station and reservoir (GCPS and GCR). The GCPS and GCR are located near Castlefrank and Hazeldean Roads. From there, major feedermains extend to the west, north and south.

As stated in Section 1.4 there is an existing 300 mm diameter watermain on the Maple Grove Road right-of-way extending to Stittsville Main Street. The 300 mm watermain will be the water supply for the subject lands.

2.2 Master Servicing Study

The KWMSS report provides trunk watermains in the Kanata West area. A copy of the recommended plan Watermain Final Concept Drawing No. WM-1 is included in **Appendix B**. The drawing shows the 300 mm diameter watermain on Maple Grove Road and on Stittsville Main Street to be extended north along the west boundary of the subject site.

2.3 Design Criteria

2.3.1 Water Demands

Water demands have been calculated for the full development including Phase 1. Per unit population density and consumption rates are taken from Tables 4.1 and 4.2 at the Ottawa Design Guidelines – Water Distribution and are summarized as follows:

- Single Family 3.4 person per unit
- Townhouse and Semi-Detached 2.7 person per unit
- Average Apartment 1.8 person per unit
- Residential Average Day Demand 350 l/cap/day
- Residential Peak Daily Demand 875 l/cap/day
- Residential Peak Hour Demand 1,925 l/cap/day

Residential units in the subject site consist of back to back and street townhouses. A watermain demand calculation sheet is included in **Appendix B** and the total water demands are summarized as follows:

- Average Day 2.31 l/s
- Maximum Day 5.77 l/s
- Peak Hour 12.69 l/s

2.3.2 System Pressure

The Ottawa Design Guidelines – Water Distribution (WDG001), July 2010, City of Ottawa, Clause 4.2.2 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 Clause 4.2.2 of 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 will be required for buildings where it is not possible/feasible to maintain the system pressure below 552 kPa.

2.3.3 Fire Flow Rates

In the recent Technical Bulletin 'ISDTB-2014-02, Revisions to Ottawa Design Guidelines – Water', the fire flow requirements for single detached dwellings and traditional town and row houses can be capped at 10,000 l/min provided that there is a minimum separation of 10 meters between the backs of adjacent units and that the town and row house blocks are limited to 600 square meters of building areas and seven dwelling units. The street townhouses in this development meet the requirements of ISDTB-2014-02, the fire flow rate of 10,000 l/min (166.7 l/s) is used in the fire flow analysis for the street townhouse units.

The townhouses in Block 10 appears to violate ISDTB-2014-02 as the rear of the units are within 10 metres of the flanking units, the same occurs between Blocks 3 and 4, however, the rear to flank distance is greater than 10 meters. A Fire Underwriters Survey (FUS) calculation has been carried out for the north block of Block 10, with a 3 meter separation between the townhouse blocks in Block 10 results in a fire flow rate of 11,000 l/min (183.3 l/s). A copy of the FUS calculation is included in Appendix B.

As the back to back townhouses of the development do not meet the requirements of ISDTB-2014-02, a FUS calculation has been undertaken to determine the required fire flow. In **Appendix B**, a FUS calculations for the largest block is included which results in a fire flow rate of 12,000 l/min (200 l/s) which is used in the hydraulic analysis for the back to back townhouse units.

2.3.4 Boundary Conditions

The City of Ottawa has provided hydraulic boundary conditions at two locations on Maple Grove Road watermain, at the site entrance. Two separate conditions were given for the max day plus fire scenario, one for the 10,000 l/min for single family and street townhouses fire flow and a separate one for the 13,000 l/min back to back townhouses. A copy of the boundary conditions is included in **Appendix B** and summarized as follows:

	CONNECTION 1	CONNECTION 2
Max HGL (Basic Day)	106.9 m	161.0 m
Peak Hour	156.6 m	156.6 m
Max Day + Fire (10,000 l/min Fire Flow)	154.3 m	154.3 m
Max Day + Fire (13,000 l/min Fire Flow)	152.5 m	152.4 m

2.3.5 Hydraulic Model

The computer model for the subject development has been developed using the InfoWater Version 6.0 program produced by Innovyze. The model includes the existing watermains and boundary conditions on Maple Grove Road. Future watermains on Stittsville Main Street, the future roadway north of the site and future development east of the site are not included in the hydraulic model.

2.4 Proposed Water Plan

2.4.1 Modeling Results

The hydraulic model was run under basic day, maximum day with fire flows and under peak hour conditions. Water pipes are sized to provide sufficient pressure and to deliver the required fire flows. The fire flows for the street townhouse is run under the Max Day plus 10,000 l/min fire scenario while the back to back townhouses and Block 10 townhouses are run under the Max Day plus 13,000 l/min fire scenario.

Results of the hydraulic model are include in **Appendix B** and summarized as follows:

Scenario	
Basic Day (Max HGL) Pressure Range	470.4 to 524.2 kPa
Peak Hour Pressure Range	428.2 to 481.1 kPa
Max Day + 10,000 l/min Fire Flow Minimum Flow	152.2 l/s (9,132 l/min)
Max Day + 13,000 l/min Fire Flow Minimum Flow	206.8 l/s (12,408 l/min)

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

Maximum Pressure	All nodes have basic day pressures under 552 kPa, therefore pressure reducing control is not required for this development.
Minimum Pressure	All nodes in the model exceed the minimum value of 276 kPa (40 psi).
Fire Flow	All the nodes for street townhouses exceed the 166.7 l/s (10,000 l/min) requirement except for Node S36 at 152.2 l/s and Node J12 at 160.0 l/s. These nodes are at temporary dead end mains, when the roadway to the north is built the watermains will be extended and looped providing more than the 166.7 l/s required. In the interim, the procedure of Appendix I of Technical Bulletin ISTB-2018-02 a Class AA hydrant within 75 meters of the last building on the temporary dead end street can contribute 5,700 l/min fire flow and a hydrant within 75 to 150 meters of the building can

contribute 3,800 l/min. The combined fire flow available at the end of the temporary dead end is 9,500 min which is within 5% of the target 10,000 l/min.

2.4.2 Watermain Layout

Figure 2.1 shows the proposed Water Plan for the proposed development.

As this development is proceeding in advance of Stittsville Main Street construction, a watermain loop is provided by two connections to the Maple Grove watermain proposed at the site entrance. Two watermains are proposed on Street No. 1 from Maple Grove Road to the pathway Block 8 where the second watermain passes. A roadway section showing the two watermains is on **Figure 2.2**. All watermains in the development are 200mm diameter to provide adequate fire flows.

There are three temporary dead end watermains on Streets 1, 2 and 3 that will be in place until the adjacent lands are developed. A calculation is included in Appendix B in which the volume of water in the pipes is compared to the consumption rate to determine the amount of time to empty or turnover the main. The population is based on 2.7 persons per townhouse unit per Section 2.3.1 and a reduced consumption rate of 200 liters per person is used rather than the design rate of 350 liters per person. The calculations show that the turnover time is less than one day for all the temporary dead ends.

3 SANITARY SEWERS

3.1 Existing Conditions

As stated in Section 1.4, there is an existing 375 mm diameter sanitary sewer on Maple Grove Road which currently drains to the Mattamy Temporary Pump Station located on the south side of Maple Grove Road approximately 485 meters east of Huntmar Drive. The permanent outlet for the Maple Grove sanitary sewer is the Kanata West Pump Station which was completed and commissioned in June 2018.

3.2 Master Servicing Study

The KWMSS provides trunk sanitary sewers and drainage areas for the Kanata West area. The subject site is located in Area 26 of the preferred wastewater option of the study which is tributary to the Kanata West Pump Station, which is now in service. In the sanitary design the KWMSS allows 30 units/hectare for area 26. The proposed development has approximately 26 units/hectare. A copy of the KWMSS Preferred Wastewater Option Drawing No. S-1 and the sanitary sewer design sheet is included in **Appendix C**.

3.3 Design Criteria

The estimated wastewater flows from the subject site are based on the proposed revised City of Ottawa design criteria. Among other items, these include:

- Average residential flow = 280 l/c/d
- Peak residential flow factor = (Harmon Formula) x 0.80
- Average commercial flow = 28,000 l/s/ha
- Average institutional flow = 28,000 l/s/ha
- Peak ICI flow factor = 1.5 if ICI area is ≤ 20% total area
  1.0 if ICI area is > 20% total area
- Inflow and Infiltration Rate = 0.33 l/s/ha
- Minimum Full Flow Velocity = 0.60 m/s
- Maximum Full Flow Velocity = 3.0 m/s
- Minimum Pipe Size = 200 mm diameter

DIAMETER (MM)	SLOPE (%)
200	0.320
250	0.240
300	0.186
375	0.140
450	0.111
525 and larger	0.100

Where practical and where there are less than 10 residential connections, the first lengths of sanitary sewers will be designed as 200 mm diameter pipes with a minimum slope of 0.65%.

The following density rates are from the City design criteria:

- Family lots = 3.4 ppu
- Semi-detached units = 2.7 ppu
- Townhouse and back to back units = 2.7 ppu
- Apartment units = 1.8 ppu

3.4 Proposed Wastewater Plan

The proposed wastewater plan for the Maple Grove Lands development is shown on **Figure 3.1**. A sanitary sewer is extended on Maple Grove Road from the existing sewer at Johnwoods Street to service the site and the lots fronting Maple Grove Road. There are no external areas draining through the site so all the sanitary sewers are local sewers at normal depth.

4 STORMWATER MANAGEMENT

4.1 Existing Conditions

As stated in Section 1.4 there is an existing 2100 mm diameter storm sewer on Maple Grove Road. The trunk storm sewer flows west outletting into Pond 4 which discharges to the Carp River. The Maple Grove storm trunk is also connected to a diversion pipe system which conveys excess flows to Poole Creek.

4.1.1 Background and Synopsis of Previous Reports

In June 2006, Stantec completed the "Kanata West Master Servicing Study" (KWMSS), which recommended the preferred stormwater management solution to accommodate sustainable development while protecting the existing natural environment and the receiving Carp River. That study outlined the tributary drainage area and conceptual design of Pond 4. The facility will provide water quality and water quantity control for the approximate 267.97ha development area tributary to the facility. The subject site is included in drainage area A-1 from that study, with a runoff coefficient of C=0.6 which is conveyed via the Maple Grove trunk sewer to Pond 4.

In January 2007, Stantec completed the "Mattamy Homes Fairwinds Subdivision Phase 1 Stormwater Management Report and Temporary Stormwater Management Facility Design Brief" (SWMF Design Brief). That study outlined the design of the interim SWM facility including water quality and water quantity controls to service the Fairwinds North and South developments.

In April 2012, J.F. Sabourin and Associates Inc. completed the "Fairwinds Development/Expansion of Drainage Area to Fairwinds Interim Pond 1 and Reconstruction of Maple Grove Road." That study outlined the expansion of the tributary drainage area serviced by the interim Pond 1 at that time. It also outlined the proposed diversion pipe through the Fairwinds West and Poole Creek Village developments to divert flows from the Maple Grove Road trunk sewer to Poole Creek to respect the capacity of the partially installed trunk sewer, which was designed to 85l/s/ha.

In September 2014, IBI completed the report 'Servicing Design Brief Poole Creek Village – Phase 1 Kanata West – City of Ottawa'. That report outlined the detailed design of Phase I, including the dual drainage system and the overflow trunk sewer to Poole Creek. The diversion pipe outfall to Poole Creek was constructed as part of that development.

In December 2014, DSEL prepared the report titled 'Design Brief for Pond 4 Kanata West' (referred to as the December design brief), a copy of Figure 2 from that report is included within Appendix D for reference. Figure 2 shows the drainage areas for Pond 4 and the diversion pipe to Poole Creek. The A1 drainage area which contains the subject development has been modelled in the Pond 4 Design Brief for 100 year capture and no storage required.

As a part of the December 2014 report from JFSA/DSEL, a consolidated XPSWMM model of the Pond 4 tributary drainage area was developed, which included the available detailed design information for Poole Creek Village, the Maple Grove Road trunk sewer overflow to Poole Creek, the Fairwinds West development, and Pond 4 detailed design information. That consolidated XPSWMM model will be used in preparing the detailed design of the subject site.

4.2 Overall Stormwater Management Approach

4.2.1 Proposed Maple Grove Road Trunk Sewer and Existing Diversion Pipe

Minor system flows from the subject site will be conveyed by new storm trunk to be installed within Maple Grove Dr and will connect to the downstream existing Maple Grove Road Trunk Sewer to the Pond 4 Stormwater Management Facility. The future development lands upstream (west) of Santolini St. are accommodated with full 100 year capture in the existing diversion pipe system.

As outlined within the December Design Brief, the existing diversion pipe through the Fairwinds West and PCV developments is designed to divert flows from the Maple Grove Road trunk sewer to Poole Creek in order to respect the capacity of the existing downstream trunk sewer in Maple Grove Road, which was designed to 85 l/s/ha. The diversion pipe consists of oversized storm pipes from Maple Grove Rd. extending through the Fairwinds and Pool Creek Village sites to the existing outlet at Poole Creek. The diversion pipe was constructed as part of PCV Phase 1.

4.3 Minor Storm Sewer Design Criteria

The minor system storm sewers for the subject site are proposed to be sized based on the rational method, applying standards of both the City of Ottawa and MOECC. Some of the key criteria for this site include the following:

- Sewer Sizing: Rational Method
- Design Return Period: 1:2 year (local streets)
  1:5 year (collector streets)
  1:10 year (arterial roads)
- Initial Time of Concentration 10 minutes
- Manning's: 0.013
- Minimum Velocity: 0.80 m/s
- Maximum Velocity: 3.00 m/s
- Minimum Slope:

PIPE DIAMETER (mm)	SLOPE (%)
250	0.432
300	0.34
375	0.25
450	0.195
525	0.16
600	0.132
675	0.113
750 and larger	0.1

4.4 Proposed Minor Storm Plan

Figure 4.1 shows the minor storm plan for this development. A storm sewer will be extended from the existing trunk storm sewer on Maple Grove Road at Johnwoods Street to service the

development and Maple Grove Road. As with the sanitary sewer system, there are no external areas flowing through the site so the storm sewers are at normal depth and run parallel to the sanitary sewers.

4.5 Proposed Major System Plan

Figure 4.2 shows the proposed macro grading plan for this development with the direction of major system flows. The road grades generally follow the natural topography of this area which grades to the north. As per the Pond 4 Design Brief, there will be 100 year capture in this area so no major system flow will leave the site. There will be opportunity for storage in the road sags in accordance with City Guidelines.

4.6 Infiltration

The Carp River Watershed/Subwatershed Study provided water balance calculations and outlined infiltration targets within the subwatershed area from a stormwater management perspective, based on soil characteristics. The KWMSS carried forward with the infiltration targets, and indicated that post development infiltration rates were to be increased by 25% above the pre-development rates. The subject site is located in an area with target infiltration rate of 70-100mm/year. Excerpts from the KWMSS regarding infiltration are provided within Appendix D for reference. The KWMSS also indicated that post development infiltration rates are to be increased by 25% above these rates. Therefore, the target infiltration rate for the site is 88 – 125mm/year. The pervious areas of the subject site (i.e., rear yards and grassed areas) will be provided with imported fine silty loam topsoil to achieve the required infiltration rate. Preliminary infiltration calculations for the site are provided within **Appendix D**.

5 EROSION AND SEDIMENTATION CONTROL PLAN

During construction, existing conveyance systems and water courses can be exposed to sediment loading. Development of a subdivision such as the subject site can potentially create deleterious material which can enter the natural environment and gain access to fish and amphibian habitat. In order to prevent site generated sediments from entering the environment, an Erosion and Sedimentation Control Plan (ESCP) will be implemented prior to development. Although a generic ESCP can be developed as part of subsequent Design Briefs, the final plan will be developed and implemented by the Owner's general contractor.

The erosion and sedimentation control strategy for the subject site could include erection of silt fences, straw bale barriers and rock check dams. These measures will ensure protection of both adjacent developments and the natural environment adjacent to and downstream of the site.

Other elements of an ESCP could also include installation of bulkhead barriers at the nearest existing downstream manholes to ensure deleterious material does not gain access to those sewers and potentially the Kanata West Pump Station and Pond 4. Also, the final ESCP will incorporate features to deal with disposal of any taken water. Some of the features or general requirements are sometimes conditions of a Permit To Take Water.

6 APPROVALS AND PERMIT REQUIREMENTS

6.1 City of Ottawa

The City of Ottawa will review all development documents including final working drawings and related reports. Upon completion, the City will approve the local watermains, under Permit No. 008-202; submit the sewer extension MOECC application to the province and eventually issue a Commence Work Notification.

6.2 Province of Ontario

The Ministry of Environment and Climate Change (MOECC) will approve the local sewers under Section 53 of the Ontario Water Resources Act and issue an Environmental Compliance Approval. A Permit To Take Water may also need to be issued by the MOECC.

6.3 Conservation Authority

The Mississippi Valley Conservation Authority will be contacted to confirm if any permits are required from the agency.

6.4 Federal Government

There are no required permits, authorizations or approvals needed expressly for this development from the federal government.

7 CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusion

While some infrastructure which is needed to help service the subject site already exists, the development plan will include expansion and extension of those infrastructure to adequately service the site with water supply, wastewater collection and disposal and management of stormwater runoff. The extension of the existing watermains through the subject site will provide a reliable source of both drinking water and fire flows. The outlet wastewater sewer system is the Kanata West Pump Station will is now in service. The trunk storm sewer and stormwater management facility are already in place, therefore, there is suitable public services in place to service the subject site.

7.2 Recommendation

From an assessment of major municipal infrastructure perspective, it is recommended that the development application for the Claridge Maple Grove Lands property at 1981 Maple Grove Road be accepted and that the development of the property move forward.

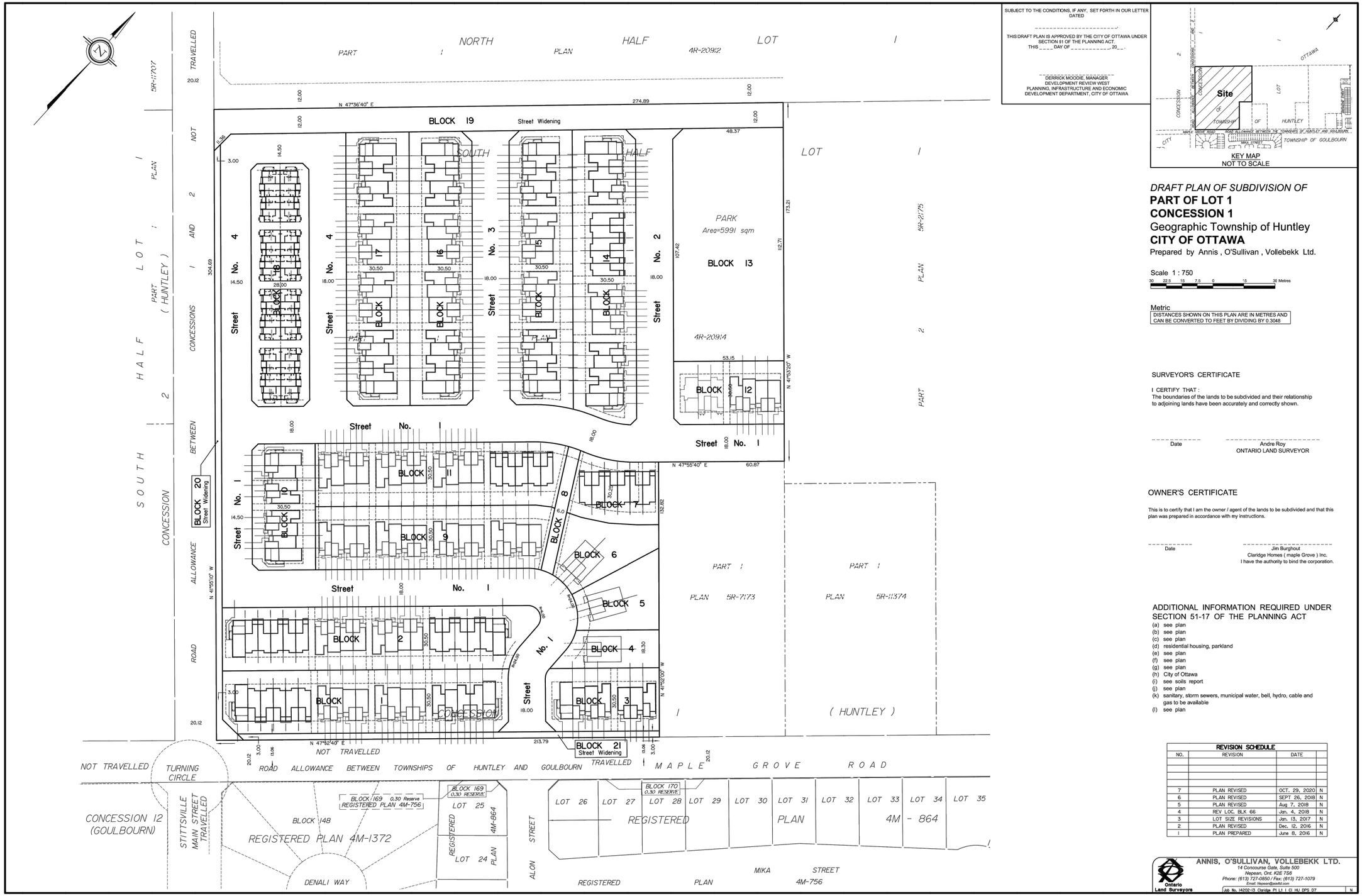
IBI GROUP

Lance Erion, P. Eng.
Associate

j:\105205_maplegrlnds\5.2 reports\5.2.2 civil\5.2.2.1 sewers\adequacy of public services report submission 3 (january 2021)\ctr_assessment of adequacy_2021-02-21.docx

J:\105205_MapleGrLnds\5.9 Drawings\59civil\current\FIGURES\105205-Fig-1.1.dwg Layout Name: FIG1.1

Project Title	Drawing Title	Sheet No.
MAPLE GROVE LANDS	SITE LOCATION	FIG. 1.1



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__.

_____
DERRICK MOODIE, MANAGER
DEVELOPMENT REVIEW WEST
PLANNING, INFRASTRUCTURE AND ECONOMIC
DEVELOPMENT DEPARTMENT, CITY OF OTTAWA

KEY MAP
NOT TO SCALE

DRAFT PLAN OF SUBDIVISION OF
PART OF LOT 1
CONCESSION 1
Geographic Township of Huntley
CITY OF OTTAWA
Prepared by Annis , O'Sullivan , Vollebekk Ltd.

Scale 1 : 750
30 22.5 15 7.5 0 15 30 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 I am the owner / agent of the lands to be subdivided and that this plan was prepared in accordance with my instructions.

_____ Date
_____ Jim Burghout
Claridge Homes (maple Grove) Inc.
I have the 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) residential housing, parkland
(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

REVISION SCHEDULE

NO.	REVISION	DATE	
7	PLAN REVISED	OCT. 29, 2020	N
6	PLAN REVISED	SEPT 26, 2018	N
5	PLAN REVISED	Aug 7, 2018	N
4	REV LOC, BLK 66	Jan. 4, 2018	N
3	LOT SIZE REVISIONS	Jan. 13, 2017	N
2	PLAN REVISED	Dec. 12, 2016	N
1	PLAN PREPARED	June 8, 2016	N

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Ontario Land Surveyors
Job No. 14202-13 Claridge Pl Lt 1 Cl HU DPS_07 N

Scale	Project Title	Drawing Title	Sheet No.
N.T.S	MAPLE GROVE LANDS	DRAFT PLAN	FIG. 1.2

MAPLE GROVE LANDS

BLOCK 19

Street Widening

PARK
Area=5991 sqm

BLOCK 13

PARK (3594 m²)

4 STOREY RESIDENTIAL (987 m²)

4 STOREY RESIDENTIAL (1692 m²)

4 STOREY RESIDENTIAL (2016 m²)

FUTURE DEVELOPMENT BY OTHERS

FRONT & BACK TOWNHOUSE

LIMNOS LANE

MAESTRO AVENUE

BRISOTE LANE

MALAJO WAY

BENSINGER WAY

MYCONOS CRESCENT

BLOCK 12

Street No. 1

Street No. 2

Street No. 3

Street No. 4

BLOCK 20 Street Widening

BLOCK 21 Street Widening

BLOCK 1 BLOCK 2 BLOCK 3 BLOCK 4 BLOCK 5 BLOCK 6 BLOCK 7 BLOCK 8 BLOCK 9 BLOCK 10 BLOCK 11 BLOCK 14 BLOCK 15 BLOCK 16 BLOCK 17 BLOCK 18

PART 1 PLAN 5R-7173

PART 1 PLAN 5R-6898

EXISTING RESIDENTIAL

MAPLE GROVE ROAD

EXISTING 2100Ø STORM
EXISTING 375Ø STORM (HIGH LEVEL)

EXISTING 300Ø W/M

EXISTING 375Ø SANITARY
EXISTING 200Ø SANITARY (HIGH LEVEL)

STITTSVILLE MAIN STREET

DENALI WAY

ALON STREET

MIKA STREET

CHADOW CRESCENT

JOHNWOODS STREET

BLOCK 203

BLOCK 204

BLOCK 221 ROAD WIDENING

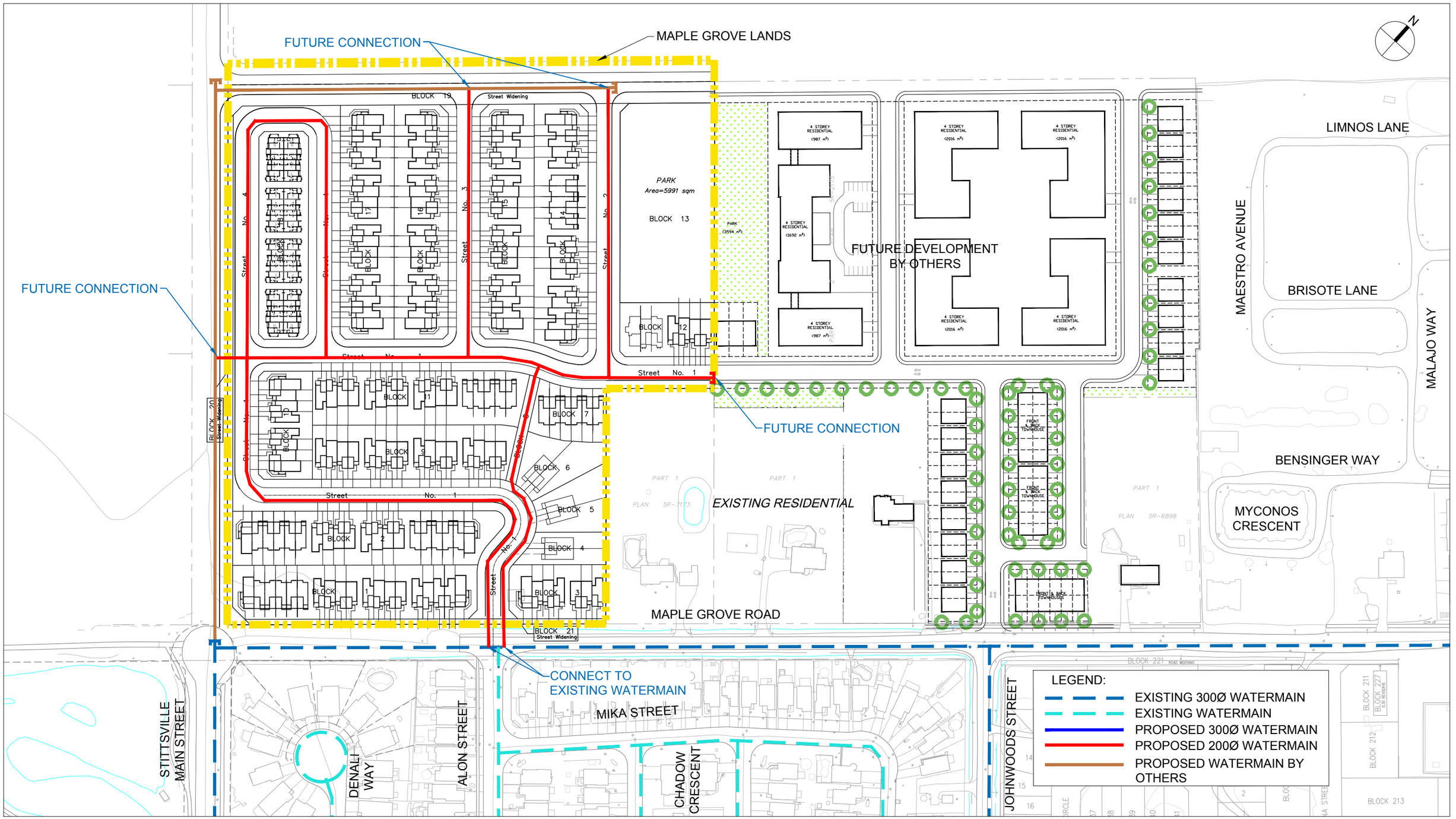
BLOCK 208

BLOCK 212

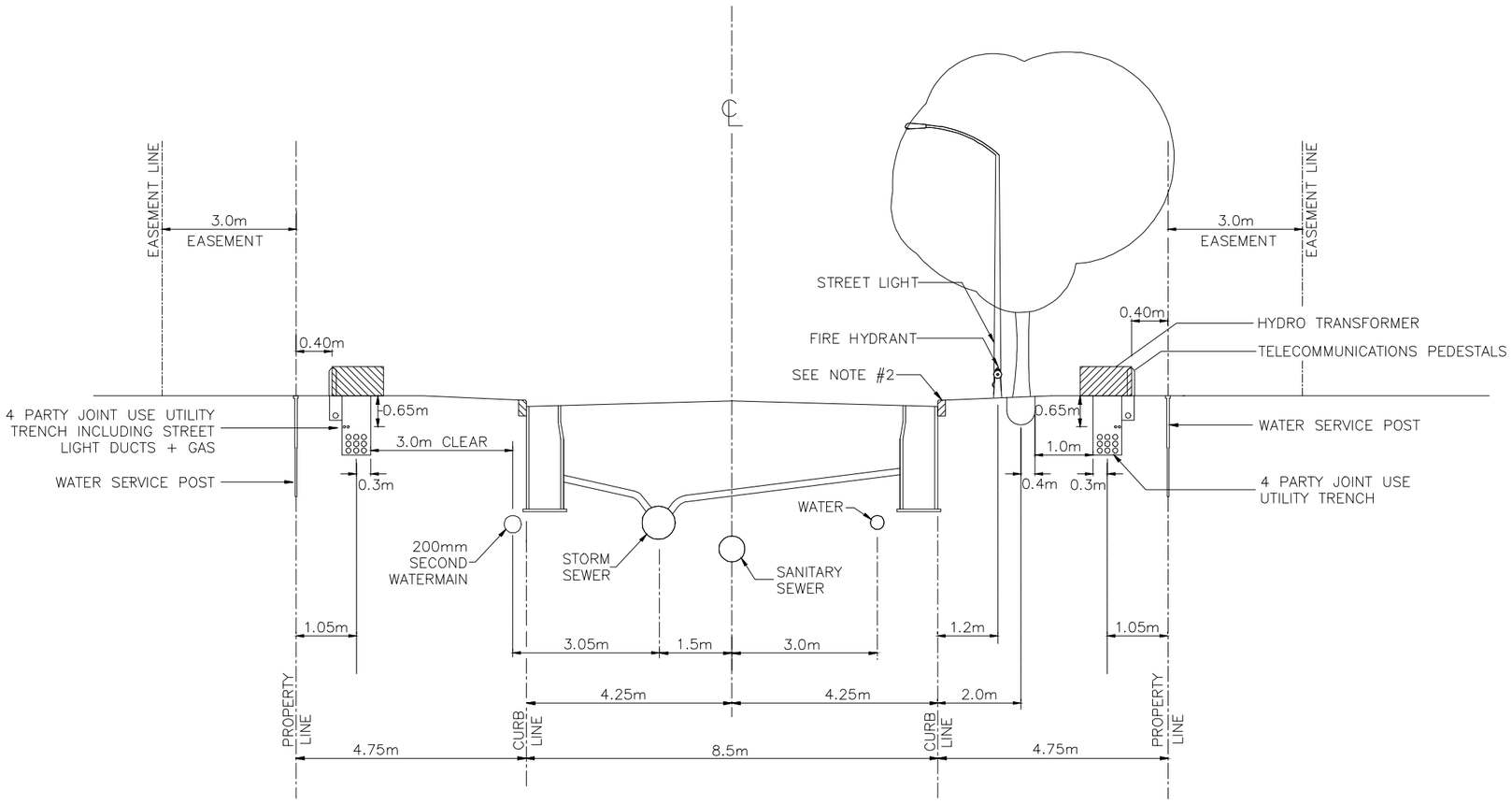
BLOCK 213

CONCESSION

Scale	Project Title	Drawing Title	Sheet No.
N.T.S	MAPLE GROVE LANDS	EXISTING MUNICIPAL INFRASTRUCTURE	FIG. 1.3



Scale	Project Title	Drawing Title	Sheet No.
N.T.S	MAPLE GROVE LANDS	PROPOSED WATER PLAN	FIG. 2.1



SECTION
STREET NO. 1 - FROM MAPLE GROVE ROAD TO BLOCK 8

NOTES:

1. REFERENCE STANDARD NOTES ROAD ALLOWANCE (DGN:ROW-NOTES)
2. CONCRETE CURBS MAY BE BARRIER TYPE OR MOUNTABLE TYPE, CATCH BASIN TYPE WILL SUIT CURB DESIGN. SEE SEWER DESIGN GUIDELINES FOR CATCH BASIN PREFERENCE.
3. AT CATCH BASIN AND HYDRANT LOCATIONS THE GAS MAIN SHALL HAVE A MINIMUM 0.6m CLEARANCE FROM STRUCTURES.
4. HYDRO TRANSFORMERS AND SIDEWALKS ARE TO BE LOCATED ON OPPOSITE SIDE OF THE ROW WHENEVER POSSIBLE. REQUIREMENT FOR PROTECTIVE BOLLARDS AT TRANSFORMERS SHALL BE DETERMINED BY HYDRO ON A CASE BY CASE BASIS.
5. STREET LIGHTS AND SIDEWALKS ARE TO BE LOCATED ON OPPOSITE SIDES OF THE ROW.

RESIDENTIAL ROAD
18.0m ROAD ALLOWANCE
4 PARTY JOINT USE TRENCH
DUAL WATERMAINS

Scale	Project Title	Drawing Title	Sheet No.
N.T.S	MAPLE GROVE LANDS	PROPOSED DUAL WATERMAIN SECTION	FIG. 2.2

J: \105205_MapleGrLnds\5.9 Drawings\59civil\current\FIGURES\105205-Fig-3.1.dwg Layout Name: Fig 3.1 Plot Scale: 1:5.13 Plotted At: 2/19/2021 Last Saved By: dsiurna Last Saved At: Feb. 19, 21

MAPLE GROVE LANDS

N

BLOCK 19

Street Widening

PARK
Area=5991 sqm

BLOCK 13

BLOCK 12

PARK
(3594 m²)

4 STOREY RESIDENTIAL (987 m²)

4 STOREY RESIDENTIAL (1692 m²)

4 STOREY RESIDENTIAL (2016 m²)

FUTURE DEVELOPMENT BY OTHERS

LIMNOS LANE

MAESTRO AVENUE

BRISOTE LANE

MALAJO WAY

BENSINGER WAY

MYCONOS CRESCENT

Street No. 4

Street No. 3

Street No. 2

Street No. 1

BLOCK 20
Street Widening

BLOCK 21
Street Widening

BLOCK 18
BLOCK 17
BLOCK 16
BLOCK 15
BLOCK 14
BLOCK 11
BLOCK 10
BLOCK 9
BLOCK 8
BLOCK 7
BLOCK 6
BLOCK 5
BLOCK 4
BLOCK 3
BLOCK 2
BLOCK 1

EXISTING RESIDENTIAL

PART 1 PLAN 5R-7173

PART 1 PLAN 5R-6898

FRONT TO REAR TOWNHOUSE

CONNECT TO EXISTING SANITARY SEWER

MAPLE GROVE ROAD

BLOCK 221 ROAD WIDENING

BLOCK 211

BLOCK 227 SWM POND

BLOCK 212

BLOCK 208

BLOCK 213

CONCESSION

STITTSVILLE MAIN STREET

DENALI WAY

ALON STREET

MIKA STREET

CHADOW CRESCENT

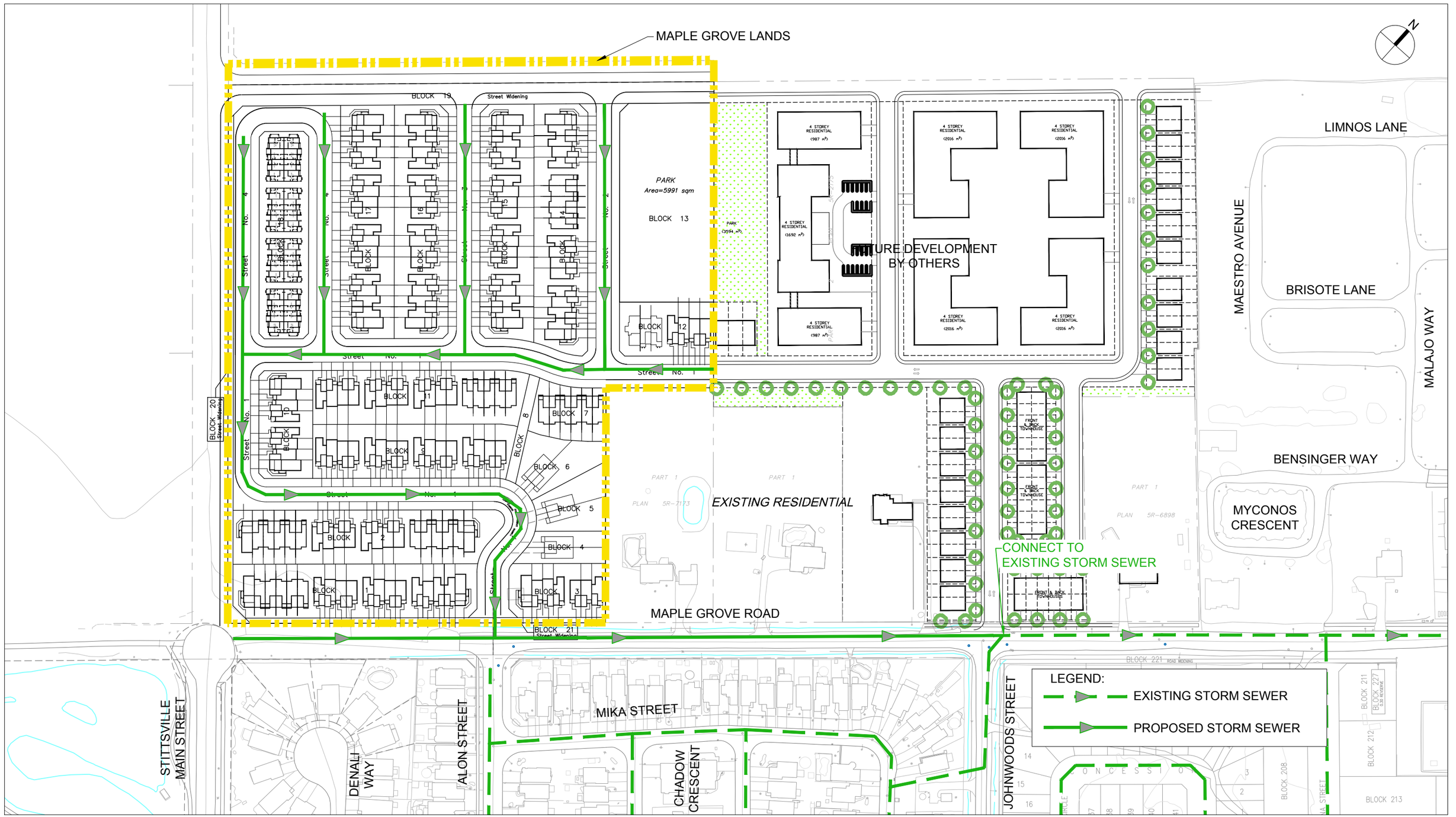
JOHNWOODS STREET

LEGEND:

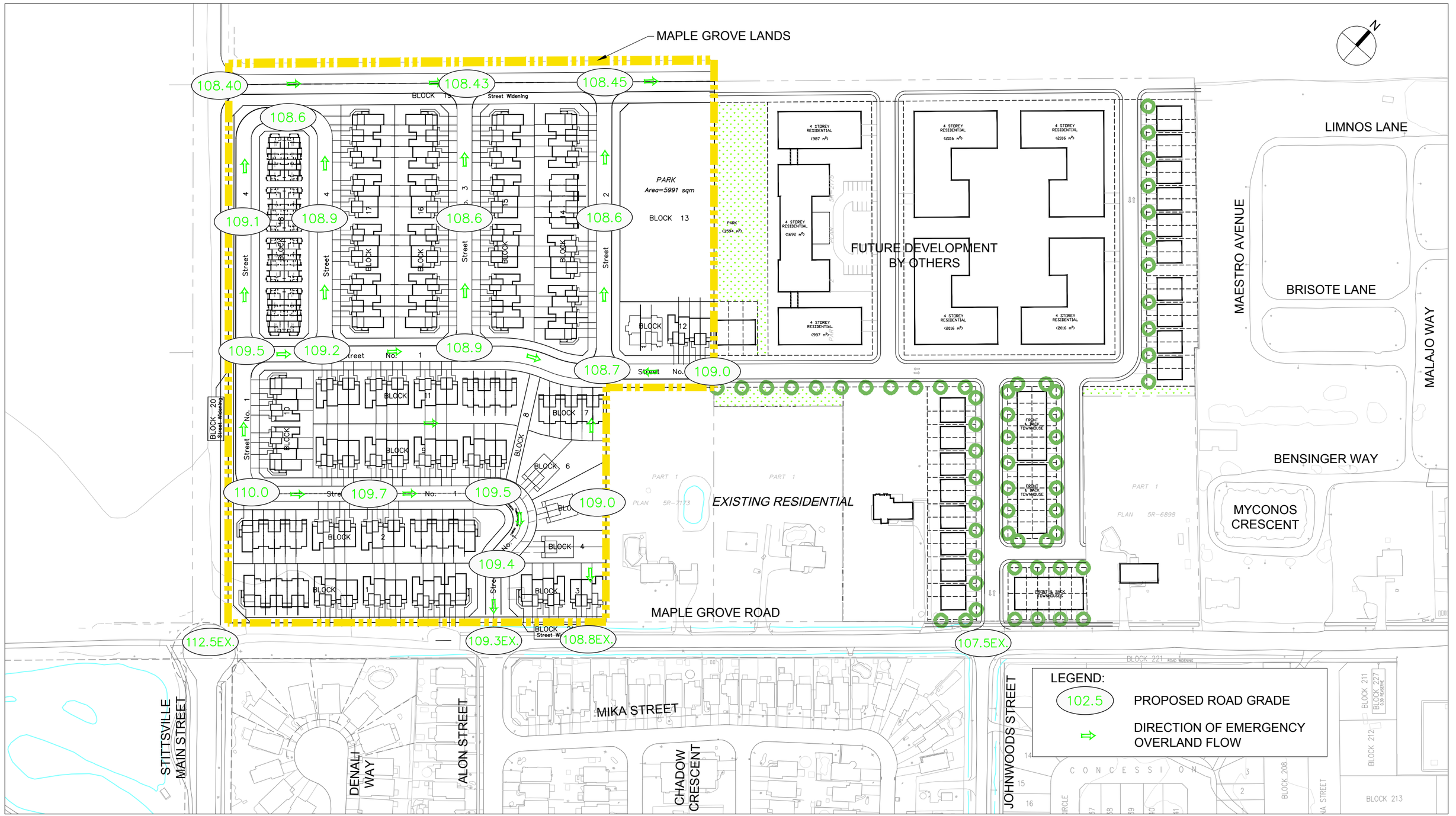
EXISTING SANITARY SEWER

PROPOSED SANITARY SEWER

Scale	Project Title	Drawing Title	Sheet No.
N.T.S	MAPLE GROVE LANDS	PROPOSED WASTE WATER PLAN	FIG. 3.1



Scale	Project Title	Drawing Title	Sheet No.
N.T.S	MAPLE GROVE LANDS	PROPOSED MINOR STORM PLAN	FIG. 4.1



Scale	Project Title	Drawing Title	Sheet No.
N.T.S	MAPLE GROVE LANDS	PROPOSED MACRO GRADING PLAN	FIG. 4.2

APPENDIX A

Development Servicing Study Checklist

The following table is a customized copy of the current City of Ottawa's Development Servicing Study Checklist. It is meant to be a quick reference for location of each of the items included on the list. The list contains the various item description and the study section in which the topic is contained.

GENERAL CONTENT

	ITEM DESCRIPTION	LOCATION
	Executive Summary (for larger reports only)	N/A
√	Date and revision number of the report	Front Cover
√	Location Map and plan showing municipal address, boundary, and layout of proposed development.	Report Title, Figure 1.1
√	Plan showing the site and location of all existing services.	Figure 1.3
√	Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.	Section 2.2, 3.2, 4.2 Figure 1.2
√	Summary of Pre-consultation Meeting with City and other approval agencies.	Section 1.5
√	Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.	Sections 1.3, 2.2, 3.2, 4.2
√	Statement of objectives and servicing criteria	Section 1.1, 2.2, 3.3, 4.3
√	Identification of existing and proposed infrastructure available in the immediate area.	Figure 1.3
√	Identification of Environmentally Significant Areas, Watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).	N/A
√	Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.	Section 1.6 Figure 4.2
√	Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.	N/A
	Proposed phasing of the development, if applicable.	N/A
√	Reference to geotechnical studies and recommendations concerning servicing.	Section 1.6

√	All preliminary and formal site plan submissions should have the following information: • Metric scale • North arrow (including construction North) • Key plan • Name and contact information of applicant and property owner • Property limits including bearings and dimensions • Existing and proposed structures and parking areas • Easements, road widening and rights-of-way • Adjacent street names	Noted

DEVELOPMENT SERVICING REPORT: WATER

	ITEM DESCRIPTION	LOCATION
√	Confirm consistency with Master Servicing Study, if available	Section 2.2
√	Availability of public infrastructure to service proposed development	Section 2.1
√	Identification of system constraints – external water needed	Section 2.2
√	Identify boundary conditions	Section 2.3.4
√	Confirmation of adequate domestic supply and pressure	Section 2.4 & Appendix B
√	Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.	Section 2.4.1 Appendix B
√	Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.	Section 2.4.1 Appendix B
	Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defining phases of the project including the ultimate design.	N/A
	Address reliability requirements such as appropriate location of shut-off valves.	Detail Design
√	Check on the necessity of a pressure zone boundary modification.	N/A
√	Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range.	Section 2.3.1 Appendix B
√	Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.	Detail Design
√	Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities and timing of implementation.	N/A
√	Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.	Section 2.3
√	Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.	Detailed Design

DEVELOPMENT SERVICING REPORT: WASTEWATER

	ITEM DESCRIPTION	LOCATION
√	Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).	Section 3.3
√	Confirm consistency with Master Servicing Study and/or justifications for deviations.	Section 3.2
√	Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age condition of sewers.	Detail Design
√	Description of existing sanitary sewer available for discharge of wastewater from proposed development.	Section 3.1
√	Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)	Section 3.2
	Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix "C") format.	Detail Design
√	Description of proposed sewer network including sewers, pumping stations and forcemains.	Section 3.4
√	Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).	Section 1.6
√	Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.	Section 3.2
√	Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.	N/A
√	Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.	N/A
√	Special considerations such as contamination, corrosive environment etc.	Detail Design

DEVELOPMENT SERVICING REPORT: STORMWATER CHECKLIST

	ITEM DESCRIPTION	LOCATION
√	Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)	Section 4.1, 4.2
√	Analysis of available capacity in existing public infrastructure.	Section 4.2
√	A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.	Figure 4.1
√	Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be	Section 4.2

	included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.	
√	Water quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.	Section 4.2
√	Description of the stormwater management concept with facility locations and descriptions with references and supporting information.	Section 4.2, 4.4
√	Set-back from private sewage disposal systems.	N/A
√	Watercourse and hazard lands setbacks.	N/A
√	Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.	Section 1.5
√	Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.	Section 4.2
√	Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).	Section 4.2 Detail Design
√	Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.	N/A
	Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.	Detail Design
√	Any proposed diversion of drainage catchment areas from one outlet to another.	N/A
√	Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.	Figures 4.1, 4.2
	If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100-year return period storm event.	N/A
√	Identification of potential impacts to receiving watercourses	N/A
√	Identification of municipal drains and related approval requirements.	N/A
√	Descriptions of how the conveyance and storage capacity will be achieved for the development.	Detail Design
√ √	100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.	Detail Design
	Inclusion of hydraulic analysis including hydraulic grade line elevations.	Detail Design
√	Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.	Section 5
√	Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.	N/A
√	Identification of fill constraints related to floodplain and geotechnical investigation.	Section 1.6

APPROVAL AND PERMIT REQUIREMENTS: CHECKLIST

	ITEM DESCRIPTION	LOCATION
√	Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement Act. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act.	Section 1.5
	Application for Certification of Approval (CofA) under the Ontario Water resources Act.	Detail Design
√	Changes to Municipal Drains	N/A
√	Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)	Section 6

CONCLUSION CHECKLIST

	ITEM DESCRIPTION	LOCATION
√	Clearly stated conclusions and recommendations	Section 7.1 & 7.2
	Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.	Detail Design
√	All draft and final reports shall be signed and stamped by professional Engineer registered in Ontario.	Completed

PLANNING AND GROWTH MANAGEMENT
URBANISME ET GESTION DE LA CROISSANCE

Pre-Application Consultation Meeting

Meeting Notes

1981 Maple Grove
November 9, 2016

Attendees: Louise Sweet-Lindsay (Planner, City of Ottawa)
Max Walker (Transit Planner, City of Ottawa)
Matthew Hayley (Environmental Planner, City of Ottawa)
Amira Shehata (Transportation Planner, City of Ottawa)
Santhosh Kurvuvilla (Project Manager, City of Ottawa)
Mark Young (Urban Design Planner, City of Ottawa)
Mark Richardson (Forester, City of Ottawa)
Kevin Wherry (Parks Planner, City of Ottawa)
Victoria Bissonnette (Co-op Student, City of Ottawa)
Greg Winters (NovaTech)
Terry Brule (IBI Group)
Jim Burghout (Claridge Homes)

Subject: Plan of Subdivision and Zoning By-law Amendment applications to rezone the subject lands from Development Reserve to Residential Third Density to permit the development of a new residential subdivision of 178 units made up of 42 single detached and 136 townhouse dwellings and a public park.

Overview (Jim Burghout)

- The site is a total of approximately 18 acres.
- Previous design schemes were a part of a joint development with the property to the east.
- The internal layout of this proposal includes the extension of Stittsville Main.
- This proposal includes a mix of housing types positioned around a central park.
    - Includes a total of 178 units made up of 42 singles, 88 townhouse units and 48 back-to-back townhouse units.
- The units have currently been aligned in an internalized fashion due to uncertainty of surrounding developments.

Engineering (Santhosh Kuruvilla and IBI Group)

- Site servicing has been developed based on the Kanata West Master Plan and is subject to when the Kanata West Pump Station operational in mid 2018.
- The sanitary services along John Woods road will be extended to the site.
- The existing Pond 4 is where the storm sewer will be located.
- There is a diversion pipe that runs through Mattamy's lands that will extend to this subdivision.
- In terms of macro grading, there is a grade raise in the middle of the site (approximately a 3 meter drop from south to west), which will require that the north and east portions of the site be raised.

- In terms of storm flow, there will be a major storm emergency route along the north and west boundary of the site.
- There will be a sewer extension as part of this development.
- The proposed water main will operate as a looped system.
- The stormwater management guidelines have been developed from current guidelines rather than the revised guidelines, however IBI Group will do their best to incorporate as much of the new guidelines as possible.
- The infiltration targets on site are as per the City's requirements and similar to what adjacent properties have done. A detailed analysis will need to be done regarding this.
- ***There will need to be a formal request for watermain boundaries.***
- Studies required by the City: KWMSS, Design Brief for Pond 4, Carp River Watershed Study along with standard reports and studies.

Conservation Authority (MVCA)

- This site is located within the Feedmill Creek watershed. Per the Carp River Watershed/Subwatershed Study, quality control corresponding to an enhanced level of protection is recommended.
- The Carp River Watershed / Subwatershed Study and the KWMSS include infiltration and temperature targets. MVCA recommends measures to maintain infiltration and reduce water temperatures be considered and implemented where possible at the site.

Environmental / Tree (Matthew Hayley)

- A TCR will be required.
- The developer is limited for retention due to the scale and density of the proposal. However, it is noted that the developer should still attempt to retain wherever possible, especially mature trees.
- It is noted that the developer should connect with Mark Richardson to determine what he requires to be included in the report.
- An EIS is required to address the species at risk in the area. For example, butternut trees and the species that are associated with them.
- There is little concern about Blandings turtles being in the area, and more concern about bats, which will need to be discussed in the tree inventory.
- ***The City's Woodland policies do not have to be addressed because of the KWCP but should briefly be included in the EIS in case the policies change and to limit the potential for an appeal.***
- An Integrated Environmental Review is required and can be included in the Planning Rationale.

Transportation/ Noise/ OC Transpo (Amira Shehata and Max Walker)

- The OP identifies Maple Grove Road as a collector road with a ROW protection of 26m, i.e. 13m from existing centerline of the road to the property line. Road widening will be required along the property frontage on Maple Grove Road.
- Stittsville Main Street is a collector road per the TMP (Map 6) with a ROW protection of 26m. Stittsville Main Street.
- Maple Grove Road and Stittsville Main Street should be designed and constructed in accordance to the Transportation Association of Canada standards and City Standards.
- A Transportation Impact Brief (TB) is required. The study should evaluate the potential impact of the proposed development on the surrounding road network, and identify mitigation measures that may be required to offset network impacts from the

development. The study should discuss non-auto modes, in keeping with the policy directions established by the Official Plan and Transportation Master Plan.

- Stittsville Main is an important north-south collector connecting otherwise isolated communities. To meet service delivery standards and provide high quality transit service at all stages of the development the Stittsville Main extension should be built during the early stage of the development.
- Regarding the urban fabric, barrier-free pedestrian connections should be provided to the aforementioned roadways in order to reduced walking distance and foster transit usage.
- A Noise Feasibility Study is required.

Urban Design (Mark Young)

- The subject property can be referred to as Area A in the KWCP.
- The KWCP requires that there be a transition in residential density, which could require moving the back-to-back townhouse from the edge of the southern property boundary.
- Although the location of the park will be suffice, it is recommended that it be relocated where it can be more easily accessible from the adjacent properties. For example in the corner of the subdivision along a collector road.
- Rear lotting will need to be removed and units should be fronting on collector roads wherever possible.
- BBSS pushes for the mixture of towns and singles.
    - Noted by developer that they avoid mixing unit types due to the stigma that is associated with this – this is not preferred by consumers.

Parks (Kevin Wherry)

- A park planner will be assigned in the near future. It will likely be the planner working on the adjacent properties.
- The intention of the park is for a standard neighbourhood park.
- Noted by the City that there is a desire for active park opportunities wherever possible, this would limit tree retention in this case.
    - The park planner will help in the design of the park.
- ***The developer is required to provide a facility fit plan before draft approval.***
- Sidewalks are preferred along the side of the road that the park is located.
- The townhouses that back onto the park need to be addressed to City standards. For example with proper fencing.
- The location of the park is preferred on a collector opposed to centrally so it can be more easily accessed. This, however, might bring up concerns from the public due to the proximity to a collector without a fence.

Closing

- List of Required Studies and Plans – attached separately
- Required applications: Plan of Subdivision (41 to 250 units) $58,961
  Zoning By-law: $15,914 + OMB legal costs max. $10,000
- Staff strongly recommended the applicant advise Ward Councillor of proposed application prior to submission. The Councillor has requested this.
- Staff offered to provide comments on further revisions to the draft Plan of Subdivision prior to application submission.

APPENDIX B

Stantec Consulting Ltd.
1505 Laperriere Avenue
Ottawa ON Canada
K1Z 7T1
Tel. 613.722.4420
Fax. 613.722.2799
www.stantec.com

Legend

- KANATA–WEST CONCEPT PLAN BOUNDARY
- EXISTING WATERMAIN
- EXISTING 610mm WATERMAIN TO BE UPGRADED TO 914mm
- EXISTING 610mm WATERMAIN TO BE UPGRADED TO 762mm
- PROPOSED 610mm DIA. WATERMAIN
- PROPOSED 406mm DIA. WATERMAIN
- PROPOSED 305mm DIA. WATERMAIN
- PROPOSED 203mm DIA. WATERMAIN

Notes

INTERNAL WATERMAIN SIZE ARE EXPECTED TO VARY FROM 152mm TO 305mm.

CCL/IBI
Cumming Cockburn Limited
1770 WOODWARD DR., OTTAWA (613)225-1311

5	REVISED FOR DEC.21/05 SUBMISSION		GBU	SJP	DEC.21/05
4	REVISED AS PER CITY COMMENTS (Sept.16/05)		GBU	MAF	OCT.28/05
3	REVISED WATER DISTRIBUTION NETWORK		GBU	S.J.P.	AUG 09/05
2	REVISED POND 1 AREA		NI	MAF	JUNE 09/05
1	REVISED LOTTING FOR TARTAN AND MATTAMY		BCB	SJP	JAN.18/05
Revision			By	Appd.	Date

File Name:

Dwn. Chkd. Dsgn. Date

Seals

Client/Project

Kanata West Concept Plan
Master Servicing Study

Ottawa, Ontario

Title

Watermain
Final Concept

Project No. 60400406
Scale 1:7500 (0 75 225 375m)
Drawing No. WM-1
Sheet 2 of 7
Revision 5

IBI GROUP
333 PRESTON STREET
OTTAWA, ON
K1S 5N4

WATERMAIN DEMAND CALCULATION SHEET

PROJECT : MAPLE GROVE LANDS
LOCATION : CITY OF OTTAWA
DEVELOPER : CLARIDGE

FILE: 105205.5.7
DATE: 2021-02-18
DESIGN: LME
PAGE : 1 OF 1

NODE	RESIDENTIAL						NON-RESIDENTIAL			AVERAGE DAILY DEMAND (l/s)			MAXIMUM DAILY DEMAND (l/s)			MAXIMUM HOURLY DEMAND (l/s)			FIRE DEMAND
	UNITS				GROSS RES. (Ha)	POP'N	COM (Ha)	IND (Ha)	INS (Ha)										
	SF	SD	TH	APT						Res.	Non-res.	Total	Res.	Non-res.	Total	Res.	Non-res.	Total	(l/s)
J02			**2**			**5**				**0.02**		**0.02**	**0.05**		**0.05**	**0.12**		**0.12**	**10,000**
J04			**4**			**11**				**0.04**		**0.04**	**0.11**		**0.11**	**0.24**		**0.24**	**10,000**
J06			**3**			**8**				**0.03**		**0.03**	**0.08**		**0.08**	**0.18**		**0.18**	**10,000**
J08			**15**			**41**				**0.16**		**0.16**	**0.41**		**0.41**	**0.90**		**0.90**	**12,000**
J10			**10**			**27**				**0.11**		**0.11**	**0.27**		**0.27**	**0.60**		**0.60**	**10,000**
J12			**10**			**27**				**0.11**		**0.11**	**0.27**		**0.27**	**0.60**		**0.60**	**10,000**
J15			**9**			**24**				**0.10**		**0.10**	**0.25**		**0.25**	**0.54**		**0.54**	**10,000**
J20			**7**			**19**				**0.08**		**0.08**	**0.19**		**0.19**	**0.42**		**0.42**	**10,000**
J25			**14**			**38**				**0.15**		**0.15**	**0.38**		**0.38**	**0.84**		**0.84**	**10,000**
J30			**11**			**30**				**0.12**		**0.12**	**0.30**		**0.30**	**0.66**		**0.66**	**10,000**
J32			**7**			**19**				**0.08**		**0.08**	**0.19**		**0.19**	**0.42**		**0.42**	**10,000**
J34			**9**			**24**				**0.10**		**0.10**	**0.25**		**0.25**	**0.54**		**0.54**	**10,000**
J36			**5**			**14**				**0.05**		**0.05**	**0.14**		**0.14**	**0.30**		**0.30**	**10,000**
J38			**4**			**11**				**0.04**		**0.04**	**0.11**		**0.11**	**0.24**		**0.24**	**12,000**
J42			**15**			**41**				**0.16**		**0.16**	**0.41**		**0.41**	**0.90**		**0.90**	**10,000**
J44			**16**			**43**				**0.18**		**0.18**	**0.44**		**0.44**	**0.96**		**0.96**	**10,000**
J46			**10**			**27**				**0.11**		**0.11**	**0.27**		**0.27**	**0.60**		**0.60**	**11,000**
J50			*14*			**38**				**0.15**		**0.15**	**0.38**		**0.38**	**0.84**		**0.84**	**12,000**
J52			**8**			**22**				**0.09**		**0.09**	**0.22**		**0.22**	**0.48**		**0.48**	**12,000**
J60			**18**			**49**				**0.20**		**0.20**	**0.49**		**0.49**	**1.08**		**1.08**	**10,000**
J62			**12**			**32**				**0.13**		**0.13**	**0.33**		**0.33**	**0.72**		**0.72**	**12,000**
J64			*8*			**22**				**0.09**		**0.09**	**0.22**		**0.22**	**0.48**		**0.48**	**12,000**
TOTALS												**2.31**			**5.77**			**12.69**	

ASSUMPTIONS

RESIDENTIAL DENSITIES

- Single Family (SF) 3.4 p/p/u
- Semi Detached (SD) 2.7 p/p/u
- Townhouse (TH) 2.7 p/p/u
- Apartment (APT) 1.8 p/p/u

AVERAGE DAILY DEMAND

- Residential 350 l/cap/day
- Commercial 60,000 l/ha/day
- Industrial 20,000 l/ha/day
- Institutional 50,000 l/ha/day

MAXIMUM DAILY DEMAND

- Residential 875 l/cap/day
- Commercial 90,000 l/ha/day
- Industrial 30,000 l/ha/day
- Institutional 75,000 l/ha/day

MAXIMUM HOURLY DEMAND

- Residential 1,925 l/cap/day
- Commercial 162,000 l/ha/day
- Industrial 54,000 l/ha/day
- Institutional 135,000 l/ha/day

FIRE DEMANDS

- SF 167 l/s
- SD 167 l/s
- TH 167 l/s
- Gallery TH 200 l/s
- ICI 250 l/s

Boundary Conditions
1981 Maple Grove Road

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	139	2.31
Maximum Daily Demand	346	5.77
Peak Hour	761	12.69
Fire Flow Demand #1	10,000	166.67
Fire Flow Demand #2	13,000	216.67

Location

Results

Connection 1 – Maple Grove Rd.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	160.9	73.5
Peak Hour	156.6	67.3
Max Day plus Fire 1	154.3	64.0
Max Day plus Fire 2	152.5	61.4

Ground Elevation = 109.3 m

Connection 2 – Maple Grove Rd.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	161.0	73.9
Peak Hour	156.6	67.8
Max Day plus Fire 1	154.3	64.5
Max Day plus Fire 2	152.4	61.8

Ground Elevation = 108.9 m

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.

Fire Flow Requirement from Fire Underwriters Survey

Building Floor Area Block 18 Interior Block

width	20.0	m
depth	24.0	m
stories	2	
	960.0	m^2

$F = 220C\sqrt{A}$

C	1.5		C =	1.5	wood frame
A	960	m^2		1.0	ordinary
				0.8	non-combustible
F	10,225	l/min		0.6	fire-resistive
use	10,000	l/min			

Occupancy Adjustment

			-25%	non-combustible
			-15%	limited combustible
Use	-15%		0%	combustible
			+15%	free burning
Adjustment	-1500	l/min	+25%	rapid burning
Fire flow	8,500	l/min		

Sprinkler Adjustment

			-30%	system conforming to NFPA 13
			-50%	complete automatic system
Use	0%			
Adjustment	0	l/min		

Exposure Adjustment

Building Face	Separation (m)	Adjacent Exposed Wall			Exposure Charge *
		Length	Stories	L*H Factor	
north	4.0	20.0	2	40	18%
east	28.0	24.0	2	48	8%
south	4.0	20.0	2	40	18%
west	> 45				0%
Total					44%

Adjustment	3,740	l/min
Total adjustments	3,740	l/min
Fire flow	12,240	l/min
Use	**12,000**	**l/min**
	200	**l/s**

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

Fire Flow Requirement from Fire Underwriters Survey

Building Floor Area Block 10 North Block

width	24.0	m
depth	16.0	m
stories	2	
	768.0	m^2

$F = 220C\sqrt{A}$

C	1.5	C =	1.5	wood frame
A	768 m^2		1.0	ordinary
			0.8	non-combustible
F	9,145 l/min		0.6	fire-resistive
use	9,000 l/min			

Occupancy Adjustment

		-25%	non-combustible
		-15%	limited combustible
Use	-15%	0%	combustible
		+15%	free burning
Adjustment	-1350 l/min	+25%	rapid burning
Fire flow	7,650 l/min		

Sprinkler Adjustment

		-30%	system conforming to NFPA 13
		-50%	complete automatic system
Use	0%		
Adjustment	0 l/min		

Exposure Adjustment

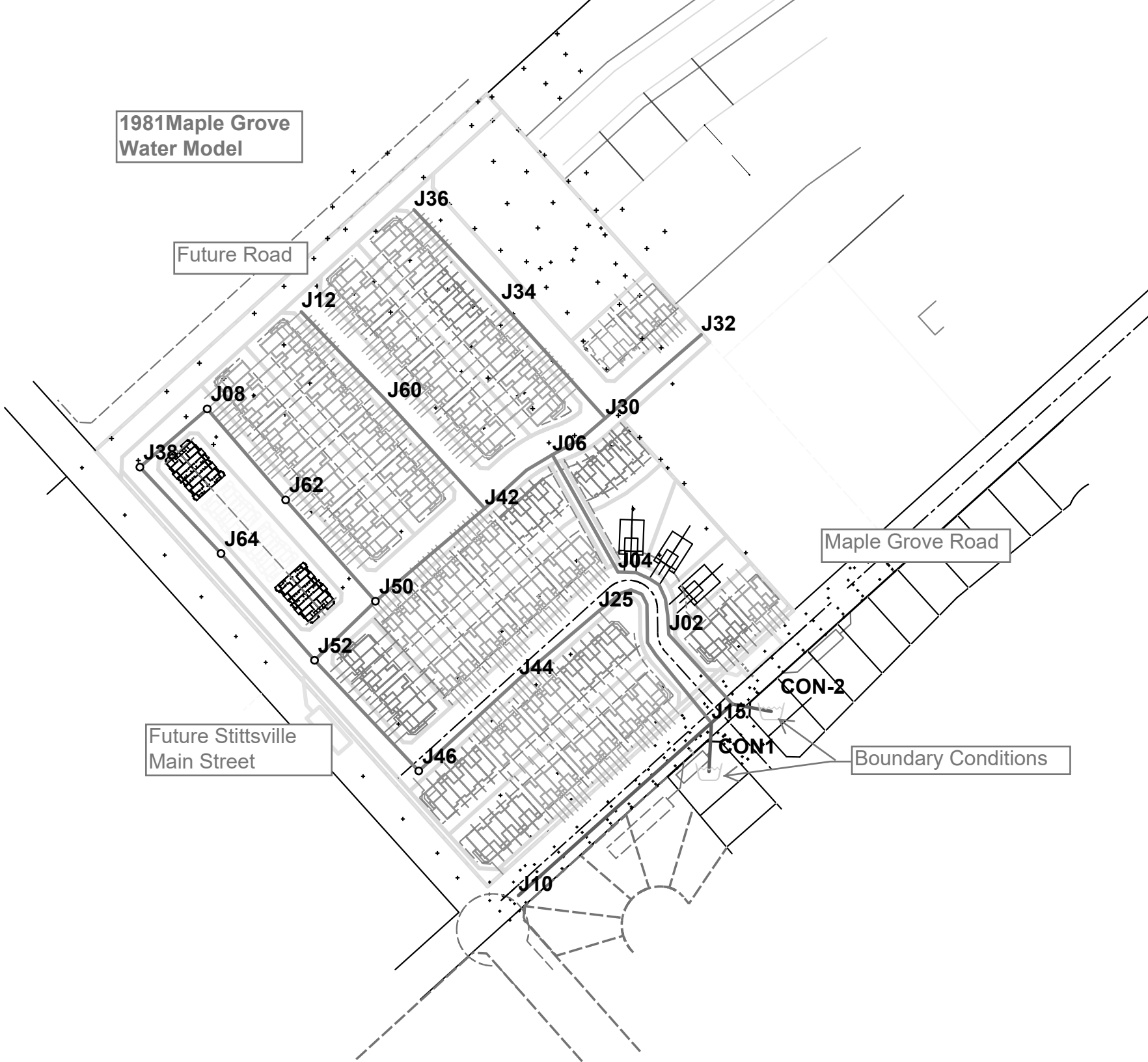
Building Face	Separation (m)	Adjacent Exposed Wall			Exposure Charge *
		Length	Stories	L*H Factor	
north	26.0	20.0	2	40	8%
east	8.0	16.0	2	32	18%
south	3.1	16.0	2	32	18%
west	> 45				0%
Total					44%

Adjustment	3,366	l/min
Total adjustments	3,366	l/min
Fire flow	11,016	l/min
Use	**11,000**	**l/min**
	183	**l/s**

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

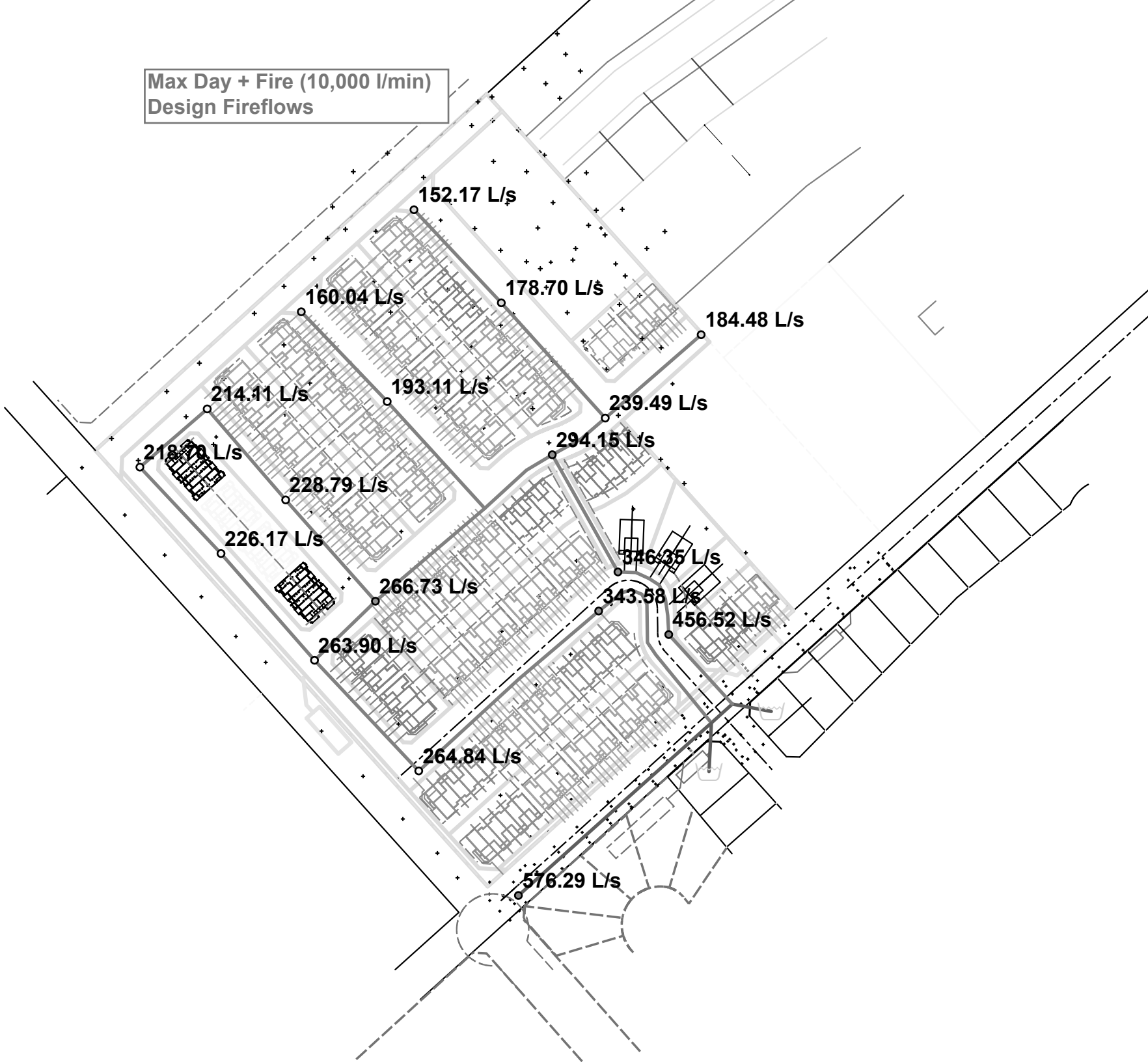
1981 Maple Grove Road - Watermain Turnover Calculation for Temporary Dead End Watermains

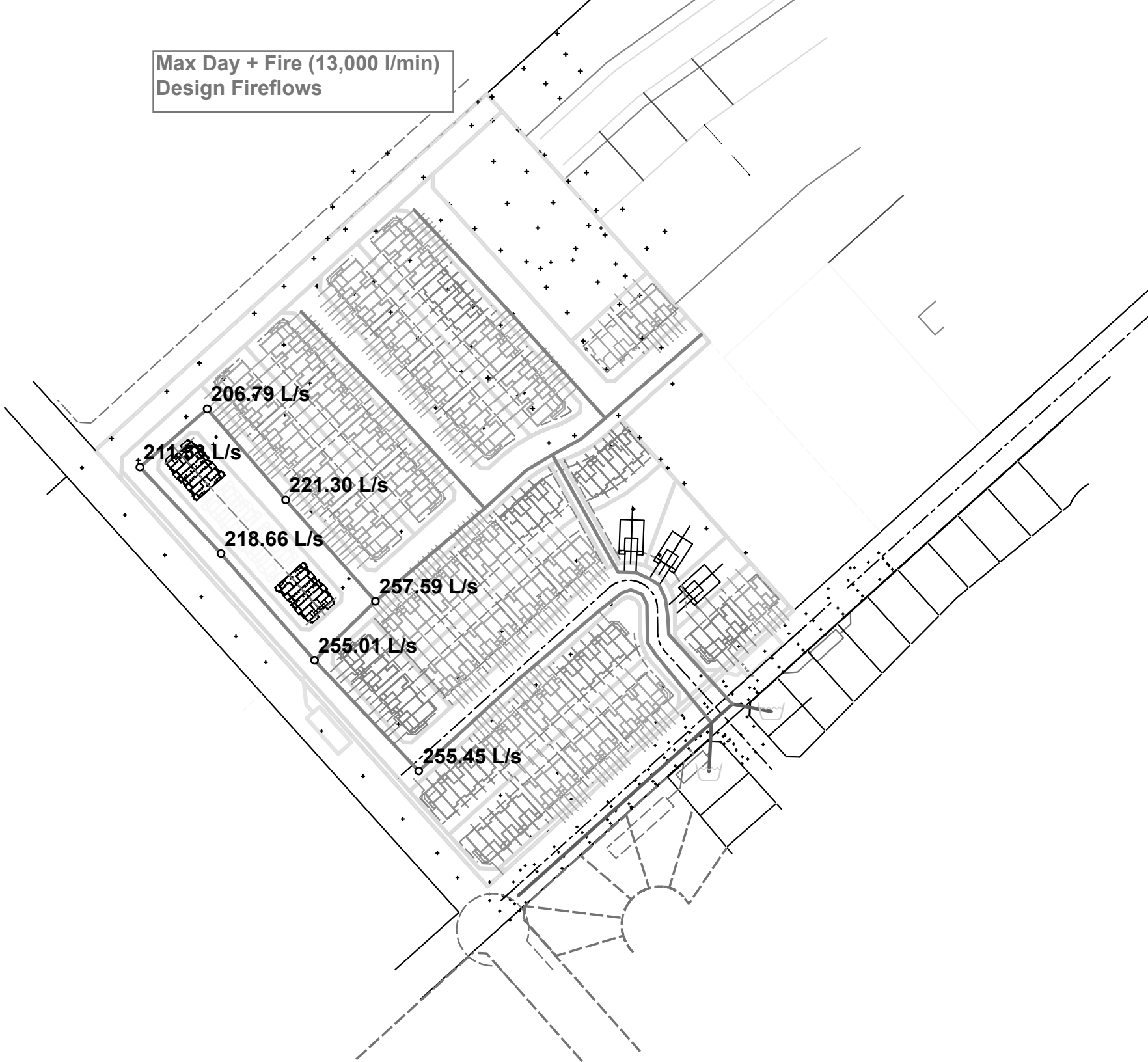
	Street No. 1		Street No. 2		Street No. 3	
Volume of Water in Pipe						
Pipe size	200	mm	200	mm	200	mm
Pipe length	60	m	145	m	135	m
Volume of water	1885	liters	4555	liters	4241	liters
Water Consumption						
No. of townhouse units	7		19		36	
Population @ 2.7 ppu	18.9	persons	51.3	persons	97.2	persons
Consumption rate	200	l/person/day	200	l/person/day	200	l/person/day
Daily consumption	3780	liters/day	10260	liters/day	19440	liters/day
Turnover time	0.5	days	0.4	days	0.2	days


1981Maple Grove
Water Model
Future Road
J36
J12
J34
J32
J08
J60
J30
J38
J06
J62
J42
J64
J04
Maple Grove Road
J50
J25
J02
J52
J44
CON-2
J15
CON1
Future Stittsville
Main Street
J46
Boundary Conditions
J10


Basic Day (Max HGL) Pressures
517.96 kPa
516.00 kPa
504.16 kPa
509.14 kPa
513.96 kPa
499.14 kPa
514.04 kPa
512.08 kPa
511.88 kPa
510.04 kPa
507.95 kPa
504.39 kPa
508.95 kPa
511.66 kPa
505.47 kPa
504.02 kPa
501.91 kPa
509.62 kPa
489.24 kPa
470.42 kPa


Peak Hour (Min HGL) Pressures
474.79 kPa
472.83 kPa
461.02 kPa
465.97 kPa
456.13 kPa
470.82 kPa
470.87 kPa
468.93 kPa
468.87 kPa
468.87 kPa
466.92 kPa
464.95 kPa
461.27 kPa
465.94 kPa
469.12 kPa
462.38 kPa
461.04 kPa
459.23 kPa
467.42 kPa
446.41 kPa
428.22 kPa


Max Day + Fire (10,000 l/min)
Design Fireflows
152.17 L/s
160.04 L/s
178.70 L/s
184.48 L/s
214.11 L/s
193.11 L/s
239.49 L/s
294.15 L/s
228.79 L/s
226.17 L/s
346.35 L/s
266.73 L/s
343.58 L/s
456.52 L/s
263.90 L/s
264.84 L/s
576.29 L/s


Max Day + Fire (13,000 l/min)
Design Fireflows
206.79 L/s
211.53 L/s
221.30 L/s
218.66 L/s
257.59 L/s
255.01 L/s
255.45 L/s

Bisic Day (Max HGL) - Junction Report

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	☐	J02	0.02	109.40	160.98	505.47
2	☐	J04	0.04	109.50	160.97	504.39
3	☐	J06	0.03	108.70	160.96	512.08
4	☐	J08	0.16	110.00	160.94	499.14
5	☐	J10	0.11	112.90	160.91	470.42
6	☐	J12	0.11	109.50	160.95	504.16
7	☐	J15	0.10	108.90	160.91	509.62
8	☐	J20	0.08	107.50	160.99	524.19
9	☐	J25	0.15	108.70	160.91	511.66
10	☐	J30	0.12	108.50	160.96	514.04
11	☐	J32	0.08	109.00	160.96	509.14
12	☐	J34	0.10	108.30	160.96	516.00
13	☐	J36	0.05	108.10	160.96	517.96
14	☐	J38	0.04	108.70	160.94	511.87
15	☐	J42	0.16	108.90	160.95	510.04
16	☐	J44	0.18	109.70	160.92	501.91
17	☐	J46	0.11	111.00	160.93	489.24
18	☐	J50	0.15	109.00	160.94	508.95
19	☐	J52	0.09	109.50	160.94	504.02
20	☐	J60	0.20	108.50	160.95	513.96
21	☐	J62	0.13	108.70	160.94	511.88
22	☐	J64	0.09	109.10	160.94	507.95

Peak Hour - Junction Report

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	☐	J02	0.12	109.40	156.59	462.38
2	☐	J04	0.24	109.50	156.57	461.27
3	☐	J06	0.18	108.70	156.55	468.93
4	☐	J08	0.90	110.00	156.55	456.13
5	☐	J10	0.60	112.90	156.60	428.22
6	☐	J12	0.60	109.50	156.55	461.02
7	☐	J15	0.54	108.90	156.60	467.42
8	☐	J20	0.42	107.50	156.60	481.14
9	☐	J25	0.84	108.70	156.57	469.12
10	☐	J30	0.66	108.50	156.55	470.87
11	☑	J32	0.42	109.00	156.55	465.97
12	☐	J34	0.54	108.30	156.55	472.83
13	☐	J36	0.30	108.10	156.55	474.79
14	☐	J38	0.24	108.70	156.55	468.87
15	☐	J42	0.90	108.90	156.55	466.92
16	☐	J44	0.96	109.70	156.56	459.23
17	☐	J46	0.60	111.00	156.56	446.41
18	☐	J50	0.84	109.00	156.55	465.94
19	☐	J52	0.48	109.50	156.55	461.04
20	☐	J60	1.08	108.50	156.55	470.82
21	☐	J62	0.72	108.70	156.55	468.87
22	☐	J64	0.48	109.10	156.55	464.95

Max Day + Fire (10,000 l/min) - Fireflow Design Report

		ID	Total Demand (L/s)	Available Flow at Hydrant (L/s)	Critical Node ID	Critical Node Pressure (kPa)	Critical Node Head (m)	Design Flow (L/s)	Design Pressure (kPa)	Design Fire Node Pressure (kPa)
1	☐	J02	166.75	456.52	J02	139.96	123.68	456.52	139.96	139.98
2	☐	J04	166.81	346.35	J04	139.96	123.78	346.35	139.96	139.98
3	☐	J06	166.78	295.71	J32	137.02	122.98	294.15	139.96	142.92
4	☐	J08	200.41	214.11	J08	139.96	124.28	214.11	139.96	139.96
5	☐	J10	166.97	576.28	J10	139.96	127.18	576.29	139.96	140.00
6	☐	J12	166.97	160.04	J12	139.96	123.78	160.04	139.96	139.96
7	☐	J25	167.08	343.58	J25	139.96	122.98	343.58	139.96	139.97
8	☐	J30	167.00	241.59	J32	135.06	122.78	239.49	139.96	144.87
9	☐	J32	166.89	184.48	J32	139.96	123.28	184.48	139.96	139.96
10	☐	J34	166.95	178.70	J34	139.96	122.58	178.70	139.96	139.96
11	☐	J36	166.84	152.17	J36	139.96	122.38	152.17	139.96	139.96
12	☐	J38	200.11	218.70	J38	139.96	122.98	218.70	139.96	139.96
13	☐	J46	183.57	264.85	J46	139.96	125.28	264.84	139.96	139.97
14	☐	J50	200.38	266.96	J08	139.51	124.24	266.73	139.96	140.44
15	☐	J52	200.22	263.90	J52	139.96	123.78	263.90	139.96	139.97
16	☐	J60	167.19	196.53	J12	130.16	122.78	193.11	139.96	149.76
17	☐	J62	200.33	228.79	J62	139.96	122.98	228.79	139.96	139.96
18	☐	J64	200.22	226.17	J64	139.96	123.38	226.17	139.96	139.96

Max Day + Fire (13,000 l/min) - Fireflow Design Report

		ID	Total Demand (L/s)	Available Flow at Hydrant (L/s)	Critical Node ID	Critical Node Pressure (kPa)	Critical Node Head (m)	Design Flow (L/s)	Design Pressure (kPa)	Design Fire Node Pressure (kPa)
1	☐	J08	200.41	206.78	J08	139.96	124.28	206.78	139.96	139.96
2	☐	J38	200.11	211.52	J38	139.96	122.98	211.52	139.96	139.96
3	☐	J46	183.57	255.49	J46	139.96	125.28	255.49	139.96	139.97
4	☐	J50	200.38	258.11	J08	138.95	124.18	257.59	139.96	141.01
5	☐	J52	200.22	255.01	J52	139.96	123.78	255.01	139.96	139.96
6	☐	J62	200.33	221.29	J62	139.96	122.98	221.29	139.96	139.96
7	☐	J64	200.22	218.66	J64	139.96	123.38	218.66	139.96	139.96

Peak Hour - Pipe Report

		ID	From Node	To Node	Length (m)	Diameter (mm)	Roughness	Flow (L/s)	Velocity (m/s)	Headloss (m)	HL/1000 (m/k-m)	Status	Flow Reversal Count
1	☐	11	J20	J15	14.57	297.00	120.00	0.11	0.00	0.00	0.00	Open	0
2	☐	13	J15	J10	134.51	297.00	120.00	0.60	0.01	0.00	0.00	Open	0
3	☐	15	J15	J25	105.46	204.00	110.00	5.31	0.16	0.03	0.25	Open	0
4	☐	17	J04	J06	69.81	204.00	110.00	5.43	0.17	0.02	0.26	Open	0
5	☐	19	J30	J34	80.62	204.00	110.00	0.84	0.03	0.00	0.01	Open	0
6	☐	21	J34	J36	66.31	204.00	110.00	0.30	0.01	0.00	0.00	Open	0
7	☐	23	J30	J32	66.02	204.00	110.00	0.42	0.01	0.00	0.00	Open	0
8	☐	29	J44	J46	70.70	204.00	110.00	3.51	0.11	0.01	0.12	Open	0
9	☐	35	J42	J60	75.13	204.00	110.00	1.68	0.05	0.00	0.03	Open	0
10	☐	39	J50	J42	74.44	204.00	110.00	-0.75	0.02	0.00	0.01	Open	0
11	☐	41	J50	J52	44.09	204.00	110.00	-1.20	0.04	0.00	0.02	Open	0
12	☐	43	J62	J50	70.33	204.00	110.00	-1.11	0.03	0.00	0.01	Open	0
13	☐	45	J62	J08	62.41	204.00	110.00	0.39	0.01	0.00	0.00	Open	0
14	☐	47	J60	J12	64.53	204.00	110.00	0.60	0.02	0.00	0.00	Open	0
15	☐	49	J38	J08	46.27	204.00	110.00	0.51	0.02	0.00	0.00	Open	0
16	☐	51	CON-2	J20	1.00	297.00	120.00	6.32	0.09	0.00	0.06	Open	0
17	☐	55	J46	J52	78.99	204.00	110.00	2.91	0.09	0.01	0.08	Open	0
18	☐	57	J52	J64	73.73	204.00	110.00	1.23	0.04	0.00	0.02	Open	0
19	☐	59	J64	J38	61.55	204.00	110.00	0.75	0.02	0.00	0.01	Open	0
20	☐	P11	J20	J02	48.90	204.00	110.00	5.79	0.18	0.01	0.29	Open	0
21	☐	P13	J02	J04	49.55	204.00	110.00	5.67	0.17	0.01	0.28	Open	0
22	☐	P15	CON1	J15	1.00	297.00	120.00	6.34	0.09	0.00	0.06	Open	0
23	☐	P17	J06	J42	45.05	204.00	110.00	3.33	0.10	0.00	0.10	Open	0
24	☐	P19	J30	J06	33.60	204.00	110.00	-1.92	0.06	0.00	0.04	Open	0
25	☐	P21	J44	J25	54.34	204.00	110.00	-4.47	0.14	0.01	0.18	Open	0

APPENDIX C

Stantec Consulting Ltd.
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Ottawa ON Canada
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www.stantec.com

Stantec

CCL/IBI
Cumming Cockburn Limited
1770 WOODWARD DR., OTTAWA (613)225-1311

Legend

- ULTIMATE MAJOR DRAINAGE LIMIT
- SUBCATCHMENT AREAS
- PROPOSED TRUNK SEWER
- PROPOSED FORCEMAIN
- TEMPORARY FORCEMAIN
- PROPOSED STITTSVILLE PUMPING STATION AND FORCEMAIN
- EXISTING TRUNK SEWER
- MAJOR DRAINAGE SPLIT
- ① NODES
- EXISTING PUMPING STATION AND FORCEMAIN (TO BE DECOMMISSIONED)
- 44 / 25.54 ha. INPUT POINT AND AREA IN HECTARES
- EXISTING PUMPING STATION GRAVITY OUTLET

5	REVISED FOR DEC.21/05 SUBMISSION	G.B.U.	S.J.P.	05:12:21
4	REVISED TRUNK SEWER FROM 16 TO KWPS	R.W.W.	R.W.W.	05:10:05
3	ARROWS FOR EXIST. PUMP STATIONS ADDED	R.W.W.	R.W.W.	05:08:09
2	REPORT JUNE 2005	R.W.W.	R.W.W.	05:06:07
1	REPORT APR. 2005	R.W.W.	R.W.W.	05:04:20
Revision		By	Appd.	Date

File Name:	Dwn.	Chkd.	Dsgn.	Date

Seals

Client/Project

Kanata West Concept Plan
Master Servicing Study

Ottawa, Ontario

Title

Preferred Waste-Water Option

Project No.	Scale
60400406	1:7500 (0, 75, 225, 375m)
Drawing No.	Sheet / Revision
S-I	7 of 7 / 5

N:\Ottawa\60400406\Design\Servicing\West Kanata\ Dwg S-1-Dec_05.dwg
Plotted: Dec 19, 2005 - 12:06pm
Last Saved By: gpuik Dec 19, 2005 - 12:06pm

SANITARY SEWER DESIGN SHEET
PROJECT : Kanata West Servicibility Study
LOCATION : CITY OF OTTAWA

PROJECT: 3598-LD-03
DATE: April 2005
DESIGN: JM
FILE: 3598LD.sewers.XLS

MODEL 1 ULTIMATE (population based criteria..ICI simultaneous peaking)

LOCATION				TOTAL AREA	RESIDENTIAL							EMPLOYMENT/RETAIL/BUSINESS PARK/OPEN SPACES							INFILTRATION			TOTAL FLOW	PROPOSED SEWER						HARMON PF	ACTUAL q/Q	va/Vf	ACTUAL VELOCITY
STREET	FROM MH	TO MH			APPLIC AREA	UNIT/Ha	TOTAL UNITS	POPULATION INDIV	POPULATION ACCUM	PEAK FACTOR	PEAK FLOW	APPLIC AREA	ACCUM AREA	TOTAL AREA	FLOW RATE	PEAK FLOW INDIV	PEAK FLOW ACCUM	PEAK FLOW TOTAL	AREA (Ha) INDIV	AREA (Ha) CUMUL	TOTAL CUMUL	PEAK FLOW		CAPACITY	VELOCITY (full)	LGTH.	PIPE	GRADE	AVAIL. CAP.				
				(Ha)	(Ha)						(l/s)	(Ha)	(Ha)	(Ha)	(l/Ha/d)	(l/s)	(l/s)	(l/s)				(l/s)	(l/s)	l/s	m/s	(m)	(mm)	%	(%)				(m/s)
Campeau Drive Trunk Sewer	1	2	Area 1 (PBP)	38.11								38.11	38.11		35000	23.16	23.16		38.11	38.11												
			Area 2 (PBP)	27.29								27.29	65.40		35000	16.58	39.74		27.29	65.40												
			Area 3 Ext Employment	14.05								14.05	79.45		50000	12.20	51.94		14.05	79.45												
			Area 4 HP Employment	10.93								10.93	90.38	90.38	50000	9.49	61.42	61.42	10.93	90.38	90.38	25.31	86.73	283.79	1.27	525.0	525	0.40	69.44%		0.306	0.730	0.927
	2	3	Area 5 Residential	29.19	29.19	19	555	1664	1664	3.65	24.58			90.38				61.42	29.19	29.19									3.65			
			Area 9 Ext Employment	8.45							24.58	8.45	8.45	98.83	50000	7.34	7.34	68.76	8.45	128.02	128.02	35.85	129.18	286.61	0.98	700.0	600	0.20	54.93%		0.451	0.830	0.815
	14	3	Area 6/8 Ext Employment	16.65								16.65	16.65		50000	14.45	14.45		16.65	16.65												
			Area 7 HP Employment	5.48								5.48	22.13	22.13	50000	4.76	19.21	19.21	5.48	22.13	22.13	6.20	25.41	148.74	0.91	910.0	450	0.25	82.92%		0.171	0.630	0.571
	3	4							1664	3.65	24.58	0.00	0.00	120.96		0.00	0.00	87.97	0.00	0.00	150.15	42.04	154.59	392.29	1.06	300.0	675	0.20	60.59%	3.65	0.394	0.790	0.839
	4A	4	Area 10 Residential	27.86	27.86	19	529	1588	1588	3.66	23.55								27.86	27.86	27.86	7.80	31.36	148.74	0.91	750.0	450	0.25	78.92%	3.66	0.211	0.660	0.598
	4	5	14 Mixed Use	4.13	1.76	50	88	263	3515	3.38	48.17	2.37	2.37	123.33	35000	1.44	1.44	89.41	4.13	4.13	182.14	51.00	188.58	392.29	1.06	450.0	675	0.20	51.93%	3.38	0.481	0.840	0.892
	Queensway	5	Area 13 Community Retail	6.35								6.35	6.35	6.35	35000	3.86	3.86	3.86	6.35													
			Area 11/12 Mixed Use	11.80	5.02	50	251	752	752	3.88	11.81	6.79	13.14	13.14	35000	4.12	7.98	7.98	11.80	18.15	18.15	5.08	24.88	43.88	0.87	420.0	250	0.50	43.31%	3.88	0.567	0.880	0.762
	5	5A	Area 15 Community Retail	3.88				0	4267	3.31	57.19	3.88			35000	2.36			3.88											3.31			
First Line Road Sewer			Area 44	25.54							57.19	25.54	29.42	165.89	35000	15.52	17.88	115.27	25.54	29.42	229.71	64.32	236.77	519.43	1.14	300.0	750	*0.20*	54.42%		0.456	0.830	0.945
				229.71							57.19							115.27				64.32	236.77							3.23			
Signature Ridge		5A	Area 100 Residential	90.20	90.20	19	1714	5141	5141	3.23	67.35	0.00											65.00										
Signature Ridge		5A	Area 100 Non-Residential	4.88							67.35	4.88	4.88	4.88	50000	4.24	4.24	4.24	95.08	95.08	95.08	26.62	98.21										
Intersticial Lands & Broughton/Richardson		5A																														
Total To SRPS	**5A**	**SRPS**		**324.79**	**154.02**		**3136**		**9409**		**124.54**	**170.77**						**119.51**			**324.79**	**90.94**	**399.98**	**580.53**	**1.27**	**30.0**	**750**	**0.25**	**31.10%**	2.98	0.689	0.940	1.197
Palladium Drive Trunk Sewer	6	7	Area 32 (PBP)	57.03								57.03	57.03		50000	49.51	49.51		57.03	57.03												
			Area 32A Park	8.34								8.34	65.37		0	0.00	49.51		8.34	65.37												
			Area 33/34 Ext Employment	54.85								54.85	120.22	120.22	50000	47.61	97.12	97.12	54.85	120.22	120.22												
	7	8	Area 37 Mixed Use	36.70	15.60	50	780	2340	2340	3.53	33.47	21.10	21.10	141.32	50000	18.32	18.32	115.44	36.70	36.70	156.92	43.94	192.85	455.83	1.23	925.0	675	0.27	57.69%	3.53	0.423	0.810	1.000
				156.92	15.60		780		2340		33.47	141.32						115.44	156.92		156.92	43.94	192.85							3.53			
Corel Centre Etc. (Existing Sewer) *		16	Area 35 HP Employment	6.05								6.05	6.05		30000	3.15	3.15		6.05													
		16	Area 36 (Corel Centre)																			30.00											
		16	Area 38 Exten Employment	20.15								20.15	26.20	26.20	14400	5.04	8.19	8.19	20.15	26.20	26.20	7.34	45.52				*Existing*						
First Line Road Sewer	15	16	Area 40 Employment	14.59								14.59	14.59		35000	8.87	8.87		14.59	14.59												
			Area 41 Employment	11.97								11.97	26.56		35000	7.27	16.14		11.97	26.56												
			Area 42 Employment	20.66								20.66	47.22		35000	12.55	28.69		20.66	47.22												
			Area 43 Employment	28.89								28.89	76.11	76.11	35000	17.55	46.25	46.25	28.89	76.11	76.11	21.31	67.56	224.35	1.00	525.0	525	0.25	69.89%		0.301	0.730	0.733
Carp River Trunk	16	8	Nothing To Add	102.31	15.60		780		2340	3.53	33.47	102.31	102.31	102.31	0	0.00	54.44	54.44	0.00	102.31	102.31	28.65	113.08	286.61	0.98	400.0	600	0.20	60.54%	3.53	0.395	0.790	0.776
Carp River Trunk	8	10A	Nothing To Add	259.23	15.60		780		2340		33.47	0.00	0.00	243.63		0.00	0.00	169.87	0.00	139.01	259.23	109.92	305.93	579.95	1.05	550.0	825	0.15	47.25%	3.53	0.528	0.860	0.904
																			23.34	23.34										3.72			
Marie Grove Road Trunk Sewer	9	10	Area 18/19 Exist. Residential	23.34	23.34	19	443	1330	1330										79.32	102.66	102.66	28.74	132.56	405.11	1.39	775.0	600	0.40	67.28%	3.03	0.327	0.740	1.027
			Area 22/26/27 Residential	79.32	79.32	30	2380	7139	8469	3.03	103.82																			3.20			
Hazeldean/Huntmar Trunk Sewer	11	12	Area 16/20 Residential	99.01	99.01	19	1881	5644	5644	3.20	73.06								99.01	99.01													
			Area 16/20 Commercial	33.50								33.50	33.50	33.50	50000	29.08	29.08	29.08	33.50	132.51													
			Area 16/20 Open Space	14.13								14.13							14.13	146.64													
			Area 17 Ex. Commercial	3.44							73.06	3.44	36.94	36.94	35000	2.09	31.17	31.17	3.44	150.08	150.08	42.02	146.26	554.82	1.50	775.0	675	0.40	73.64%		0.264	0.700	1.051
	12	10	Area 21 Exist. Employment	10.89								10.89	10.89	10.89	50000	9.45	9.45		10.89	10.89													
			Area 19A Exist Residential	6.63	6.63	19	126	378									9.45		6.63	17.52													
			Area 23/24 Community Retail	17.61								17.61	28.50	28.50	35000	10.70	20.15	51.32	17.61	35.13													
			Area 28/30 Residential	27.10	27.10	30	813	2439	8460	3.03	103.72	0.00	0.00	65.44				51.32	27.10	62.23	212.31	59.45	214.49	519.43	1.14	950.0	750	0.20	58.71%	3.03	0.413	0.800	0.911
Marie Grove Road Trunk Sewer	10	10A	Area 39 Mixed Use	21.13	8.98	50	449	1347				12.15	12.15	77.59	35000	7.38	7.38	58.71	21.13														
			Area 29 Residential	15.00	15.00	30	450	1350	19627	2.66	211.54							58.71	15.00	36.13	351.10	98.31	368.56	669.89	1.21	1000.0	825	0.20	44.98%	2.66	0.550	0.870	1.056
Carp River Trunk Sewer	13	10A	Area 25 Community Retail	20.24								20.24	20.24	20.24	35000	12.30	12.30	12.30	20.24														
			Area 31 residential	38.72	38.72	30	1162	3485	3485	3.39	47.80							12.30	38.72	58.96	58.96	16.51	76.61	320.17	1.10	1000.0	600	0.25	76.07%	3.39	0.239	0.680	0.746
		10A	Area 31A (PBP)	0.75								0.75	0.75	0.75	50000	0.65	0.65	0.65	0.75	0.75	0.75	0.21	0.86	36.69	0.72	100.0	250	0.35	97.65%		0.023	0.340	0.246
Pumping Station 2 to KWPS	**10A**	**KWPS**		**670.04**	**313.70**		**8484**		**25451**		**292.82**	**356.34**						**241.53**			**670.04**	**224.95**	**759.29**	**1273.71**	**1.43**	**30.0**	**1050**	**0.20**	**40.39%**	2.55	0.596	0.900	1.283
STUDY TOTALS				994.83	467.72		11620		34860			527.11																		2.41			

Average Daily Per capita Flow Rate =	350 l/cap/d
Infiltration Allowance Flow Rate =	0.28 l/sec/Ha
Residential Peaking Factor = 1+(14/(4+(P^0.5))), P=Pop. in 1000's, Max of 4	
Population density per unit =	3.00
Peak Fof Employment/Retail/Business Park =	1.50

Mixed Uses Assumes: 15% Community Retail, 42.5% Business Park and 42.5% Residential

Revision No. 1: April 01, 2005
Revision No. 2: April 11, 2005
Revision No. 3: April 21, 2005
Revision No. 4: June 07, 2005
Revision No. 5: August 10, 2005
Revision No. 6: Oct. 14, 2005
Revision No. 7: Nov. 10, 2005
Revision No. 8: Nov. 11, 2005
Revision No. 9: Apr. 19, 2006

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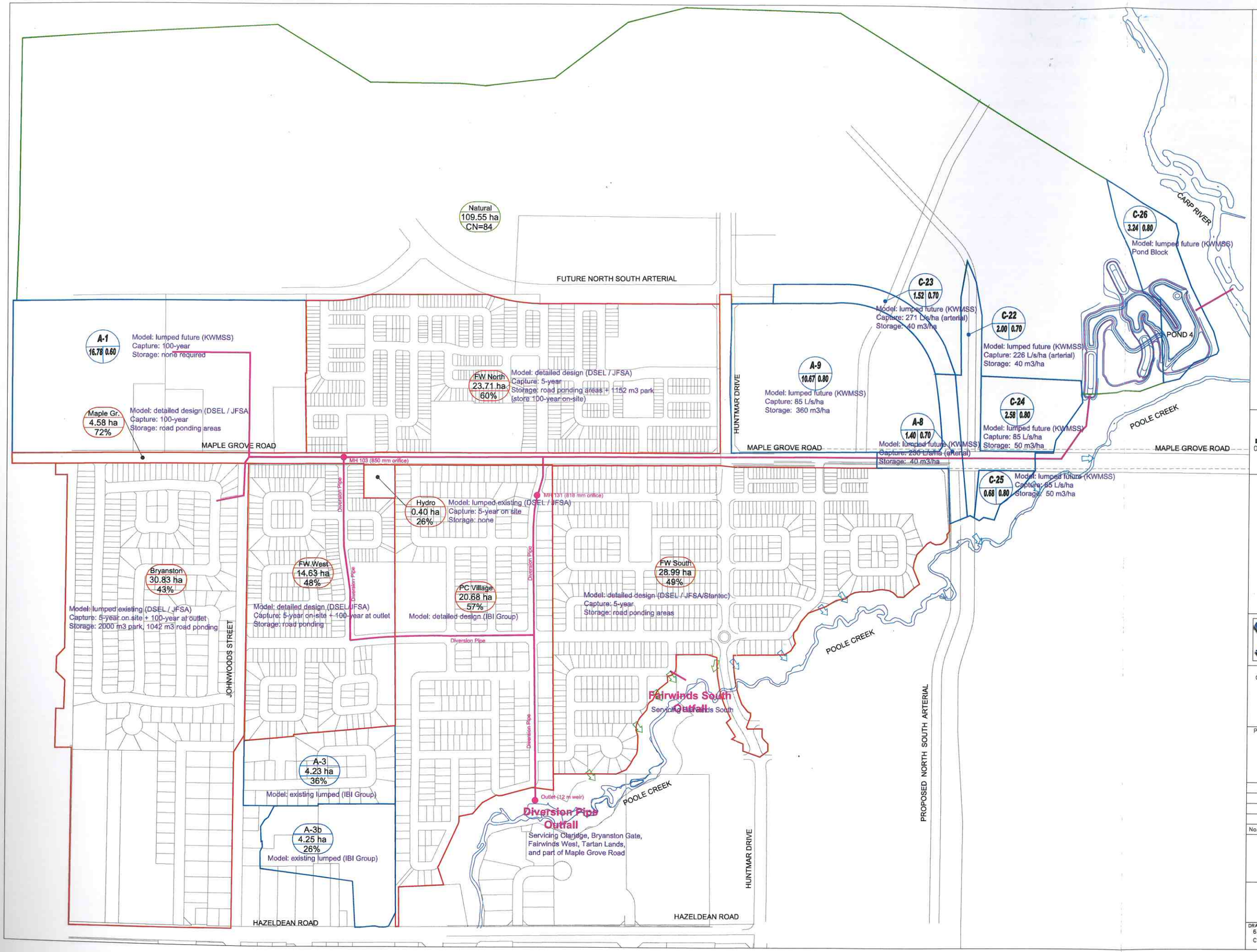
FIG. 4.2-1

APPENDIX D



J.F. Sabourin & Associates Inc.
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CLIENT :

DSEL
david schaeffer engineering ltd
120 IBER ROAD, SUITE 203
OTTAWA, ONTARIO K2S 1E9
(613) 836-0856

PROJECT :

Kanata West Community
Pond 4

No.	BY	DATE	DESCRIPTION	BY

Proposed Interim Conditions
Drainage Area to SWM Facility

FIGURE 2

DESIGNED:
DRAWN: LP
VERIFIED: JFS
APPROVED: JFS

DRAWING REF.
631-07\Design\Pond Exp\201408\
CAD\JFSA Fairwinds Global.dwg

DATE: Aug/14
PROJECT No.: 631-07

Natural Environment (NE) 20%

All three alternatives will have essentially the same impact on the natural environment. Alternative I has a minor increased impact due to the number of ponds (8) and there location within the KWCP.

5.5.2 Selection of Stormwater Management Alternatives

Based on the above evaluation, Alternative III is selected as the preferred stormwater management alternative. This option offers the greatest amount of flexibility for phasing opportunities while providing an economical servicing solution that meets the objectives of the Carp River Watershed/Subwatershed Study.

5.6 Best Management Practices

The Carp River Watershed/Subwatershed Study (Robinson Consultants, November 2004) proposes target infiltration rates of 104 mm/yr and 73 mm/yr for areas of moderate and low recharge, respectively, within the KWCP. To meet the identified infiltration targets suggested the following best management practices (BMP's) were recommended and are shown on Figures 7.3.3 through 7.3.7 in Appendix 3.4.

- Subsurface Infiltration;
- Biofilters;
- Wet ponds; and
- Dry ponds.

A water balance and subsurface hydrogeological investigation at the detailed design stage will dictate which of the proposed BMPs will be selected for specific developments.

Given the establishment of the dominant soil associations that exist in the Study area **(see Figure 5.4)**, and considering the extent of the poorly draining soils within the nearly flat topography, it is apparent that drainage in the Study area is primarily governed by the characteristics of the poorly draining silty clay to clay soils underlying all but a small percentage of the Study area. As a result, the establishment of the infiltration rates of the soils can be simplified to reflect the silty clay to clay soils and the till material over bedrock. Table 5.6 below summarizes the anticipated infiltration rates of these two principal soil groups, based on soil characteristics and borehole data regarding degree of compaction.

Table 5.6 -Summary of Infiltration Rates of Principal Soil Groups

Soil Groups	Estimated Infiltration Rates [1] (mm/yr)	Percent of Annual Rainfall Infiltrated
Castor, Dalhousie, North Gower (silty clay to clay)	50-70 mm/yr	5-7
Anstruther, Farmington, Nepean (sandy loams to till)	70-100 mm/yr	7-11

1. Infiltration rates presented in this table are consistent with the average hydraulic conductivities of the individual soils comprising the principal soil group.

As the infiltration rates provided in Table 5.6 reflect estimated hydraulic conductivities only, further in-situ analysis of soils under saturated loading conditions is necessary at each site in order to provide site-specific values. The above rates are based on borehole logs completed to date appended to this report in Appendix 3.5.

Post development infiltration rates are to be increased by 25 percent above the pre-development rate. This rate of infiltration has been established to compensate for those areas (ie. Roadway corridors) that can not provide infiltration.

5.7 Stormwater Management Design

Preliminary site plans of each of the proposed ponds have been prepared and are provided in Appendix 3.1. These ponds have been sized to meet the requirements established in Section 5.2. It is noted that the pond site plans are included to demonstrate the land area required to accommodate an appropriate SWM facility and are not intended for construction purposes. A detailed design of the specific facilities will be required at the subsequent design stage. Stage-storage curves for the proposed ponds are presented in Appendix 3.3.1.

At the detailed design stage for Ponds 6 and 7, consideration shall be made for erosion control volumes in order to comply with any erosion control criteria established for Feedmill Creek.

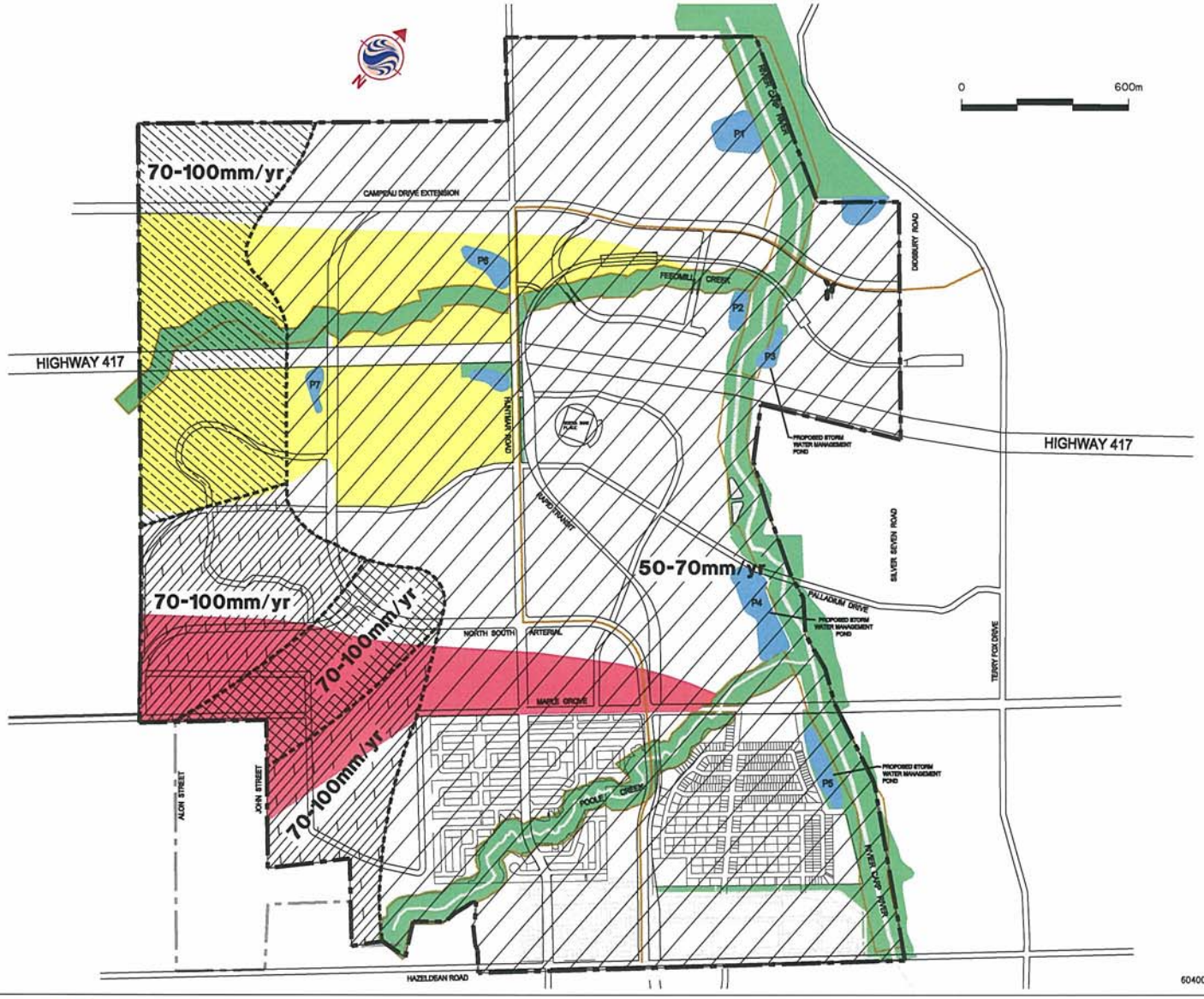
Low flow velocities for existing and future conditions were modeled for the 2, 5 and 10 year events to assess erosion potential. Pond banks are clay and loam and the calculated velocities do not approach levels that would create erosion for these banks.

The post development analysis addresses the potential changes in the Regulatory 1:100 year flood plain and the potential impact on erosion throughout the reach. The hydrologic and hydraulic analysis, which has been reviewed and supported by the Mississippi Valley Conservation Authority, indicates that there will be no significant impact. A further assessment of the potential for erosion has been conducted in the Flow Characterization and Flood Level Analysis, prepared by CH2MHill and dated June 2006. Pond sizing is provided in **Tables 5.7.1 and 5.7.2** below.

Table 5.7.1 – Stormwater Management Pond Elevations Constraining the Minor System

Pond	***Carp/Poole/Feedmill 100 year Water Level (m)****	***Carp/Poole/Feedmill Normal Water Level (m)***	***100 year Pond Level* (m)***
1	93.65	92.00	93.96
2	93.80	92.25	94.23
3	93.85	92.25	94.20
4	94.20	92.50	94.74
5	94.60	92.70	94.94
6	97.20	96.50	98.94
7	101.80	100.50	102.92

- 100 yr water levels from Mississippi Valley Conservation Authority Regulatory Floodplain Mapping



INFILTRATION TARGETS

	SOIL TYPE	RECHARGE
	FINE SAND	MODERATE
	PALEOZOIC BEDROCK	MODERATE
	TILL	MODERATE
	CLAY	LOW

- Kanata-West Concept Plan Boundary
- Area Tributary To Feedmill Creek (Existing Conditions)
- Area Tributary To Maple Grove Ditch System and Poole Creek (Existing Conditions)
- OPEN SPACE

NOTE:
SOIL TYPES AND RECHARGE POTENTIAL FROM CARP RIVER WATERSHED/SUBWATERSHED STUDY BY ROBINSON CONSULTANTS INC. 2004.
TARGET INFILTRATION RATES OBTAINED FROM ENVIRONMENTAL FACT SHEETS FROM 2004 REPORT.

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MAY 2006

FIG. 5.4

Infiltration Calculations
Maple Grove Lands 1981 Maple Grove Road

The Kanata West Master Servicing Study indicated target infiltration rates for various areas within the Kanata West development area. The proposed Maple Grove Lands site is located in an area with target infiltration rate of 70-100mm/year. The KWMSS also indicated that post development infiltration rates are to be increased by 25% above these rates. Therefore, the target infiltration rate for the site is 88 – 125mm/year. The subject site has a certain amount of infiltration under every rainfall event which will contribute to the required infiltration range. The pervious areas (grassed rear yards and road boulevards) will be provided with imported fine sandy loam topsoil to increase infiltration rates for the development. Infiltration from the pervious areas within the development have been calculated using the MOE Stormwater Management Planning and Design Manual (March, 2003) Table 3.1. The post-development infiltration calculation for the site is provided below.

Post-Development Infiltration
Drainage Area: 8ha
Target Post-Development Infiltration Volume: 8ha x (88 to 125 mm/year target range) x 10 = 7040 to 10000 m^3/year
Weighted Imperviousness: 60%
Impervious Area: 4.8ha
Pervious Area: 3.2ha
Land Cover: Urban Lawns
Soils: Imported Fine Sandy Loam
Infiltration: 228mmx3.2hax10=7296m^3/year

Where 228mm is the annual infiltration for fine sandy loam soils as per Table 3.1 of the MOE SWMPDM (March, 2003)

The total infiltration provided by the site is therefore 7296m^3/year, within the range of the Target Post-Development Infiltration Volume of 7040 to 10000m^3/year.