



Lansdowne Development Preliminary Servicing Report

Prepared for:

**10194549 Canada Ltd. and 10725994 Canada Ltd.
c/o Mr. Shane Kelly**

Prepared by:

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Date: March 2020

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2. represents Consultant's judgement in light of the limitations and industry standards for the preparation of similar reports;
3. may be based on information provided to Consultant which has not been independently verified;
4. has not been updated since the date of issuance of the Report and its accuracy is limited to the time and circumstances in which it was prepared; and
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March 31, 2020

10194549 Canada Ltd.
& 10725994 Canada Ltd.
c/o Mr. Shane Kelly
377 Cadillac Avenue South
Oshawa, ON
L1H 6A1

Dear Mr. Kelly,

**Regarding: Lansdowne Development
 Preliminary Servicing Report**

The enclosed report details the existing water and sanitary infrastructure and our recommendations for water and sanitary services for the proposed Lansdowne development.

The proposed Lansdowne development includes two parcels of land; the West and East parcels. The West parcel is 26.77 ha with approximately 15.25 hectares of developable area proposed with approximately five developable light industrial blocks with complementary commercial and two new municipal streets. The East parcel is 83.34 ha with approximately 17.19 hectares of developable area proposed with approximately 145 residential lots, two low rise multi residential blocks, two commercial blocks, parkland and three new municipal streets.

Water and sanitary services are proposed throughout the developments.

Preliminary calculations demonstrate that the existing water infrastructure is capable of supplying adequate water flow and pressure to the proposed development.

Preliminary calculations find that existing downstream sanitary sewers and proposed sanitary sewers are capable of and will effectively service the proposed development.

The existing pumping station may require pump upgrades and the sewage lagoons require upgrading to facilitate the full buildout of the proposed development. These upgrades are proposed to be completed by the Township.

The proposed development sanitary sewer is to discharge to the sanitary sewer on Prince Street and Railway Street via gravity sewers and eventually to the Railway Street Pumping Station.

Individual water and sanitary sewer sizing and water for fire protection for the industrial blocks shall be confirmed during the site plan control process.

This Report demonstrates that adequate water and sanitary sewer servicing is available for the proposed initial phase of development. Pump station upgrade may be required, and Lagoon upgrades are required to support the full buildout of the development.

If you have any enquiries or wish to discuss further, please contact this office.

Sincerely,

FOREFRONT Engineering Inc.

A handwritten signature in blue ink, appearing to read 'K. Nielissen'.

Kyle Nielissen, P.Eng.

Kyle.Nielissen@Forefronteng.ca

FOREFRONT Signatures

Report Prepared By:

Jeff Homer, P.Eng.



Report Reviewed By:

Kyle Nielissen, P.Eng.



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1. Introduction

Forefront has assembled relevant supporting information for the proposed Lansdowne Development, encompassed by Prince Street (County Road 3), Railway Street, and the Canadian National Railway. The legal description of the land is Parts 1 to 6, Registered Plan 194, Geographic Township of Lansdowne, Township of Leeds and the Thousand Islands, County of Leeds. The property is located north of County Road 2 and bounded by Railway Street to the north and divided by Prince Street. Please refer to Figure 1: Location Plan for the site location.



Figure 1: Location Plan

The subject site includes the west and east proposed draft plans totaling approximately 39.30 hectares.

The west plan is currently zoned Light Industrial and the east plan is currently zoned Residential in the Township of Leeds and the Thousand Islands Zoning Bylaw 07-079.

On the west plan and east plan the lands south of the site are vacant lands. Along Prince Street there are existing residential and commercial land uses. North of the east plan is Railway Street which is fronted by residential dwellings.

The proposed Lansdowne development includes two parcels of land; the West and East parcels. The West parcel is 26.77 ha with approximately 15.25 hectares of developable area and proposes approximately five developable light industrial blocks with complementary commercial and two new municipal streets. The East parcel is 83.34 ha with approximately 17.19 hectares of developable area and proposes approximately 145 residential lots, two low rise multi residential blocks, two commercial blocks, parkland and three new municipal streets.

Outside of the urban boundary adjacent to the West plan is a proposed stormwater facility. Within the East plan but outside of the urban boundary is the proposed parkland.

Development of the Lansdowne Development will result in an increase in municipal water consumption and sewerage discharge. This Servicing Report proposes a plan to provide water and sanitary sewer services for the proposed development.

Refer to Appendix A, for the proposed development Draft Plans.

2. Water Supply

2.1 Existing Conditions

The Village of Lansdowne is located within the Township of Leeds and the Thousand Islands and has a population of approximately 550 residents. Water is supplied by two municipal owned deep wells, two submersible pumps, and the Lansdowne elevated storage tank. Water is treated onsite by a treatment system operated by the Ontario Clean Water Agency (OCWA). The existing water supply network that services the village of Lansdowne is primarily 150mm to 200mm diameter pipe installed prior to 1977.

Using the most current assessment report on file provided by OCWA to estimate existing water demand, the water supply system records an average daily flow of 181m³/day, a maximum daily flow of 476m³/day, and a total consumption of 66,000m³ for the year of 2018. According to the OCWA assessment report, the design capacity of the deep wells is approximately 720m³/day. The system operates at approximately 25% capacity on average, and 66% during the maximum day flow. Monthly water supply demand peaks in the months between May and August and is relatively low in the winter and spring months.

Please refer to Appendix B, Ontario Clean Water Agency Performance Assessment Report.

The elevated storage tank is located on Church Street in the north portion of the Village of Lansdowne. Water levels in the elevation storage tank operate between approximately 139.75m to 147.37m, a range of 7.6m. Physical dimensions of the storage tank include a nominal diameter of 9.1m, height of 34.4m and a storage capacity of approximately 2,230 m³. As-built drawings are included in Appendix B for further details.

The existing subject site is currently vacant and is not serviced by a water supply. Watermains within the vicinity of the subject site include a 200mm diameter watermain along Prince Street and a 150mm diameter watermain along Railway Street.

Refer to Appendix B, **Figure 2: Proposed Water Infrastructure** for further details.

2.2 Proposed Development

The proposed Lansdowne development includes two proposed draft plans, the West and East plans. A number of new streets are proposed with watermains and water services proposed throughout the developments.

The West plan is approximately 15.25 hectares of developable area and proposes approximately five developable light industrial blocks with complementary commercial uses and two new municipal streets. Block 2 proposes a recreation centre with approximately 600 seats and a restaurant with approximately 115 seats. Block 5 proposes an adventure park with approximately 300 seats. Lands owned by the developer that are not included in the Draft Plan include an area of 8.87 ha to the west where the stormwater management facility is proposed. Note, existing Block 44 of registered plan 397 is owned by others and is included in the analysis.

The East plan is approximately 17.19 hectares of developable area and proposes approximately 145 residential lots, two low rise multi residential blocks, two commercial blocks, parkland and three new municipal streets. Two watermain connections are proposed at Prince Street and MacDonald Drive, one watermain connection is proposed at Railway Street. 250mm diameter watermains are proposed throughout the West parcel and 200mm diameter watermains are proposed throughout the East parcel. These connections will improve looping and water

circulation in and around the development area. Reduced or eliminated water quality impacts in the area will result from the additional connections particularly along the existing dead-end mains.

During development, a single service connection per block/lot to the proposed municipal watermain is to be sized and will be dependent on the future site design.

Refer to Appendix B, **Figure 2: Proposed Water Infrastructure** for further details.

From review of the Lansdowne Standpipe design, the water supply system is designed with a minimum operating water level of 139.75m.

Analysis based on the Lansdowne Standpipe minimum water level and existing water supply network has been completed.

The Ministry of the Environment, Conservation and Parks (MECP) requires that the system be assessed at the critical locations for peak hour flow, maximum day, and maximum day plus fire flow demand. MECP requires that the system maintain an operating pressure of 280-700 kPa under peak flow conditions and 140 kPa under maximum day plus fire flow conditions.

Design Flow Parameters

Proposed Single Family Res.	350	L/cap. D
Existing Single Family Res.	270	L/cap. D
capita per dwelling unit		
-Single Family detached	2.5	pop/unit
-Low Rise Residential	1.5	pop/unit
-Assembly Hall / Church	8	L/Seat-day
-School	70	L/Student-day
-Stadium	20	L/Seat-day
-Restaurant	125	L/Seat-day
-Commercial / Industrial Flow	15,000	L/ha-day
-Existing Commercial / Industrial Flow	10,540	L/ha-day
Peak Hour Flow Factor	4.25	
Maximum Day Flow Factor	2.75	
(Values are consistent with similar municipalities)		

Note, as per the MECP Design Guidelines for Drinking Water Systems (2008) industrial demands vary with the type of industry and specific use. They recommend an average daily demand allowance of between 28m³/day.ha for commercial and 35m³/ha.day for business park industrial. The flows recommended largely relate to an urban setting with uses that require significant water and sewer consumption. Uses expected within the West parcel are expected to be more dry type developments with limited levels of water and sewer consumption, we have assumed that over 50% of the uses will be warehousing or storage units with minimal water and sewer flows being generated. An allowance of 15m³(15,000L) per hectare per day is utilized for the analysis.

During a review of the OCWA assessment report, it was estimated that the existing water demand average daily flow was 234 m³/day.

Based on an estimated total existing residential, assembly hall / church, and school daily flows of 178.25m³/day, an average commercial and industrial flow was calculated at 10.54m³/ha.day for a total existing flow of 234 m³/day. As the type of commercial and industrial demands can vary, an allowance of 15 m³/ day ha is proposed throughout. Note, water demands are site specific and are to be based on the future building design and use, individual assessments are required during the Site Plan process for each block.

Appropriate demands were assigned to the existing and proposed distribution system and are summarized in the appendix. EPA NET (Version 2.0) was used to model the following: Peak Hour pressure demand (kPa), Maximum Daily pressure demand (kPa), Fire flow (L/min) at Maximum Day plus Fire demand maintaining 140 kPa. Refer to Appendix B, EPA NET for modeling results and Figure 2 for the proposed water infrastructure schematic.

The combined existing and proposed Peak Hour Flow Demand is approximately 30.23 L/s based on a peaking factor of 4.25. Maximum Daily Flow demand is approximately 19.56 L/s based on a peak day factor of 2.75. The proposed system maintains 336 kPa at its critical point during peak hour flow conditions and 358 kPa during maximum day flow conditions. Refer to Appendix B modelling results for further details.

Proposed development pressures are within the normal operation range of 280 kPa to 700 kPa.

Note, existing pressures within the Village of Lansdowne north of a contour of approximately 112 m experience pressures below the normal operating range of 280 kPa ranging from 259 kPa to 276 kPa. During the proposed scenario these existing pressures range from 248 kPa to 266 kPa, the proposed development will have negligible effects on the existing infrastructure.

A watermain on an easement is proposed to loop the system between lots 73, 74, 125 and 126.

Fire Flows

Water supply requirements for fire suppression in municipal water works systems are based on the "Water Supply for Public Fire Protection, 1999" by Fire Underwriters Survey (FUS). The proposed development includes residential and a number of industrial and complementary commercial uses.

Minimum requirements for water suppression are not less than 1,000 L/min for two hours or 2,000 L/min for one hour in addition to any domestic consumption at the maximum daily rate. Using the short method within the FUS guidelines, in general single and small two family dwellings require a minimum of 4,000 L/min with 3.0 meters of separation between exposures (1.5m side yards). Fire Flow requirements for development Blocks need to be assessed during site plan approval, it is expected that onsite storage may be required on some of the Blocks.

Fire flow available in the existing system at Maximum Daily Flow demand plus fire flow demand varies from approximately 4,800 L/min to 11,400 L/min. Within the proposed development, Maximum Daily Flow demand plus fire flows is approximately 4,200 L/min to 5,400 L/min available. The system was assessed at the minimum operating pressure of 140 kPa and the available Maximum Daily flow plus Fire flow.

The proposed development meets the recommended minimum standards by FUS and the MECP requirements. Offsite upgrades are not required.

Site Plan approval is required for each Block. Fire flows and service sizes to individual Blocks shall be confirmed during the Site Plan process. Water supply for Fire protection may be required on individual blocks. Isolation valves are required at the property line. Block service sizing and installation is to be as per Township standards, Township Site Plan Control Guidelines and the Ontario Building Code.

The West parcel will include hydrants spaced at 150m along the proposed Streets, private hydrants may be required on Blocks and shall be determined during the site plan approval stage.

Throughout the East parcel fire hydrants are proposed at 150m spacing throughout the development. 25mm cross linked high density polyethylene (PEX) services are proposed.

Based on the infrastructure review, there will be no negative impact on the local water distribution system. There is adequate water pressure and flow available for the proposed development. Note, Block Fire Flow requirements need assessed at the Site Plan Approval stage.

3. Sanitary Sewer

3.1 Existing Conditions

The Village of Lansdowne is serviced by municipal sanitary sewers that were constructed prior to 1977. The sanitary sewer system discharge for the Village of Lansdowne is directed to the Railway Street pumping station via gravity sewers, eventually discharging via a forcemain to two sewage lagoons directly north of Railway Street.

A 300mm diameter sanitary sewer from Railway Street connects to the maintenance hole directly south of the pumping station, and another 250mm diameter sanitary sewer along King Street East connects at the north side of the pumping station where the discharge is combined into a 375mm sanitary sewer into the pumping station.

Sewage Lagoons

The pumping station and forcemain discharge to two sewage lagoon cells directly to the northeast of the pumping station. Influent flows to the north cell and then passes into the south cell through a valve. Eventually, the treated effluent is discharged to a municipal ditch and into the tributary of the La Rue Mills Creek. The lagoon discharges on a seasonal frequency during the spring and fall.

From a review of the most recent records on file, the 2018 OCWA assessment record and the 2018 MECP Lagoon Inspection Report, the average daily flow to the sewage lagoons is approximately 213m³/day for the year of 2018. The design capacity of the lagoons is approximately 336m³/day equivalent residential units. According to the OCWA records, average daily flows from 2015 to 2018 are between 161 to 213 m³/day and are not approaching the rated capacity of the sewage works. The lagoon facility is utilizing between 45% to 64% of the rated capacity, it is estimated that 123 m³ of capacity is available.

Refer to Appendix C for the Wastewater Ontario Clean Water Agency Performance Assessment Report.

Railway Street Pumping Station

Lansdowne's gravity sanitary sewer network flows south to the Railway Street Pumping Station located on the north side of Railway Street and approximately 455m north east of the intersection of Prince Street. Sewage from the pump station is discharged through a 150mm diameter forcemain to two sewage lagoon cells.

The pumping station was recently upgraded in 2015 and equipped with two pumps (one duty, one standby), each with a capacity of average daily flow of 21.5 L/s and peak design flow of 30 L/s at 26.3m of total dynamic head (TDH).

Pumping Station Forcemain

The existing forcemain from the pumping station is 150mm diameter pipe. MECP maximum permitted flow velocities for forcemains is 3.0m/s. Utilizing the maximum velocity of 3.0 m/s equates to a maximum capacity of 54 L/s.

Gravity Sanitary Sewers

The existing subject site is currently vacant and is not serviced by a sanitary sewer. Sanitary sewers within the vicinity of the subject site include a 250mm diameter sanitary sewer along Prince Street. The sanitary sewer connects to a 300mm diameter sanitary sewer to the north on Railway Street, eventually discharging to the pumping station. Existing sanitary sewers along Prince Street and Railway Street slope at 0.3%.

A 250mm diameter sanitary trunk main at the intersection of Prince Street and Grand Truck Avenue is directed south under the CN rail tracks and connects to the sanitary sewer on Railway Street, eventually discharging to the pumping station.

3.2 Proposed Development

The proposed Lansdowne development includes two proposed draft plans, the West and East plans. A number of new streets are proposed with sanitary mains and sanitary services proposed throughout the developments.

The West plan is approximately 15.25 hectares of developable area and proposes approximately five developable light industrial blocks with complementary commercial uses and two new municipal streets. Block 2 proposes a recreation centre with approximately 600 seats and a restaurant with approximately 115 seats. Block 5 proposes an adventure park with approximately 300 seats. Lands owned by the developer that are not included in the Draft Plan include an area of 8.87 ha to the west where the stormwater management facility is proposed. Note, existing Block 44 of Registered Plan 397 is owned by others and is included in the analysis.

The East plan is approximately 17.19 hectares of developable area and proposes approximately 145 residential lots, two low rise multi residential blocks, two commercial blocks, parkland and three new municipal streets.

The **Initial Phase** of development includes a recreational centre and adventure park (Block 2 and 5), approximately 30 low rise multi-residential units (Block 150), 82 single detached dwellings and the proposed stormwater management facility. A sanitary sewer connection is proposed at the intersection of Macdonald Drive and Prince Street. No upgrades are required for the Initial Phase of development.

The sewage lagoons and possibly the pump station require upgrading to facilitate the **Full Buildout** of the proposed development. Holding Symbols to limit development are recommended until such time as the sewage lagoon capacity is available on Blocks 3, 4, 146, 147, 148 and lots 115 to 145. Note, the pump station may not require upgrades and should be assessed on actual flows as development progresses. It is recommended that any necessary future upgrades are completed by the Township. A sanitary sewer connection is proposed at Railway Street to service lots 115 to 145.

Refer to Appendix C for Preliminary Sanitary Sewerage Design Sheets for the Existing, proposed Initial Phase and Full Buildout sewage demands and **Figure 3** for Proposed Sanitary Sewerage Areas. Below are the proposed design parameters.

Design Flow Parameters

Peak Residential Factor	Harmon Formula
Peak Industrial/commercial Factor	2.75
Infiltration Allowance:	0.14 L/s/ha

Minimum Pipe Size Diameter:

200mm Diameter

Average Daily Demand

Proposed Single Family Res.	350	L/cap. D
Existing Single Family Res.	270	L/cap. D
capita per dwelling unit		
-Single Family detached	2.5	pop/unit
-Low Rise Residential	1.5	pop/unit
-Assembly Hall / Church	8	L/Seat-day
-School	70	L/Student-day
-Stadium	20	L/Seat-day
-Restaurant	125	L/Seat-day
-Commercial / Industrial Flow	15,000	L/ha-day
-Existing Commercial / Industrial Flow	10,540	L/ha-day

(Values are consistent with similar municipalities)

Each development block will be subject to Site Plan Control when they are proposed for development. During the site plan process, a MISA maintenance hole at the property limit and a single service connection per block to the proposed sanitary sewer is required. The sewer shall be sized based on the proposed site use and building design. Block service sizing and installation is to be as per the Township of Leeds and the Thousand Islands Site Plan Control Guidelines and the Ontario Building Code.

Residential lots are proposed with 125mm diameter services and manufactured tee connections.

It is recommended that the west parcel and part of the east parcel connect to the 250mm diameter sanitary sewer at the intersection of Prince Street and Macdonald Drive and direct the development's discharge to the Railway Street pumping station. Residential lots 115 to 145 are proposed to connect to the 300mm diameter sanitary sewer directly south of the Railway Street pumping station.

Initial Phase

The proposed initial phase of the development includes approximately 30 low rise multi-residential units, 82 single family dwelling units, the recreation centre (Block 2) and the adventure park (Block 5).

An Initial sanitary sewerage area of 19.82 hectares is estimated to discharge an average daily flow of 123 m³/day with an additional peak flow of 7.87L/s to the sanitary sewer system.

Existing sanitary flow from the Village of Lansdowne to the pumping station is estimated at 15.75 L/s. The proposed initial development will increase peak flow to the pump station by 7.87L/s, for a total Estimate Peak Flow of 23.62 L/s.

The existing sanitary system including the pumping station, sewage lagoons, forcemain and gravity sewers have been assessed at the critical locations. No downstream sanitary upgrades are necessary for the initial phase of development.

Full Buildout

The Full Buildout sanitary sewerage area of 41.22 hectares is estimated to discharge an average daily flow of 368 m³/day with an additional peak flow of 21.95L/s to the sanitary sewer system.

Existing sanitary flow from the Village of Lansdowne to the pumping station is estimated at 15.75 L/s. The proposed Full Buildout will increase peak flow to the pump station by 21.95 L/s, for a total Estimate Peak Flow of 38.70 L/s. Proposed peak flows exceed the design capacity of the pumping station, as the initial phase of development proceeds the pumping station should be assessed as to whether larger pumps are required to support the development.

The sanitary system including the pumping station, sewage lagoons, forcemain and gravity sewers have been assessed at the critical locations. The pump station may require pump upgrades and the sewage lagoon facility require upgrading to expand the rated capacity to accommodate an increase in daily flow of a minimum of 245 m³/day.

The industrial and commercial sanitary demands contained herein are conservative estimates of the future land use of the blocks. As future industrial and commercial blocks are developed individual assessments of the sites can be determined.

No forcemain or gravity sewer upgrades are required for the proposed development.

It is proposed that all areas will drain by gravity sewer. All sanitary sewers are proposed to extend along the centreline of the proposed roads.

4. Conclusions

Preliminary calculations demonstrate that the existing water infrastructure is capable of supplying adequate water flow and pressure to the proposed development.

Water connections are proposed at Prince Street and Railway Street.

Preliminary calculations find that existing downstream sanitary sewers and proposed sanitary sewers are capable of and will effectively service the proposed development.

The existing pumping station may require pump upgrades and the sewage lagoons require upgrading to facilitate the full buildout of the proposed development. These upgrades are proposed to be completed by the Township.

Sanitary sewers and the water network shall be designed in accordance with Ministry of the Environment, Conservation and Parks Guidelines.

The proposed development sanitary sewer is to discharge to the sanitary sewer on Prince Street and Railway Street via gravity sewers and eventually to the Railway Street Pumping Station.

Individual water and sanitary sewer sizing and water for fire protection for the industrial blocks shall be confirmed during the site plan control process.

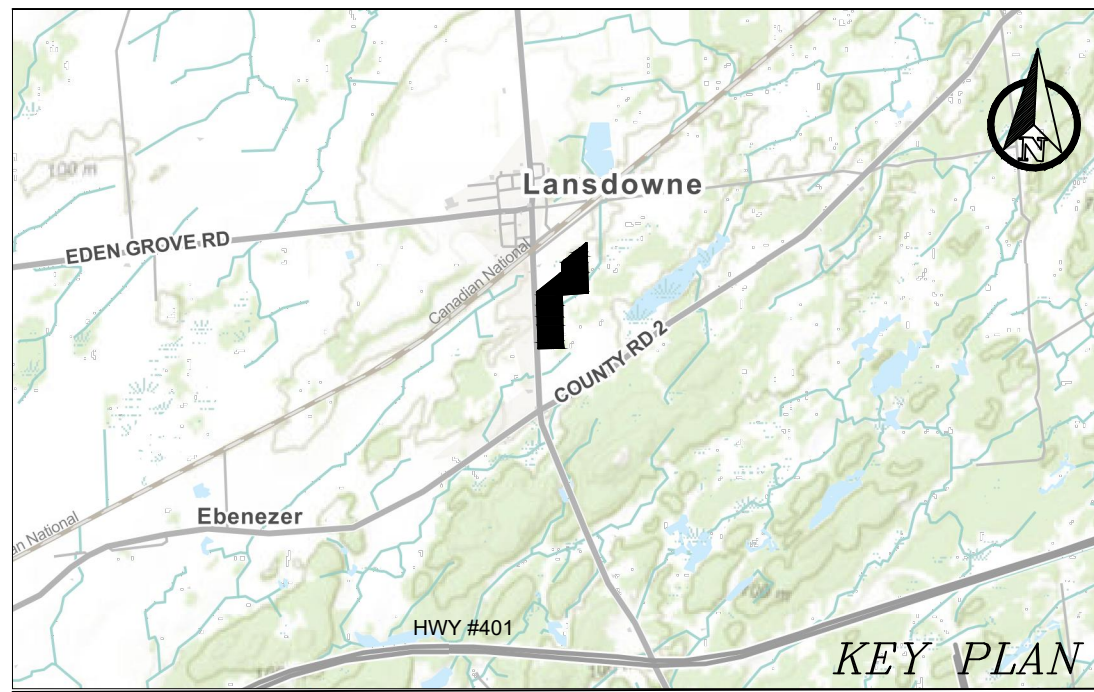
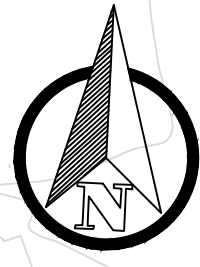
Approval by the Township for the proposed watermain network is required. An application for watermain additions, modifications, replacements and extensions for the watermain system will be required. Approval by the Township for

the proposed sanitary sewer network is required. An Environmental Compliance Approval (ECA) from the Ministry of the Environment for the sanitary sewer system is required.

Appendix A

- Draft Plan East Parcel
- Draft Plan West Parcel

DRAFT PLAN of SUBDIVISION
 ALL of LOTS 56 to 65, 68 to 87, 90 to 109, 112 to 131, 134 to 143, PART of BLOCKS C and D, PART of LOTS 45 to 55, 66, 67, 88, 89, 110, 111, 132, and 133. PART of UNNAMED STREET, CALUMET STREET, ONTARIO STREET, DARLING STREET, LAPPAN STREET AND JOHN STREET REGISTERED PLAN 194
 Geographic Township of Lansdowne
 TOWNSHIP of LEEDS and the THOUSAND ISLANDS
 COUNTY of LEEDS



ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51.17(A-L) OF THE PLANNING ACT

- a: Shown On Draft Plan
- b: Shown On Draft Plan
- c: All Lands Owned, or In Which the Applicants Have An Interest Are Shown On the Key Plan.
- d: Residential & Commercial
- e: Shown On Draft Plan
- f: Shown On Draft Plan
- g: Shown On Draft Plan
- h: Municipal Water Supply
- i: Napanee Clay
- j: Shown On Draft Plan
- k: Road Maintenance, Garbage Collection, Phone, Cable, Gas, Sanitary and Hydro
- l: Shown On Draft Plan

LEGEND

- LANDS TO BE SUBDIVIDED
- - - FUTURE EASEMENT

OWNER'S CERTIFICATE

I, SHANE KELLY, HEREBY AUTHORIZE FOREFRONT TO PREPARE AND SUBMIT THIS PLAN FOR REVIEW AND APPROVAL.

SHANE KELLY, PRESIDENT DATE
 10194549 CANADA LTD.

I HAVE THE AUTHORITY TO BIND THE CORPORATION

SURVEYOR'S CERTIFICATE:

I CERTIFY THAT:
 1. THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AND THE RELATIONSHIP TO THE ADJACENT LANDS ARE CORRECTLY SHOWN.

HOPKINS CHITTY LAND SURVEYORS INC.

PHIL W. CHITTY - O.L.S. DATE

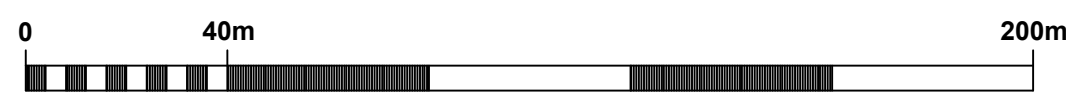
SITE DATA

LAND USE	LOTS & BLOCKS	AREA ±	UNITS	DENSITY
RESIDENTIAL	LOTS 1-145	13.89 ha	145	10.44 u/ha.
MULTI UNIT RESIDENTIAL	BLOCK 148	0.65 ha	00	00.00 u/ha.
	BLOCK 149	0.65 ha	00	00.00 u/ha.
SUB-TOTAL RESIDENTIAL		15.19 ha	00	00.00 u/ha.
COMMERCIAL	BLOCK 146	0.42 ha		
	BLOCK 147	1.51 ha		
STREETS/RESERVES	MUNICIPAL RIGHT OF WAY BLOCKS 152/153	4.21 ha		
PARKLAND	BLOCK 154	1.39 ha		
EASEMENT	BLOCKS 150/151	0.07ha		
TOTAL		22.79± ha	145	6.36 u/ha.

PARKLAND DEDICATION

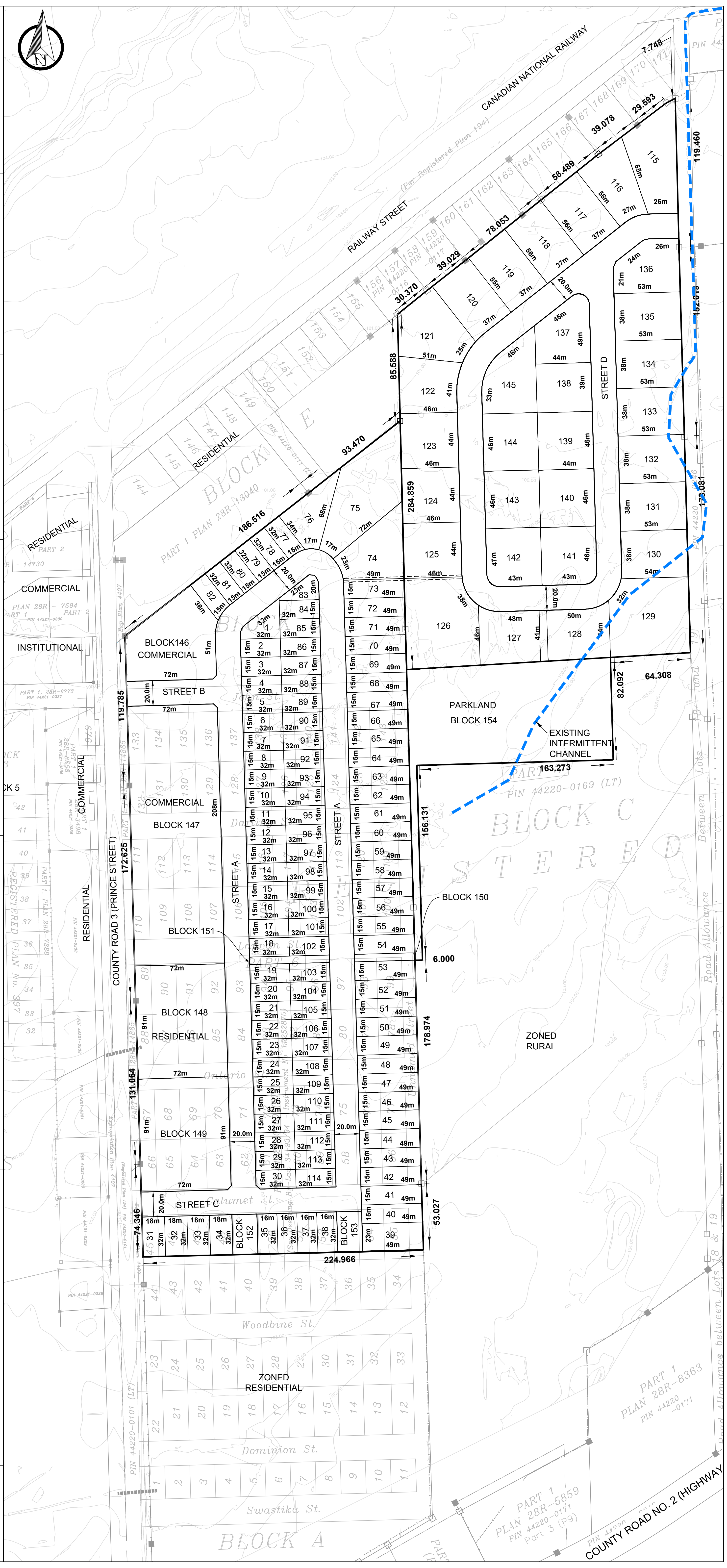
LAND USE	AREA ±	REQUIRED	PROVIDED
RESIDENTIAL	15.19 ha	(5%) 0.76ha	
INDUSTRIAL/COMMERCIAL EAST/WEST	17.18 ha	(2%) 0.34ha	
PUBLIC PARK	1.39 ha	1.10 ha	1.39 ha

SCALE = 1:1500



METRIC

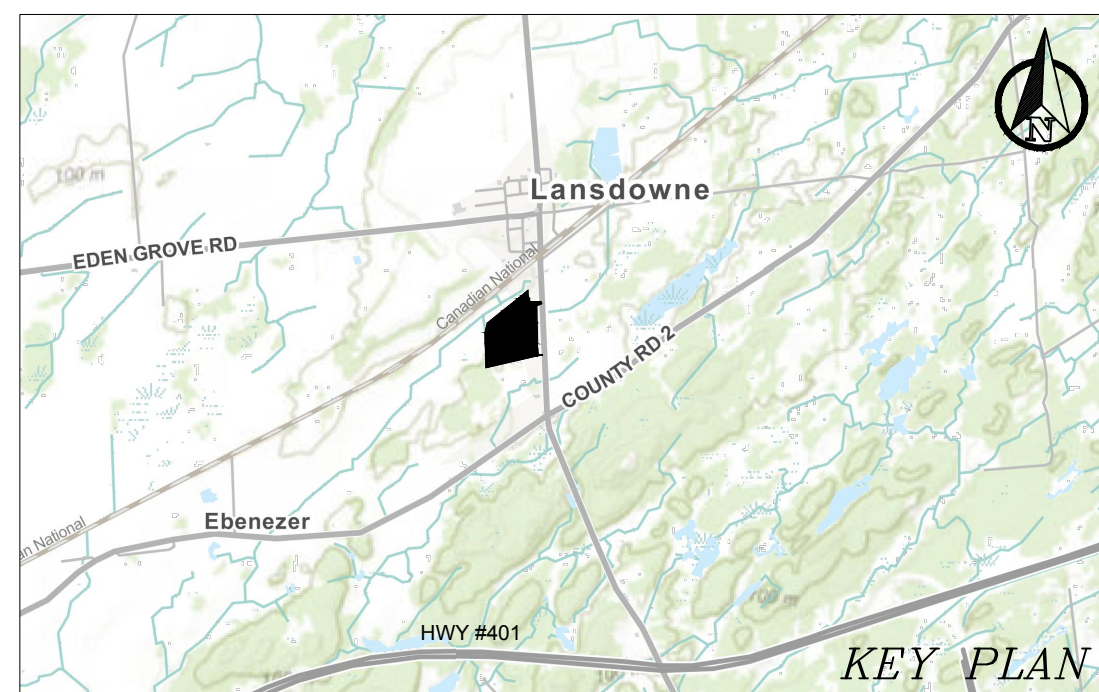
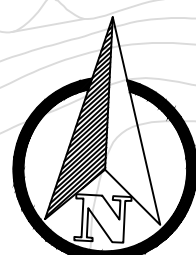
DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048



1329 Gardiners Road, Suite 210
 Kingston, ON, Canada K7P 0L8
 613.634.9009 tel.
 1.888.884.9392 fax.

Date Issued:

DRAFT PLAN of SUBDIVISION
 PART of BLOCKS Q and S
 REGISTERED PLAN No. 194
 ALL of LOTS 1 to 42, ALL of BLOCKS 43,
 45, 46 and 47 and ALL of MACDONALD
 DRIVE, BOWEN AVENUE, SLITER STREET and
 ARMSTRONG AVENUE
 REGISTERED PLAN No. 397
 Geographic Township of Lansdowne
 TOWNSHIP of LEEDS and the THOUSAND
 ISLANDS
 COUNTY of LEEDS



ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51.17(A-L) OF THE PLANNING ACT

- a: Shown On Draft Plan
- b: Shown On Draft Plan
- c: All Lands Owned, or In Which the Applicants Have An Interest Are Shown On the Key Plan.
- d: Residential & Commercial
- e: Shown On Draft Plan
- f: Shown On Draft Plan
- g: Shown On Draft Plan
- h: Municipal Water Supply
- i: Vapour Clay
- j: Shown On Draft Plan
- k: Road Maintenance, Carbage Collection, Phone, Cable, Gas, Sanitary and Hydro
- l: Shown On Draft Plan

LEGEND

- LANDS TO BE SUBDIVIDED
- - - FUTURE EASEMENT

OWNER'S CERTIFICATE

I, SHANE KELLY, HEREBY AUTHORIZE FOREFRONT TO PREPARE AND SUBMIT THIS PLAN FOR REVIEW AND APPROVAL.

SHANE KELLY, PRESIDENT DATE
 10725994 CANADA LTD.
 I HAVE THE AUTHORITY TO BIND THE CORPORATION

OWNER'S CERTIFICATE

I, HEREBY AUTHORIZE FOREFRONT TO PREPARE AND SUBMIT THIS PLAN FOR REVIEW AND APPROVAL.

DATE
 REPRESENTATIVE FOR THE TOWNSHIP OF LEEDS AND THOUSAND ISLANDS
 I HAVE THE AUTHORITY TO BIND THE CORPORATION

SURVEYOR'S CERTIFICATE:

I CERTIFY THAT:
 1. THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AND THE RELATIONSHIP TO THE ADJACENT LANDS ARE CORRECTLY SHOWN.

HOPKINS CHITTY LAND SURVEYORS INC.

PHIL W. CHITTY - O.L.S. DATE

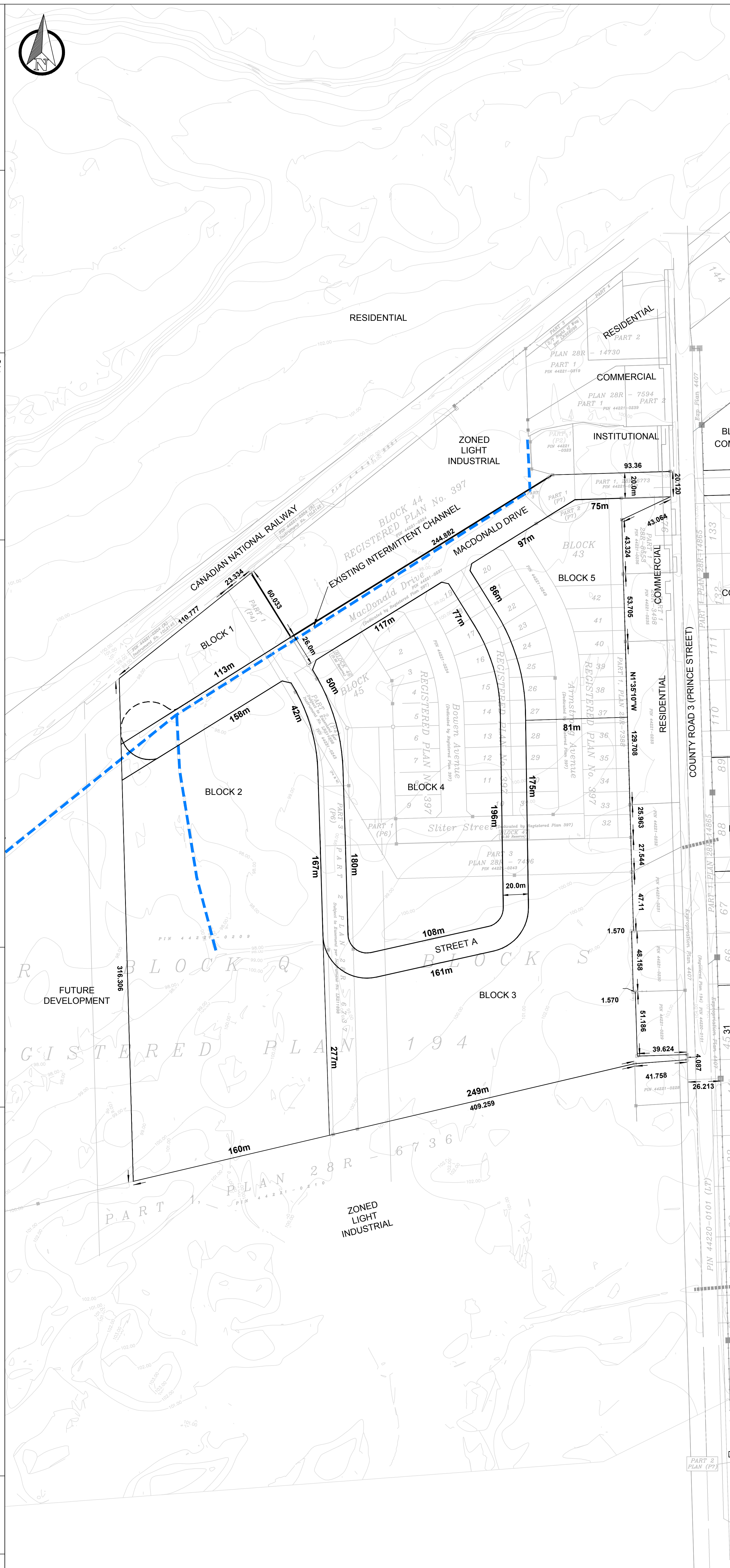
SITE DATA			
LAND USE	LOTS & BLOCKS	AREA ±	UNITS DENSITY
INDUSTRIAL/COMMERCIAL	BLOCK 1	0.69 ha	
	BLOCK 2	5.35 ha	
	BLOCK 3	4.30 ha	
	BLOCK 4	3.30 ha	
	BLOCK 5	1.61 ha	
STREETS/RESERVES	MUNICIPAL RIGHT OF WAY	2.65 ha	
TOTAL		17.90± ha	

SCALE = 1:1500



METRIC

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



Forefront Engineering Inc
 1329 Gardiners Road, Suite 210
 Kingston, ON, Canada K7P 0L8
 613.634.9009 tel.
 1.888.884.5392 fax.

Date issued:

Appendix B

- Ontario Clean Water Agency Performance Assessment Report
- Figure 2-Proposed Water Infrastructure
- Lansdowne Standpipe As-Built
- Hydrant Flow – Railway Street
- Existing and Proposed Demands
- EPA NET- Modeling Results
 - Water Distribution Schematic
 - Existing Maximum Day Plus Fire Flow – Water Model Results
 - Proposed Maximum Day Plus Fire Flow – Water Model Results
 - Existing Peak Hour Flow – Water Model Results
 - Proposed Peak Hour Flow – Water Model Results

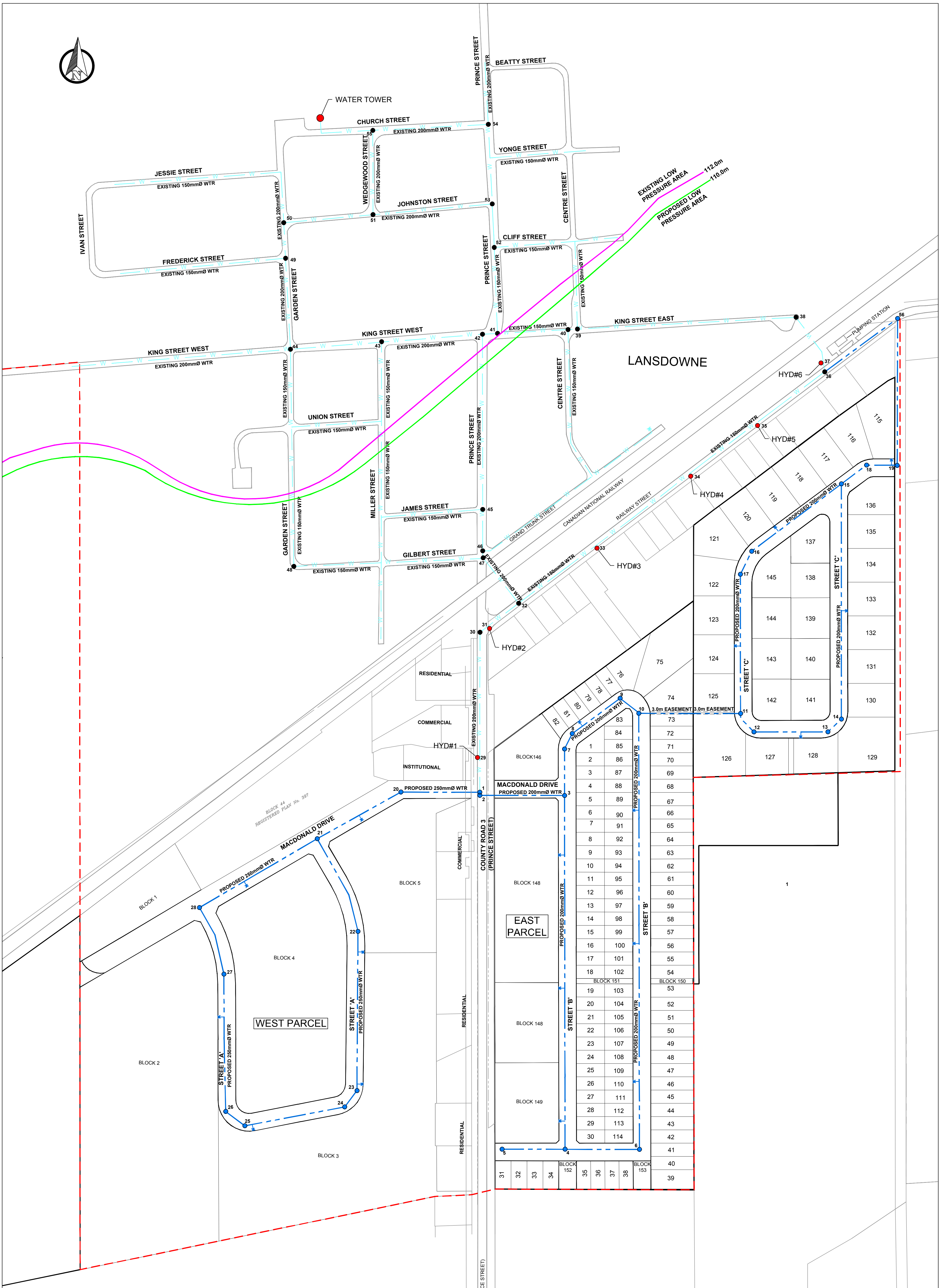
ONTARIO CLEAN WATER AGENCY PERFORMANCE ASSESSMENT REPORT

MUNICIPALITY: **TOWNSHIP OF LEEDS & THE THOUSAND ISLANDS**
 PROJECT: **LANSDOWNE WELL SUPPLY**
 ORG. NUM.: **5973**
 WORKS NUM.: **210001022**
 DESCRIPTION: **TWO DEEP WELLS EQUIPPED WITH SUBMERSIBLE PUMPS CAPABLE OF DELIVERING 8.3 L/SEC,
 CARTRIDGE FILTRATION, ULTRAVIOLET DISINFECTION, CHLORINATION AND AN ELEVATED STORAGE TANK**

YEAR: **2018**
 WATER SOURCE: **GROUNDWATER**
 DESIGN CAP.: **720 m³/d**

MONTH	SYSTEM FLOWS (TREATED)			TREATED		DISTRIBUTION		FILTER 1	FILTER 2	FILTER 3	BACTI (INDICATE NO. OF SAMPLES)				RAW WATER	
	TOTAL FLOW	AVG DAY FLOW	MAX DAY FLOW	MIN FREE CL ₂ RESID.	MAX FREE CL ₂ RESID.	MIN FREE CL ₂ RESID.	MAX FREE CL ₂ RESID.	MAX TURBIDITY	MAX TURBIDITY	MAX TURBIDITY	<i>E. coli</i> , Total Coliform, HPC				<i>E. coli</i>	
	(m ³)	(m ³)	(m ³)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(NTU)	(NTU)	(NTU)	Safe		Adverse		ABSENT	PRESENT
												TREAT	DIST	TREAT	DIST	
JAN	6,533	211	361	0.89	2.81	0.96	1.72	0.20	0.24	0.46	15	25	0	0	10	0
FEB	5,132	183	291	0.87	4.42	0.99	1.90	0.36	0.20	0.21	12	20	0	0	8	0
MAR	4,951	160	223	0.87	4.28	0.97	1.66	0.19	0.31	0.71	12	20	0	0	8	0
APR	4,957	165	249	0.95	2.91	0.94	1.55	0.18	0.23	0.19	15	25	0	0	10	0
MAY	5,586	180	476	1.30	2.83	0.90	1.46	0.15	0.21	0.19	12	20	0	0	8	0
JUN	5,914	197	319	0.91	3.67	0.66	1.71	0.19	0.44	0.18	12	20	0	0	8	0
JUL	7,263	234	410	0.87	4.41	0.47	1.90	0.30	0.31	0.21	15	25	0	0	10	0
AUG	5,926	191	347	0.90	2.69	0.51	1.62	0.32	0.46	0.39	12	20	0	0	8	0
SEP	5,278	176	239	0.87	2.41	0.88	1.63	0.35	0.33	0.23	12	20	0	0	8	0
OCT	5,099	164	321	0.81	4.20	0.80	1.88	0.17	0.42	0.25	15	25	0	0	10	0
NOV	4,558	152	256	1.26	3.00	0.93	1.74	0.22	0.23	0.25	12	20	0	0	8	0
DEC	4,923	159	269	0.89	3.36	0.72	1.59	0.16	0.42	0.30	12	20	0	0	8	0
TOTAL	66,120										156	260	0	0	104	0
AVG		181														
MIN				0.81		0.47										
MAX			476		4.42		1.90	0.36	0.46	0.71						
CRITERIA			720	CT 0.70		0.05	4.00	<1	<1	<1						

COMMENTS: **MAX. DAY FLOWS INCLUDE DAYS HYDRANTS WERE FLUSHED.**



No.	Revision/Issue	Date



LEGEND:

- · — · — PROPOSED WATERMAIN
- PROPOSED NODE
- - - URBAN BOUNDARY
- HYDRANT NODE
- · — · — EXISTING WATERMAIN
- EXISTING NODE



1329 Gardiners Road, Suite 210
Kingston, ON, Canada K7P 0L8
613.634.9009 tel.
1.888.884.9392 fax.

Client
10194549 CANADA
c/o SHANE KELLY

Project
LANDSDOWNE DEVELOPMENT

Drawing
PROPOSED WATER INFRASTRUCTURE

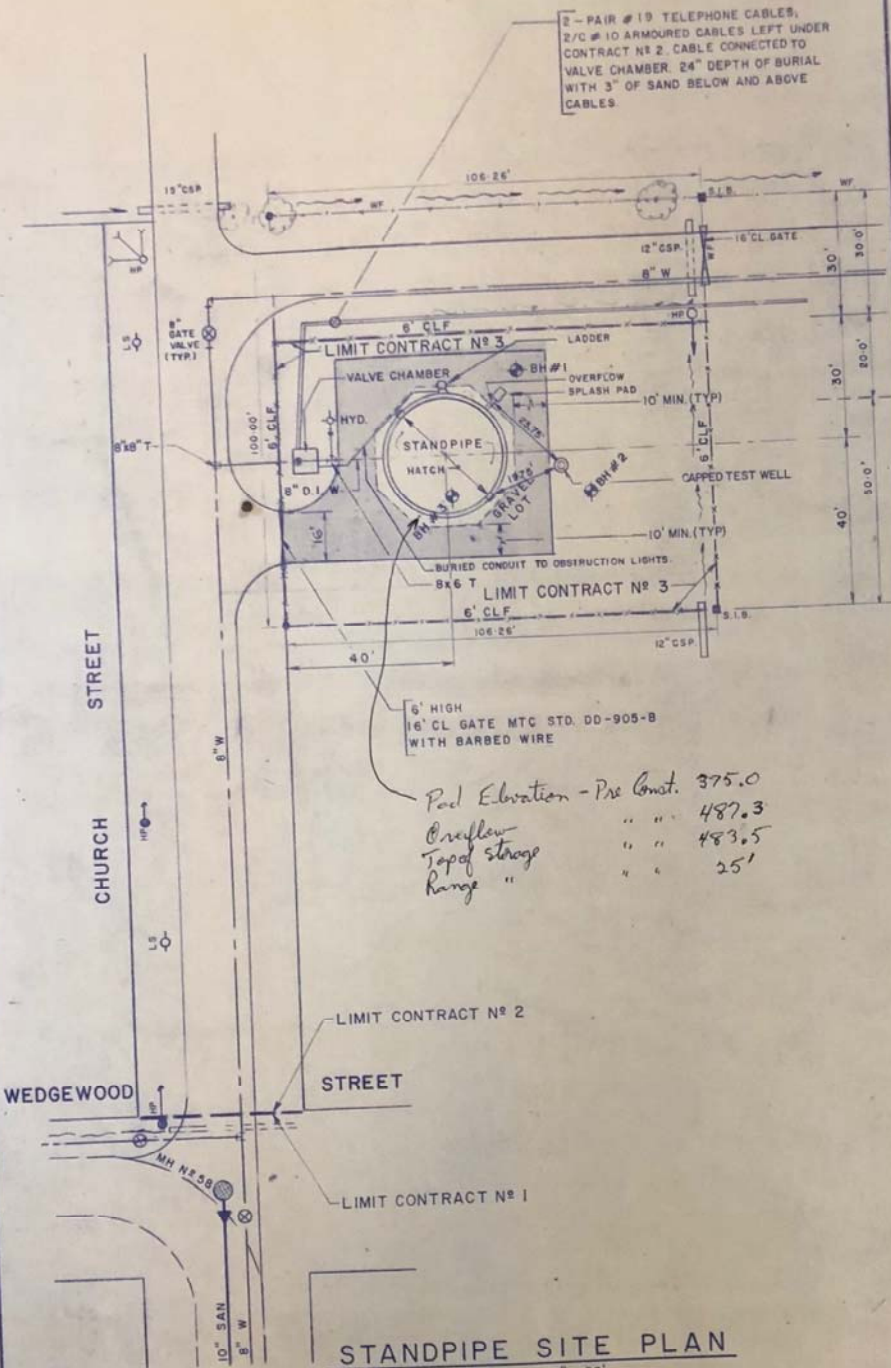
Drawn by: BCAT	Checked by: KMN	Project No.
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Designed by: KMN	Approved by: KMN	Drawing No.
---------------------	---------------------	-------------

Date: MARCH, 2020	FIG.2
Scale: 1:2000 (ANSI D)	

NOTE

- 1 AREA WITHIN STANDPIPE SITE IS SODDED SOG IS PLACED ON 2" (MIN) OF TOPSOIL
- 2 THE GRAVEL LOT AROUND THE STANDPIPE IS CONSTRUCTED OF 12" G.B.C. "B" AND 4" G.B.C. "A"
- 3 CHAIN LINK SECURITY FENCE IS AS M.T.C. STANDARD DD-905-A. BARBED WIRE IS INSTALLED AS PER M.T.C. SPECIAL STANDARD NO 50-9-63.



Pool Elevation - Pre Const. 375.0
 Overflow Top of Storage " " 487.3
 Range " " 483.5
 " " 25'

AS BUILT PLANS

B.M. No 131 ELEVATION 375.65
 BOLT SET IN SOUTH WALL 18 INCHES EAST OF WEST CORNER AND 12 INCHES ABOVE WATER TABLE ON FIRE HALL. (GEODETIC DATUM)

REVISIONS		
NO	DATE	DETAILS
1	6/12/76	AS-BUILT INFORMATION

MINISTRY OF THE ENVIRONMENT
 TOWNSHIP OF THE FRONT OF LEEDS AND LANSDOWNE
 WATER AND SEWAGE WORKS PROGRAMME
 PROJECT No. 5-0107-69
 WATER STORAGE STANDPIPE

SITE PLAN and VALVE CHAMBER DETAILS



DESIGNED BY
I. K. HODGKIN

ISSUED

JUN 6 1977

MAKSYMEC & ASSOCIATES LTD.
CONSULTING PROFESSIONAL ENGINEERS

MAKSYMEC & ASSOCIATES LTD.
 CONSULTING PROFESSIONAL ENGINEERS

DRAWN BY: WESOLOWSKI	DATE: DECEMBER 1976
CHECKED BY: D. K. K.	SHEET: OF
SCALE: AS SHOWN	PROJECT No: 6950 - 30

BOREHOLE No 1	BOREHOLE No 2	BOREHOLE No 3
0 - 5" TOPSOIL - CLAYEY 5" - 3.5' SILTY CLAY - SOME SMALL STONES, TRACE - SAND - STIFF, LIGHT GREYISH BROWN. 3.5' - 8.75' SILTY SAND TILL - STONEY, SOME CLAY TO 7' DEPTH. - WET AT 7.3'. - DENSE TO VERY DENSE. - BROWN 8.75' NO FURTHER PROGRESS (PRESUMED BEDROCK)	0 - 5" TOPSOIL - CLAYEY 5" - 5.5' SILTY CLAY - STONEY, TRACES OF SAND. - STIFF TO VERY STIFF. - LIGHT GREYISH BROWN. 5.5' - 9.5' SILTY SAND TILL - STONEY, TRACE OF SOME CLAY. - WET AT 7'. - DENSE TO VERY DENSE. - LIGHT GREYISH BROWN. 9.5' NO FURTHER PROGRESS (PRESUMED BEDROCK) WATER LEVEL AT 7' JULY 4, 1974.	0 - 7" TOPSOIL - CLAYEY 7" - 4.25' SILTY CLAY - STONEY, TRACES OF SAND. - STIFF LIGHT GREYISH BROWN. 4.25' - 9.25' SILTY SAND TILL - STONEY, WET BELOW 6.75' - DENSE TO VERY DENSE. - LIGHT BROWN. 9.25' NO FURTHER PROGRESS (PRESUMED BEDROCK) WATER LEVEL AT 6.8' JULY 4, 1974 NOTE: FOR FURTHER INFORMATION SEE SOILS REPORT BY "SITE INVESTIGATION SERVICES LIMITED" JOB # 1003.

SITE NAME lansdowne Distribution DATE June 4/2014

LOCATION Railway St.

TEST DATA

TIME OF TEST _____

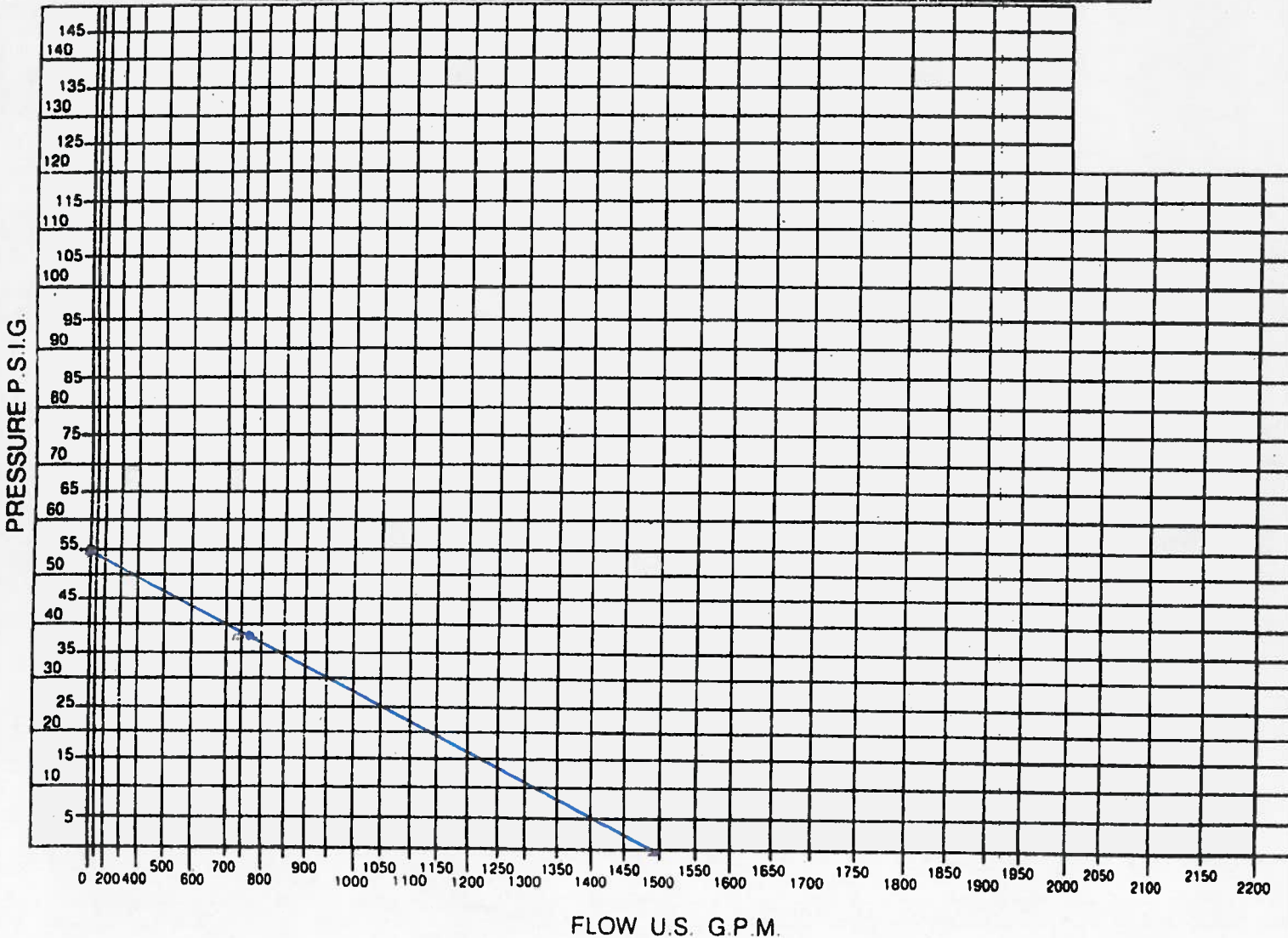
LOCATION OF TEST (FLOW) hydrant # 6

(RESIDUAL) hydrant # 3

MAIN SIZE 6"

STATIC PRESSURE: 55psi

	NUMBER OF OUTLETS & ORIFICE SIZE	PITOT PRESSURE	FLOW (U.S.G.P.M.)	RESIDUAL PRESSURE
#1	2.5"	21	767	38psi
#2				
#3				
#4				



COMMENTS _____

Proposed Single Family Res.
Existing Single Family Res.
capita per dwelling unit
-Single Family detached
-Low Rise Residential

350 L/cap. D
270 L/cap. D

2.5 pop/unit
1.5 pop/unit
525 (1.5 x 350 LPD)

-Assembly Hall / Church
-School
-Stadium
-Restaurant
-Commercial / Industrial Flow
-Existing Commercial / Industrial Flow

8 L/Seat-day
70 L/Student-day
20 L/Seat-day
125 L/Seat-day
15,000 L/ha-day
10,540 L/ha-day

Peak Hour Flow Factor
Maximum Day Flow Factor

4.25
2.75

Single Family Homes	Low Rise Residential	Assembly Hall / Church	School	Stadium	Restaurant	Commercial / Industrial Units	Street	Block	Nodes	No.	Unit	Rate	Unit	L/day	L/s	Peak Flow Demands	
																Peak Hour L/s	Maximum Day L/s
West Proposed Commercial and Industrial																	
						1		Block 44	20	1.91	Seat	15,000	L/ha-day	28650	0.33	1.41	0.91
				300				Block 5	21	300	Seat	20	L/Seat-day	6000	0.07	0.30	0.19
						1		Block 3	25	4.30	ha	15,000	L/ha-day	64440	0.75	3.17	2.05
				600				Block 2	27	600	Seat	20	L/Seat-day	12000	0.14	0.59	0.38
					115			Block 2	27	115	Seat	125	L/Seat-day	14375	0.17	0.71	0.46
						1		Block 4	28	3.29	ha	15,000	L/ha-day	49350	0.57	2.43	1.57
East Proposed Residential																	
29	60							Block 149, 150	3	162.50	L/person/day	350	people	56875	0.66	2.80	1.81
8									4	20.00	L/person/day	350	people	7000	0.08	0.34	0.22
27									6	67.50	L/person/day	350	people	23625	0.27	1.16	0.75
1									7	2.50	L/person/day	350	people	875	0.01	0.04	0.03
6									8	15.00	L/person/day	350	people	5250	0.06	0.26	0.17
4									9	10.00	L/person/day	350	people	3500	0.04	0.17	0.11
39									10	97.50	L/person/day	350	people	34125	0.39	1.68	1.09
9									11	22.50	L/person/day	350	people	7875	0.09	0.39	0.25
2									12	5.00	L/person/day	350	people	1750	0.02	0.09	0.06
1									13	2.50	L/person/day	350	people	875	0.01	0.04	0.03
27									14	67.50	L/person/day	350	people	23625	0.27	1.16	0.75
8									15	20.00	L/person/day	350	people	7000	0.08	0.34	0.22
3									16	7.50	L/person/day	350	people	2625	0.03	0.13	0.08
1									17	2.50	L/person/day	350	people	875	0.01	0.04	0.03
1									18	2.50	L/person/day	350	people	875	0.01	0.04	0.03
East Proposed Commercial and Industrial																	
						2		Block 147, 148	3	1.93	ha	15,000	L/ha-day	28950	0.34	1.42	0.92
Existing Commercial, Industrial, and Institutional																	
						2	Prince Street		2	0.41	ha	10,540	L/ha-day	4321	0.05	0.21	0.14
						3	Prince Street		30	1.90	ha	10,540	L/ha-day	20026	0.23	0.99	0.64
						1	Railway Street		32	1.13	ha	10,540	L/ha-day	11910	0.14	0.59	0.38
		40					Prince Street		42	40	Seat	8	L/Seat-day	320	0.00	0.02	0.01
						8	Prince Street		42	0.96	ha	10,540	L/ha-day	10118	0.12	0.50	0.32
			200				King Street West		44	200	Student	70	L/Seat-day	14000	0.16	0.69	0.45
						2	King Street West		44	0.61	ha	10,540	L/ha-day	6429	0.07	0.32	0.20
		100					Jessie Street		50	100	Seat	8	L/Seat-day	800	0.01	0.04	0.03
		40					Prince Street		52	40	Seat	8	L/Seat-day	320	0.00	0.02	0.01
						2	Prince Street		52	0.16	ha	10,540	L/ha-day	1686	0.02	0.08	0.05
						1	Church Street		55	0.12	ha	10,540	L/ha-day	1265	0.01	0.06	0.04
Existing Residential																	
3							Prince Street		30	7.50	L/person/day	270	people	2025	0.02	0.10	0.06
1							Railway Street		31	2.50	L/person/day	270	people	675	0.01	0.03	0.02
4							Railway Street		32	10.00	L/person/day	270	people	2700	0.03	0.13	0.09
2							Railway Street		33	5.00	L/person/day	270	people	1350	0.02	0.07	0.04
2							Railway Street		34	5.00	L/person/day	270	people	1350	0.02	0.07	0.04
4							Railway Street		35	10.00	L/person/day	270	people	2700	0.03	0.13	0.09
2							Railway Street		36	5.00	L/person/day	270	people	1350	0.02	0.07	0.04

16						King Street East	39	40.00	L/person/day	270	people	10800	0.13	0.53	0.34	
12						King Street East	40	30.00	L/person/day	270	people	8100	0.09	0.40	0.26	
5						King Street East	41	12.50	L/person/day	270	people	3375	0.04	0.17	0.11	
16						King Street East	42	40.00	L/person/day	270	people	10800	0.13	0.53	0.34	
29						King Street East	43	72.50	L/person/day	270	people	19575	0.23	0.96	0.62	
37						King Street East	44	92.50	L/person/day	270	people	24975	0.29	1.23	0.79	
9						Prince Street	45	22.50	L/person/day	270	people	6075	0.07	0.30	0.19	
3						Prince Street	46	7.50	L/person/day	270	people	2025	0.02	0.10	0.06	
5						Prince Street	47	12.50	L/person/day	270	people	3375	0.04	0.17	0.11	
3						Gilbert Street	48	7.50	L/person/day	270	people	2025	0.02	0.10	0.06	
21						Garden Street	49	52.50	L/person/day	270	people	14175	0.16	0.70	0.45	
11						Garden Street	50	27.50	L/person/day	270	people	7425	0.09	0.37	0.24	
10						Johnstone Street	51	25.00	L/person/day	270	people	6750	0.08	0.33	0.21	
12						Prince Street	52	30.00	L/person/day	270	people	8100	0.09	0.40	0.26	
2	22					Prince Street	53	38.00	L/person/day	270	people	10260	0.12	0.50	0.33	
15						Prince Street	54	37.50	L/person/day	270	people	10125	0.12	0.50	0.32	
4						Church Street	55	10.00	L/person/day	270	people	2700	0.03	0.13	0.09	
												Total Existing	234006.60	2.71	11.51	7.45
												Total Proposed	351865.00	4.40	18.72	12.11
												Total Proposed and Existing	585871.60	7.11	30.23	19.56

TOTAL AVERAGE DAY FLOW
PEAK DAY FACTOR - 2.75
MAXIMUM DAY FLOW

7.1 L/s

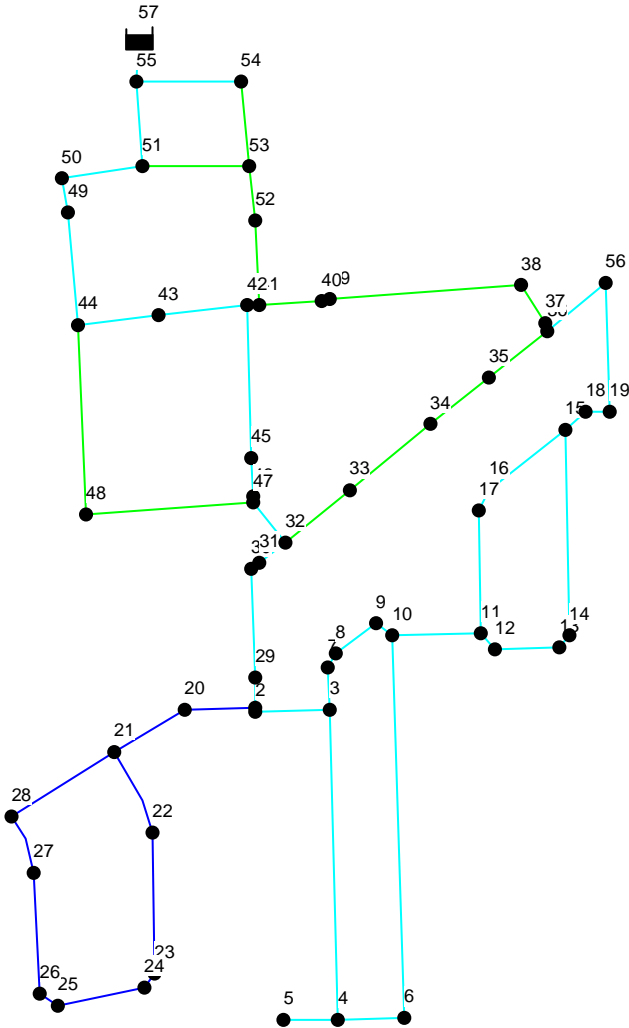
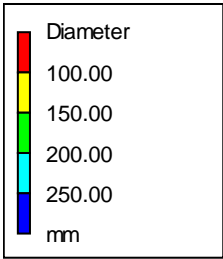
1173.6 L/min

19.56 L/s

PEAK HOUR FACTOR - 4.25
PEAK HOUR FLOW

1813.7 L/min

30.23 L/s



Lansdowne Water Distribution Network
Scenario: Existing Network Maximum Day Demand

	MD Demand	Head	Pressure	Pressure	Pressure	Fire Flow	Fire Flow
Node ID	LPS	m	m	kPa	psi	lps	lpm
Junc 1	0	139.69	40.36	396	57	90	5400
Junc 2	0.14	139.69	40.36	396	57	90	5400
Junc 29	0	139.69	40.66	399	58	90	5400
Junc 30	0.7	139.69	39.17	384	56	110	6600
Junc 31	0.02	139.69	39	383	55	110	6600
Junc 32	0.47	139.69	39.66	389	56	110	6600
Junc 33	0.04	139.69	40.16	394	57	90	5400
Junc 34	0.04	139.69	40.32	396	57	80	4800
Junc 35	0.09	139.69	40.81	400	58	80	4800
Junc 36	0.04	139.69	40.69	399	58	80	4800
Junc 37	0	139.69	40.65	399	58	80	4800
Junc 38	0	139.69	39.91	392	57	80	4800
Junc 39	0.34	139.69	35.64	350	51	90	5400
Junc 40	0.26	139.69	35.11	344	50	90	5400
Junc 41	0.11	139.69	29.14	286	41	110	6600
Junc 42	0.47	139.69	28.64	281	41	110	6600
Junc 43	0.62	139.69	27.18	267	39	110	6600
Junc 44	1.45	139.7	26.94	264	38	110	6600
Junc 45	0.19	139.69	37.27	366	53	120	7200
Junc 46	0.06	139.69	38.16	374	54	120	7200
Junc 47	0.11	139.69	38.31	376	54	120	7200
Junc 48	0.06	139.69	35.92	352	51	90	5400
Junc 49	0.45	139.71	26.45	259	38	120	7200
Junc 50	0.26	139.71	26.46	260	38	130	7800
Junc 51	0.21	139.73	26.47	260	38	190	11400
Junc 52	0.32	139.71	28.14	276	40	120	7200
Junc 53	0.33	139.72	27.72	272	39	150	9000
Junc 54	0.32	139.74	26.49	260	38	160	9600
Junc 55	0.13	139.75	26.5	260	38	1730	103800

Lansdowne Water Distribution Network
Scenario: Proposed Network Maximum Day Demand

	MD Demand	Head	Pressure	Pressure	Pressure	Fire Flow	Fire Flow
Node ID	LPS	m	m	kPa	psi	lps	lpm
Junc 1	0	139.05	39.72	390	56	90	5400
Junc 2	0.14	139.05	39.72	390	56	90	5400
Junc 3	2.73	139.04	39.54	388	56	90	5400
Junc 4	0.22	139.04	37.37	367	53	70	4200
Junc 5	0	139.04	37.02	363	53	70	4200
Junc 6	0.75	139.04	36.54	358	52	70	4200
Junc 7	0.03	139.04	40.3	395	57	80	4800
Junc 8	0.17	139.04	40.3	395	57	80	4800
Junc 9	0.11	139.04	40.02	393	57	80	4800
Junc 10	1.09	139.04	38.11	374	54	80	4800
Junc 11	0.25	139.05	39.55	388	56	80	4800
Junc 12	0.06	139.05	37.55	368	53	80	4800
Junc 13	0.03	139.05	39.35	386	56	80	4800
Junc 14	0.75	139.05	37.72	370	54	80	4800
Junc 15	0.22	139.07	41.5	407	59	80	4800
Junc 16	0.08	139.06	41.35	406	59	80	4800
Junc 17	0.03	139.06	41.12	403	58	80	4800
Junc 18	0.03	139.07	41.46	407	59	80	4800
Junc 19	0	139.08	41.4	406	59	90	5400
Junc 20	0.91	138.95	40.03	393	57	90	5400
Junc 21	0.19	139.03	40.52	398	58	80	4800
Junc 22	0	139.03	40.19	394	57	80	4800
Junc 23	0	139.03	39.68	389	56	80	4800
Junc 24	0	139.03	39.63	389	56	80	4800
Junc 25	2.05	139.03	39.28	385	56	80	4800
Junc 26	0	139.03	39.4	387	56	80	4800
Junc 27	0.84	139.03	40.19	394	57	80	4800
Junc 28	1.57	139.03	40.54	398	58	80	4800
Junc 29	0	139.07	40.04	393	57	90	5400
Junc 30	0.7	139.13	38.61	379	55	100	6000
Junc 31	0.02	139.14	38.45	377	55	100	6000
Junc 32	0.47	139.16	39.13	384	56	100	6000
Junc 33	0.04	139.15	39.62	389	56	90	5400
Junc 34	0.04	139.14	39.77	390	57	80	4800
Junc 35	0.09	139.13	40.25	395	57	80	4800
Junc 36	0.04	139.13	40.13	394	57	90	5400
Junc 37	0	139.13	40.09	393	57	90	5400
Junc 38	0	139.19	39.41	387	56	80	4800
Junc 39	0.34	139.29	35.24	346	50	90	5400
Junc 40	0.26	139.29	34.71	341	49	90	5400
Junc 41	0.11	139.34	28.79	282	41	100	6000
Junc 42	0.47	139.34	28.28	277	40	100	6000
Junc 43	0.62	139.36	26.85	263	38	100	6000
Junc 44	1.45	139.39	26.64	261	38	100	6000
Junc 45	0.19	139.24	36.83	361	52	100	6000
Junc 46	0.06	139.22	37.7	370	54	100	6000
Junc 47	0.11	139.22	37.84	371	54	100	6000
Junc 48	0.06	139.3	35.53	349	51	90	5400
Junc 49	0.45	139.48	26.23	257	37	110	6600
Junc 50	0.26	139.52	26.26	258	37	120	7200
Junc 51	0.21	139.62	26.36	259	37	180	10800
Junc 52	0.32	139.5	27.94	274	40	110	6600
Junc 53	0.33	139.59	27.59	271	39	140	8400
Junc 54	0.32	139.69	26.44	259	38	150	9000
Junc 55	0.13	139.75	26.49	260	38	1700	102000
Junc 56	0	139.11	41.12	403	58	90	5400

Lansdowne Water Distribution Network
Scenario: Existing Network Peak Demand

Node ID	PK Demand	Head	Pressure	Pressure	Pressure
	LPS	m	m	kPa	psi
Junc 1	0	139.4	40.07	393	57
Junc 2	0.61	139.4	40.07	393	57
Junc 29	0	139.4	40.37	396	57
Junc 30	4.22	139.4	38.88	381	55
Junc 31	0.03	139.41	38.72	380	55
Junc 32	0.72	139.45	39.42	387	56
Junc 33	0.07	139.45	39.92	392	57
Junc 34	0.07	139.46	40.09	393	57
Junc 35	0.13	139.46	40.58	398	58
Junc 36	0.07	139.46	40.46	397	58
Junc 37	0	139.47	40.42	397	57
Junc 38	0	139.47	39.69	389	56
Junc 39	0.53	139.49	35.44	348	50
Junc 40	0.4	139.49	34.91	342	50
Junc 41	0.17	139.5	28.96	284	41
Junc 42	1.04	139.5	28.44	279	40
Junc 43	0.96	139.51	26.99	265	38
Junc 44	2.23	139.52	26.77	263	38
Junc 45	0.3	139.47	37.06	364	53
Junc 46	0.1	139.47	37.94	372	54
Junc 47	0.17	139.46	38.09	374	54
Junc 48	0.1	139.49	35.72	350	51
Junc 49	0.7	139.57	26.32	258	37
Junc 50	0.4	139.59	26.34	258	37
Junc 51	0.33	139.66	26.41	259	38
Junc 52	0.5	139.59	28.02	275	40
Junc 53	0.65	139.64	27.64	271	39
Junc 54	0.5	139.71	26.45	259	38
Junc 55	0.2	139.75	26.49	260	38
Junc 56	0.2	139.75	26.49	260	38

Lansdowne Water Distribution Network
Scenario: Proposed Network Peak Demand

Node ID	PK Demand	Head	Pressure	Pressure	Pressure
	LPS	m	m	kPa	psi
Junc 1	0	136.01	36.68	360	52
Junc 2	0.61	136.01	36.68	360	52
Junc 3	5.65	136.01	36.51	358	52
Junc 4	0.34	136.01	34.34	337	49
Junc 5	0	136.01	33.99	333	48
Junc 6	1.16	136.01	33.52	329	48
Junc 7	0.04	136.02	37.28	366	53
Junc 8	0.26	136.02	37.29	366	53
Junc 9	0.17	136.04	37.03	363	53
Junc 10	1.68	136.05	35.12	345	50
Junc 11	0.39	136.14	36.65	360	52
Junc 12	0.09	136.15	34.65	340	49
Junc 13	0.04	136.16	36.46	358	52
Junc 14	1.16	136.17	34.84	342	50
Junc 15	0.34	136.25	38.69	380	55
Junc 16	0.13	136.2	38.5	378	55
Junc 17	0.04	136.19	38.26	375	54
Junc 18	0.04	136.29	38.68	379	55
Junc 19	0	136.32	38.66	379	55
Junc 20	1.41	135.96	37.04	363	53
Junc 21	0.3	135.9	37.4	367	53
Junc 22	0	135.9	37.06	364	53
Junc 23	0	135.88	36.54	358	52
Junc 24	0	135.88	36.49	358	52
Junc 25	6.34	135.87	36.13	354	51
Junc 26	0	135.87	36.25	356	52
Junc 27	1.3	135.87	37.04	363	53
Junc 28	4.86	135.88	37.39	367	53
Junc 29	0	136.08	37.05	363	53
Junc 30	4.22	136.33	35.81	351	51
Junc 31	0.03	136.46	35.77	351	51
Junc 32	0.72	136.96	36.93	362	53
Junc 33	0.07	136.88	37.35	366	53
Junc 34	0.07	136.78	37.41	367	53
Junc 35	0.13	136.71	37.84	371	54
Junc 36	0.07	136.65	37.65	369	54
Junc 37	0	136.67	37.64	369	54
Junc 38	0	137.02	37.25	365	53
Junc 39	0.53	137.6	33.56	329	48
Junc 40	0.4	137.63	33.06	324	47
Junc 41	0.17	137.86	27.32	268	39
Junc 42	1.04	137.86	26.8	263	38
Junc 43	0.96	138	25.48	250	36
Junc 44	2.23	138.14	25.39	249	36
Junc 45	0.3	137.38	34.97	343	50
Junc 46	0.1	137.27	35.75	351	51
Junc 47	0.17	137.25	35.87	352	51
Junc 48	0.1	137.66	33.89	332	48
Junc 49	0.7	138.55	25.3	248	36
Junc 50	0.4	138.72	25.47	250	36
Junc 51	0.33	139.16	25.9	254	37
Junc 52	0.5	138.63	27.07	266	39
Junc 53	0.65	139.04	27.04	265	38
Junc 54	0.5	139.49	26.24	257	37
Junc 55	0.2	139.74	26.48	260	38
Junc 56	0	136.53	38.55	378	55

Appendix C

- Ontario Clean Water Agency Performance Assessment Report - Wastewater
- Figure 3 – Proposed Sanitary Sewerage Areas
- Existing Sanitary Sewer Design Sheet
- Proposed Sanitary Sewer Design Sheet – Initial Phase
- Proposed Sanitary Sewer Design Sheet – Full Buildout

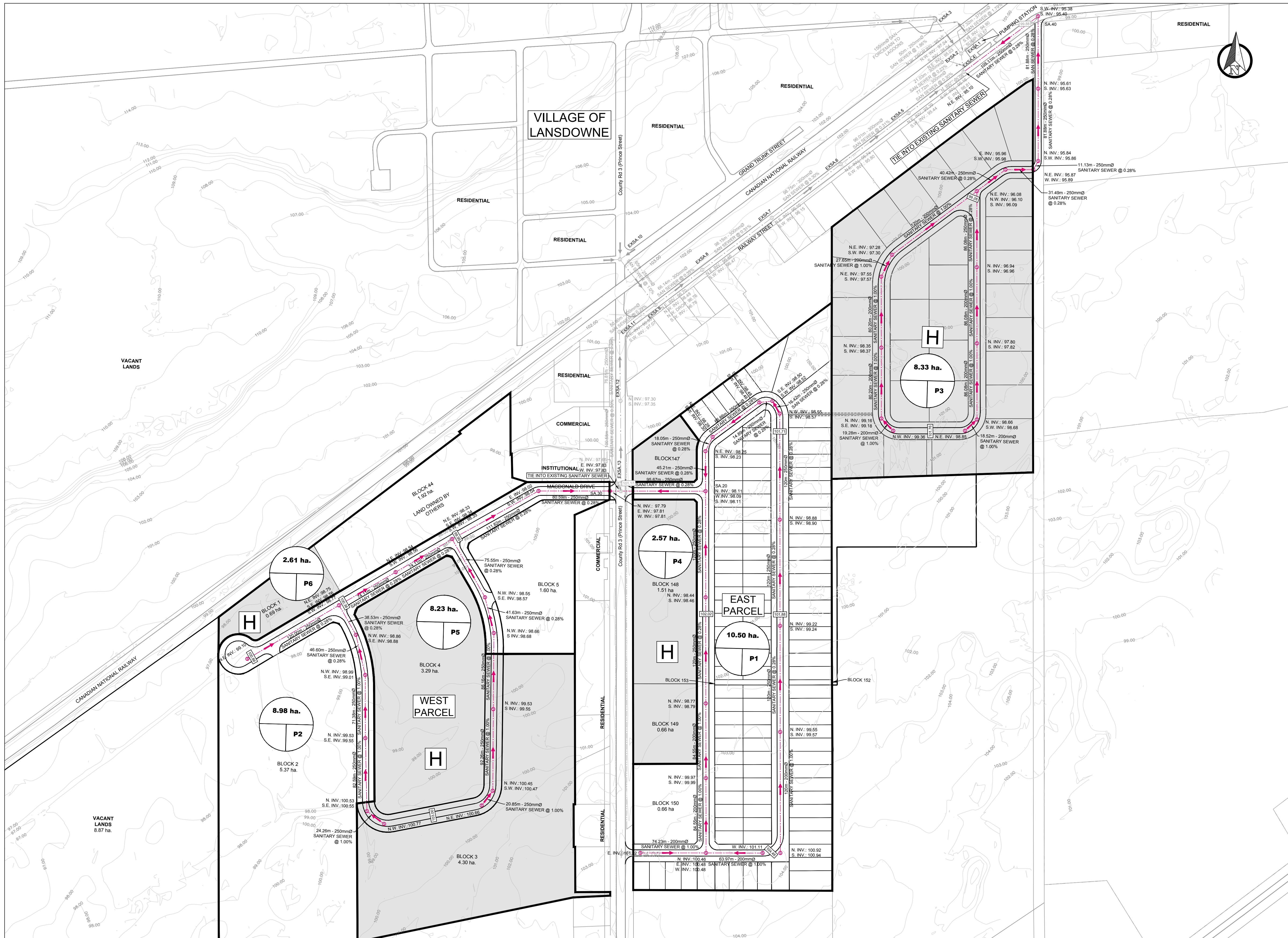
ONTARIO CLEAN WATER AGENCY PERFORMANCE ASSESSMENT REPORT

MUNICIPALITY: TOWNSHIP OF LEEDS & THE THOUSAND ISLANDS
 PROJECT: LANSDOWNE WASTEWATER LAGOON
 PROJECT NUM.: 5975
 WORKS NUM.: 110001934
 DESCRIPTION: A SINGLE SEWAGE PUMPING STATION EQUIPPED WITH STANDBY DIESEL POWER,
TWO FACULTATIVE LAGOON CELLS AND A SPRAY IRRIGATION SITE

YEAR: 2018
 WATER COURSE: LA RUE MILLS CREEK
 DESIGN CAPACITY: 336 m³/d

MONTH	FLOWS					BIOCHEMICAL O ₂ DEMAND			TOTAL SUSPENDED SOLIDS			PHOSPHORUS			TKN
	TOTAL FLOW (m ³)	AVG DAY FLOW (m ³)	MAX DAY FLOW (m ³)	LAGOON EFFLUENT FLOW (m ³)	IRRIGATION EFFLUENT FLOW (m ³)	AVG RAW BOD (mg/L)	AVG EFF CBOD (mg/L)	PERCENT REMOVAL (%)	AVG RAW TSS (mg/L)	AVG EFF TSS (mg/L)	PERCENT REMOVAL (%)	AVG RAW PHOS. (mg/L)	AVG EFF PHOS. (mg/L)	PERCENT REMOVAL (%)	AVG RAW TKN (mg/L)
JAN	8,920	288	1,162			162			135			19.40			52.2
FEB	7,871	281	714			96			175			3.46			33.2
MAR	7,303	236	344			114			160			4.98			41.0
APR	11,376	379	662			150			120			3.17			29.4
MAY	6,113	197	350	12,418		180	12.7		80	10.3		4.38	0.75		35.7
JUN	4,766	159	197	28,552		252	5.3		210	18.3		5.57	0.25		38.9
JUL	4,673	151	176			189			100			5.48			35.4
AUG	4,284	138	175			192			180			5.19			42.7
SEPT	4,020	134	165			123			135			5.53			48.0
OCT	4,080	132	165			184			180			5.13			51.5
NOV	6,431	214	550			253			260			6.34			50.8
DEC	7,668	247	542			51			100			2.32			16.8
TOTAL	77,505			40,970	0										
AVG		213				162	8.4	94.8	153	14.9	90.3	5.9	0.47	92.1	39.6
MAX			1,162			253			260			19.4			
CRITERIA		336					25			25			1.0		
COMPLIANCE		YES					YES			YES		YES			

COMMENTS: PERCENT REMOVAL BASED ON 12 MONTHS OF COMPOSITE SAMPLES



LEGEND:

- URBAN BOUNDARY
- EXISTING SANITARY MAIN
- EXISTING SANITARY MH
- PROPOSED PROPERTY LINE
- PROPOSED SANITARY MAIN
- PROPOSED SANITARY MH
- HOLDING SYMBOL

AREA (hectares)
#.# ha (L/ha/Day)
P#

AVERAGE FLOW
CATCHMENT ID

Scale: 1:2000 (ANSI D)

Benchmark

No.	Revision/Issue	Date

Forefront Engineering Inc

1329 Gardiners Road, Suite 210
Kingston, ON, Canada K7P 0L8
613.634.9009 tel.
1.888.884.9392 fax.

Client:
10194549 CANADA
c/o SHANE KELLY

Project:
LANSDOWNE DEVELOPMENT

Drawing: PROPOSED SANITARY SEWERAGE AREAS		
Drawn by: JB	Checked by: KMN	Project No.:
Designed by: KMN	Approved by: KMN	Drawing No.:
Date: MARCH 2020	FIG.3	
Scale: 1:2000 (ANSI D)		



Date: March 2020

Client: 10194549 Canada

Municipality: Lansdowne Ontario

Drainage Area: Lansdowne

Guidelines : MECP

SANITARY SEWER DESIGN SHEET LANSDOWNE DEVELOPMENT EXISTING SEWERAGE

Proposed Residential 350 L/cap/day
Existing Single Family 270 L/cap/day
Single Family Res. 2.5 pop/unit
Low Rise Residential 1.5 pop/unit

Assembly Hall 8 L/seat-day
School 70 L/student-day
Stadium 20 L/Seat-day
Restaurant 125 L/seat-day
Commercial 15 m³/ha day
Light Industrial 15 m³/ha day
Eisting Comerercial 10.54 m³/ha day

I=unit of peak extraneous flow (L/ha. s) 0.14 L/ha.s

M=peaking factor 1+14/(4+(P/1000)^{0.5}) 4.0 MAX

Commercial and Industrial Peaking Factor = 2.75

Q(p)=peak population flow (L/s)

Q(i)=peak extraneous flow (L/s)

Q(d)=peak design flow

Minimum Velocity (m/s)

0.6

LOCATION													INDIVIDUAL		CUMULATIVE		PROPOSED SEWER												
STREET	MH	MH	Single Residential Units	Low Rise Residential Units	Residential Population	Cumulative Population	Assembly Hall/ Church	School	Stadium	Restaurant	Commercial / Industrial Area (hectares)	Commercial / Industrial m ² /Day.Ha	q flow Q (L/s)	Area A (hectares)	q flow Q (L/s)	Area A (hectares)	Peaking factor M	Peak Unit flow Q(p) (L/s)	Extraneous flow Q(i) (L/s)	design flow Q(d) (L/s)	Pipe size (mm)	Pipe Length (m)	Grade %	Pipe Capacity (L/s) n=0.013	Full flow velocity (m/s)	Actual velocity (m/s)	Utilized Pipe Capacity (%)		
Jesse Street							100						0.01		0.01		4.00	0.04											
Garden Street			32		80.0	80							0.25		0.26		4.00	1.04											
Johnstone Street			10		25.0	105							0.08		0.34		4.00	1.35											
King Street West			66		165.0	270							0.52		0.85		4.00	3.41											
King Street West								200			0.61	10.54	0.24		1.09		4.00	4.36											
Prince Street			17		42.5	313							0.13		1.22		4.00	4.89											
Gilbert Street			3		7.5	320							0.02		1.25		4.00	4.98											
Grand Trunk Street & Centre Street			12		30.0	350							0.09		1.34		4.00	5.36											
Grand Trunk Street to Railway Street	EXSA.10	EXSA.9				350									1.34	19.2	4.00	5.36	2.7	8.0	250	65	1.00	59.4	1.21	0.75	14%		
Church Street			4		10.0	10					0.12	10.54	0.05		0.05		4.00	0.18											
Prince Street (North End)			29	22	105.5	116	40				0.16	10.54	0.35		0.40		4.00	1.60											
Prince Street (North End)							40				0.96	10.54	0.12		0.52		4.00	2.08											
Kings Street East			37		92.5	208							0.29		0.81		4.00	3.23											
Kings Street East	EXSA.3	EXSA.2				208									0.81	11.5	4.00	3.23	1.6	4.8	250	65	1.86	81.1	1.65	0.89	6%		
Prince Street	EXSA.13	EXSA.12									0.41	10.54	0.05	0.41	0.05	0.41	4.00	0.20	0.1	0.3	250	100.5	0.30	32.6	0.66	0.00	1%		
Prince Street	EXSA.12	EXSA.11									1.90	10.54	0.23	1.90	0.28	2.31	4.00	1.13	0.3	1.5	250	76.8	0.29	32.0	0.65	0.32	5%		
Railway Street	EXSA.11	EXSA.9	2		5.0	5.0							0.02	0.34	0.30	2.65	4.00	1.19	0.4	1.6	300	50.9	0.29	52.1	0.74	0.31	3%		
Railway Street	EXSA.9	EXSA.8	4		10.0	365.0							0.03	0.38	1.67	22.2	4.00	6.67	3.1	9.8	300	66.1	0.35	57.2	0.81	0.57	17%		
Railway Street	EXSA.8	EX.SA7	3		7.5	372.5							0.16	1.13	1.83	23.4	4.00	7.32	3.3	10.6	300	98.2	0.31	53.8	0.76	0.59	20%		
Railway Street	EXSA.7	EXSA.6	4		10.0	382.5							0.03	0.60	1.86	24.0	4.00	7.44	3.4	10.8	300	98.75	0.30	52.9	0.75	0.58	20%		
Railway Street	EXSA.6	EXSA.5	3		7.5	390.0							0.02	0.56	1.88	24.5	4.00	7.54	3.4	11.0	300	96.1	0.31	53.8	0.76	0.59	20%		
Railway Street	EXSA.5	EXSA.4	2		5.0	395.0							0.02	0.46	1.90	25.0	4.00	7.60	3.5	11.1	300	77.7	0.30	52.9	0.75	0.58	21%		
Railway Street	EXSA.4	EXSA.2				395.0									1.90	25.0	4.00	7.60	3.5	11.1	300	21.1	0.23	46.4	0.66	0.51	24%		
Railway Street Pump Station	EXSA.2	EXSA.1				603.0									2.71	36.5	3.93	10.65	5.1	15.75	375	7.3	1.79	234.5	2.12	1.18	7%		
Railway Street Pump Station	EXSA.1	PS				603.0									2.71	36.5	3.93	10.65	5.1	15.75									

*Total Existing Peak Flow Including Infiltration 15.75 L/s

*Note, peaking factor of 3.93



SANITARY SEWER DESIGN SHEET LANSDOWNE DEVELOPMENT INITIAL PHASE SEWERAGE

Date: March 2020
Client: 10194549 Canada
Municipality: Lansdowne Ontario
Drainage Area: Lansdowne
Guidelines : MECP

Proposed Residential	350 L/cap/day
Existing Single Family	270 L/cap/day
Single Family Res.	2.5 pop/unit
Low Rise Residential	1.5 pop/unit

Assembly Hall	8 L/seat-day
School	70 L/student-day
Stadium / Adventure Park	20 L/Seat-day
Restaurant	125 L/seat-day
Commercial	15 m ³ /ha day
Light Industrial	15 m ³ /ha day
Existing Commercial	10.54 m ³ /ha day

I=unit of peak extraneous flow (L/ha. s) **0.14** L/ha.s

M=peaking factor $1+14/(4+(P/1000)^{0.5})$ 4.0 MAX

Commercial and Industrial Peaking Factor = 2.75

Q(p)=peak population flow (L/s)

Q(i)=peak extraneous flow (L/s)

Q(d)=peak design flow

Minimum Velocity (m/s) **0.6**

LOCATION	STREET	MH	MH	Single Residential Units	Low Rise Residential Units	Residential Population	Cumulative Population	Assembly Hall/ Church	School	Stadium / Adventure Park	Restaurant	Commercial / Industrial Area (hectares)	Commercial / Industrial m ³ /Day.Ha	INDIVIDUAL		CUMULATIVE		Peaking factor M	Peak Unit flow Q(p) (L/s)	PROPOSED SEWER								
														q flow Q (L/s)	Area A (hectares)	q flow Q (L/s)	Area A (hectares)			Extraneous flow Q(i) (L/s)	design flow Q(d) (L/s)	Pipe size (mm)	Pipe Length (m)	Grade %	Pipe Capacity (L/s) n=0.013	Full flow velocity (m/s)	Actual velocity (m/s)	Utilized Pipe Capacity (%)
Jesse Street								100						0.01		0.01		4.00	0.04									
Garden Street				32		80.0	80							0.25		0.26		4.00	1.04									
Johnstone Street				10		25.0	105							0.08		0.34		4.00	1.35									
King Street West				66		165.0	270							0.52		0.85		4.00	3.41									
King Street West									200			0.61	10.54	0.24		1.09		4.00	4.36									
Prince Street				17		42.5	313							0.13		1.22		4.00	4.89									
Gilbert Street				3		7.5	320							0.02		1.25		4.00	4.98									
Grand Trunk Street & Centre Street				12		30.0	350							0.09		1.34		4.00	5.36									
Grand Trunk Street to Railway Street	EXSA.10		EXSA.9				350									1.34	19.2	4.00	5.36	2.7	8.0	250	65	1.00	59.4	1.21	0.75	14%
Church Street				4		10.0	10					0.12	10.54	0.05		0.05		4.00	0.18									
Prince Street (North End)				29	22	105.5	116	40				0.16	10.54	0.35		0.40		4.00	1.60									
Prince Street (North End)								40				0.96	10.54	0.12		0.52		4.00	2.08									
Kings Street East				37		92.5	208							0.29		0.81		4.00	3.23									
Kings Street East	EXSA.3		EXSA.2				208									0.81	11.5	4.00	3.23	1.2	4.4	250	65	1.86	81.1	1.65	0.85	5%
MacDonald Drive - Porposed West Parcel Blocks (2 and 5)	SA.30		EXSA.13							900	115			0.37	8.68	0.37	8.7	4.00	1.50	1.2	2.7	250	10	0.28	31.5	0.64	0.38	9%
MacDonald Drive - Porposed East Parcel Lots 1 - 80, Block 150	SA.20		EXSA.13	82	30	250.0	250.0							1.01	9.84	1.01	11.1	4.00	4.05	1.6	5.6	250	10	0.28	95.7	0.64	0.34	6%
Prince Street	EXSA.13		EXSA.12				250.0					0.41	10.54	0.05	0.41	1.44	20.2	4.00	5.75	2.8	8.6	250	100.5	0.30	32.6	0.66	0.00	26%
Prince Street	EXSA.12		EXSA.11				250.0					1.90	10.54	0.23	1.90	1.67	22.1	4.00	6.68	3.1	9.8	250	76.8	0.29	32.0	0.65	0.55	31%
Railway Street	EXSA.11		EXSA.9	2		5.0	255.0							0.02	0.34	1.68	22.5	4.00	6.74	3.1	9.9	300	50.9	0.29	52.1	0.74	0.52	19%
Railway Street	EXSA.9		EXSA.8	4		10.0	615.0							0.03	0.38	3.06	42.0	3.93	12.00	5.9	17.9	300	66.1	0.35	57.2	0.81	0.68	31%
Railway Street	EXSA.8		EX.SA7	3		7.5	622.5					1.13	10.54	0.16	1.13	3.22	43.2	3.92	12.62	6.0	18.7	300	98.2	0.31	53.8	0.76	0.69	35%
Railway Street	EXSA.7		EXSA.6	4		10.0	632.5							0.03	0.60	3.25	43.8	3.92	12.73	6.1	18.9	300	98.75	0.30	52.9	0.75	0.68	36%
Railway Street	EXSA.6		EXSA.5	3		7.5	640.0							0.02	0.56	3.27	44.3	3.92	12.81	6.2	19.0	300	96.1	0.31	53.8	0.76	0.69	35%
Railway Street	EXSA.5		EXSA.4	2		5.0	645.0							0.02	0.46	3.29	44.8	3.91	12.87	6.3	19.1	300	77.7	0.30	52.9	0.75	0.68	36%
Railway Street	EXSA.4		EXSA.2				645.0									3.29	44.8	3.91	12.87	6.3	19.1	300	21.1	0.23	46.4	0.66	0.59	41%
Railway Street Pump Station	EXSA.2		EXSA.1				853.0									4.10	56.3	3.84	15.7	7.9	23.62	375	7.3	1.79	234.5	2.12	1.31	10%
Railway Street Pump Station	EXSA.1		PS				853.0									4.10	56.3	3.84	15.7	7.9	23.62							

Existing Peak Flow Including Extraneous Flow
Proposed Peak Flow Including Extraneous Flow
***Total Peak Flow Including Extraneous Flow**
*Note, Peaking Factor of 3.84

15.75 L/s
7.87 L/s
23.62 L/s



**SANITARY SEWER DESIGN SHEET
LANSDOWNE DEVELOPMENT
FULL BUILDOUT SEWERAGE**

Date: March 2020

Client: 10194549 Canada

Municipality: Lansdowne Ontario

Drainage Area: Lansdowne

Guidelines : MECP

Proposed Residential **350 L/cap/day**
Existing Single Family **270 L/cap/day**
Single Family Res. **2.5 pop/unit**
Low Rise Residential **1.5 pop/unit**

Assembly Hall **8 L/seat-day**
School **70 L/student-day**
Stadium / Adventure Park **20 L/Seat-day**
Restaurant **125 L/seat-day**
Commercial **15 m³/ha day**
Light Industrial **15 m³/ha day**
Eisting Comerercial **10.54 m³/ha day**

I=unit of peak extraneous flow (L/ha. s) **0.14 L/ha.s**

M=peaking factor $1+14/(4+(P/1000)^{0.5})$ 4.0 MAX

Commercial and Industrial Peaking Factor = 2.75

Q(p)=peak population flow (L/s)

Q(i)=peak extraneous flow (L/s)

Q(d)=peak design flow

Minimum Velocity (m/s) **0.6**

LOCATION	INDIVIDUAL												CUMULATIVE				PROPOSED SEWER													
	STREET	MH	MH	Single Residential Units	Low Rise Residential Units	Residential Population	Cumulative Population	Assembly Hall/ Church	School	Stadium / Adventure Park	Restaurant	Commercial / Industrial Area (hectares)	Commercial / Industrial m ² /Day,Ha	q flow Q (L/s)	Area A (hectares)	q flow Q (L/s)	Area A (hectares)	Peaking factor M	Peak Unit flow Q(p) (L/s)	Extraneous flow Q(i) (L/s)	design flow Q(d) (L/s)	Pipe size (mm)	Pipe Length (m)	Grade %	Pipe Capacity (L/s) n=0.013	Full flow velocity (m/s)	Actual velocity (m/s)	Utilized Pipe Capacity (%)		
Jesse Street								100						0.01		0.01		4.00	0.04											
Garden Street			32		80.0	80								0.25		0.26		4.00	1.04											
Johnstone Street			10		25.0	105								0.08		0.34		4.00	1.35											
King Street West			66		165.0	270								0.52		0.85		4.00	3.41											
King Street West									200					0.24		1.09		4.00	4.36											
Prince Street			17		42.5	313					0.61	10.54		0.13		1.22		4.00	4.89											
Gilbert Street			3		7.5	320								0.02		1.25		4.00	4.98											
Grand Trunk Street & Centre Street			12		30.0	350								0.09		1.34		4.00	5.36											
Grand Trunk Street to Railway Street	EXSA.10	EXSA.9				350									1.34	19.2	4.00	5.36	2.7	8.0	250	65	1.00	59.4	1.21	0.75	14%			
Church Street			4		10.0	10					0.12	10.54		0.05		0.05		4.00	0.18											
Prince Street (North End)			29	22	105.5	116		40			0.16	10.54		0.35		0.40		4.00	1.60											
Prince Street (North End)								40			0.96	10.54		0.12		0.52		4.00	2.08											
Kings Street East			37		92.5	208								0.29		0.81		4.00	3.23											
Kings Street East	EXSA.3	EXSA.2				208									0.81	11.5	4.00	3.23	1.6	4.8	250	65	1.86	81.1	1.65	0.89	6%			
MacDonald Drive - Porposed West Parcel Blocks (1, 2, 3, 4, 5, 44)	SA.30	EXSA.13							900	115	9.50	15	2.02	19.82	2.02	19.8	2.75	5.57	2.8	8.3	250	10	0.28	31.5	0.64	0.54	27%			
MacDonald Drive - Porposed East Parcel Lots 1 - 114, Blocks 146, 147, 148 & 149	SA.20	EXSA.13	136	60	430.0	430.0					1.93	15	2.08	9.84	2.08	13.1	4.00	8.31	1.8	10.1	250	10	0.28	95.7	0.64	0.39	11%			
Prince Street	EXSA.13	EXSA.12				430.0					0.41	10.54		0.05	0.41	4.15	33.3	4.00	16.60	4.7	21.3	250	100.5	0.30	32.6	0.66	0.69	65%		
Prince Street	EXSA.12	EXSA.11				430.0					1.90	10.54		0.23	1.90	4.38	35.2	4.00	17.53	4.9	22.5	250	76.8	0.29	32.0	0.65	0.70	70%		
Railway Street	EXSA.11	EXSA.9	2		5.0	435.0								0.02	0.34	4.40	35.5	4.00	17.59	5.0	22.6	300	50.9	0.29	52.1	0.74	0.70	43%		
Railway Street	EXSA.9	EXSA.8	4		10.0	795.0								0.03	0.38	5.77	55.1	3.86	22.28	7.7	30.0	300	66.1	0.35	57.2	0.81	0.81	52%		
Railway Street	EXSA.8	EX.SA7	3		7.5	802.5					1.13	10.54		0.16	1.13	5.93	56.3	3.86	22.89	7.9	30.8	300	98.2	0.31	53.8	0.76	0.76	57%		
Railway Street	EXSA.7	EXSA.6	4		10.0	812.5								0.03	0.60	5.96	56.9	3.86	22.99	8.0	30.9	300	98.75	0.30	52.9	0.75	0.75	58%		
Railway Street	EXSA.6	EXSA.5	3		7.5	820.0								0.02	0.56	5.99	57.4	3.85	23.07	8.0	31.1	300	96.1	0.31	53.8	0.76	0.76	58%		
Railway Street	EXSA.5	EXSA.4	2		5.0	825.0								0.02	0.46	6.00	57.9	3.85	23.12	8.1	31.2	300	77.7	0.30	52.9	0.75	0.78	59%		
Railway Street	EXSA.4	EXSA.2				825.0									6.00	57.9	3.85	23.12	8.1	31.2	300	21.1	0.23	46.4	0.66	0.70	67%			
Railway Street - Proposed East Parcel (Lots 115 - 145)	SA.40	EXSA.2	30		75.0	75.0							0.30	8.33	0.30	8.3	4.00	1.22	1.2	2.4	250	105	0.28	31.5	0.64	0.37	8%			
Railway Street Pump Station	EXSA.2	EXSA.1				1108.0									7.11	77.7	3.77	26.82	10.9	37.70	375	7.3	1.79	234.5	2.12	1.49	16%			
Railway Street Pump Station	EXSA.1	PS				1108.0									7.11	77.7	3.77	26.82	10.9	37.70										

Existing Peak Flow Including Extraneous Flow
Proposed Peak Flow Including Extraneous Flow
*Total Peak Flow Including Extraneous Flow

15.75 L/s
21.95 L/s
37.70 L/s

*Note, Peaking Factor of 3.77