First Capital (Park Lawn) Corporation and 2253213 Ontario Limited

2150 Lake Shore

Functional Servicing Report

Issue 2 | February 26th, 2021

Job number 264635-00

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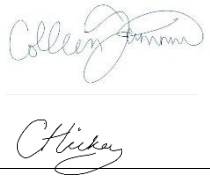
		Signature			
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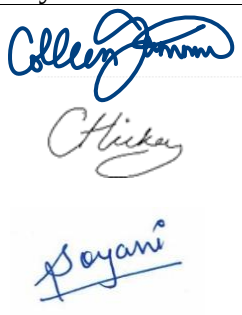
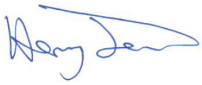
		Signature			

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Executive Summary

This Functional Servicing Report discusses sanitary and water servicing requirements for the redevelopment of the 27.7 acre / 11.2 hectare site located on the northeast corner of Park Lawn Road and Lake Shore Boulevard West, municipally known as 2150-2194 Lake Shore Boulevard West and 23 Park Lawn Road ("the site" or "2150 Lake Shore").

The proposed development includes several mixed-use buildings with a total GFA of 701,809m^2, a large park, municipal and private streets, and a new GO station, all of which require water, sanitary, and storm servicing. The development is a mix of uses as follows:

Use Type	Gross Floor Area (m2)
Residential	584,932
Institutional / Other	17,071
Commercial / Retail	36,364
Employment	63,444
Total	701,809

For the purpose of analyzing sanitary and water requirements, population equivalencies for commercial/retail areas (1.1ca/100m^2) and employment areas (3.3ca/100m^2) were used. Additionally, there are two potential schools on site with an estimated number of pupils of 1,100 where the population in the calculations were reflected based on a the per hectare equivalent outlined in the Design Criteria for Sewers and Watermains (resultant equivalent population of 228).

This report examines existing and proposed conditions for the water and sanitary services. Stormwater management is discussed under a separate Stormwater Management Report.

Water Network Requirements

Using a baseline consumption value of 190 Litres/capita/day (L/ca/d) and peaking factors set out by the City of Toronto, the overall demand value was calculated to be 34.25 L/s during Average Day Demand, 76.60 L/s during Peak Hour Demand, and 43.14 L/s during Maximum Day Demand.

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Building	**(m^2)**	**ca**	**L/day**	**L/s**	**Min Hr**	**Peak Hr**	**Max Day**
Development	**701,809**	**17,302**	**3,192,179**	**36.97**	**31.05**	**83.29**	**46.65**
Block A	141,511	3,314	628,050	7.29	6.12	16.04	9.14
Block B	112,812	2,531	480,816	5.56	4.67	13.66	7.20
Block C	50,427	1,129	214,580	2.48	2.09	6.10	3.21
Block D	282,968	7,820	1,392,261	16.11	13.54	34.08	19.99
Block E	58,028	1,241	235,725	2.73	2.29	6.53	3.50
Block F	56,063	1,267	240,747	2.79	2.34	6.88	3.61

Required fire flow to each building was calculated using the Fire Underwriter's Survey (FUS). The largest calculated fire flow was calculated to be 220 L/s for a two-hour fire event.

The existing and proposed network were modelled in EPANET2 using hydrant test data from September 2020 and consumption data from the existing network. Modelled scenarios generally resulted in high pressures during average day demand, acceptable pressures during peak hour demand, and sufficient flow within the system to provide 220 L/s of fire flow to building A1 for a two-hour fire event while maintaining residual system pressures of 140 kPa.

The suggested size of watermain to service the site is 300mm PVC based on the preliminary model results.

Sanitary Network Requirements

Local servicing sewers were designed using baseline peak flow rates from the criteria of 450 L/ca/day (and considering Harmon peaking factor) for residential and 180,000 L/Ha/day for non-residential. The following peak flow rates for each block were calculated:

Block	**Residential**		**Commercial**			**Total**
	Population	Peak flow (l/sec)	GFA (m^2)	Eq. Population	Peak flow (l/sec)	**Peak Flow (l/sec)**
A	2,551	49.6	32,053	764	6.7	56.3
B	2,444	49.2	7,937	87	1.7	50.9
C	1,089	21.9	3,606	40	0.8	22.7
D	5,158	101.2	61,295	1,790	12.8	113.9
E	1,140	22.2	9,123	100	1.9	24.1
F	1,236	24.0	2,863	31	0.6	24.6
Total	13,617	268.2	116,877	2,813	24.3	292.5

An allowance of 0.26 L/second/ha should be considered for groundwater and infiltration into the pipes and maintenance holes.

The existing and proposed sanitary network were modelled in InfoWorks ICM using flow rates outlined in the City of Toronto sanitary network design criteria and flow monitoring data. For downstream sewer capacity analysis, modeling parameters in the baseline scenario have been adjusted based on the available

monitoring data. The contributing peak flow rates from the proposed development for the downstream flow analysis are summarised below.

Block	**Asset ID**	**Residential**		**Commercial**			**Total**
		Population	Peak Flow (l/sec)	GFA	Equivalent Population	Peak Flow (l/sec)	**Peak Flow (l/sec)**
A1 A2	CB3137606351	1,952	15.7	8,972	106	0.3	16.0
A3 A4	MH3148306388	599	5.0	23,081	658	1.8	6.8
B1	SL200958	736	5.9	3,526	39	0.1	6.0
B2	MH3130906328	1,708	13.8	4,411	49	0.1	13.9
C	SL200947	1,089	8.8	3,606	40	0.1	8.9
D1	MH3003428	1,170	10.7	25,440	801	2.2	12.9
D2	MH3148306388	1,071	8.9	24,885	738	2.1	11.0
D3	MH3148306388	2,917	24.3	10,970	252	0.7	25.0
E	MH3148306388	1,140	9.5	9,123	100	0.3	9.8
F	MH3148306388	1,236	10.3	2,863	31	0.1	10.4
Total		**13,618**	112.9	**116,877**	2,814	7.8	120.7

Considering the proposed network flow and baseline flow rates, the model output under Dry Weather Flow (DWF) condition indicates that some additional capacity may be required along Lake Shore Boulevard West. The preliminary DWF results from the current model indicates that upgrades may be required along Lake Shore Boulevard West to increase the capacity of the system and convey flows under post development conditions. Downstream sewer capacity and upgrade plan also needs to be analysed under WWF condition (once data is available).

Civica have been commission to carry out flow monitoring at 5 locations in order to calibrate the existing flow conditions. Some data available to update the DWF model and baseline scenario has been updated to reflect current monitoring data. However, a longer duration and additional information is required to fully calibrate the model. It should be noted that, there has not been any significant storm event data collected in this time period and so adequate WWF data is not yet available.

Boundary conditions, geometry of the network also needs to be confirmed since the current model has been developed based on the available data and is not fully calibrated.

Finally, alignment with the TGS v3 water reductions will be also evaluated during further analysis of the sanitary network. It is recommended that the discharge per capita be amended to align with the commitment to reduce water use.

Stormwater Management Requirements

A Stormwater Management Report has been prepared under a separate cover for this Application which should be read in conjunction with the following section.

Stormwater management for the study area is achieved by a combination of major and minor system. Based on the TWAG data received from the City of Toronto, the surface runoff from the south west side of the site, drains into an existing 300mm and a 525mm diameter concrete pipe, which is located at the south end, along Lake Shore Boulevard West. These pipes drain eventually into the Mimico Creek outfall.

The current storm sewer network will be checked and updated using field data to make sure it is reflecting the current conditions. The current hydraulic capacity of these pipes is unknown, the design team conducting existing network analysis to understand if any mitigation measures are required to support proposed developments.

The stormwater management strategy aims to meet WWFMG criteria for water balance and water quality by retaining 25 mm of rainfall onsite and control the run-off from the development blocks to 2-year pre-development allowable release rates.

Overland flow from the retention features will be drained to minor system which will eventually join Lake Shore and Park Lawn Road sewer system, before draining into the Mimico Creek through the existing outfall.

The surface runoff exceeding 2-year pre-development allowable release rates where it is practical will flow through an approved existing overland flow route to the outfall. To address conveyance requirements of the system, the capacity of the existing minor and major systems should be evaluated, and any required upgrades for the existing network and the outfall needs to be considered for this design approach.

The project is targeting to meet TGS Tier 3 requirements for Water Balance, where at minimum, the first 25mm generated runoff from every storm event must be retained from all site surfaces through infiltration, evapotranspiration, water harvesting and water reuse. Arup proposed to meet the water balance requirements with the use of green roofs, rainwater harvesting tanks at block level and soil cells within the public right of way.

The collection of total runoff from the development plots is managed by controlling the flows to the allowable 2-year pre-development rate. The public and private streets within the project site are identified as collector road and the relief road is categorised as an arterial road. Dual drainage system has been considered to collect and convey stormwater flows for these roads. The minor system of the proposed roads is to design to capture and convey 5 and 10- year peak flow rates. For runoff generated by storm events greater than this, flow will be limited via inlet control devices and allowing the excess runoff to be conveyed to the outfall

following an approved overland flow route. During severe storm events, the street would act as an open channel and will be designed accordingly.

WWFM guidelines in line with MOE SWM Planning and Design Manual, requires long term 80% removal of TSS on an average annual loading basis from all runoff leaving the proposed development site based on the post-development level of imperviousness. Retaining 25mm of rainfall on site to meet water balance target, will satisfy not only water quality target of 80% TSS removal from 90% average annual rainfall but also erosion and sediment control requirements for the site.

The proposed network, including the connection to the existing network on Park Lawn and Lake Shore, is shown in Appendix C of the Stormwater Management Report.

Groundwater

This report provides a summary of the groundwater condition and groundwater discharge to the municipal sewers during construction. Further information about groundwater condition for the existing site can be found in the Hydrological Review as submitted on 5th May 2020, attached as Appendix I to this report.

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1 Introduction

1.1 Project Description

In October 2019, First Capital filed an Official Plan Amendment (OPA) application on behalf of FCR (Park Lawn) LP and CPPIB Park Lawn Canada Inc (the Owners) that establishes a framework for a transit-oriented mixed-use master plan redevelopment of a 27.7 acre/11 hectare site on the northeast corner of Park Lawn Road and Lake Shore Boulevard West, municipally known as 2150-2194 Lake Shore Boulevard West and 23 Park Lawn Road ("the site" or "2150 Lake Shore"), as shown in Figure 1.

Figure 1 - Site Location

1.1.1 The Initial Plan

The initial Master Plan Proposal introduced a new proposed Park Lawn GO station integrated with Toronto Transit Commission (TTC) streetcar and bus stations. A network of fine-grained internal streets was proposed and connected the site to the surrounding network, while a new 'relief road' was proposed along the northern edge of the site to function as an alternative access to the Gardiner Expressway and a bypass route for through traffic on Park Lawn Road and Lake Shore Boulevard West, providing traffic relief to the community.

A diverse open space system was proposed across the site, including a new 0.5-hectare public park, a covered Galleria, three urban squares, and a series of largos (enlarged sidewalks), lanes and pedestrian mews woven into a rich public realm

network. The existing water tower on the site was proposed to be retained as a historic landmark.

A diverse mix of uses were proposed including significant employment uses comprising office-type, retail, entertainment, and service uses. 1.4 hectares of General Employment Areas were proposed along the Gardiner Expressway on the north edge of the site. Significant residential uses were also proposed with approximately 7,500 new units, including larger 2- and 3- bedroom family-sized units, as well as affordable housing units. The proposal featured a distinct assembly of built form typologies including low, mid and high-rise buildings. Fifteen towers were proposed, ranging in height between 22 and 71 storeys.

1.1.2 The May 2020 Master Plan Proposal

The May 2020 Master Plan proposal maintained the fundamental vision and features of the initial 2019 Master Plan proposal, including the provision of an integrated GO/TTC transit hub, a new relief road and a fine-grained internal street network, a covered galleria lined with retail and amenities, significant employment, diversity of housing options, and unique architecture featuring a blend of built form and uses. The height of proposed towers ranged from 16 to 70 storeys. The May 2020 proposal featured the following key changes:

- Provision of an enlarged park of approximately 1 hectare
- Accommodation of two potential elementary schools in response to the Toronto District School Board and Toronto Catholic District School Board's interest in co-locating schools within the Master Plan site
- Increased provision of employment GFA by approximately 33%, and locating the General Employment Areas around the GO station and in the central Galleria block, creating a cluster of office-type uses proximate to regional transit, public park, and retail and amenities in the Galleria
- Refinements to the built form to reinforce a pedestrian-scaled street wall along Park Lawn Road and Lake Shore Boulevard West through measures such as shifting towers behind mid-rise buildings and introducing setbacks
- Conversion of previously proposed street into a pedestrian plaza that extends Station Square to Park Lawn Road, creating a safe and convenient pedestrian connection between the proposed TTC bus activity along Park Lawn Road and the GO station

1.1.3 The Current Master Plan Proposal (February 2021)

The current Master Plan proposal has further evolved as a result of the continued effort to align with key feedback from various City departments and commenting agencies, as well as with policy directions emerging out of the City's draft

Christie's Secondary Plan. The current proposal maintains the vision and key features of the May 2020 Master Plan proposal, incorporating the following additional revisions:

- **Boulevard Square Park:** In addition to the 1- hectare Community Park, the current proposal adds the 2,500 m2 Boulevard Square as a public park. This addition brings the proposed total on-site parkland provision to 1.25 hectares, nearly 2.5 times the size in the initial Master Plan proposal. As Boulevard Square was previously proposed as a privately-owned publicly-accessible space (POPS) with an underground parking structure below, this change required a reconfiguration and redistribution of parking areas to ensure that Boulevard Square Park is now fully unencumbered. The overall open space system continues to make up 42.6% of the net site area.
- **New Community Uses:** Discussions on community benefits with City staff have advanced since the May 2020 proposal. The current proposal now includes two daycares, a community recreation centre, a public library, and a not-for-profit community agency space, all to be delivered on site in contributing to the Master Plan vision of creating a complete community. These facilities are intended to be secured through a Section 37 agreement with the City, subject to review and finalization. These new facilities are proposed in addition to the space allocated for two potential schools within the site. It is noted that the actual realization of these schools rely on a number of factors including approval and funding by the Ministry of Education, to be secured by the two School Boards.
- **A Sunnier Community Park:** Access to sunlight in the proposed Community Park has been improved by shifting height and density away from the south and east of the park. With the exception of shadows cast by the existing context surrounding the site, the May 2020 proposal achieved no new net shadow on 70% of the park for 5 continuous hours during spring and autumn equinoxes. With the redistribution of height and density, the current Master Plan exceeds the more rigorous sunlight metric in the draft Christie's Secondary Plan to create no new shadows on 85% of the park or more for 5 continuous hours, achieving 6 continuous hours between 9:18 and 15:18.
- **Enhanced Street Wall along Park Lawn, Lake Shore, and the Loop Road:** A number of built form refinements have been made in reinforcing pedestrian-scaled street walls along Park Lawn Road, Lake Shore Boulevard West, and the loop road. This involved reducing street wall heights to be no taller than the width of the right-of-way on these streets, and stepping back upper floors of some mid-rise and podium buildings.
- **Retention of the Water Tower in Station Square:** As a response to City Staff comments, the historic water tower is now proposed to be located in Station Square, from its previous location in the Community Park. At this location, the water tower will have visual prominence as it will remain

visible from the Gardiner Expressway, and also visible from a number of other key locations including Park Lawn Road, the loop road, and the proposed Community Park.

- **Overall Redistribution of Height and Density:** The revisions noted above; enhanced sunlight in the Community Park, new community facilities, and reinforcing the pedestrian scale; have all resulted in overall shifts in heights and distribution of density across the site. This has generally resulted in taller tower heights to the north of the Community Park and along Park Lawn Road, and lower tower heights to the immediate south and east of the Park. As a result, tower heights now range between 28 and 70 storeys, maintaining the 70 storey height peak at the proposed GO station. These revisions have also resulted in a modest increase in the overall density of the project. This includes non-residential density associated with the introduction of the proposed library, community recreation centre, two daycares, and community agency space, along with a 4.9% increase in residential density above the May 2020 Proposal associated with the costs of delivering the comprehensive package of new community benefits identified by the City.
- **A Wider Loop Road:** The central loop road has been widened from a 23-metre right-of-way in the May 2020 submission to a 26-metre right-of-way in discussion with City staff. The portion of the street along the proposed Community Park has also been widened from 20 metres to 22 metres. Taking a complete streets approach, the widened right-of-way accommodates wider pedestrian zones, vehicle lanes, planting zones, a bi-directional multi-use trail, and TTC streetcar tracks, balancing the needs of all users.

1.2 Existing Site Conditions

The site is historically known as the Mr. Christie Cookie Factory, which was closed in 2013 and demolished in 2017. It is currently empty land with the exception of a Bank of Montreal building in the southwest corner (currently operational).

1.3 Proposed Development

The proposed site contains several mix-use buildings (residential, employment, institutional and retail), two potential schools, several open spaces, a number of potential community facilities, a new train station on the existing Lake Shore GO line, a TTC streetcar loop, and a series of public and private roadways, as shown in Figure 2 - Proposed Development Layout.

Figure 2 - Proposed Development Layout

The building uses are described in Table 1:

Table 1 - Land Use Mix

Use Type	**Gross Floor Area (m2)**
Residential	584,932
Institutional / Other	17,071
Commercial / Retail	36,364
Employment	63,444
Total	**701,809**

Further granularity is provided in Appendix A.

1.4 Phasing Overview

The development is planned to be constructed in 6 phases, as shown below in Figure 3.

Figure 3 - Proposed Development Phasing

Phasing considerations for water and sewer infrastructure are discussed within their respective sections.

1.5 Scope of Servicing Report

Arup has been retained by the Owner to prepare a Functional Servicing Report, Stormwater Management Report, and civil/utility drawings in support of the combined Zoning By-Law and Draft Plan of Subdivision Application. The scope of the Functional Servicing Report, in conjunction with the Stormwater Management Report, examines the existing boundary servicing conditions (potable water, storm and sanitary), identifies requirements to service the proposed development, and analyses impacts to the surrounding existing infrastructure.

This report has been prepared in support of the Application, to satisfy the City of Toronto application requirements, and to provide analysis of the required municipal servicing to the site.

Information forming the basis of this report include:

- Record Drawings from City of Toronto;
- Toronto Water Asset Group GIS files from Toronto Water received on 20/01/2020;
- Site Survey from EllisDon on February 24th, 2020; and
- Design information from the consultant/client team.

2 Water Supply and Distribution

The site will be serviced from existing water networks on Park Lawn Road and Lake Shore Boulevard West. To understand existing conditions and the impacts of proposed water demands, a model was created using EPANET. The calibration of the existing model, calculation of proposed demands, and results of the additional demands on the existing system are described below.

2.1 Design Criteria

The water network will be assessed using criteria set out in the Design Criteria for Sewers and Watermains (City of Toronto, January 2021), and as summarized below:

2.1.1 Demand Values

To understand demand, population equivalencies were used to calculate the equivalent population for commercial and office buildings.

Table 2 - Population Equivalencies (City of Toronto Design Criteria for Sewers and Watermains, January 2021)

Sector	**Population Equivalent**
Commercial/retail	Based on 1.1 persons/ 100m^2
Office Building	Based on 3.3 persons/ 100m^2

Per capita demand is outlined in City of Toronto Design Criteria for Sewers and Watermains as follows:

Table 3 - Per Capita Water Demand (City of Toronto Design Criteria for Sewers and Watermains, January 2021)

Sector	**Per capita Demand**
Residential, Commercial, Office	190 litres/capita/day
School Buildings	70-140 litres/student/day

These values were used to calculate the Average Day Demand (ADD) along with land use mixes described in Table 1.

2.1.2 Peaking Factors

Peaking factors will be applied to the ADD to obtain the Minimum Hour Demand (MHD), Peak Hour Demand (PHD), and Maximum Day Demand (MDD) as follows:

Table 4 - Peaking Factors (City of Toronto Design Criteria for Sewers and Watermains, January 2021, Table 30)

Land Use	MHD	PHD	MDD
Residential >150,000 population range*	0.80	2.25	1.50
Commercial/Retail	0.84	1.20	1.10
Industrial/Institutional	0.84	1.90	1.10
Apartments	0.84	2.50	1.30

*for residential demand calculations, the peaking factors for apartments were used as the population of the site is less than 150,000.

2.1.3 Fire Protection

The required fire flow will be calculated using the Fire Underwriters Survey (FUS). Assumptions for reduction/surcharge values are described in Appendix D.

2.1.4 Target Design Criteria

The following criteria must be achieved by new watermain design in the City of Toronto:

- Supply the greater of MDD + Fire Flow (FF) or PHD
- Maximum velocity under ADD < 2m/s
- Maximum velocity under FF < 3m/s
- Maximum Head Loss under PHD is 2-5m/1000m
- ADD pressure range of 350-550 kPa
- MHD and PHD pressure range of 275-700 kPa
- Minimum pressure under non-fire demand scenario > 275 kPa
- Minimum residual pressure during MDD + FF > 140 kPa

- Maximum static pressure < 690 kPa
- Test pressure = 1000 kPa

2.2 Existing Water Supply System

Existing water network data for the site and surrounding area was provided by the City of Toronto. The site is currently serviced as follows:

- 300mm D.I. watermain on the east side of Park Lawn Road
- A 300mm PVC watermain on Marine Parade Drive
- A 300mm PVC watermain on The Marginal Boulevard
- A 300mm PVC watermain on the south side of Lake Shore Boulevard West (turns north to cross under Gardiner Expressway and rail corridor and connect with Queensway)
- 300mm DC and 200mm CI and 150mm DI watermains on The Queensway

2.2.1 Existing Site Resiliency

The site is bound by the Humber River to the east, Mimico Creek to the west, and by the Gardiner/GO Rail Corridor to the north – all of which are considered barriers for normal infrastructure installation. Existing water infrastructure currently services the site from all three directions, but understanding the requirements of the proposed network are important to ensure that additional infrastructure across these barriers is not required.

2.2.2 Existing Network Characteristics

The site exists within Pressure District 2, near the boundary to PD1W. In 2018, City of Toronto performed the Water Distribution Study and concluded that PD2 and PD1W were able to accommodate future growth based on domestic demand (Downtown Water Strategy, April 2018).

Four hydrant tests were completed on September 22nd between 9:30AM and 11:00AM in proximity to the site. Hydrant locations are shown in Figure 4 and detailed results are included in Appendix C. The observed static pressure at the hydrants ranged from 427 kpa to 689 kpa.

Figure 4 - Hydrant Test Locations and Indicative Site Boundary

2.3 Proposed Water Network

2.3.1 Proposed Water Network Layout

The proposed network, including connections to the existing network on Park Lawn and Lake Shore, is shown in Appendix B. It includes a 300mm PVC watermain along Street B (the loop road) that connects to Park Lawn Road and Lake Shore Boulevard West at four locations.

Each building has a minimum of one siamese domestic/fire connection as per City of Toronto standard detail T-1105302-1 and T-1104.02-3. Buildings over 81m will have an additional fire connection. Each building will be sprinklered and will have meters, backflow prevention, and fire pumps within a mechanical room.

2.3.2 Hydrant Coverage

Hydrants are included along Street B approximately 60m apart as per City of Toronto Design Criteria for Sewers and Watermains, Chapter 4, Table 33: Fire hydrant spacing and location. Final hydrant placements will ensure unobstructed access from hydrant to each building entrance is less than 40m.

Existing hydrants are present on both the east and west side of Park Lawn Road and along the south side of Lake Shore Boulevard West.

2.3.3 Domestic & Fire Demand Calculations

Domestic water demands and associated peaking values were calculated using populations, building uses, and City of Toronto requirements as described in

Section 1 and 2 of this report. Fire flow requirements for each building were calculated using the Fire Underwriter's Survey.

In summary, the development has a domestic Average Day Demand of 36.97 L/s. Building A1 required the highest calculated fire flow of 3434 GPM or 220 L/s. Table 5 and Table 6 provide a summary of the calculations. See Appendix D for detailed calculations.

Table 5 - Summary of Domestic Water Demands

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Building	(m2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Development	701,809	17,302	3,192,179	36.97	31.05	83.29	46.65
Block A	141,511	3,314	628,050	7.29	6.12	16.04	9.14
A1 (Subtotal)	62,679	1,385	263,065	3.04	2.56	7.38	3.92
A2 (Subtotal)	30,084	673	127,932	1.48	1.24	3.64	1.91
A3 (Subtotal)	19,932	623	118,433	1.37	1.15	1.64	1.51
A4 (Subtotal)	28,815	633	118,619	1.39	1.17	3.38	1.80
Block B	112,812	2,531	480,816	5.56	4.67	13.66	7.20
B1 (Subtotal)	35,097	775	147,172	1.70	1.43	4.15	2.20
B2 (Subtotal)	77,715	1,756	333,644	3.86	3.24	9.52	5.00
Block C	50,427	1,129	214,580	2.48	2.09	6.10	3.21
Block D	282,968	7,820	1,392,261	16.11	13.54	34.08	19.99
D1 (Subtotal)	75,751	1,971	374,463	4.33	3.64	8.55	5.28
D2 (Subtotal)	70,775	1,809	343,636	3.98	3.34	7.84	4.85
D3 (Subtotal)	136,442	4,040	674,161	7.80	6.55	17.70	9.87
Block E	58,028	1,241	235,725	2.73	2.29	6.53	3.50
Block F	56,063	1,267	240,747	2.79	2.34	6.88	3.61

Table 6 - Summary of Fire Flow Requirements

Building	FF (L/min)	FF (L/s)	US GPM
A1	13000	220	3434
A1 Market	7000	120	1849
A2	8000	127	2113
A3	9000	147	2378
A4	9000	150	2378
B1	8000	138	2113
B2	10000	163	2642

Building	FF (L/min)	FF (L/s)	US GPM
C1	9000	153	2378
D1	8000	134	2113
D2	8000	134	2113
D3	10000	161	2642
E1	10000	163	2642
F1	6000	92	1585

2.4 Network Modelling

The existing system was modelled in PCSWM (using EPANET add-on). Elevations were assigned at all nodes based on existing TWAG information and the proposed subdivision's drawings. The model layout with node IDs is included in Figure 5 (existing) and Figure 6 (existing and proposed).

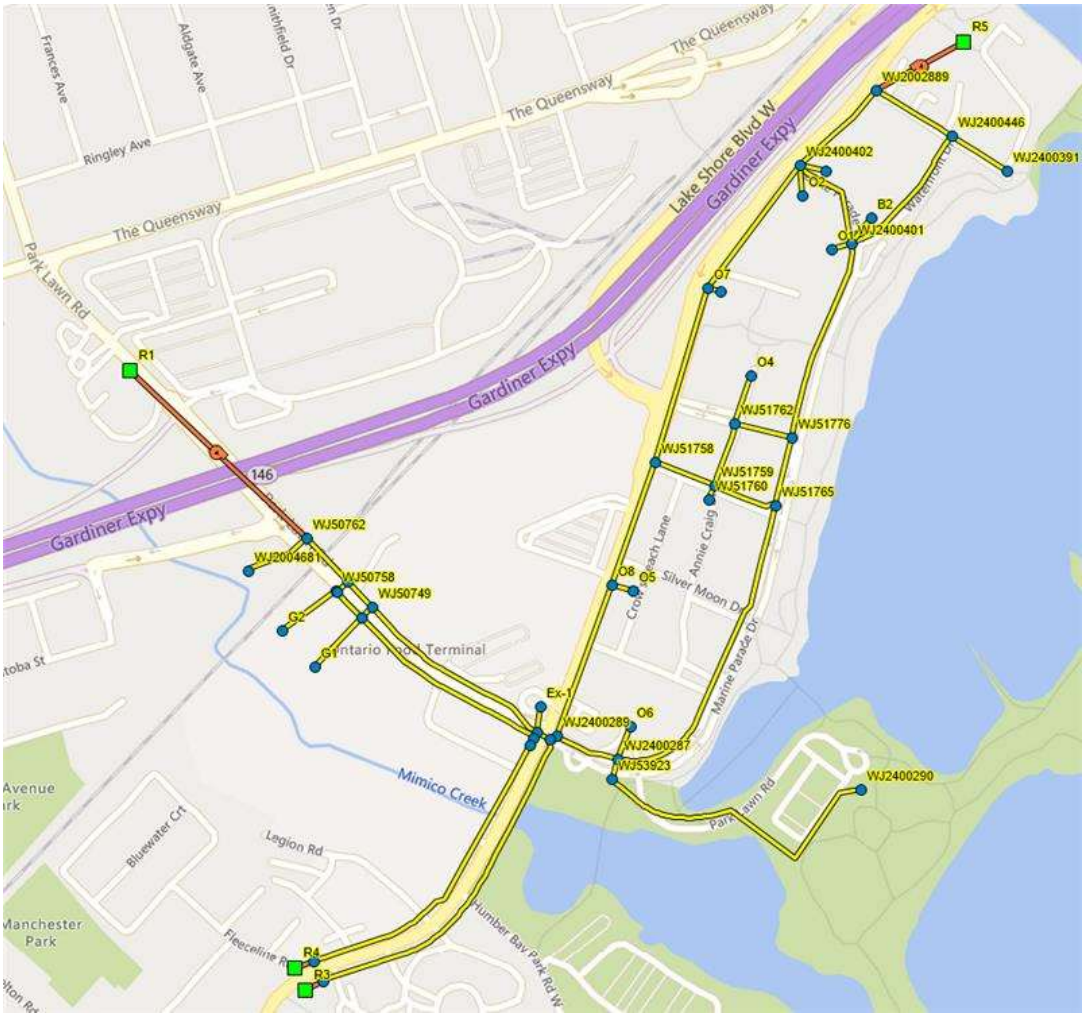


Figure 5 - Existing water network surrounding development site with indicative pumps at hydrant locations

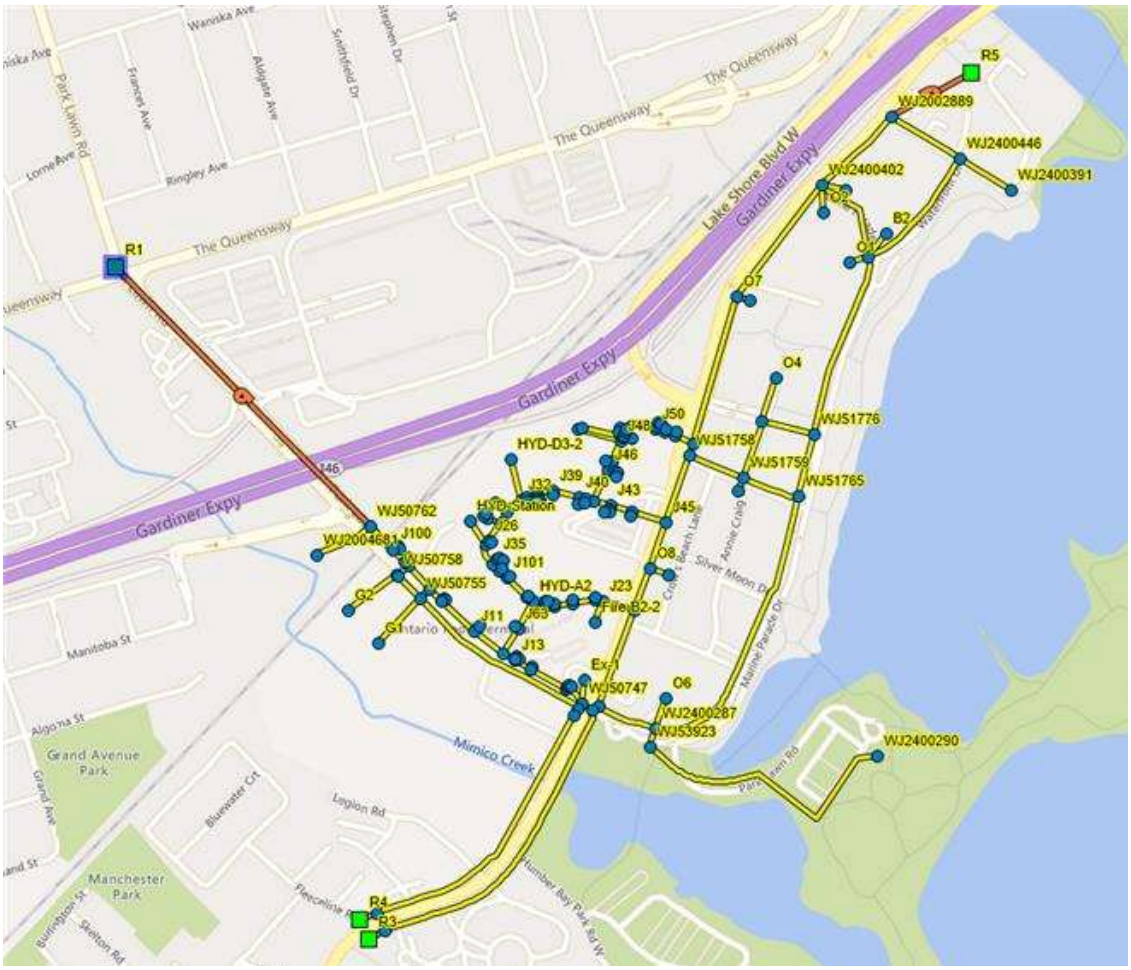


Figure 6 - Proposed and existing water network with indicative pumps at hydrant locations

In order to calibrate the model to the results of the fire flow tests, three reservoirs were created at the model boundaries with using data from hydrants 2, 3, and 4. The model was then calibrated using the results of Hydrant 1 (see Figure 7 for calibration curve).

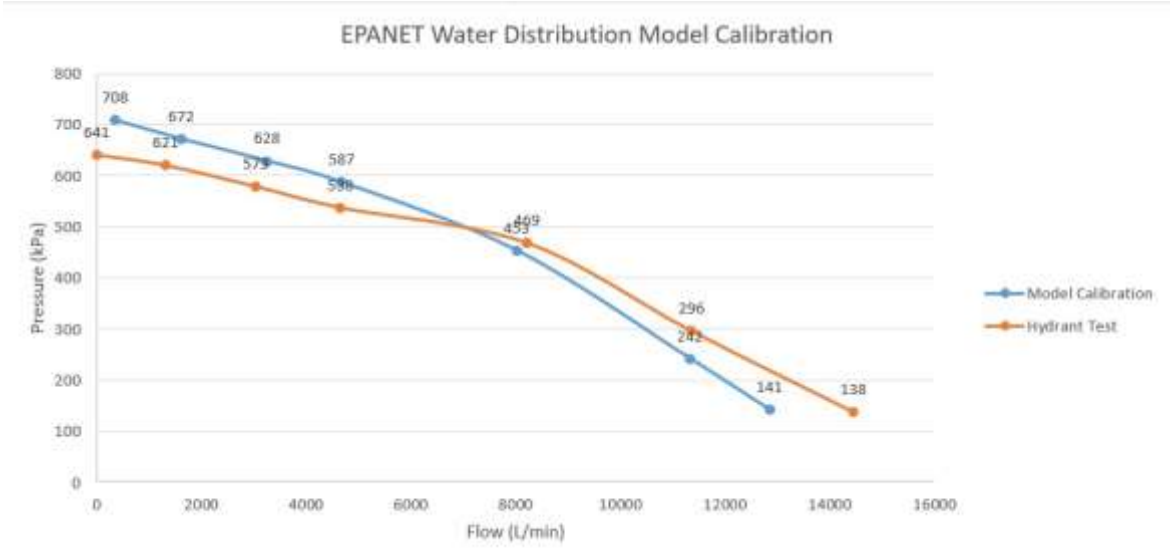


Figure 7 - Calibration Curve at Hydrant 1

While the model has a slightly higher static pressure than the hydrant test, the achievable flow at 140 kpa is lower and therefore conservative. The hydrant tests were assumed to be performed in an Average Day Demand condition, and existing ADD consumption data provided by the City of Toronto was used to run the existing test scenario. It is noted that these hydrant tests were performed during the COVID-19 pandemic and may not accurately reflect conditions in the system on a typical average day.

2.4.1 Model Scenarios

Several scenarios were run in the model to determine the appropriate pipe sizing and network capacity. The proposed sewer within the loop road is 300mm PVC.

Table 7 - Water Model Scenarios

Scenario ID	Proposed Network Demand	Existing Network Demand
LS_WM_0*	-	ADD
LS_WM_1	ADD	ADD
LS_WM_2	PH	PH
LS_WM_3	MDD + FF**	MDD

* Scenario 0 is a calibrated model of the existing system using consumption data from 2017, assumed to represent the ADD.

**A fire was applied at Building A1 (to both building connections), as this was calculated to be the building requiring the largest fire flow (13,200 L/min).

2.4.2 Preliminary Scenario Results

Full results from the model scenarios are included in Appendix E. The modelling software outputs pressure in metres of head, which is converted from kPa by multiplying by 0.102. Therefore, when reading the model results, the values that are acceptable are as follows:

- Maximum velocity under ADD < 2m/s
- Maximum velocity under FF < 5m/s
- ADD pressure range of 35 m to 56 m
- MHD and PHD pressure range of 28 m to 71 m
- Minimum pressure during non-fire scenarios > 28 m
- Minimum residual pressure during MDD + FF > 14 m
- Maximum static pressure < 70 m

A summary of the preliminary model results is found in Table 8.

Table 8 - Summary of Water Model Results

Scenario	Minimum Observed Pressure (m)	Maximum Observed Pressure (m)	Within Range? (Y/N)	Adequate Fire Flow? (Y/N)
LS_WM_0	68.35	79.34	N*	N/A
LS_WM_1	64.84	78.57	N*	N/A
LS_WM_2	57.22	71.23	Y	N/A
LS_WM_3	38.76	54.99	Y	Y

*the maximum observed pressure in the ADD scenarios exceeds the stipulated 56m pressure head. This is aligned with the static pressures observed at the hydrant tests (ranging from 427 kpa to 689 kpa or 43 m to 70 m of pressure head).

Pressure conditions experienced in the modelling scenarios are generally higher than the pressure ranges noted within the City design criteria. This may be due to the fact that the hydrant tests were assumed to be done at Average Day Demand, where they may have been carried out during a Maximum Day or Peak Hour condition. This is further heightened by the large number of residents who were

likely at home during the tests instead of in office environments due to the COVID-19 pandemic. It is recommended that additional hydrant testing is completed once the stay at home order is lifted to allow for re-calibration.

However, this area is at a low elevation within the water pressure district and historical hydrant test data has also demonstrated high pressures in the vicinity of the development site. Pressure reducing mechanisms may be considered during detailed design for building connections.

Velocities were observed to be within the desired range. Head losses were not greater than 5 m/1000 m during peak hour demand.

The Peak Hour Demand scenario pressure values fall within the acceptable range of 28 m to 71 m of pressure head. During a fire event applied to building A1, residual pressures remained above 14 m head (140 kPa) in the network while supplying sufficient fire flow. See Appendix E for full results.

2.5 Considerations for Water Demand Reductions & Toronto Green Standard

In line with the development's sustainability strategy, reduction in water use was presented in the Official Plan Amendment application.

All new buildings that require site planning applications must comply with Toronto Green Standard (TGS) which has demand reduction strategies for potable water use. City of Toronto is currently operating at TGS Version 3 (v3) Tier 1, and it is expected that TGS will target the next tier every 3 years, therefore it is likely that at the time of development TGS v3 Tier 3 will be the minimum requirement.

The table below outlines the target demand reductions for potable water for new mid-high rise residential and all non-residential developments.

Table 9 - Toronto Green Standard Tiers for Water Demand Reduction

Tier	Landscape demands		Buildings Demands	
	Strategy	Reduction	Strategy	Reduction
TGSv3 T1	Drought-Tolerant Landscapes: Where potable water is used for irrigation, provide drought-tolerant plants for least 50% of the landscape site area.		-	-
TGS v3 T2	Efficient Irrigation	60%	Water Efficient Fixtures or non potable water source	40%
TGS v3 T3	-	-	Water Efficient fixtures or non potable water source	50%

The TGS v3 Water Efficient Fixtures calculations refer to LEED v4 BD+C Water Efficiency prerequisite and credit methodology for Indoor Water Use Reduction. Calculations for each Block at 2150 Lake Shore were completed using the USGBC's LEED v4 Indoor Water Use Reduction Calculator and the fixture flow rates summarized in Table 10 for the LEED defined baseline and Design cases.

The lower-flow design case fixture flow rates summarized in Table 10 are common fixture flow rates available in the Canadian market.

Table 10 - LEED Defined Baselines for Fixture Flow Rates.

Fixture	LEED Baseline	Design	Unit	Source
Toilet	6.0	3.6	L/flush	https://fulcrum.ecomedes.com/products/unison-ridge-limited/BT2316E233
Urinal	3.8	0.5	L/flush	https://fulcrum.ecomedes.com/products/contrac/4810BSX
Public lavatory faucet	1.9	1.9	L/min	No change
Residential lavatory faucet	8.3	1.9	L/min	https://www.allianceforwaterefficiency.org/resources/topic/faucet-fixtures
Kitchen faucet	8.3	1.9	L/min	https://www.allianceforwaterefficiency.org/resources/topic/faucet-fixtures
Residential kitchen faucet	8.3	1.9	L/min	https://www.allianceforwaterefficiency.org/resources/topic/faucet-fixtures
Showerhead	9.5	8.3	L/min	https://www.epa.gov/watersense/product-search
Residential showerhead	9.5	8.3	L/min	https://www.epa.gov/watersense/product-search

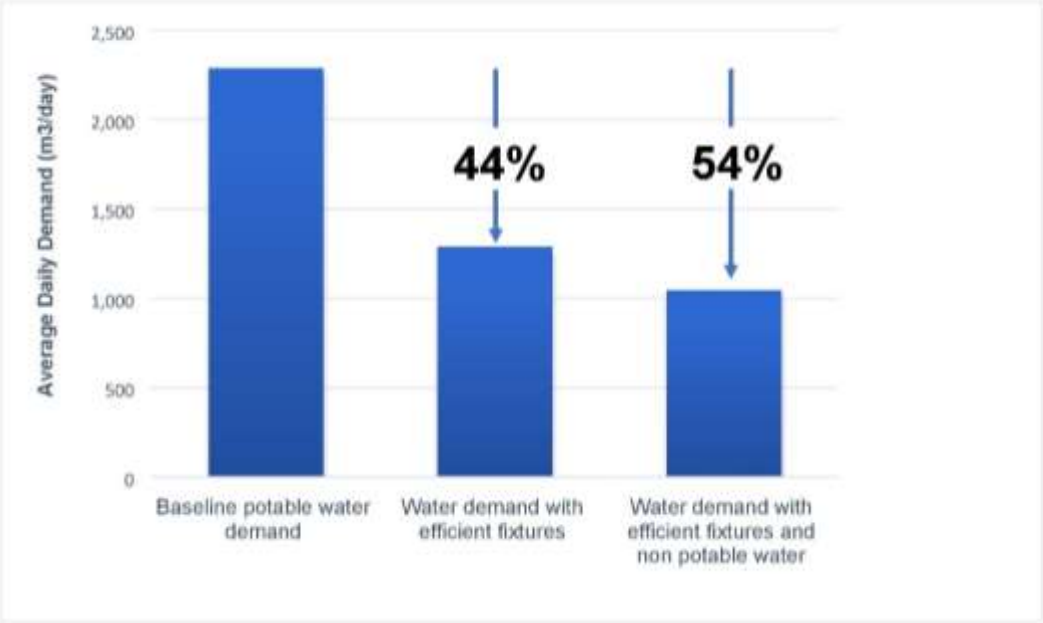


Figure 8 - Average Indoor Water Reductions

The average baseline indoor water use, as well as the resulting average design case indoor water use reduction for all blocks is summarized in Figure 8. The low-flow fixtures listed in Table 10 result in approximately 44% indoor water use reduction compared to the LEED baseline, which meets the requirements of TGS v3 Tier 2 Core requirement WQ4.2 Water Efficient Fixtures, the criterion included in the 2150 Lake Shore minimum requirements and inherent design category.

For the 2150 Lake Shore site Tier 3 50% reduction could be achieved using grey or rainwater harvesting systems. Potential strategies for the project have been evaluated not only on their ability to reduce indoor potable water consumed by the project but have also been evaluated based on capital and operational carbon emissions. Due to the site's proximity to stable fresh water supply, a non-potable re-use network is not proposed as it is not considered to the most sustainable water management practice at this time.

In further design development, if TGS Tier 3 becomes mandated for planning, there is potential to reassess the reductions to calculated potable water demand This will be readdressed if or when the Tier 3 become statutory for planning. There's potential this reduction measures will be reassessed or revaluated; even lower flow fixtures and performance of fixture could be developed in the future.

It should be noted that while demand reductions measures are proposed for the site, water requirements discussed within this report for sizing the potable water network represent a "Maximum Demand" scenario, where the City's design criteria for domestic demand values have been used.

This section of the report is for information only and has not been used in any modelling or assessment of the suitability of the existing water network to serve the proposed development. The required demand values in the City's Design Criteria have been used.

2.6 Watermain Network & Development Phasing

Buildings that are part of Phase 1 (D1 and C1) will be serviced from Park Lawn Road. During Phase 2, the Loop Road will be constructed along with the 300mm water main. This phase will also include all of the watermain connections to the development from Lake Shore Boulevard West. The final length of watermain along Private Street D will be included as part of Phase 3 or Phase 5. During the Site Plan Application for each building, an analysis of the water requirements will be undertaken to ensure that each phase of development can be supported by previously installed infrastructure or existing infrastructure. Given that the Loop Road (and the bulk of the watermain that supplies the development and connects to Lake Shore Boulevard West and Park Lawn Road) is installed in Phase 2, issues with supply water to all subsequent phases is not anticipated.

2.7 Upgrades to Existing System

At the time of analysis with the available information on the existing network and the proposed development, upgrades to the existing water network in the area are not anticipated. The hydrant test results indicate a static pressure ranging from 427kpa to 689kpa and the modelled fire flow scenario resulted in residual pressures higher than 140kpa in the surrounding area.

3 Sanitary Drainage System

3.1 Introduction

This section outlines City of Toronto sanitary network design criteria, sanitary flow rates for each of the building blocks within the site and analyse the impact the development will have on the surrounding existing sanitary network to identify where upgrades may be required.

3.2 Sanitary Design Criteria

The sanitary network was assessed using criteria set out in the Design Criteria for Sewers and Watermains (City of Toronto, Jan 2021), and as summarized below:

3.2.1 Population Assumptions

The sanitary analysis will use the occupancy assumptions outlined in the criteria (Table 11). These assumptions differ from the masterplan occupancy assumptions as these are required for the analysis by Toronto Water.

Table 11 - Population Equivalents Based on Type of Housing, (City of Toronto Design Criteria for Sewers and Watermains, Jan 2021)

Apartments or condominium:	Persons per unit
bachelor	1.4
1 bedroom	1.4
2 bedroom	2.1
3 bedroom	3.1
4 bedroom	3.7

3.2.2 Existing Network Per Capita Flow

The sanitary downstream flow analysis used the flow rates for existing buildings and the proposed development as outlined in the criteria (Table 12).

Table 12 - Existing Network Per Capita Flow, (City of Toronto Design Criteria for Sewers and Watermains, Jan 2021)

Sector	Per capita Discharge
Residential	240 litres/capita/day
Commercial/Retail/Institutional (Non-Residential)	250 litres/capita/day

3.2.3 Extraneous Flows

An infiltration allowance of 0.26 litre/second/ha will be applied as per the Criteria for all contributing plot and road areas.

3.2.4 Proposed Sewer Per Capita Flow

For sizing new local sewers the following baseline flow rates were considered:

Table 13 - Proposed Sewer Per Capita Flow, (City of Toronto Design Criteria for Sewers and Watermains, Jan 2021)

Sector	Per capita Discharge
Residential	450 litres/capita/day
Commercial/retail	180,000 litres/Ha/day

3.2.5 Peaking Factor

Commercial peaking factors are included within the average flow. Residential peaking factor was calculated using the Harmon equation considering the contributing upstream population. The peaking factor used at each point is a function of the upstream population.

Harmon equation: $PF=1 + (14/(4+(P/1000)^{½}))$ Where P=population

3.2.6 Sanitary Sewer Design

New proposed sewers are designed in accordance with the Criteria to ensure adoptable standards from Toronto Water, key criteria to note are as follows:

- Sewer capacities will be computed by using the Manning formula.
- The minimum allowable size for a sanitary sewer will be 250 mm diameter.
- Generally, sanitary sewers will be designed to flow at a maximum of 80 percent full flow design capacity of the pipe.
- The minimum actual velocity permitted in a sanitary sewer when flowing full will be 0.6 m/second to ensure the flow is self cleansing.
- The maximum velocity permitted in sanitary sewers is 3 m/second.
- Minimum Slope for 250mm pipe is 0.5%, minimum slope of the first leg is 1%.
- The minimum depth of a sanitary sewer will be 2.75 metres measured from the centre line elevation of the road to obvert of the sewer. In some

places this may not be achievable due to the invert of downstream connection. These locations will be discussed with the City.

3.3 Existing Sanitary Drainage Network

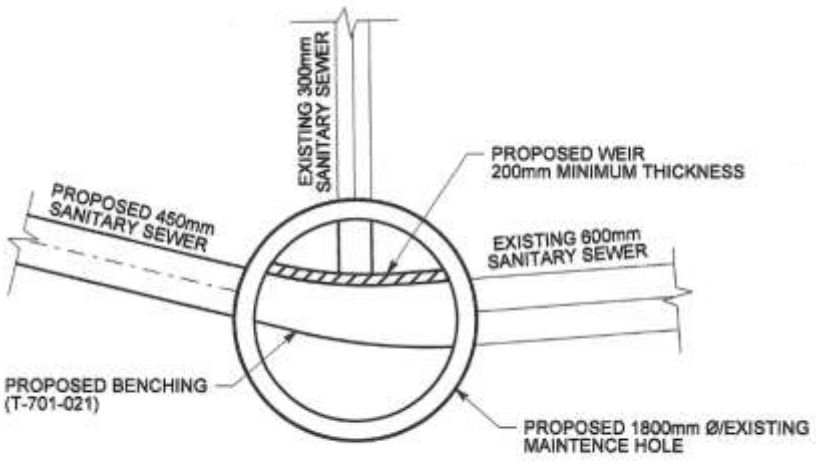
Existing utility information has been ascertained using asset information from the Toronto Water Asset Group (TWAG) GIS data and Toronto City Sanitary Drawing MC-4984, last revised in 1994.The asset mapping indicates the presence of sanitary sewers along roads surrounding the site. The system shown in Figure 5 is a gravity system which flows north east where it crosses beneath the Gardiner Expressway and Metrolinx corridor. The gravity system terminates at the Queensway Pumping Station which the pumps into the Humber Bay Wastewater Treatment Plant.

These mains are present in the following locations:

- Park Lawn Road - a 375mm PVC sanitary wastewater pipe conveys flows from the north-west of the site, southeast along Park Lawn Road. This sewer appears to originate north of the Gardiner Expressway and collects flow from the developments on the west side of Park Lawn Road and continues onto Marine Parade Drive.

- Park Lawn Road – the 375mm pipe increases to a 450mm pipe just before the junction with Marine Parade Drive and Lake Shore Boulevard.

- Lake Shore / Marine Parade MH3121606317 Weir – at the junction of Park Lawn, Lake Shore, and Marine Parade Drive, the manhole has a weir that directs flow from Park Lawn to Marine Parade Drive with a 200mm high overflow weir to a 300mm pipe along Lake Shore.



PROPOSED BENCHING AND WEIR DEATIL MH No 14A

N.T.S.

- Marine Parade Drive – A 600mm (material to be confirmed) pipe along Marine Parade Drive carries flow from Park Lawn Road South and collects flow from various developments along the north side of Marine Parade Drive. The sewer follows the curve of Marine Parade Drive and meets up with Lake Shore, where it continues to flow east. The sewer transitions to a 675mm concrete pipe one maintenance hole upstream of Palace Pier Court.

- Lake Shore Boulevard – A 225mm Vitrified Clay (VC) pipe appears to collect flow from the 2150 Lake Shore site and discharges west to a 300mm VC sewer which then flows east along Lake Shore to Palace Pier Court. At this junction, the 300mm VC sewer joins with the 675mm concrete sewer and continues to flow east as a 675mm VC pipe.

- Approximately 60m east of Palace Pier Court, the 675mm VC sewer along Lake Shore Boulevard West collects flow from the development east of Palace Pier court and flows under the Gardiner Expressway and Metrolinx/GO rail corridor to a pumping station that discharges into a sewer on the Queensway, and eventually into the Humber Wastewater Treatment Plant.

The objective of this study is to determine if the current system can support the proposed development, or if upgrades/mitigations may be required.

The asset record does not show any existing sanitary network within the site boundary. It is therefore assumed that there may be a series of private/unadopted mains supplying the bulk of the light industrial area. It should be noted, under the current condition of the site, there is no sanitary flow discharge to the municipal network.

The existing sanitary network to be modelled in this study is shown in Figure 9.

Figure 9 - Known existing sanitary water network (TWAG)

3.3.1 Existing Sanitary Flow Generation

Estimates of sanitary flow generation from the existing plots which discharge to the existing network along Park Lawn Road, Lake Shore Boulevard West and Marine Parade Drive have been prepared in accordance with current City of Toronto standards, and are included in Appendix F.

The existing contributing population was calculated using the 2016 Census population data and the planning applications for developments post 2016.

The sanitary flow generation calculations are based on an estimated existing residential population of 18,980, commercial population equivalent of 192 and extraneous flows from 30 ha.

A location plan of existing plots and the assumed direct connections to the existing network is shown in Figure 10.

Figure 10 - Location Plan of Existing Inflows

3.3.2 Existing Sanitary Flow Monitoring

Civica have been commission to carry out flow monitoring at 5 locations in order to calibrate the existing flow conditions. Data has been collected from October 2020- January 2021 and is ongoing. Table 14 and Figure 11 display the flow monitoring locations, MH IDs and pipe dimeters.

- Some data available to update the DWF model. Baseline scenario has been updated to reflect current monitoring data. However, a longer duration and additional information is required to fully calibrate the model.
- There has not been any significant storm event data collected in this time period and so adequate WWF data is not yet available.

Table 14 - Flow monitoring locations

	MH ID	Pipe Diameter
FM1	MH3221506814	375
FM2	MH3003433	250
FM3	MH3209906731	600
FM4	MH3195006587	300
FM5	MH3119506363	600

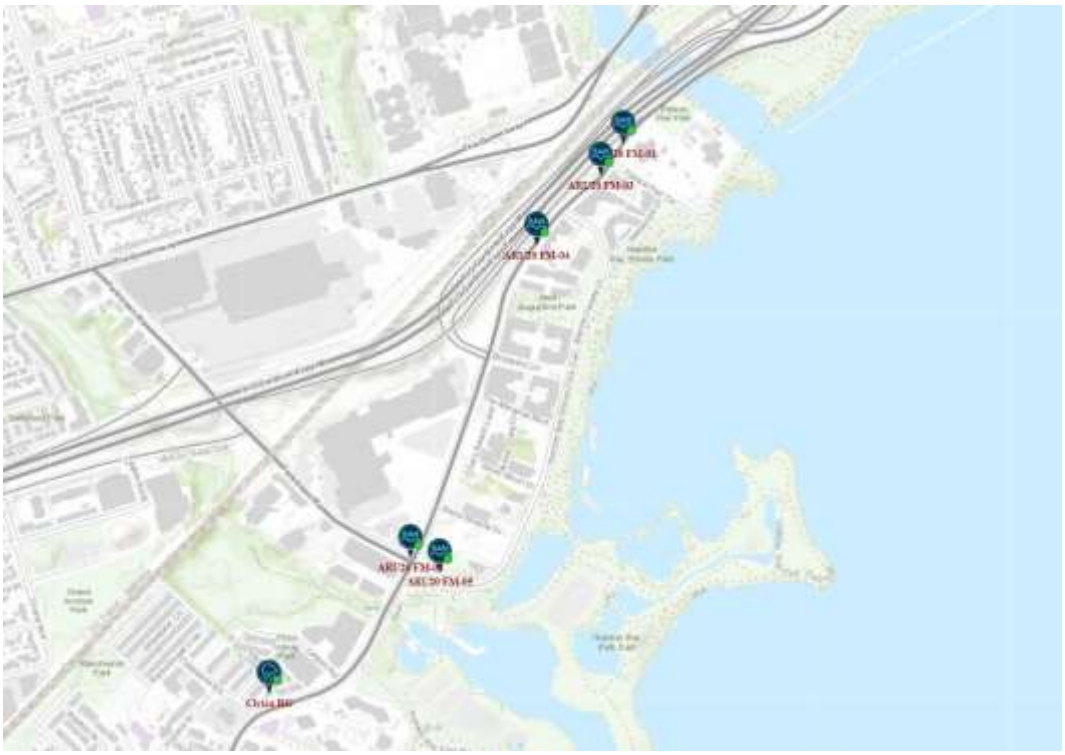


Figure 11 - Location plan of flow monitoring stations

3.3.3 Capacity of the Existing System

A hydraulic model was created using InfoWorks ICM to determine the capacity of the existing system. Model development included creating sub-catchments, existing sanitary sewer network and wastewater peak flow estimates.

The current model has been validated using the available monitoring data under DWF conditions. In addition, WWF Scenario will be analyzed to provide HGL assessment for both pre and post-development conditions. No storm event larger than a 1:2-year storm has been captured in the current record. Wet weather flow monitoring will take place during the late spring, summer and early fall in order to collect data during severe summer storm events.

See Section 3.6 for a summary of modelling results under DWF conditions.

3.4 Proposed Sanitary Network

The Proposed Sanitary Drainage Network shown in drawing LSB-ARP-XX-XX-DR-CD-70000 and LSB-ARP-XX-XX-DR-CD-70001 in (Appendix B) shows the preliminary internal network of 250mm diameter pipes which were designed based on design flows in Table 15.

The proposed network has been designed with 6 connections to the existing municipal network which will allow for phased development.

The proposed sanitary connections to the municipal network are as follows:

- Block D1 will have two connections to the existing 375mm diameter sanitary sewer flowing south east along Park Lawn Road. Connections will be made to Manhole MH3003428 and MH3003429.

- Buildings B1-1, B1-2, B1-3, B1-4 and Block C and will discharge to a new 250mm pipe in private street C which will connect to existing 375mm diameter pipe along Park Lawn Road. A new manhole is required in the existing network to allow for the proposed site connection.

- Buildings B2-1, B2-2 and B2-3 will discharge to a new 250mm pipe which will connect to existing manhole MH3130906328 along Lake Shore Boulevard West.

- Blocks A1 and A2 will discharge to a new 250mm diameter pipe flowing anticlockwise within the loop road which will cross Lake Shore Boulevard West and connect to the existing 300mm diameter pipe along Lake Shore Boulevard West. A new manhole is required in the existing network to allow for the proposed site connection, this connection should be installed during the other planned modifications to this intersection.

- Blocks A3 and A4 will discharge to a new 250mm diameter pipe flowing clockwise within the loop road which will connect to the existing 300mm diameter pipe flowing north along Lake Shore Boulevard West. The connection to manhole MH3148606410 will need to be beneath the existing TTC and should be installed during the other planned modifications to this intersection.

- Blocks D3, E and F will discharge to a new 250mm diameter pipe flowing south along private street D and will connect to the new 250mm diameter pipe flowing clockwise within the loop road.

3.4.1 New Local Sewers

The design of new local sanitary sewers will be based on the sewage flows from ultimate buildup of the proposed development and expected from tributary area. All contributing peak flows should be accounted for sizing the sewer pipes.

3.4.2 Design Flows

Preliminary estimates of expected sanitary flow generation for each of the proposed buildings within the 2150 Lake Shore Boulevard Master Plan have been prepared in accordance with current City of Toronto standards, and are included in Appendix F.

Design Peak Flow

For designing new local sewers, the baseline peak flow rates from the criteria of 450 l/ca/day for residential (and considering Harmon peaking factor) and 180,000 Litres/ha/day for non-residential were used. The following peak flow rates for each block were calculated:

Table 15 - Proposed Peak Flow Rates

Block	**Residential**		**Commercial**			**Total**
	Population	Peak flow (l/sec)	GFA (m^2)	Eq. Population	Peak flow (l/sec)	**Peak Flow (l/sec)**
A	2,551	49.6	32,053	764	6.7	56.3
B	2,444	49.2	7,937	87	1.7	50.9
C	1,089	21.9	3,606	40	0.8	22.7
D	5,158	101.2	61,295	1,790	12.8	113.9
E	1,140	22.2	9,123	100	1.9	24.1
F	1,236	24.0	2,863	31	0.6	24.6
Total	13,617	268.2	116,877	2,813	24.3	292.5

Extraneous Flows

An allowance of 0.26 L/second/ha has been considered for groundwater and infiltration into the pipes and maintenance holes.

3.4.3 Downstream Flow Analysis

The preliminary downstream flow analysis used peak flow rates from the criteria of 240 Litres/capita/day for residential and 250 Litres/capita/day for non-residential. The contributing peak flow rates from the proposed development are summarised below.

Table 16 - Existing Downstream Sewer Flow Rates

Block	**Asset ID**	**Residential**		**Commercial**			**Total**
		Population	Peak Flow (l/sec)	GFA	Equivalent Population	Peak Flow (l/sec)	**Peak Flow (l/sec)**
A1 A2	CB3137606351	1,952	15.7	8,972	106	0.3	16.0
A3 A4	MH3148306388	599	5.0	23,081	658	1.8	6.8
B1	SL200958	736	5.9	3,526	39	0.1	6.0
B2	MH3130906328	1,708	13.8	4,411	49	0.1	13.9

Block	Asset ID	Residential		Commercial			Total
C	SL200947	1,089	8.8	3,606	40	0.1	8.9
D1	MH3003428	1,170	10.7	25,440	801	2.2	12.9
D2	MH3148306388	1,071	8.9	24,885	738	2.1	11.0
D3	MH3148306388	2,917	24.3	10,970	252	0.7	25.0
E	MH3148306388	1,140	9.5	9,123	100	0.3	9.8
F	MH3148306388	1,236	10.3	2,863	31	0.1	10.4
Total		**13,618**	112.9	**116,877**	2,814	7.8	120.7

3.5 Demand Reduction and TGS v3 Tier 3 Water Commitments

There are two key drivers that lead the design team to believe that the actual average sanitary generation from the proposed development will be significantly less than the baseline design criteria:

1. The sanitary criteria requires an average flow of 450 litres/capita/day for sizing of new local sewers which is 2.35 times higher than the potable water demands of 190 litres/capita/day, stated in the same guidelines for multi-unit buildings. The large average flow rate seen in the criteria may be to accommodate for any future increase in density, however considering types of the buildings for proposed development, it is highly unlikely that the density of this site could be increased. The large average flow rate seen in the criteria may also be to accommodate averages between single family dwellings and multi unit dwellings, however, all proposed unit will be multi-unit high-rise dwellings.

2. In line with the TGS requirements, building water demand reductions, as described in Section 2.5, will be reduced by an average of 44% to 107 Litres/capita/day, and therefore the sanitary flow generated will also be reduced. Hence, the proposed development inflows could be reduced for the downstream flow analysis.

The baseline flow rates in the Criteria do not well represent the likely site conditions for this development and therefore the following changes to the development flow rates are proposed in Table 17.

Table 17 - Proposed Reduced Sewer Per Capita Flow

Sector	Design Criteria Per capita Demand	Expected Per capita Demand
New Sewers		
Residential	450 litres/capita/day	252 litres/capita/day
Commercial/retail	180,000 litres/Ha/day	100,800 litres/Ha//day
Downstream flow analysis		
Residential	240 litres/capita/day	159 litres/capita/day
Commercial/retail	250 litres/capita/day	165 litres/capita/day

3.6 Hydraulic Modelling

A preliminary downstream analysis of the receiving sanitary sewers has been prepared using InfoWorks ICM. Three scenarios defined and analysed in order to assess performance of the downstream sewer system:

Existing Scenario

Estimates of sanitary flow generation from the existing developments which discharge to the existing network along Park Lawn Road, Lakeshore Boulevard, Marine Parade Drive, Palace Pier and the Gardiner have been prepared in accordance to the current City of Toronto standards and are included in Appendix F. The dry weather sanitary flows generated in the base scenario for the existing areas shown in figure 10 consists of wastewater and infiltration flows. The population for the surrounding developments was found through the combination of 2016 Census information and ZBA submissions for developments completed between 2016 and 2021. The population in the base scenario consists of four Dissemination Blocks and six developments that have been completed and are habitable. The flows generated from the wastewater flows has been calculated based off City of Toronto standards and available sanitary monitoring data in order to create an accurate base scenario.

Modeling parameters have been adjusted in the base scenario in order to match the current monitoring data. Finally, the infiltration flow has also been calculated for each area based off the monitoring data. The total infiltration for each network has been provided in the monitoring information data that was received and the infiltration factor has been adjusted based off the interpreted monitoring results in order to have an accurate base flow in the system. To create an accurate base model the wastewater and base flows for the 2 unfinished developments and 2150 Lakeshore have been set to zero as there should be negligible infiltration to the system from these sites as it is assumed that there is no direct sanitary connections.

Intermediate Scenario

In the Intermediate scenario the two unfinished developments noted above (As the approved development) were added to the base scenario listed above. The information for the population and area of these developments was found through the ZBA submission. The wastewater and infiltration flows for the two new developments were not based off the monitoring data as the buildings are not yet contributing to the system and instead the generated flows are were calculated based off the City of Toronto Design Criteria for Sewers and Watermains. A flow of 240 l/c/day for residential and 250 l/c/day for commercial was used to estimate the wastewater flows and a peaking factor was calculated by the use of the Harmon equation. As per city of Toronto standards the infiltration allowance for these sites has been set to 0.26 l/s/ha.

Proposed Scenario

In the Proposed scenario proposed development at 2150 Lakeshore Boulevard was added to the intermediate scenario explained above. As in the intermediate scenario the wastewater and infiltration flows were calculated based off the City of Toronto Design Criteria for sewers and watermains. A flow of 240 l/c/day for residential and 250 l/c/day for commercial was used to estimate the wastewater flows and a peaking factor was calculated by the use of the Harmon equation. As per city of Toronto standards the infiltration allowance for these sites has been set to 0.26 l/s/ha. It should be noted that this scenario also simulated based on 450 l/c/day generate rates for residential area.

the current model terminates upstream of the PS as the downstream boundary conditions of the model needs to be also verified in the later stages.

The modelling results and sewer profiles have been included as Appendix G. As indicated in this analysis, a summary of the site flows under existing and proposed conditions is as follows:

3.6.1 Existing Critical Pipe Capacity

- 375mm diameter pipe along Park Lawn Road – **175 l/s**
- 300mm diameter pipe along Lake Shore Boulevard West - **37 l/s**
- 225mm diameter pipe along Lake Shore Boulevard West **– 24 l/s**
- 675mm diameter pipe along Lake Shore Boulevard West - **285 l/s**
- 600mm pipe along Marine Parade Drive **– 120 l/s**
- 675mm pipe beneath the Gardiner - **333 L/s**

3.6.2 Existing DWF Conditions

- 375mm diameter pipe along Park Lawn Road is shown with spare capacity in the pipe
- 225mm diameter pipe along Lake Shore Boulevard West is shown with spare capacity in the pipe
- 300mm diameter pipe along Lake Shore Boulevard West is shown with spare capacity in the pipe
- 600mm pipe along Marine Parade Drive is shown with spare capacity in the pipe
- 675mm pipe beneath the Gardiner is shown with spare capacity in the pipe.

3.6.3 Proposed DWF Conditions

- 375mm diameter pipe along Park Lawn Road shown to with spare capacity in the pipe.
- 225mm diameter pipe along Lake Shore Boulevard West has no direct connections and is shown to with spare capacity in the pipe.
- 300mm diameter pipe along Lake Shore Boulevard West shown to exceed capacity under the DWF conditions, the pipe has been upgraded to a 450mm diameter.
- 600mm pipe along Marine Parade Drive is shown to with spare capacity in the pipe under DWF condition.
- 675mm pipe beneath the Gardiner is shown as capable of conveying the proposed development flows and is shown to with spare capacity in the pipe. The boundary condition of the model currently is set to free outfall and needs to be confirmed. In addition, existing pipe parameters needs to be confirmed, and the model will be fully calibrated once more flow data is available.

Based on the preliminary DWF conditions modeling results, there is a capacity issue in the existing network at Lake Shore Boulevard West to support the additional development flows and upgrades to this network are required along Lake Shore Boulevard. The model will be updated once more flow data is available which could change the results under both existing condition and post development scenarios.

3.6.4 Wet Weather Flow Conditions

Flow monitoring data thus far has not captured any major storm with intensity greater than a 1:2 year storm event. Hence it is not yet possible to accurately simulate WWF conditions. The WWF will be the critical scenario on the existing network and so the proposed design/upgrades are subject to change once the WWF data is available and additional upgrades may be required.

3.7 Potential Network Upgrades

Based on the DWF conditions simulation results Lake Shore Boulevard West system shown to exceed capacity under proposed conditions. In order to support the additional flows from the proposed development upgrades and mitigations are required to provide capacity in the system. The proposed upgrades are based on the DWF scenario and needs to be evaluated under WWF conditions (once data is available) and are subject to change.

3.7.1 Upgrades Existing Network

DWF modelling of the baseline flow rates indicate that upgrades may be required along Lake Shore Boulevard West to increase the capacity of the system and convey flows under post development conditions. As shown drawing LSB-ARP-XX-XX-DR-CD-70000 the existing 300mm pipe should be increased to a 450mm pipe between manhole MH3148606410 and MH3214406762.

Three additional manholes are proposed for the connections to existing network along Park Lawn and Lake Shore Boulevard West, the location of these are shown in drawing LSB-ARP-XX-XX-DR-CD-70000. The design of this would be captured in the later stages of design.

At present it is assumed that the existing Manhole MH3122906287 with a weir is configured to covey most of the flows from Park Lawn Road into Marine Parade Drive, with surcharge condition diverting flow along Lake Shore Boulevard West system. If under WWF conditions Marine Parade Drive is exceeding capacity, then upgrades to the weir height, benching or invert levels may be required in this manhole to divert more of the flows along Lake Shore Boulevard West. The design of this would be captured in the later stages of design.

It should be noted that, current Dry Weather Flow modelling results indicate that the current system has enough capacity to service first phase of development without any improvement. This assumption will also be reassessed based on future monitoring data and WWF modelling results.

Dry weather flow monitoring indicates that there is system capacity at the location where the flow crosses the Gardiner/GO Rail Corridor (675mm SAN). Final modelling results and required upgrades will be confirmed once required weather data is available and the boundary conditions are confirmed.

3.7.2 Existing Queensway Pumping Station

Once the network has crossed the Gardiner/GO Rail Corridor the flows are conveyed to Queensway Pumping Station (PS) and then pumped to the Humber Wastewater Treatment Plan. As indicated by Toronto Water (via e-mail on October 6th, 2020), the Queensway PS has 4 pumps, 120L/s discharge rate each, three on-duty and one stand-by. SCADA data was provided for August and September for the Queensway PS, however the information on typical pump configuration/capacity was not observed. Further data collection is anticipated to occur in the next stage of analysis.

- The nominal maximum capacity of three on-duty pumps at Queensway pumping station is estimated to be 360 L/s (Needs to be confirmed based on the pump configuration and other design parameters)

- Existing incoming peak design flow to the pumping station is 172.4 l/s under DWF (calculated by Toronto Water with theoretical values of 240L/cap/d, peaking factor 3, and I/I rate of 0.26 l/s/ha).
- DWF modelling indicates an existing flow rate of 120l/s from beneath the Gardiner to the pumping station and proposed from rate of 267 l/s for (Proposed scenario considering 250 l/c/day). There is an additional lateral connection to the pumping station from the west along Queensway (Dissemination Block #35201526023), estimated very low flow. These flow rates suggest that there is capacity in the PS to support the proposed development, however, the current model terminates upstream of the PS as the boundary conditions of the model needs to be verified in the later stages based on the actual design of the existing PS.

- WWF monitoring data is outstanding (monitoring data being collected) and the capacity of the PS will need to be reassessed once the WWF has been modelled.

Downstream of the pumping station Figure 12 indicates that the flows are conveyed into a 12” (300mm) forcemain. Comprehensive information on the forcemain is conflicting as GIS TWAG data indicates an additional 450mm forcemain. The capacity of these are subject to size of the sump/configuration of PS.

The forcemains ultimately discharge to a 600mm gravity main which connects to the 72” (1500mm) @0.06% trunk sewer before going to Humber WWTP (Limited information on other incoming flows, Toronto water to confirm available capacity in this network).

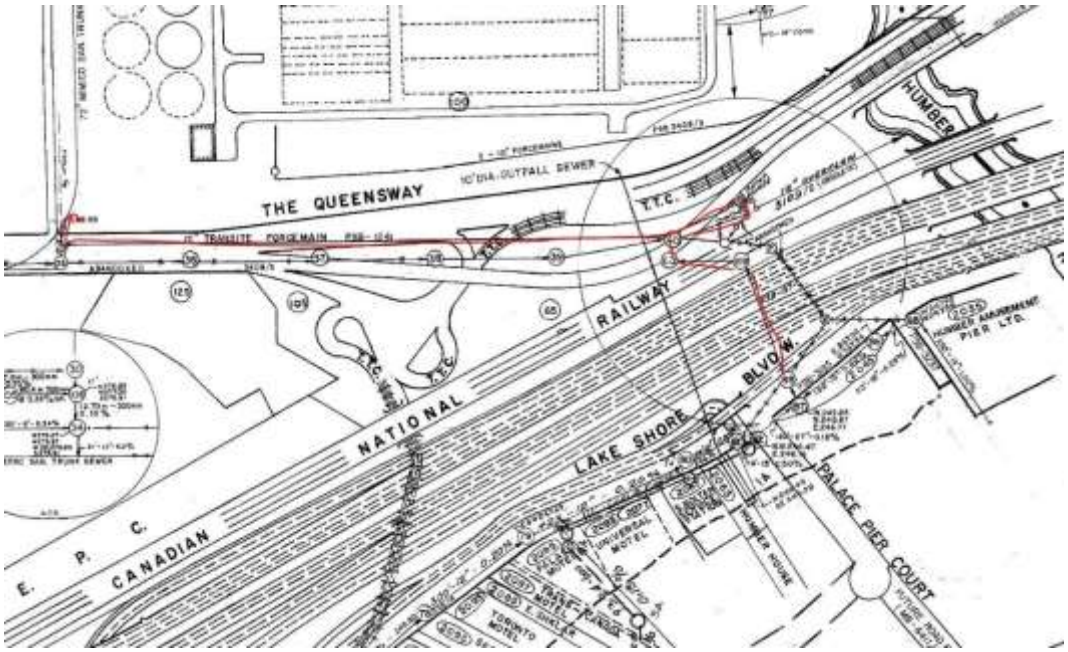


Figure 12 - Existing asset information from the Gardiner Expressway to Queensway Pumping Station and Humber Bay Shores WWTP (from Toronto Water Digital Mapping Group)

3.8 Next Steps

Further modelling is required to assess the need to upgrade existing network:

1. Identify discrepancies between TWAG GIS data and SUE information and update model accordingly.
2. Limit of the analysis as well as downstream boundary conditions should be confirmed by Toronto Water.
3. Additional DWF Monitoring data will eliminate uncertainty in existing development flow rates.
4. WWF Scenario will be analyzed on receipt of adequate data from the ongoing monitoring program to provide HGL assessment for both pre and post-development conditions. Mitigations will be reassessed based on the outcome of the WWF modelling.

As described in Section 3.5 it is expected that the proposed development flow rates used do not well represent the likely conditions when considering the baseline water consumption and the target demand reduction of 44% in line with the TGS requirements. Considering the phased development of the site, meters and flow monitors should be used to collect data on actual new building water consumption, building sewage generation and peak flows within the network. This will allow further calibration of the model and a better understanding if upgrades are required to the existing network, and at which Phase they will be required.

4 Stormwater System

A Stormwater Management Report has been prepared under separate cover for the Application which should be read in conjunction with the following section.

4.1 Introduction

This section outlines City of Toronto storm network design criteria, stormwater management strategy for the site and an analysis of the impact of the proposed development on the existing downstream storm sewer network.

4.2 Design Criteria and Assumptions

The stormwater management approach for new development site is driven by the relevant federal, provincial, and municipal legislation, by-laws and design guidelines and criteria. The governmentally mandated criteria include the following:

- City of Toronto's Wet Weather Flow Management (WWFM) guidelines (2006)
- City of Toronto's Design Criteria for Sewer and Watermains (DCSW, 2021)
- Toronto Green Standard (TGS, version 3, 2019)
- Toronto and Region Conservation Authority (TRCA) Stormwater Management Criteria (2012)
- The Ministry of Environment (MOE) Stormwater Management Planning and Design Manual (2003)

In accordance with the City of Toronto's WWFM guidelines, stormwater management systems for redevelopment areas will be required to control post-development flows from the 100-year storm event to 2-year pre-development levels.

Table 18 - Stormwater Management Design Criteria for Project Site

Criteria	Requirements	Governing Authority
Water Quality Management	Enhanced level of protection is required by long-term 80% removal of Total Suspended Solids (TSS) on an annual loading basis from all run-off leaving the proposed development site.	WWFMG – Section 2.2.2.1 (a)

Water Balance Management	In all cases, the minimum on-site runoff retention requires the proponent to retain all runoff from small design rainfall event- typically 5mm m (In Toronto, storms with 24- hour volumes of 5 mm or less contribute about 50% of the total average annual rainfall volume) through infiltration, evapotranspiration & rainwater reuse. Retain runoff generated from a minimum of 25 mm depth of rainfall from all site surfaces through infiltration, evapotranspiration and water harvesting and reuse.	WWFMG – Section 2.2.1.2 (2) Toronto Green Standards – Tier-1 Toronto Green Standards – Tier 3
Water Quantity - Erosion and Sediment Control	Regardless of size for all development sites, temporary erosion and sediment control for construction must be provided on-site.	WWFMG – Section 2.2.3.5 (a)
Water Quantity – Discharge criteria to municipal sewers	The allowable release rate to the municipal storm sewer system (minor system) from the development site during a 2-year design storm event must not exceed the peak runoff rate from the site under pre-development conditions during the same storm event, or existing capacity of the receiving storm sewer, whichever is less.	WWFMG – Section 2.2.3.7

4.3 Existing Conditions

The existing topography is generally sloping East towards Lake Shore Boulevard West and south towards the Park Lawn Road and Lake Shore Boulevard West intersection.

Stormwater management for the study area is achieved by a combination of major and minor system. Based on the TWAG data received from the City of Toronto, the surface runoff from the south west side of the site, drains into an existing 300mm and a 525mm diameter concrete pipe, which is located at the south end, along Lake Shore Boulevard West. These pipes drain eventually into the Mimico Creek outfall.

The Humber bay shore precinct is located to the east of the proposed site. The Functional Servicing Report for Humber Bay Shores Precinct was prepared by Schaeffer and Associates Ltd. in 2014. This report indicates that the east part of the proposed development along Lake Shore Boulevard West, drains to Lake Ontario. This runoff is conveyed as an overland flow via multiple lanes perpendicular to Lake Shore Boulevard West, acting as overland flow routes. Figure 13 indicates the overland flow routes from along the Lake Shore Boulevard

West and Park Lawn Road based on the available topographic information and the functional servicing report.

Figure 13 - Existing Overland Flow Routes (Background source: Google Maps)

4.3.1 Key Assumptions

Based on the available information and meeting with Toronto Water, following assumptions have been adopted:

- In absence of final geotechnical investigation results for the site, it is assumed that the infiltration rate and soil type as well as groundwater table will support current SWM design to achieve water balance, water quality and quantity targets. These calculations will be revised, upon receiving the actual infiltration rate values and other relevant geotechnical information.
- Based on preliminary investigations, infiltration rates for the native soil are estimated be in the range of 12 -30 mm/hr. The development lots of the site will be built up from existing levels using granular permeable material and so greater infiltration rates are anticipated. All the infiltration measures and parameters will be verified at the detailed design stage and all the stormwater management facilities with infiltration components will be reassessed and re-designed based on the final geotechnical information.

- The existing municipal network information is based on the TWAG data made available by the City of Toronto. This information will be confirmed and revised as a result of the SUE investigation.
- The relief road (Street A) is assumed to be an Arterial road and other streets within the site, to be collector roads. The drainage design for these roads is done to meet stormwater management requirements for these categories of roads.

4.4 Existing Storm Sewer System

The known existing stormwater infrastructure near the site is shown in Figure 14 in green. The CUMAP and TWAG asset records do not show a complete extent of any network within much of the site. It is therefore assumed that there may be a series of private/un-adopted sewers servicing the bulk of the industrial area.

TWAG data was used to ascertain existing utility information, findings of which has been discussed in the Existing infrastructure section. Based on the available information, it is assumed that the surface runoff from the previous use i.e. Christie Cookie Factory, drained in to a 300mm diameter concrete pipe located south of the site, which eventually outfalls into the Mimico Creek.

Figure 14 - Known Existing Storm Sewer Network (TWAG data)

Existing utility asset information has been ascertained from the Toronto Water Asset Group (TWAG). The asset mapping indicates the presence of storm sewers along roads surrounding the site. These mains are present in the following locations:

- Park Lawn Road - A 300mm concrete storm sewer flows south along Park Lawn Road towards the intersection where it is upsized to a 600 Vitrified Clay (VC) pipe and flows into the 900mm concrete pipe outfall to Mimico Creek.
- Marine Parade Drive – a 450mm concrete storm sewer collects flow from the bus loop at the intersection of Marine Parade Drive and Lake Shore Boulevard West and connects to the 900mm concrete outfall to Mimico Creek.
- Lake Shore Boulevard West – from west the intersection of the Marginal Boulevard and Lake Shore Boulevard West, a 250mm VC pipe (transitioning to 375mm and 525mm) flows towards Park Lawn Road. It is joined by a 525mm concrete pipe from the 2150 Lake Shore property, where it crosses Lake Shore Boulevard West in a 1200mm concrete sewer and turns to flow west on Lake Shore Boulevard West as a 750mm concrete pipe (see Figure 14). This pipe joins up with the 900mm outfall to Mimico Creek.

  The 525mm pipe appears to continue flowing west to meet up with the 600mm VC pipe at the intersection of Park Lawn Road and Lake Shore Boulevard West (to be confirmed in the field)

The current storm sewer network will be checked and updated using field data to ensure it is reflecting the current conditions. The current hydraulic capacity of these pipes is unknown. The design team will conduct existing network analysis to understand if any mitigation measures are required to support proposed developments upon receiving further information.

4.5 Proposed Stormwater Management Strategy

4.5.1 Key Drivers

The stormwater management and drainage strategy must consider; proposed site levels, infiltration rates, the capacity of existing's sewers, the proposed landscape strategy, and the level of flood protection to be provided (1:100-year storm).

4.5.2 Stormwater Strategy

The stormwater management strategy aims to meet WWFMG criteria for water balance and water quality by retaining 25 mm of rainfall onsite and control the run-off from the development blocks to 2-year pre-development allowable release rates.

Overland flow from the retention features will be drained to minor system which will eventually join Lake Shore and Park Lawn Road sewer system, before draining into the Mimico Creek through the existing outfall.

The surface runoff exceeding 2-year pre-development allowable release rates where it is practical will flow through an approved existing overland flow route to

the outfall. To address conveyance requirements of the system, the capacity of the existing minor and major systems should be evaluated, and any required upgrades for the existing network and the outfall needs to be considered for this design approach.

The proposed storm water strategy is discussed in more detail in the Stormwater Management Report. Drawings LSB-ARP-XX-XX-DR-CD-60000 and LSB-ARP-XX-XX-DR-60001 in Appendix B, represents the stormwater management plan for 2150 Lake Shore.

4.5.3 Baseline Conditions

The baseline conditions for the project site are summarized in Table 19, based on the City storm drainage plan MC 2525/3 as received on 27th January 2021.

The baseline conditions for the project site are summarized in Table 19.

Table 19 - Baseline Conditions of Project Site

Site Area (ha)	Percent Impervious (%)	Composite Runoff Coefficient
11.13	78	0.76

4.5.4 Proposed Conditions

The proposed conditions of the project site are summarized in Table 20 and Table 21. The proposed site is divided into separate catchments, based on the proposed development blocks. The development blocks are private property and consists of buildings, podium, and landscape area. The development blocks are connected by internal loop road which is a public right of way, a public and a private street and a pedestrian street. The internal loop will consist of a dedicated lane for TTC streetcar.

Table 20 - Proposed Conditions of Project Site

Site Area (ha)	Percent Impervious (%)	Composite Runoff Coefficient
11.13	65	0.69

Table 21 - Breakdown of Areas in Proposed Condition

Land Cover	Area (ha)	Percent of Site Area (%)	Runoff coefficient
Hardscape	7.25	65	0.9
Landscape	2.58	23	0.25
Green Roof	1.30	12	0.25
Total	11.13	100	

4.5.5 Water Balance

The primary objective of the Water Balance criteria is to preserve the pre-development hydrology by capturing and managing the annual rainfall on the development site.

The project is targeting to meet TGS Tier 3 requirements for Water Balance, where at minimum., the first 25mm generated runoff from every storm event must be retained from all site surfaces through infiltration, evapotranspiration, water harvesting and water reuse. The water balance target for the project site will be re-evaluated at Site Plan stage.

The total volume of water retention required to retain 25mm of runoff on site, without considering initial abstraction is 2721 m^3. This has been determined as outlined in Table 22.

Table 22 - Water Balance Volume Calculation

Land Use	**Area (ha)**	**Water Depth Retention Through Initial Abstraction and Green Roof (mm)**	**Volume Retained on Site (m3)**	**Volume of Retention Required for 25mm (m3)**
Roof Area – Green	1.3	25.0*	325	325
Roof Area – Hardscape**	0.9	25.0*	217	217
Landscape	2.5	5.0	126	630
Hardscape	6.2	1.2	74	1549
Total	**10.9**		**743**	**2721**
Volume of runoff retained by soil cells within Public ROW (m^3)				**963**
Volume to be Retained by RWH tanks and underground geocellular facilities under Park and Boulevard square (m^3)				**1016**

*Green roofs would be designed to capture runoff due to 25mm of rainfall on the total available roof area.
** The hardscape roof area represents 40% of the available roof area. Not all building towers are designed to have green roof. Area for such roofs is accounted within the “Hardscape” area.

The design team aims to meet the water balance requirements with the use of green roofs, rainwater harvesting tanks at block level and soil cells within the public right of way. Large geocellular storage beneath the Christie Park and Boulevard square with infiltration provided at the bottom to capture runoff from park and adjacent development blocks.

4.5.6 Water Quantity Control

Water Quantity targets focus primarily on flood flow management and erosion control aimed to minimize the impacts on downstream flooding, stream bank erosion, and overflows of infrastructure. For discharge into existing sewer according to the WWFM guidelines, the allowable release rate to the municipal storm sewer system during a 2-year design storm event must not exceed the peak

runoff rate from the site under pre-development conditions during the same storm event, or existing capacity of the receiving storm sewer (whichever is less).

The collection of total run-offs from the development plots is managed by controlling the flows to the allowable 2-year pre-development rate. The public and private streets within the project site are identified as collector road and the relief road is categorised as an arterial road. Dual drainage system has been considered to collect and convey stormwater flows for these roads. The minor system of the proposed roads is to design to capture and convey 5 and 10- year peak flow rates. For runoff generated by storm events greater than this, flow will be limited via inlet control devices and allowing the excess runoff to be conveyed to the outfall following an approved overland flow route. During severe storm events, the street would act as an open channel and will be designed accordingly.

The existing site has extensive impervious area which is greater than 50% of the total site area. The run-off coefficient from the existing site is limited to 0.5 per WWMG guidelines for water quantity assessment. Table 23 presents the preliminary targeted allowable runoff rate from all the proposed development plots and roads.

Table 23 - Preliminary allowable release rate for the development plots

Plots	Area (ha)	Allowable Release rate (l/s)
A	1.95	238.7
B	1.09	134.2
C	0.67	82.3
D1	0.83	101.7
D2 & D3	1.87	229.2
E	0.53	64.9
F	0.41	49.7
Portion of relief Road within property boundary	0.33	74.5
Public Street B	1.30	238.3
Public Street C	0.12	22.0
Private Street D	0.21	38.6

It is assumed that existing overland flow route to the outfall are approved by the city. If no approved overland flow route exists, alternative solution for stormwater strategy is to fully capture the 100-year flows and discharging at the existing Mimico creek outfalls using existing municipal storm network. This will be achieved by providing cross-falls and longitudinal grading of the roads towards catch basins located at low points. The existing downstream system will be assessed, and any required mitigation/upgrade will be proposed. TRCA requirements also needs to be followed at the existing Mimico Creek outfall.

4.5.7 Water Quality Control and Erosion and Sediment Control

WWFM guidelines in line with MOE SWM Planning and Design Manual, requires long term 80% removal of TSS on an average annual loading basis from all runoff leaving the proposed development site based on the post-development level of imperviousness. Retaining 25mm of rainfall on site to meet water balance target, will satisfy not only water quality target of 80% TSS removal from 90% average annual rainfall but also erosion and sediment control requirements for the site.

4.5.8 Proposed Storm Servicing

The proposed network, including the connection to the existing network on Park Lawn and Lake Shore, is shown in Appendix C of the Stormwater management report. It includes pipes of 300mm, 375mm, 450mm and 525mm diameter proposed along Street B, Street C, Private street D and a portion of the relief road between Plot E and Plot F.

A storm sewer is proposed beneath The Mews (area between B1 and B2 buildings) connecting to the existing manhole MH3003495 on Park Lawn Road.

A 450mm diameter pipe is proposed from the relief road and Block F to existing manhole MH3159006428 on Lake Shore Boulevard West.

Two pipe runs within the loop road, both reaching 525mm diameter, connecting to existing manhole MH3147506388 and existing 525mm pipes. It is recommended to make these connections at the same time as planned upgrades to these intersections.

The final alignment and size of the storm sewers will be designed and confirmed at detailed design stage.

4.6 Potential Network Upgrades

Based on the simulation results the existing stormwater systems along Lakeshore Boulevard West and Park Lawn Road have shown to exceed capacity under proposed conditions. To support the additional flows from the proposed development, upgrades and mitigation are required to provide capacity in the system. The current modelling and proposed upgrades are based the available TWAG data as provided by City of Toronto under post-development conditions. The current hydraulic model and proposed upgrades will be re-evaluated upon receiving further results of the SUE investigation. Please note complete assessment of the Mimico Creek outfall and any potential upgrade needs to be confirmed with TRCA.

Table 24 presents the potential upgrades proposed to the existing storm sewer network.

Table 24 - Potential Upgrades to Existing Storm Sewer Network

Location	Manhole		Storm Sewer Diameter (mm)	
	U/s	D/s	Ex.	Prop.
Lakeshore Boulevard West	MH3159006428	MH3157006421	250	450
	MH3157006421	MH3147506388	375	450
	MH3147506388	MH3138906358	525	600
Park Lawn Road	MH3003440	MH3003480	300	375
	MH3003480	MH3003497	300	375
	MH3003497	MH3003495	375	450

4.7 Summary and Next Steps

This section presents the proposed overview of stormwater management strategy and design of the proposed development at 2150 Lake Shore. Technical requirements including Quantity, Quality, Water Balance and Erosion control also have been outlined and addressed as outlined in the City of Toronto Sewer and Watermain Design and Wet Weather Flow Management Guidelines.

Proposed public roads will be designed considering dual drainage methodology. The minor system is sized based on 10 and 5-Year storm events, considering the category of the proposed road. Any runoff exceeding minor system design storm capacity shall be carried by proposed ROWs, Lake Shore Boulevard West, and Park Lawn Road. It is assumed that approved overland flow route to the outfall are available.

The enhanced water quality control targets required 80% removal of TSS on annual loading from the annual average runoff. Retaining 25mm of rainfall on site will satisfy not only water quality target of 80% TSS removal from 90% average annual rainfall but also erosion and sediment control requirements for the site.

5 Site Grading

Preliminary grading has been completed with the following objectives:

- Match existing elevations at the project limits (Park Lawn Road, Lake Shore Boulevard West, GO Rail Corridor, Gardiner Expressway);
- Allow for relief road underpass at the GO Rail Corridor; and

- Respect the stormwater management requirements and provide passive flood protection from buildings

For the proposed site levels grading plan, cut and fill isopach and grading long sections, refer to drawings LSB-ARP-XX-XX-DR-CE-20001, LSB-ARP-XX-XX-DR-CE-20002 and LSB-ARP-XX-XX-DR-CE-21001- LSB-ARP-XX-XX-DR-CE-21006.

As the design progresses into the next stage, the grading will be developed to ensure it:

- is within the City's criteria for minimum and maximum slopes;
- optimizes cut/fill where possible;
- favours universal accessibility;
- achieves required cover over basement structures for utilities and planting; and
- has detailed passive flood protection in specific areas within the Master Plan to meet the stormwater management requirements.

For information on the soil profile and ground conditions refer to the Preliminary Geotechnical Study which summarizes the findings from available geotechnical investigations and provides assessment on the soil, bedrock and groundwater characteristics of the subject property.

6 Groundwater

A report consisting of Hydrological Review of the proposed site has been prepared in accordance with the requirements set out by the City of Toronto. It was submitted to the City on 15th May 2020 and since then there has been no significant changes to the report.

This report summarizes findings from available relevant investigations and provides an analysis of available groundwater information and can be found attached to the Functional Servicing Report as Appendix I for further details.

During construction of the basements it is anticipated that the groundwater level will have to be lowered below the bottom of the proposed excavation. The Hydrological Review report discusses the analytical assessment and anticipated groundwater discharge for each basement. The anticipated discharge from each basement is less than 1 litre per second. The quantity of groundwater discharge from basement will be revised based on the outcome of further investigation.

The groundwater quality sampling and testing for the purpose of groundwater discharge will be carried out as part of further investigation at the site.

Current hydraulic models do not consider groundwater discharge into the municipal sewers. The groundwater discharge strategy will be established, and hydraulic models and downstream capacity analysis will be updated, upon receiving further information.

Appendix A

Land Use, Population & Massing

Appendix B

Drainage, Utility and Grading Drawings

Appendix C

Existing & Proposed Hydrant Tests

Appendix D

Watermain Demand Calculations

Appendix E

Water Modelling Output

Appendix F

Sanitary Flow Calculations

Appendix G

Sanitary Modelling Output

Appendix H

Flow Monitoring Report

Appendix I

Hydrological Review

Appendix A

Land Use, Population & Massing

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Area Schedule

Zone	Plot	Building	Use	GBA_sqm	GBA_sqft	GFA_sqm	GFA_sqft	Studio	1BDR	1BDR+DEN	2BDR	2BDR+DEN	3BDR	Total
A														
	A1													
		A1-1												
			Residential	39,508	425,259	34,767	374,228	22	76	147	67	89	45	446
			Retail	1,289	13,876	1,160	12,488	0	0	0	0	0	0	0
		A1-1 Total		40,797	439,135	35,927	386,716	22	76	147	67	89	45	446
		A1-2												
			Residential	22,734	244,707	20,006	215,342	13	44	85	39	51	26	258
		A1-2 Total		22,734	244,707	20,006	215,342	13	44	85	39	51	26	258
		A1-Market Building												
			Retail	2,006	21,592	1,805	19,433	0	0	0	0	0	0	0
		A1-Market Building Total		2,006	21,592	1,805	19,433	0	0	0	0	0	0	0
		A1-Podium												
			Employment	353	3,796	318	3,416	0	0	0	0	0	0	0
			Residential	1,167	12,557	1,027	11,050	1	2	4	2	3	1	13
			Retail	3,995	43,000	3,596	38,700	0	0	0	0	0	0	0
		A1-Podium Total		5,515	59,353	4,940	53,167	1	2	4	2	3	1	13
	A1 Total			**71,052**	**764,787**	**62,679**	**674,658**	**36**	**122**	**236**	**108**	**143**	**72**	**717**
	A2													
		A2-1												
			Residential	31,377	337,737	27,612	297,209	18	60	117	53	71	35	354
			Retail	605	6,511	545	5,860	0	0	0	0	0	0	0
		A2-1 Total		31,982	344,248	28,156	303,068	18	60	117	53	71	35	354
		A2-Podium												
			Residential	431	4,635	379	4,079	0	1	2	1	1	0	5
			Retail	1,721	18,529	1,549	16,676	0	0	0	0	0	0	0
		A2-Podium Total		2,152	23,164	1,928	20,755	0	1	2	1	1	0	5
	A2 Total			**34,134**	**367,412**	**30,084**	**323,823**	**18**	**61**	**119**	**54**	**72**	**35**	**359**
	A3													
		A3-1												
			Employment	10,344	111,337	9,310	100,203	0	0	0	0	0	0	0
		A3-1 Total		10,344	111,337	9,310	100,203	0	0	0	0	0	0	0
		A3-2												
			Employment	2,110	22,717	1,899	20,445	0	0	0	0	0	0	0
		A3-2 Total		2,110	22,717	1,899	20,445	0	0	0	0	0	0	0
		A3-3												
			Employment	6,325	68,080	5,693	61,272	0	0	0	0	0	0	0
		A3-3 Total		6,325	68,080	5,693	61,272	0	0	0	0	0	0	0
		A3-Podium												
			Employment	1,629	17,532	1,466	15,779	0	0	0	0	0	0	0
			Retail	1,739	18,721	1,565	16,849	0	0	0	0	0	0	0
		A3-Podium Total		3,368	36,253	3,031	32,628	0	0	0	0	0	0	0
	A3 Total			**22,147**	**238,387**	**19,932**	**214,548**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	A4													
		A4-1												
			Residential	24,377	262,393	21,452	230,906	14	47	91	41	55	28	276
			Retail	443	4,771	399	4,294	0	0	0	0	0	0	0
			Community	901	9,704	811	8,734	0	0	0	0	0	0	0
		A4-1 Total		25,721	276,868	22,661	243,933	14	47	91	41	55	28	276
		A4-2												
			Residential	3,774	40,621	3,321	35,746	2	7	14	6	9	4	42
		A4-2 Total		3,774	40,621	3,321	35,746	2	7	14	6	9	4	42
		A4-Podium												
			Residential	1,016	10,936	894	9,624	1	2	4	2	2	1	12
			Retail	2,067	22,244	1,860	20,020	0	0	0	0	0	0	0
			Community	87	940	78	846	0	0	0	0	0	0	0
		A4-Podium Total		3,170	34,120	2,833	30,489	1	2	4	2	2	1	12
	A4 Total			**32,665**	**351,609**	**28,815**	**310,169**	**17**	**56**	**109**	**49**	**66**	**33**	**330**
A Total				**159,998**	**1,722,195**	**141,511**	**1,523,199**	**71**	**239**	**464**	**211**	**281**	**140**	**1,406**
B														
	B1													
		B1-1												
			Residential	19,808	213,207	17,431	187,622	11	38	74	34	45	22	224
		B1-1 Total		19,808	213,207	17,431	187,622	11	38	74	34	45	22	224
		B1-2												
			Residential	8,075	86,916	7,106	76,486	5	16	30	14	18	9	92
			Retail	257	2,761	231	2,485	0	0	0	0	0	0	0
		B1-2 Total		8,332	89,677	7,337	78,971	5	16	30	14	18	9	92
		B1-3												
			Residential	7,211	77,619	6,346	68,305	4	14	27	12	16	8	81
		B1-3 Total		7,211	77,619	6,346	68,305	4	14	27	12	16	8	81
		B1-Podium												
			Residential	782	8,414	688	7,404	0	2	3	1	2	1	9
			Retail	2,216	23,856	1,994	21,470	0	0	0	0	0	0	0
			Community	1,445	15,556	1,301	14,000	0	0	0	0	0	0	0
		B1-Podium Total		4,443	47,826	3,983	42,875	0	2	3	1	2	1	9
	B1 Total			**39,794**	**428,329**	**35,097**	**377,773**	**20**	**70**	**134**	**61**	**81**	**40**	**406**
	B2													
		B2-1												
			Residential	33,779	363,594	29,726	319,963	19	65	126	57	76	38	381
			Retail	1,981	21,319	1,783	19,187	0	0	0	0	0	0	0
		B2-1 Total		35,760	384,913	31,508	339,150	19	65	126	57	76	38	381
		B2-2												
			Residential	47,756	514,045	42,025	452,360	27	92	178	81	108	54	540
		B2-2 Total		47,756	514,045	42,025	452,360	27	92	178	81	108	54	540
		B2-3												
			Residential	995	10,707	876	9,422	1	2	4	2	2	1	12
		B2-3 Total		995	10,707	876	9,422	1	2	4	2	2	1	12
		B2-Podium												
			Residential	770	8,290	678	7,295	0	1	3	1	2	1	8

B	B2	B2-Podium	Retail	2,920	31,433	2,628	28,290	0	0	0	0	0	0	0
		B2-Podium Total		3,690	39,723	3,306	35,585	0	1	3	1	2	1	8
	B2 Total			**88,201**	**949,388**	**77,715**	**836,516**	**47**	**160**	**311**	**141**	**188**	**94**	**941**
B Total				**127,995**	**1,377,717**	**112,812**	**1,214,289**	**67**	**230**	**445**	**202**	**269**	**134**	**1,347**
C														
	C													
		C-1												
			Residential	39,648	426,772	34,890	375,559	22	76	148	67	90	45	448
		C-1 Total		39,648	426,772	34,890	375,559	22	76	148	67	90	45	448
		C-2												
			Residential	3,620	38,964	3,186	34,288	2	7	13	6	8	4	40
		C-2 Total		3,620	38,964	3,186	34,288	2	7	13	6	8	4	40
		C-3												
			Residential	9,175	98,757	8,074	86,906	5	18	34	16	21	10	104
		C-3 Total		9,175	98,757	8,074	86,906	5	18	34	16	21	10	104
		C-Podium												
			Residential	762	8,199	671	7,215	0	1	3	1	2	1	8
			Retail	4,007	43,132	3,606	38,819	0	0	0	0	0	0	0
		C-Podium Total		4,769	51,331	4,277	46,034	0	1	3	1	2	1	8
	C Total			**57,212**	**615,824**	**50,427**	**542,788**	**29**	**102**	**198**	**90**	**121**	**60**	**600**
C Total				**57,212**	**615,824**	**50,427**	**542,788**	**29**	**102**	**198**	**90**	**121**	**60**	**600**
D														
	D1													
		D1-1												
			Residential	56,740	610,748	49,931	537,458	32	109	211	96	128	64	640
		D1-1 Total		56,740	610,748	49,931	537,458	32	109	211	96	128	64	640
		D1-2												
			Employment	7,740	83,315	6,966	74,984	0	0	0	0	0	0	0
		D1-2 Total		7,740	83,315	6,966	74,984	0	0	0	0	0	0	0
		D1-3												
			Employment	16,656	179,288	14,990	161,359	0	0	0	0	0	0	0
		D1-3 Total		16,656	179,288	14,990	161,359	0	0	0	0	0	0	0
		D1-Podium												
			Employment	1,918	20,641	1,726	18,577	0	0	0	0	0	0	0
			Residential	431	4,642	379	4,085	0	1	2	1	1	0	5
			Retail	1,953	21,018	1,758	18,916	0	0	0	0	0	0	0
		D1-Podium Total		4,302	46,301	3,863	41,578	0	1	2	1	1	0	5
	D1 Total			**85,438**	**919,652**	**75,751**	**815,379**	**32**	**110**	**213**	**97**	**129**	**64**	**645**
	D2													
		D2-1												
			Residential	51,667	556,135	45,467	489,399	29	99	193	88	117	58	584
		D2-1 Total		51,667	556,135	45,467	489,399	29	99	193	88	117	58	584
		D2-2												
			Employment	21,617	232,688	19,455	209,419	0	0	0	0	0	0	0
		D2-2 Total		21,617	232,688	19,455	209,419	0	0	0	0	0	0	0
		D2-Podium												
			Employment	1,801	19,389	1,621	17,450	0	0	0	0	0	0	0
			Residential	481	5,182	423	4,560	0	1	2	1	1	1	6
			Retail	4,232	45,552	3,809	40,997	0	0	0	0	0	0	0
		D2-Podium Total		6,514	70,123	5,853	63,007	0	1	2	1	1	1	6
	D2 Total			**79,798**	**858,946**	**70,775**	**761,825**	**29**	**100**	**195**	**89**	**118**	**59**	**590**
	D3													
		D3-1												
			Residential	50,680	545,520	44,598	480,058	29	97	189	86	114	57	572
		D3-1 Total		50,680	545,520	44,598	480,058	29	97	189	86	114	57	572
		D3-2												
			Residential	40,893	440,171	35,986	387,350	23	78	152	69	92	46	460
		D3-2 Total		40,893	440,171	35,986	387,350	23	78	152	69	92	46	460
		D3-3												
			Residential	48,596	523,081	42,764	460,311	27	93	181	82	110	55	548
		D3-3 Total		48,596	523,081	42,764	460,311	27	93	181	82	110	55	548
		D3-Podium												
			Residential	2,413	25,970	2,123	22,854	1	5	9	4	5	3	27
			Retail	861	9,264	775	8,338	0	0	0	0	0	0	0
			School (poten	9,823	105,731	8,841	95,158	0	0	0	0	0	0	0
			Community	1,505	16,200	1,355	14,580	0	0	0	0	0	0	0
		D3-Podium Total		14,602	157,165	13,094	140,929	1	5	9	4	5	3	27
	D3 Total			**154,771**	**1,665,937**	**136,442**	**1,468,648**	**80**	**273**	**531**	**241**	**321**	**161**	**1,607**
D Total				**320,007**	**3,444,535**	**282,968**	**3,045,853**	**141**	**483**	**939**	**427**	**568**	**284**	**2,842**
E														
	E													
		E-1												
			Residential	47,438	510,614	41,745	449,340	27	91	177	80	107	54	536
		E-1 Total		47,438	510,614	41,745	449,340	27	91	177	80	107	54	536
		E-2												
			Residential	7,430	79,972	6,538	70,375	4	14	28	13	17	8	84
		E-2 Total		7,430	79,972	6,538	70,375	4	14	28	13	17	8	84
		E-Podium												
			Residential	706	7,603	621	6,691	0	1	3	1	2	1	8
			Retail	3,427	36,892	3,084	33,203	0	0	0	0	0	0	0
			Community	6,710	72,222	6,039	65,000	0	0	0	0	0	0	0
		E-Podium Total		10,843	116,717	9,745	104,893	0	1	3	1	2	1	8
	E Total			**65,711**	**707,303**	**58,028**	**624,609**	**31**	**106**	**208**	**94**	**126**	**63**	**628**
E Total				**65,711**	**707,303**	**58,028**	**624,609**	**31**	**106**	**208**	**94**	**126**	**63**	**628**
F														
	F													
		F-1												
			Residential	53,294	573,651	46,899	504,813	30	102	199	90	120	60	601
		F-1 Total		53,294	573,651	46,899	504,813	30	102	199	90	120	60	601
		F-2												
			Residential	2,865	30,839	2,521	27,138	2	5	11	5	6	3	32
		F-2 Total		2,865	30,839	2,521	27,138	2	5	11	5	6	3	32
		F-Podium												
			Residential	4,296	46,245	3,780	40,696	2	8	16	7	10	5	48
			Retail	3,181	34,239	2,863	30,815	0	0	0	0	0	0	0
		F-Podium Total		7,477	80,484	6,643	71,511	2	8	16	7	10	5	48
	F Total			**63,636**	**684,974**	**56,063**	**603,462**	**34**	**115**	**226**	**102**	**136**	**68**	**681**
F Total				**63,636**	**684,974**	**56,063**	**603,462**	**34**	**115**	**226**	**102**	**136**	**68**	**681**

Grand Total		**794,559**	**8,552,548**	**701,809**	**7,554,199**	**373**	**1,275**	**2,480**	**1,126**	**1,501**	**749**	**7,504**

GBA TOTALS	Use Type	GBA_sqm	GBA_sqft	GFA_sqm	GFA_sqft
	Retail	38,900	418,710	35,010	376,839
	Residential	664,695	7,154,702	584,932	6,296,138
	Employment	70,493	758,783	63,444	682,905
	School (potential)	9,823	105,731	8,841	95,158
	Community	10,648	114,622	9,583	103,160
	Grand Total	**794,559**	**8,552,548**	**701,809**	**7,554,199**

Appendix B

Drainage, Utility and Grading Drawings

A1

N

Existing services within the rail link extent to be addressed in future stages of work once discussions with Metrolinx progress.

GARDINER EXPY

PARK

STATION SQUARE

STREET B

STREET C

PEDESTRIAN STREET

LANE

A1 MARKET BUILDING

GALLERIA

BOULEVARD SQUARE

PARK LAWN ROAD

LAKE SHORE BOULEVARD WEST

THE MARGINAL BLVD

SILVER MOON DR

ANNIE CRAIG DR

SHORE BREEZE DR

F-1 F-2 E-1 E-2 D3-1 D3-2 D3-3 D2-1 D2-2 D1-1 D1-2 A3-1 A3-2 A3-3 A4-1 A4-2 A2-1 A2-2 A1-1 A1-2 A1-3 C-1 C-2 C-3 B1-1 B1-2 B1-3 B1-4 B2-1 B2-2 B2-3

0 5 10 20 50 Metres

Scale 1:1000

Do not scale

© Arup

Notes

1. All coordinates are in metres and referenced to Zone 10 of the Ontario Coordinate System, NAD (North American Datum) 1927, 1968 adjustment, 3 degree MTM (NAD 27 MTM 3 degrees Zone 10)
4. Existing services are based in the topographical survey issued by EllisDon on 24 February 2020 and TWAG information provided by Toronto Water on 04 February 2020.
5. Connection to existing networks is subject to agreement with statutory authorities and approving bodies.
6. Location and extent of existing services is indicative only and is intended to identify approximate location of main service corridors. For full details refer to utility providers record drawings or topographical survey.
7. Off-site reinforcement and temporary construction services are excluded from this drawing.
8. Proposed network design, plot connections and details are indicative only and are subject to approval.
9. Conflicts with existing utilities and other proposed works should be notified to the Engineer of Record.

Legend

- Site Boundary
- Basement/Tunnel Extent
- Extent of Right-of-way

Existing Utilities

- Sanitary Network
- Stormwater Network
- Water Network
- Intermediate pressure gas main
- High pressure gas main
- Bell Telecommunications Network
- Rogers Telecommunications Network
- Street Lights
- Hydro (Electrical Network)
- Overhead Electrical
- Rail Signal
- Existing Utilities to be abandoned or diverted

Proposed Utilities

- Sanitary Sewer and Manhole
- Stormwater Sewer and Manhole
- Stormwater Force Main
- Pumping Station
- Park area including SWM facility with infiltration
- Soakaway pit with Infiltration capacity
- Soil Cells with Infiltration Capacity
- Soft Landscape
- Water Main
- Gas Main Intermediate and High pressure
- Bell Telecommunications Network
- Rogers Telecommunications Network
- Hydro Network (high and low voltage)

Rev	Date	By	Chkd	Appd
02	26/02/21	AF	FF	HJ
Zoning By-Law Application r1				
01	15/05/20	AF	FF	HJ
For planning submission				

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LICENSED PROFESSIONAL ENGINEER
H. R. T. JEENS
100517802
26/02/2021
PROVINCE OF ONTARIO

Client
First Capital (Park Lawn) Corporation and 2253213 Ontario Limited

Project Title
2150 Lake Shore

Drawing Title
Composite Landscape and Utilities Plan

Scale at Arch D
1:1000

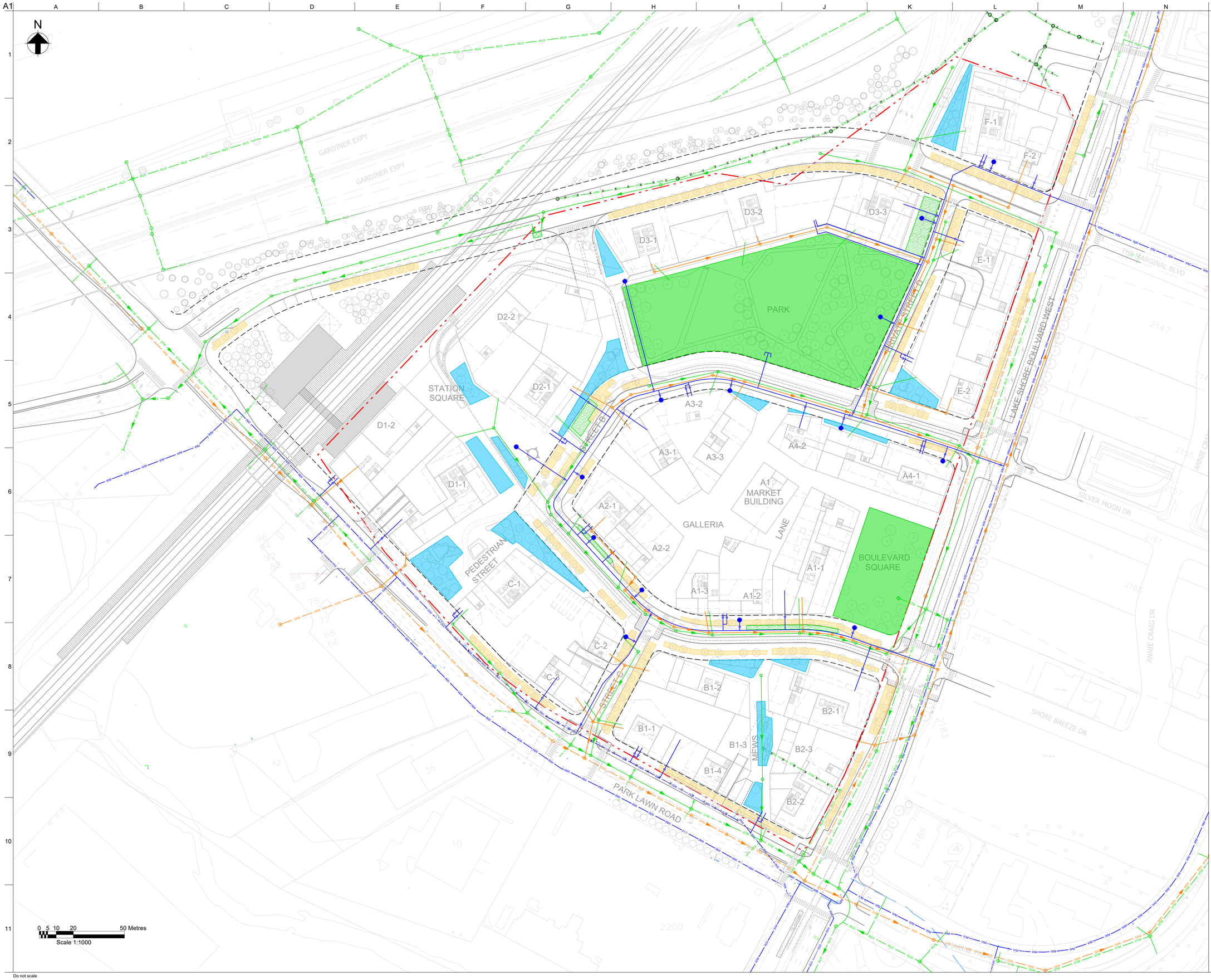
Role
Civil

Suitability
Detailed Masterplan

Arup Job No
277167

Rev
02

Name
LSB-ARP-XX-XX-DR-CU-80000



Notes

1. All coordinates are in metres and referenced to Zone 10 of the Ontario Coordinate System, NAD (North American Datum) 1927, 1968 adjustment, 3 degree MTM (NAD 27 MTM 3 degrees Zone 10)
4. Existing services are based in the topographical survey issued by EllisDon on 24 February 2020 and TWAG information provided by Toronto Water on 04 February 2020.
5. The design of the wet services should comply with Design Criteria for Sewers and Watermains, 2nd edition, January 2021 and Wet Weather Flow Management Guidelines, November 2006.
6. All manholes in the carriageway should be suitable to vehicle loading and finished to same skid resistance as adjacent carriageway.
7. Connection to existing networks is subject to agreement with Toronto Water.
8. Location and extent of existing services is indicative only and is intended to identify approximate location of main service corridors. For full details refer to utility providers record drawings or topographical survey.
9. Off-site reinforcement and temporary construction services are excluded from this drawing.
10. Proposed network design, plot connections and details are indicative only and are subject to approval by Toronto Water and the building designer.
11. Extent of proposed geocellular storage, soil cells and permeable pavement is indicative only and subject to further detailed modelling.

Legend

- Site Boundary
- Basement/Tunnel Extent
- Extent of Right-of-way

Existing Utilities

- Sanitary Network
- Stormwater Network
- Water Network
- Existing Utilities to be abandoned or diverted

Proposed Utilities

- Stormwater Sewer and Manhole
- Stormwater Force Main
- Pumping Station
- Park area including SWM facility with infiltration
- Soakaway pit with Infiltration capacity
- Soil Cells with Infiltration Capacity
- Soft Landscape
- Water Main

Rev	Date	By	Chkd	Appd
02	26/02/21	AF	FF	HJ
Zoning By-Law Application r1				
01	15/05/20	AF	FF	HJ
For planning submission				

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100517802
26/02/2021
PROVINCE OF ONTARIO

Client
First Capital (Park Lawn) Corporation and 2253213 Ontario Limited

Project Title
2150 Lake Shore

Drawing Title
Public Utilities Plan

Scale at Arch D
1:1000

Role
Civil

Suitability
Detailed Masterplan

Arup Job No
277167

Rev
02

Name
LSB-ARP-XX-XX-DR-CU-80001

A1

N

PARK

Plot D3 and respective buildings to discharge stormwater run-off to geocellular storage under the park

STATION SQUARE

PRIVATE STREET D

LAKE SHORE BOULVARD WEST

THE MARGINAL BLVD

GARDINER EXPY

STREET B

PEDESTRIAN STREET

STREET C

MEWS

LANE

GALLERIA

A1 MARKET BUILDING

BOULEVARD SQUARE

PARK LAWN ROAD

SILVER MOON DR

ANNIE CRAIG DR

SHORE BREEZE DR

MARINE PARADE DR

MH2165506451
Top/Grade 85.042
Invert 85.040

MH3159006428
Top/Grade 84.341
Invert 82.467

MH3147506388
Top/Grade 83.716
Invert 81.107

MH3138906358
Top/Grade 83.024
Invert 80.178

MH3130606329
Top/Grade 81.321
Invert 79.050

MH3003438
Top/Grade 85.198
Invert 82.930

MH3003440
Top/Grade 84.481
Invert 82.450

MH3003497

MH3003495
Top/Grade 79.42
Invert 77.310

Market building to discharge to the surrounding stormwater network. Further design to address the internal supply network layout

Re-use existing connection for SWM Storage/Facility

Potential extension to service building C-1 - subject to further design coordination

Existing stormwater pipe and manhole within the site boundary to be abandoned

ObjectID 51 between asset MH3003440 to asset MH3003480 invert of existing pipe at this location approx. 81.930

0 5 10 20 50 Metres
Scale 1:1000

Do not scale

Notes

1. All coordinates are in metres and referenced to Zone 10 of the Ontario Coordinate System, NAD (North American Datum) 1927, 1968 adjustment, 3 degree MTM (NAD 27 MTM 3 degrees Zone 10)
2. All dimensions are in metres unless noted otherwise.
3. The design of the stormwater network should comply with Design Criteria for Sewers and Watermains, 2nd edition, January 2021 and Wet Weather Flow Management Guidelines, November 2006.
4. Existing services are based in the topographical survey issued by EllisDon on 24 February 2020 and TWAG information provided by Toronto Water on 04 February 2020.
5. All manholes in the carriageway should be suitable to vehicle loading and finished to same skid resistance as adjacent carriageway.
6. Connection to existing stormwater network is subject to agreement with Toronto Water.
7. Location and extent of existing services is indicative only and is intended to identify approximate location of main service corridors. For full details refer to utility providers record drawings or topographical survey.
8. Off-site reinforcement and temporary construction services are excluded from this drawing.
9. Proposed network design, plot connections and details are indicative only and are subject to approval by existing and proposed network operators as well as building designer.
10. Extent of proposed Soakaway pit, soft landscape and soil cells is indicative only and subject to further detailed modeling.
11. For typical street sections and cover depths refer to drawings LSB-ARP-XX-XX-DR-CU-72001 and LSB-ARP-XX-XX-DR-CU-72002
12. All proposed stormwater mains within the road corridor to be minimum 300mm pipes with a minimum gradient of 1:200, unless otherwise stated.
13. Refer to landscape drawings for Soil Cells details.

Legend

- Site Boundary
- Basement/Tunnel Extent
- Extent of Right-of-way

Existing Utilities

- Stormwater Network

Proposed Utilities

- Stormwater Sewer
- Stormwater Manhole
- Stormwater Force Main
- Pumping Station (Designed by others)
- Existing Stormwater Sewer to be abandoned or diverted
- Park area including SWM facility with infiltration
- Soakaway pit with Infiltration capacity
- Soil Cells with Infiltration Capacity (refer to note 13)
- Soft Landscape (refer to note 13)

Rev	Date	By	Chkd	Appd
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Zoning By-Law Application r1				
01	15/05/20	AF	FF	HJ
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26/02/2021
PROVINCE OF ONTARIO

Client
First Capital (Park Lawn) Corporation and 2253213 Ontario Limited

Project Title
2150 Lake Shore

Drawing Title
Proposed Stormwater Drainage Layout

Scale at Arch D
1:1000

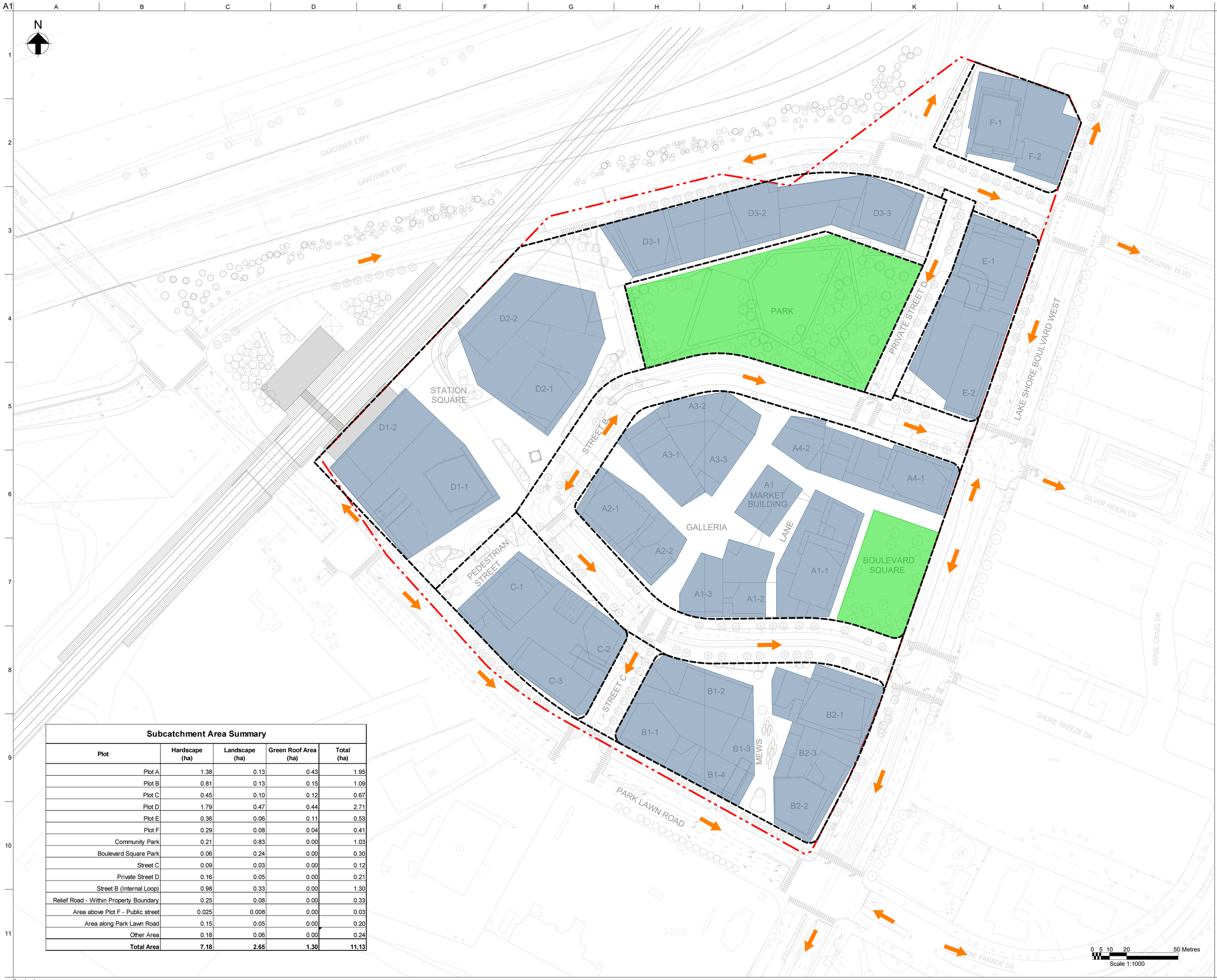
Role
Civil

Suitability
Detailed Masterplan

Arup Job No
277167

Rev
02

Name
LSB-ARP-XX-XX-DR-CD-60000



Notes

1. All coordinates are in metres and referenced to Zone 10 of the Ontario Coordinate System, NAD (North American Datum) 1927, 1968 adjustment, 3 degree MTM (NAD 27 MTM 3 degrees Zone 10)
2. All dimensions are in metres unless noted otherwise.
3. Refer to Landscape plans for green roof and soil cells details. Green roof occupies 60% of the total available roof area.
4. Refer to general arrangement plans for building and roof plans

Legend

- Site Boundary
- Indicative Plot Boundary
- Indicative Building Area (Refer to Note 3 & 4)
- Park area including SWM facility with infiltration
- Overland flow route

Subcatchment Area Summary

Plot	Hardscape (ha)	Landscape (ha)	Green Roof Area (ha)	Total (ha)
Plot A	1.38	0.13	0.43	1.95
Plot B	0.81	0.13	0.15	1.09
Plot C	0.45	0.10	0.12	0.67
Plot D	1.79	0.47	0.44	2.71
Plot E	0.36	0.06	0.11	0.53
Plot F	0.29	0.08	0.04	0.41
Community Park	0.21	0.83	0.00	1.03
Boulevard Square Park	0.06	0.24	0.00	0.30
Street C	0.09	0.03	0.00	0.12
Private Street D	0.16	0.05	0.00	0.21
Street B (Internal Loop)	0.98	0.33	0.00	1.30
Relief Road - Within Property Boundary	0.25	0.08	0.00	0.33
Area above Plot F - Public street	0.025	0.008	0.00	0.03
Area along Park Lawn Road	0.15	0.05	0.00	0.20
Other Area	0.18	0.06	0.00	0.24
Total Area	**7.18**	**2.65**	**1.30**	**11.13**

Rev	Date	By	Chkd	Appd
02	26/02/21	AF	FF	HJ
Zoning By-Law Application r1				
01	15/05/20	AF	FF	HJ
For planning submission				

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LICENSED PROFESSIONAL ENGINEER
H. R. T. JEENS
100517802
26/02/2021
PROVINCE OF ONTARIO

Client
First Capital (Park Lawn) Corporation and 2253213 Ontario Limited

Project Title
2150 Lake Shore

Drawing Title
Drainage Catchment Plan

Scale at Arch D
1:1000

Role
Civil

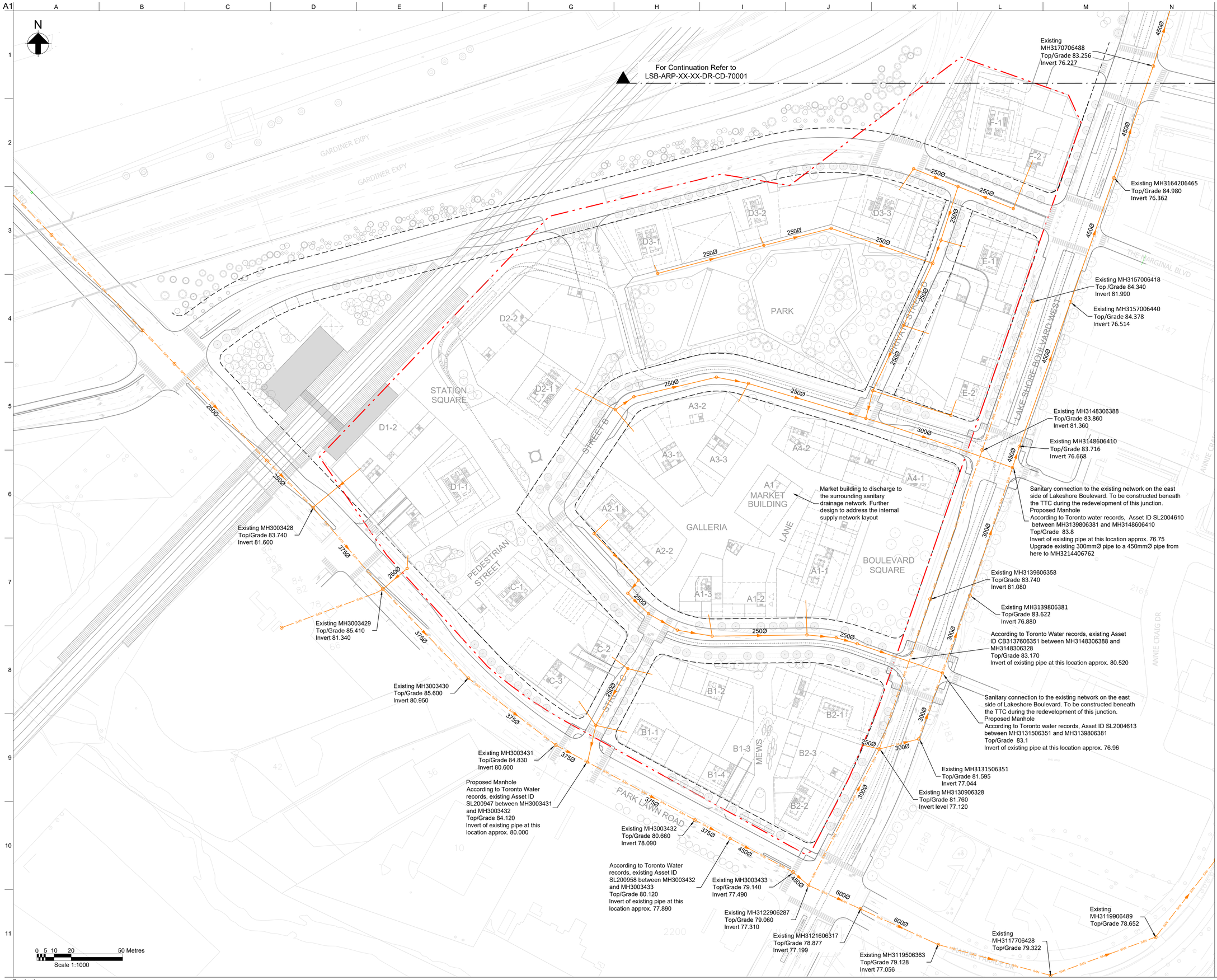
Suitability
Detailed Masterplan

Arup Job No
277167

Rev
02

Name
LSB-ARP-XX-XX-DR-CD-60001

Do not scale



Notes

1. All coordinates are in metres and referenced to Zone 10 of the Ontario Coordinate System, NAD (North American Datum) 1927, 1968 adjustment, 3 degree MTM (NAD 27 MTM 3 degrees Zone 10)
2. All dimensions are in metres unless noted otherwise.
3. The design of the sanitary drainage network should comply with Design Criteria for Sewers and Watermains, 2nd edition, January 2021.
4. Existing services are based in the topographical survey issued by EllisDon on 24 February 2020 and TWAG information provided by Toronto Water on 04 February 2020.
5. All manholes in the carriageway should be suitable to vehicle loading and finished to same skid resistance as adjacent carriageway.
6. Connection to existing sanitary drainage network is subject to agreement with Toronto Water.
7. Location and extent of existing services is indicative only and is intended to identify approximate location of main service corridors. For full details refer to utility providers record drawings or topographical survey.
8. Off-site reinforcement and temporary construction services are excluded from this drawing.
9. Proposed network design, plot connections and details are indicative only and are subject to approval by existing and proposed network operators as well as building designer
10. For typical street sections and cover depths refer to drawings
11. LSB-ARP-XX-XX-DR-CU-72001 and LSB-ARP-XX-XX-DR-CU-72002
12. All proposed sanitary mains within the road corridor to be a minimum of 250mm diameter, with a minimum gradient of 1:200, unless otherwise stated.

Legend

- Site Boundary
- Basement/Tunnel Extent
- Extent of Right-of-way

Existing Utilities

- Sanitary Network

Proposed Utilities

- Sanitary Sewer
- Sanitary Manhole

Rev	Date	By	Chkd	Appd
02	26/02/21	AF	FF	HJ
Zoning By-Law Application r1				
01	15/05/20	AF	FF	HJ
For planning submission				

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26/02/2021
PROVINCE OF ONTARIO

Client
First Capital (Park Lawn) Corporation and 2253213 Ontario Limited

Project Title
2150 Lake Shore

Drawing Title
Proposed Sanitary Drainage Layout Sheet 1

Scale at Arch D 1:1000

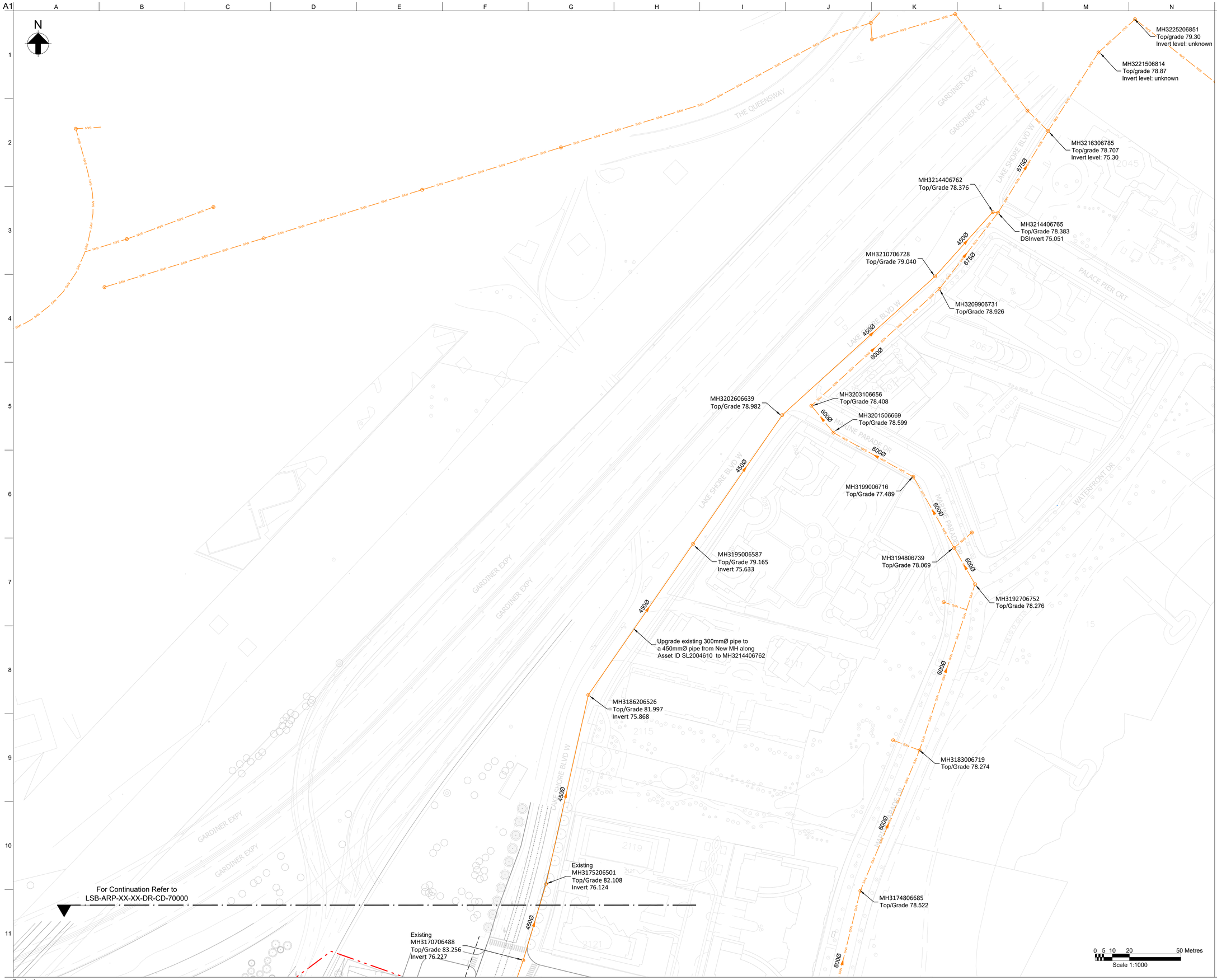
Role Civil

Suitability Detailed Masterplan

Arup Job No 277167

Rev 02

Name LSB-ARP-XX-XX-DR-CD-70000



Notes

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5. All manholes in the carriageway should be suitable to vehicle loading and finished to same skid resistance as adjacent carriageway.
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8. Off-site reinforcement and temporary construction services are excluded from this drawing.
9. Proposed network design, plot connections and details are indicative only and are subject to approval by existing and proposed network operators as well as building designer
10. For typical street sections and cover depths refer to drawings
11. LSB-ARP-XX-XX-DR-CU-72001 and LSB-ARP-XX-XX-DR-CU-72002
12. All proposed sanitary mains within the road corridor to be a minimum of 250mm diameter, with a minimum gradient of 1:200, unless otherwise stated.

Legend

- Site Boundary
- Basement/Tunnel Extent
- Extent of Right-of-way

Existing Utilities

- Sanitary Network

Proposed Utilities

- Sanitary Sewer
- Sanitary Manhole

Rev	Date	By	Chkd	Appd
01	26/02/21	AF	FF	HJ

Zoning By-Law Application r1

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26/02/2021
PROVINCE OF ONTARIO

Client
First Capital (Park Lawn) Corporation and 2253213 Ontario Limited

Project Title
2150 Lake Shore

Drawing Title
Proposed Sanitary Drainage Layout Sheet 2

Scale at Arch D 1:1000
Role Civil
Suitability Detailed Masterplan
Arup Job No **277167**
Rev **01**
Name **LSB-ARP-XX-XX-DR-CD-70001**

Do not scale

A1

N

0 5 10 20 50 Metres

Scale 1:1000

Do not scale

Notes

1. All levels are in metres and coordinates referenced to Zone 10 of the Ontario Coordinate System, NAD (North American Datum) 1927, 1968 adjustment, 3 degree MTM (NAD 27 MTM 3 degrees Zone 10).
2. Existing level information based on the following topographic survey: "19-075BD01_Nad27-Exp(Jan09,2020)" dated January 2020, performed by EllisDon.
3. Ground levels in private areas (e.g. galleria, park, boulevard square) are indicative and subject to further design development in the next masterplan stages.
4. Proposed ground levels have been defined to comply with accessibility requirements, to guarantee sufficient soil depth for tree planting and to ensure the stormwater falls towards the highway drainage system.
5. 5. For cross-sections comparing existing and proposed ground levels, please refer to drawing series LSB-ARP-XX-XX-DR-CE-21001 to 21006.

Legend

- Site Boundary
- Basement/Tunnel Extent
- Extent of Right-of-way
- Building entrance (as per A&M ground floor plan)
- 85.000 Major Contour (500mm intervals)
- Minor Contour (100mm intervals)

NOTE:
THIS DRAWING CONTAINS EXTENSIVE USE OF COLOUR LINE WORK AND MUST BE PLOTTED IN COLOUR.

Rev	Date	By	Chkd	Appd
03	26/02/21	AF	LS	HJ
Zoning By-Law Application r1				
02	13/11/20	AF	LS	HJ
For information				
01	15/05/20	AR	FF	HJ
For planning submission				

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26/02/2021
PROVINCE OF ONTARIO

Client
First Capital (Park Lawn) Corporation and 2253213 Ontario Limited

Project Title
2150 Lake Shore

Drawing Title
Grading Plan

Scale at Arch D
1:1000

Role
Civil

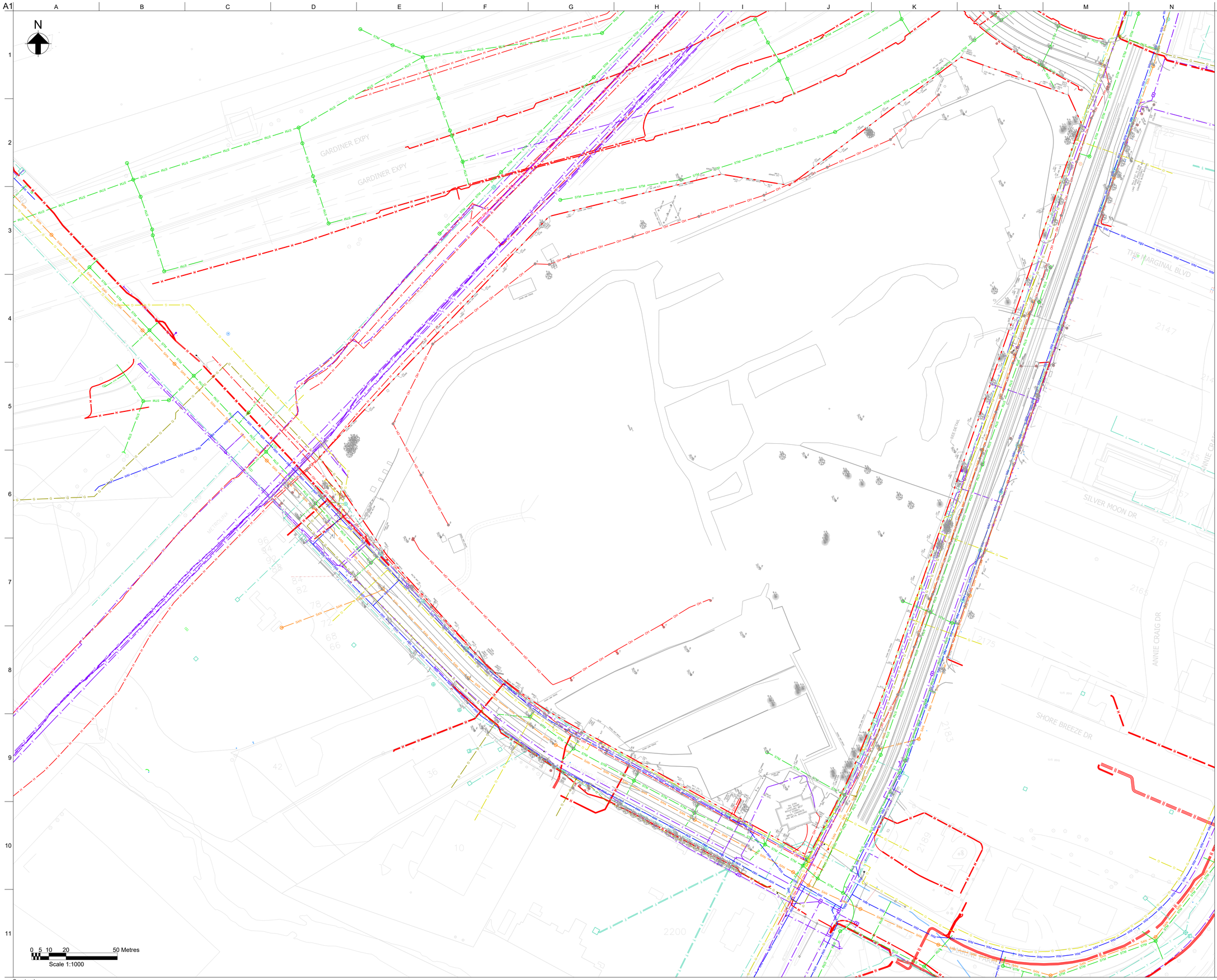
Suitability
Detailed Masterplan

Arup Job No
277167

Rev
03

Name
LSB-ARP-XX-XX-DR-CE-20001

A1



Notes

1. All coordinates are in metres and referenced to Zone 10 of the Ontario Coordinate System, NAD (North American Datum) 1927, 1968 adjustment, 3 degree MTM (NAD 27 MTM 3 degrees Zone 10)
4. Existing services are based in the topographical survey issued by EllisDon on 24 February 2020 and TWAG information provided by Toronto Water on 04 February 2020.
5. A number of routes are partially incomplete due to poor signal results. Where gaps in traces were found, record drawings were used. In all cases, contractor to satisfy himself location of existing services.
6. The locations of existing services and structures are indicative only and are based on record drawings produced by each statutory authority or reflected in topographical survey - no representation is made by Arup as to the accuracy, completeness, sufficiency or otherwise of this information. Further site investigation works will be required prior to construction to confirm their locations.
7. All existing utility route location shall be confirmed on site through site investigation, such as using trial pits.
8. The contractor is responsible for the disconnection or capping of all existing utilities to be diverted or abandoned.
9. Programme for abandonment, diversion or reuse of existing utilities to be further developed and agreed with developer and statutory authorities.
10. For proposed abandonments and diversions, refer to the proposed utility and drainage drawings.

Legend

- Site Boundary
- Existing Topo Survey

Existing Utilities

- Sanitary Network
- Stormwater Network
- Water Network
- Intermediate pressure gas main
- High pressure gas main
- Bell Telecommunications Network
- Rogers Telecommunications Network
- Street Lights
- Hydro (Electrical Network)
- Overhead Electrical
- Rail Signal

Rev	Date	By	Chkd	Appd
02	26/02/21	AF	FF	HJ
Zoning By-Law Application r1				
01	15/05/20	AF	FF	HJ
For planning submission				

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100517802
26/02/2021
PROVINCE OF ONTARIO

Client
First Capital (Park Lawn) Corporation and 2253213 Ontario Limited

Project Title
2150 Lake Shore

Drawing Title
Existing Drainage and Utility Layout

Scale at Arch D
1:1000

Role
Civil

Suitability
Detailed Masterplan

Arup Job No
277167

Rev
02

Name
LSB-ARP-XX-XX-DR-CU-70000

Do not scale

A1

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GARDINER EXPY

STATION SQUARE

PARK

PEDESTRIAN STREET

STREET B

STREET C

GALLERIA

MARKET BUILDING

BOULEVARD SQUARE

MEWS

LANE

PARK LAWN ROAD

LAKE SHORE BOULEVARD WEST

THE MARGINAL BLVD

SILVER MOON DR

ANNIE CRAIG DR

SHORE BREEZE DR

MARINE PARADE DR

PRIVATE

D1-1 D1-2 D2-1 D2-2 D3-1 D3-2 D3-3 C-1 C-2 A1-1 A1-2 A1-3 A2-1 A2-2 A3-1 A3-2 A3-3 A4-1 A4-2 B1-1 B1-2 B1-3 B1-4 B2-1 B2-2 B2-3 F-1 F-2 E-1 E-2

Water connection for building F

Second Fire connection for building F

300mm PVC WM

Water connections for building D3. Domestic service to D3 to be 200mm.

Second Fire connection for building D3

Tee connection to existing Watermain c/w isolation gate valve

Second Fire connection for building E

Potential stub for park amenities

Second Fire connection for building D2

Water connections for building D2

Water connections for building E

Water connections for building A3

Second Fire connection for building A4

Water connections for building A4

Second Fire connection for building A3

Water connections for building A2

Second Fire connection for building A2

Market building to be supplied by the loop road water network. Further design to address the internal supply network layout

Water connections for building A1

Second Fire connection for building A1

Second Fire connection for building D1

Water connections for building D1

Water connections for building C1

Second Fire connection for building C1

Second Fire connection for building B2

Water connections for building B1

Second Fire connection for building B2

Water connections for building B2

Tee connection to existing Watermain c/w isolation gate valve

300Ø

0 5 10 20 50 Metres

Scale 1:1000

Do not scale

Notes

1. All coordinates are in metres and referenced to Zone 10 of the Ontario Coordinate System, NAD (North American Datum) 1927, 1968 adjustment, 3 degree MTM (NAD 27 MTM 3 degrees Zone 10)
2. All dimensions are in metres unless noted otherwise.
4. Existing services are based in the topographical survey issued by EllisDon on 24 February 2020 and TWAG information provided by Toronto Water on 04 February 2020.
5. Connection to existing water network is subject to agreement with Toronto Water.
6. Location and extent of existing services is indicative only and is intended to identify approximate location of main service corridors. For full details refer to utility providers record drawings or topographical survey.
7. Proposed network design, plot connections and details are indicative only and are subject to approval by existing and proposed network operators as well as building designer.
8. The proposed water network should comply with the Design Criteria for Sewers and Watermains, 2nd edition, January 2021.
9. Capacity of the existing water network has been assessed based on information provided by Toronto Water in January 2020. Further hydrant pressure tests are required to ensure the design assumptions are aligned with the existing network conditions and capacity.
10. Refer to the servicing report for details of design assumptions and criteria for the water and fire supply demands.
11. All buildings will be provided with a combined fire and domestic water connection as per City of Toronto Standard Drawing T-1104.02-3. The fire line is sized at 200mm and the domestic branch is sized at 150mm unless otherwise noted. Buildings greater than 81m in height have an additional 200mm fire line.

Legend

- Site Boundary
- Basement/Tunnel Extent
- Extent of Right-of-way

Existing Utilities

- Water Network
- Existing Water Network to be abandoned or diverted

Proposed Utilities

- Water Main
- Gate Valve
- Hydrant

Rev	Date	By	Chkd	Appd
02	26/02/21	AF	FF	HJ
Zoning By-Law Application r1				
01	15/05/20	AF	FF	HJ
For planning submission				

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LICENSED PROFESSIONAL ENGINEER H. R. T. JEENS 100517802 26/02/2021 PROVINCE OF ONTARIO

Client
First Capital (Park Lawn) Corporation and 2253213 Ontario Limited

Project Title
2150 Lake Shore

Drawing Title
Proposed Water Network

Scale at Arch D 1:1000

Role Civil

Suitability Detailed Masterplan

Arup Job No 277167

Rev 02

Name LSB-ARP-XX-XX-DR-CU-71001

Appendix C

Hydrant Tests

10 Estate Drive
Toronto, Ontario
Canada M1H 2Z1

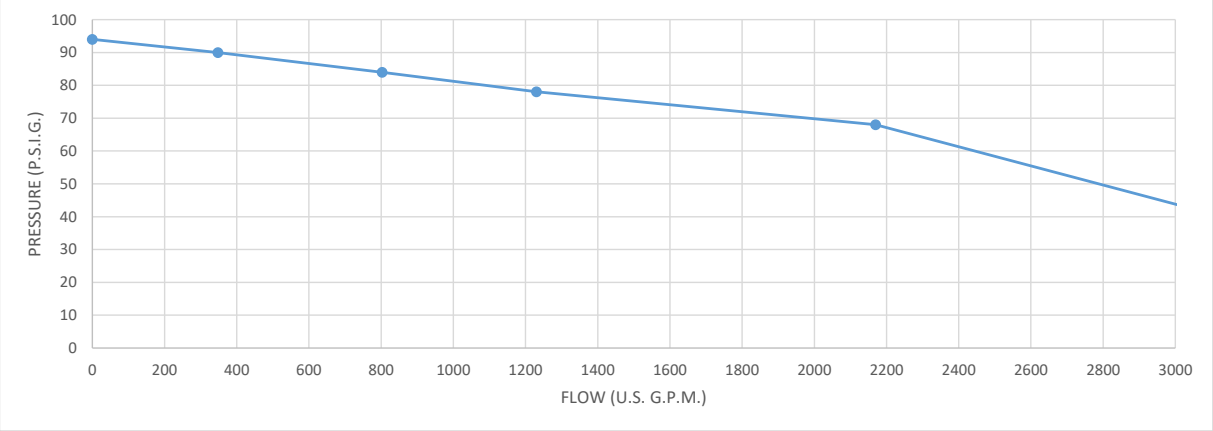
T 416.282.1665
F 416.282.7702
www.corix.com

Hydrant 1

FLOW TEST REPORT

Date	SEPTEMBER 22ND 2020
Customer	ARUP
Job Location	2150 LAKESHORE BOULEVARD WEST,TORONTO ON.
Time of Test	9:45AM
Location of test (flow)	CV CENTURY 3PORT HYDRANT, 2169 LAKESHORE BOULEVARD W, TORONTO
Location of test (residual)	CV CENTURY 3PORT HYDRANT, 2143 LAKESHORE BOULEVARD W, TORONTO
Main Size (mm)	
Static Pressure (psi)	94

	Number of Outlets & Orifice Size	PITOT Pressure (psi)	Flow (U.S. G.P.M.)	Residual Pressure (psi)
#1	1 x 1 1/8	86	348	90
#2	1 x 1 3/4	78	803	84
#3	1 x 2 1/2	54	1230	78
#4	2 x 2 1/2	42	2170	68
#5			3817	20
Colour code	Blue			



Comments	PERFORMED ONE COMPLETE NFPA 291 FLOW TEST ON LAKESHORE BLVD W, TORONTO
Crew Member	JEFF COWAN

10 Estate Drive
Toronto, Ontario
Canada M1H 2Z1

T 416.282.1665
F 416.282.7702
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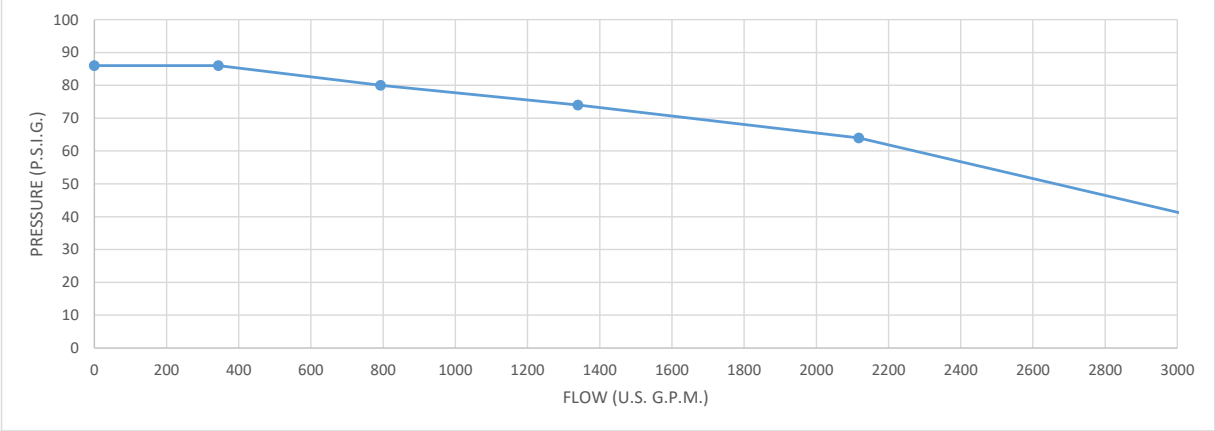
Hydrant 2

FLOW TEST REPORT

Date	SEPTEMBER 22ND 2020
Customer	ARUP
Job Location	2150 LAKESHORE BOULEVARD WEST,TORONTO ON.
Time of Test	9:30AM
Location of test (flow)	CV CENTURY 3PORT HYDRANT, 36 PARKLAWN RD (EAST SIDE, NORTH LAKESHORE)
Location of test (residual)	CV CENTURY 3PORT HYDRANT, 90 PARKLAWN RD (EAST SIDE, BEFORE CNR BRIDGE)
Main Size (mm)	
Static Pressure (psi)	86

	Number of Outlets & Orifice Size	PITOT Pressure (psi)	Flow (U.S. G.P.M.)	Residual Pressure (psi)
#1	1 x 1 1/8	84	344	86
#2	1 x 1 3/4	76	792	80
#3	1 x 2 1/2	64	1339	74
#4	2 x 2 1/2	40	2117	64
#5			3832	20
Colour code	Blue			



Comments	PERFORMED ONE COMPLETE NFPA 291 FLOW TEST ON PARKLAWN ROAD, TORONTO
Crew Member	JEFF COWAN

10 Estate Drive
Toronto, Ontario
Canada M1H 2Z1

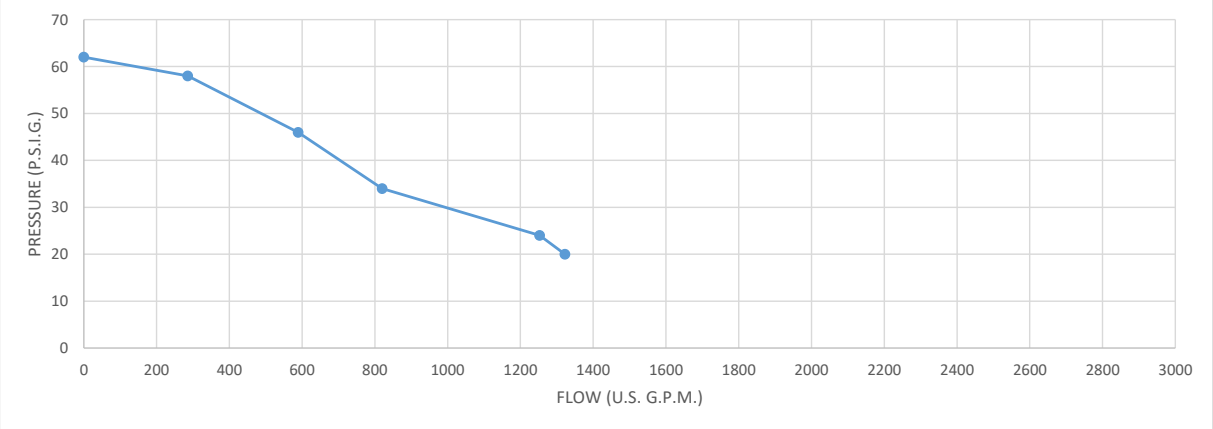
T 416.282.1665
F 416.282.7702
www.corix.com

Hydrant 3

FLOW TEST REPORT

Date	SEPTEMBER 22ND 2020
Customer	ARUP
Job Location	2150 LAKESHORE BOULEVARD WEST,TORONTO ON.
Time of Test	11:00AM
Location of test (flow)	CONCORD DAIGLE D67M 3PORT, 2204 LAKESHORE BOULEVARD WEST, TORONTO
Location of test (residual)	CONCORD DAIGLE D67M 3PORT, ACROSS FROM 2230 LAKESHORE BOULEVARD WEST, TORONTO
Main Size (mm)	
Static Pressure (psi)	62

	Number of Outlets & Orifice Size	PITOT Pressure (psi)	Flow (U.S. G.P.M.)	Residual Pressure (psi)
#1	1 x 1 1/8	58	286	58
#2	1 x 1 3/4	42	589	46
#3	1 x 2 1/2	24	820	34
#4	2 x 2 1/2	14	1253	24
#5			1322	20
Colour code	Green			



Comments	PERFORMED ONE NFPA 291 FLOW TEST ON LAKESHORE BOULEVARD WEST, TORONTO
Crew Member	JEFF COWAN

10 Estate Drive
Toronto, Ontario
Canada M1H 2Z1

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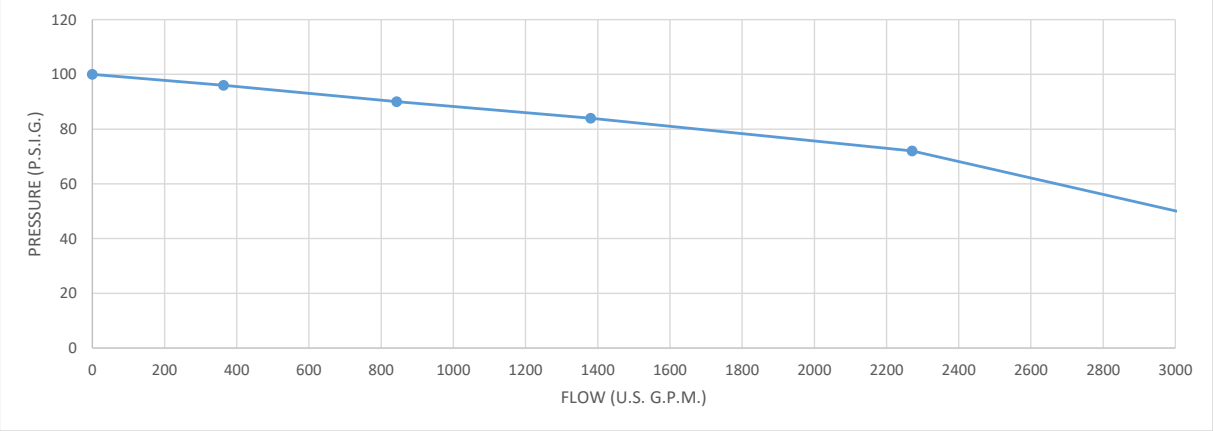
F 416.282.7702
www.corix.com

Hydrant 4

FLOW TEST REPORT

Date	SEPTEMBER 22ND 2020
Customer	ARUP
Job Location	2150 LAKESHORE BOULEVARD WEST,TORONTO ON.
Time of Test	10:30AM
Location of test (flow)	CV CENTURY 3PORT HYDRANT ONLAKESHORE BLVD W, 88 PALACE PIER CRT, TORONTO
Location of test (residual)	DARLING B50B 2PORT HYDRANT, 2045 LAKESHORE BLVD W @ PALACE PIER CRT, TORONTO
Main Size (mm)	
Static Pressure (psi)	100

	Number of Outlets & Orifice Size	PITOT Pressure (psi)	Flow (U.S. G.P.M.)	Residual Pressure (psi)
#1	1 x 1 1/8	94	364	96
#2	1 x 1 3/4	86	843	90
#3	1 x 2 1/2	68	1380	84
#4	2 x 2 1/2	46	2271	72
#5			4003	20
Colour code	Blue			



Comments	PERFORMED ONE NFPA 291 FLOW TEST ON LAKESHORE BLVD W @ PALACE PIER CRT, TORONTO
Crew Member	JEFF COWAN

Appendix D

Watermain Demand Calculations

ARUP	Job No.		Rev.
	277167	First Capital Realty	01
	Member/Location	City of Toronto	
Job Title: 2150 Lake Shore Boulevard	Drg. Ref.	See Appendix B	
Calculation: Domestic Water Demand	Made by: C.G.	Date: 13/01/2021	Chd.: F.F.

General Assumptions & Calculations

Population Mix

Unit	Population	% Mix
Bachelor	1.4	5%
1 BDRM	1.4	50%
2 BDRM	2.1	35%
3 BDRM	3.1	10%

Calculation Inputs

Criteria	Value	Unit	Notes
Water Demand	190	L/p/day	City of Toronto Design Criteria
Commercial/Retail Population Equivalents	1.1	p/100m^2	City of Toronto Design Criteria
Office Population Equivalent	3.3	p/100m^2	City of Toronto Design Criteria
School Population	1100	p	Allies & Morrison Population
School Demand	70-140	L/p/day	City Design Criteria (Select 105L)
Peaking Factors			

	MIN Hr	Peak Hr	MAX Day	Notes
Industrial/Institute	0.84	1.90	1.10	City of Toronto Design Criteria
Commercial	0.84	1.20	1.10	City of Toronto Design Criteria
Apartments	0.84	2.50	1.30	City of Toronto Design Criteria

*p = people/person

ARUP	Job No.		Rev.
	277167	First Capital Realty	01
	Member/Location	City of Toronto	
Job Title: 2150 Lake Shore Boulevard	Drg. Ref.	See Appendix B	
Calculation: Domestic Water Demand	Made by: C.G.	Date: 13/01/2021	Chd.: F.F.

Summary of Domestic Demands

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Building	**(m^2)**	**ca**	**L/day**	**L/s**	**Min Hr**	**Peak Hr**	**Max Day**
Development	**701,809**	**17,302**	**3,192,179**	**36.97**	**31.05**	**83.29**	**46.65**
Block A	141,511	3,314	628,050	7.29	6.12	16.04	9.14
A1 (Subtotal)	62,679	1,385	263,065	3.04	2.56	7.38	3.92
A1-1	35,927	823	156,344	1.81	1.52	4.49	2.35
A1-2	20,006	468	88,996	1.03	0.87	2.58	1.34
A1-Podium	4,940	73	13,953	0.16	0.14	0.26	0.19
A1-Market	1,805	20	3,773	0.04	0.04	0.05	0.05
A2 (Subtotal)	30,084	673	127,932	1.48	1.24	3.64	1.91
A2-1	28,156	648	123,099	1.42	1.20	3.54	1.85
A2-Podium	1,928	25	4,833	0.06	0.05	0.09	0.07
A3 (Subtotal)	19,932	623	118,433	1.37	1.15	1.64	1.51
A3-1	9,310	307	58,371	0.68	0.57	0.81	0.74
A3-2	1,899	63	11,907	0.14	0.12	0.17	0.15
A3-3	5,693	188	35,692	0.41	0.35	0.50	0.45
A3-Podium	3,031	66	12,464	0.14	0.12	0.17	0.16
A4 (Subtotal)	28,815	633	118,619	1.39	1.17	3.38	1.80
A4-1	22,661	515	96,061	1.13	0.95	2.79	1.47
A4-2	3,321	76	14,459	0.17	0.14	0.42	0.22
A4-Podium	2,833	43	8,099	0.09	0.08	0.17	0.11
Block B	112,812	2,531	480,816	5.56	4.67	13.66	7.20
B1 (Subtotal)	35,097	775	147,172	1.70	1.43	4.15	2.20
B1-1	17,431	406	77,197	0.89	0.75	2.23	1.16
B1-2	7,337	169	32,118	0.37	0.31	0.92	0.48
B1-3	6,346	147	27,854	0.32	0.27	0.81	0.42
B1-Podium	3,983	53	10,002	0.12	0.10	0.19	0.13
B2 (Subtotal)	77,715	1,756	333,644	3.86	3.24	9.52	5.00
B2-1	31,508	711	135,035	1.56	1.31	3.85	2.02
B2-2	42,025	980	186,219	2.16	1.81	5.39	2.80
B2-3	876	21	4,047	0.05	0.04	0.12	0.06
B2-Podium	3,306	44	8,343	0.10	0.08	0.16	0.11
Block C	50,427	1,129	214,580	2.48	2.09	6.10	3.21
C1 (Subtotal)	50,427	1,129	214,580	2.48	2.09	6.10	3.21
C1-1	34,890	814	154,584	1.79	1.50	4.47	2.33
C1-2	3,186	73	13,794	0.16	0.13	0.40	0.21
C1-3	8,074	189	35,815	0.41	0.35	1.04	0.54
C1-Podium	4,277	55	10,387	0.12	0.10	0.19	0.14

Block D	282,968	7,820	1,392,261	16.11	13.54	34.08	19.99
D1 (Subtotal)	75,751	1,971	374,463	4.33	3.64	8.55	5.28
D1-1	49,931	1162	220,704	2.55	2.15	6.39	3.32
D1-2	6,966	230	43,677	0.51	0.42	0.61	0.56
D1-3	14,990	495	93,990	1.09	0.91	1.31	1.20
D1-Podium	3,863	85	16,093	0.19	0.16	0.25	0.21
D2 (Subtotal)	70,775	1,809	343,636	3.98	3.34	7.84	4.85
D2-1	45,467	1060	201,343	2.33	1.96	5.83	3.03
D2-2	19,455	642	121,985	1.41	1.19	1.69	1.55
D2-Podium	5,853	107	20,308	0.24	0.20	0.31	0.26
D3 (Subtotal)	136,442	4,040	674,161	7.80	6.55	17.70	9.87
D3-1	44,598	1038	197,163	2.28	1.92	5.70	2.97
D3-2	35,986	835	158,631	1.84	1.54	4.59	2.39
D3-3	42,764	995	189,069	2.19	1.84	5.47	2.84
D3-Podium	13,094	1173	129,298	1.50	1.26	1.94	1.67
Block E	58,028	1,241	235,725	2.73	2.29	6.53	3.50
E1 (Subtotal)	58,028	1,241	235,725	2.73	2.29	6.53	3.50
E-1	41,745	973	184,889	2.14	1.80	5.35	2.78
E-2	6,538	152	28,918	0.33	0.28	0.84	0.44
E-Podium	9,745	115	21,918	0.25	0.21	0.35	0.29
Block F	56,063	1,267	240,747	2.79	2.34	6.88	3.61
F1 (Subtotal)	56,063	1,267	240,747	2.79	2.34	6.88	3.61
F-1	46,899	1090	207,176	2.40	2.01	5.99	3.12
F-2	2,521	58	10,944	0.13	0.11	0.32	0.16
F-Podium	6,643	119	22,627	0.26	0.22	0.56	0.33

Detailed Breakdown of Building Demands

Block A

Building A1

Unit Type	Studio	1 BDRM	2 BDRM	3+ BDRM	Total Units
People/Unit	1.4	1.4	2.1	3.1	
A1-1	22	223	156	45	**446**
A1-2	13	129	90	26	**258**
A1-Podium	1	6	5	1	**13**

Building A1-1

Use/Unit	GFA (m^2)	Population ca	Domestic Demand L/day	Domestic Demand L/s	Peaking Values (L/s) Min Hr	Peak Hr	Max Day
Residential	34,767	810	153,919	1.78	1.50	4.45	2.32
Retail	1,160	13	2,425	0.03	0.02	0.03	0.03
Total	35,927	823	156,344	1.81	1.52	4.49	2.35

Building A1-2

Use/Unit	GFA (m^2)	Population ca	Domestic Demand L/day	Domestic Demand L/s	Peaking Values (L/s) Min Hr	Peak Hr	Max Day
Residential	20,006	468	88,996	1.03	0.87	2.58	1.34
Total	20,006	468	88,996	1.03	0.87	2.58	1.34

Building A1-Podium

Use/Unit	GFA (m^2)	Population ca	Domestic Demand L/day	Domestic Demand L/s	Peaking Values (L/s) Min Hr	Peak Hr	Max Day
Residential	1,027	23	4,446	0.05	0.04	0.13	0.07
Retail	3,596	40	7,515	0.09	0.07	0.10	0.10
Employment	318	10	1,992	0.02	0.02	0.03	0.03
Total	4,940	73	13,953	0.16	0.14	0.26	0.19

Building A1-Market

Use/Unit	GFA (m^2)	Population ca	Domestic Demand L/day	Domestic Demand L/s	Peaking Values (L/s) Min Hr	Peak Hr	Max Day
Retail	1,805	20	3,773	0.04	0.04	0.05	0.05
Total	1,805	20	3,773	0.04	0.04	0.05	0.05

Block A Summary

Building A1

Use/Unit	GFA (m^2)	Population ca	Domestic Demand L/day	Domestic Demand L/s	Peaking Values (L/s) Min Hr	Peak Hr	Max Day
Residential	55,800	1,302	247,361	2.86	2.40	7.16	3.72
Retail	6,561	72	13,712	0.16	0.13	0.19	0.17
Employment	318	10	1,992	0.02	0.02	0.03	0.03
Total	62,679	1,385	263,065	3.04	2.56	7.38	3.92

Building A2

Unit Type	Studio	1 BDRM	2 BDRM	3+ BDRM	Total Units
People/Unit	1.4	1.4	2.1	3.1	
A2-1	18	177	124	35	**354**
A2-Podium	0	3	2	0	**5**

Building A2-1

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	27,612	642	121,961	1.41	1.19	3.53	1.84
Retail	545	6	1,138	0.01	0.01	0.02	0.01
Total	28,156	648	123,099	1.42	1.20	3.54	1.85

Building A2-Podium

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	379	8	1,596	0.02	0.02	0.05	0.02
Retail	1,549	17	3,237	0.04	0.03	0.04	0.04
Total	1,928	25	4,833	0.06	0.05	0.09	0.07

Block A Summary

Building A2

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	27,991	650	123,557	1.43	1.20	3.58	1.86
Retail	2,093	23	4,375	0.05	0.04	0.06	0.06
Total	30,084	673	127,932	1.48	1.24	3.64	1.91

Building A3

Building A3-1

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Employment	9,310	307	58,371	0.68	0.57	0.81	0.74
Total	9,310	307	58,371	0.68	0.57	0.81	0.74

Building A3-2

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Employment	1,899	63	11,907	0.14	0.12	0.17	0.15
Total	1,899	63	11,907	0.14	0.12	0.17	0.15

Building A3-3

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Employment	5,693	188	35,692	0.41	0.35	0.50	0.45
Total	5,693	188	35,692	0.41	0.35	0.50	0.45

Building A3-Podium

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Employment	1,466	48	9,192	0.11	0.09	0.13	0.12
Retail	1,565	17	3,271	0.04	0.03	0.05	0.04
Total	3,031	66	12,464	0.14	0.12	0.17	0.16

Block A Summary

Building A3

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Retail	1,565	17	3,271	0.04	0.03	0.05	0.04
Employment	18,367	606	115,162	1.33	1.12	1.60	1.47
Total	19,932	623	118,433	1.37	1.15	1.64	1.51

ARUP	Job No.		Rev.
	277167	First Capital Realty	01
	Member/Location	City of Toronto	
Job Title: 2150 Lake Shore Boulevard	Drg. Ref.	See Appendix B	
Calculation: Domestic Water Demand	Made by: C.G.	Date: 13/01/2021	Chd.: F.F.

Building A4

Unit Type	Studio	1 BDRM	2 BDRM	3+ BDRM	Total Units
People/Unit	1.4	1.4	2.1	3.1	
A4-1	14	138	96	28	**276**
A4-2	2	21	15	4	**42**
A4-Podium	1	6	4	1	**12**

Building A4-1

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	**(m^2)**	**ca**	**L/day**	**L/s**	**Min Hr**	**Peak Hr**	**Max Day**
Residential	21,452	501	95,228	1.10	0.93	2.76	1.43
Retail	399	4	833	0.01	0.01	0.01	0.01
Community	811	9	1,695	0.02	0.02	0.02	0.02
Total	22,661	515	96,061	1.13	0.95	2.79	1.47

Building A4-2

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	**(m^2)**	**ca**	**L/day**	**L/s**	**Min Hr**	**Peak Hr**	**Max Day**
Residential	3,321	76	14,459	0.17	0.14	0.42	0.22
Total	3,321	76	14,459	0.17	0.14	0.42	0.22

Building A4-Podium

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	**(m^2)**	**ca**	**L/day**	**L/s**	**Min Hr**	**Peak Hr**	**Max Day**
Residential	894	21	4,047	0.05	0.04	0.12	0.06
Retail	1,860	20	3,888	0.05	0.04	0.05	0.05
Community	78	1	164	0.00	0.00	0.00	0.00
Total	2,833	43	8,099	0.09	0.08	0.17	0.11

Block A Summary

Building A4

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	**(m^2)**	**ca**	**L/day**	**L/s**	**Min Hr**	**Peak Hr**	**Max Day**
Residential	25,667	599	113,734	1.32	1.11	3.29	1.71
Retail	2,259	25	4,721	0.05	0.05	0.07	0.06
Employment/ Community	889	10	1,858	0.02	0.02	0.03	0.02
Total	28,815	633	120,314	1.39	1.17	3.38	1.80

Block A Summary

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	**(m^2)**	**ca**	**L/day**	**L/s**	**Min Hr**	**Peak Hr**	**Max Day**
Residential	109,458	2,551	484,652	5.61	4.71	14.02	7.29
Retail	12,479	137	26,080	0.30	0.25	0.36	0.33
Employment	19,574	626	119,013	1.38	1.16	1.65	1.52
Total	**141,511**	**3,314**	**629,745**	**7.29**	**6.12**	**16.04**	**9.14**

Block B

Building B1

Unit Type	Studio	1 BDRM	2 BDRM	3+ BDRM	Total Units
People/Unit	1.4	1.4	2.1	3.1	
B1-1	11	112	79	22	**224**
B1-2	5	46	32	9	**92**
B1-3	4	41	28	8	**81**
B1-Podium	0	5	3	1	**9**

Buildin B1-1

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	17,431	406	77,197	0.89	0.75	2.23	1.16
Total	17,431	406	77,197	0.89	0.75	2.23	1.16

Buildin B1-2

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	7,106	167	31,635	0.37	0.31	0.92	0.48
Retail	231	3	483	0.01	0.00	0.01	0.01
Total	7,337	169	32,118	0.37	0.31	0.92	0.48

Buildin B1-3

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	6,346	147	27,854	0.32	0.27	0.81	0.42
Total	6,346	147	27,854	0.32	0.27	0.81	0.42

Buildin B1-Podium

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	688	16	3,116	0.04	0.03	0.09	0.05
Retail	1,994	22	4,168	0.05	0.04	0.06	0.05
Community	1,301	14	2,718	0.03	0.03	0.04	0.03
Total	3,983	53	10,002	0.12	0.10	0.19	0.13

Block B Summary

Buildin B1

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	31,571	736	111,948	1.30	1.09	3.24	1.68
Retail	3,526	24	4,168	0.05	0.04	0.06	0.05
Employment/ Community	1,301	14	2,718	0.03	0.03	0.04	0.03
Total	36,398	775	118,834	1.38	1.16	3.33	1.77

Building B2

Unit Type	Studio	1 BDRM	2 BDRM	3+ BDRM	Total Units
People/Unit	1.4	1.4	2.1	3.1	
B2-1	19	191	133	38	**381**
B2-2	27	270	189	54	**540**
B2-3	1	6	4	1	**12**
B2-Podium	0	4	3	1	**8**

Buildin B2-1

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	29,726	691	131,309	1.52	1.28	3.80	1.98
Retail	1,783	20	3,726	0.04	0.04	0.05	0.05
Total	31,508	711	135,035	1.56	1.31	3.85	2.02

Buildin B2-2

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	42,025	980	186,219	2.16	1.81	5.39	2.80
Total	42,025	980	186,219	2.16	1.81	5.39	2.80

Buildin B2-3

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	876	21	4,047	0.05	0.04	0.12	0.06
Total	876	21	4,047	0.05	0.04	0.12	0.06

Buildin B2-Podium

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	678	15	2,850	0.03	0.03	0.08	0.04
Retail	2,628	29	5,493	0.06	0.05	0.08	0.07
Total	3,306	44	8,343	0.10	0.08	0.16	0.11

Block B Summary
Buildin B2

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	73,304	1,708	324,425	3.75	3.15	9.39	4.88
Retail	4,411	49	9,219	0.11	0.09	0.13	0.12
Total	77,715	1,756	333,644	3.86	3.24	9.52	5.00

Block B Summary

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	104,875	2,443	436,373	5.05	4.24	12.63	6.57
Retail	7,937	73	13,387	0.15	0.13	0.19	0.17
Employment	1,301	14	2,718	0.03	0.03	0.04	0.03
Total	**114,112**	**2,531**	**452,478**	**5.24**	**4.40**	**12.85**	**6.77**

Block C

Building C1

Unit Type	Studio	1 BDRM	2 BDRM	3+ BDRM	Total Units
People/Unit	1.4	1.4	2.1	3.1	
C1-1	22	224	157	45	**448**
C1-2	2	20	14	4	**40**
C1-3	5	52	37	10	**104**
C- Podium	0	4	3	1	**8**

Buildin(C1-1

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	34,890	814	154,584	1.79	1.50	4.47	2.33
Total	34,890	814	154,584	1.79	1.50	4.47	2.33

Buildin(C1-2

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	3,186	73	13,794	0.16	0.13	0.40	0.21
Total	3,186	73	13,794	0.16	0.13	0.40	0.21

Buildin(C1-3

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	8,074	189	35,815	0.41	0.35	1.04	0.54
Total	8,074	189	35,815	0.41	0.35	1.04	0.54

Buildin(C1-Podium

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	671	15	2,850	0.03	0.03	0.08	0.04
Retail	3,606	40	7,537	0.09	0.07	0.10	0.10
Total	4,277	55	10,387	0.12	0.10	0.19	0.14

Block C Summary

Buildin(C1

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	46,820	1,090	207,043	2.40	2.01	5.99	3.12
Retail	3,606	40	7,537	0.09	0.07	0.10	0.10
Total	50,427	1,129	214,580	2.48	2.09	6.10	3.21

Block C Summary

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	46,820	1,090	207,043	2.40	2.01	5.99	3.12
Retail	3,606	40	7,537	0.09	0.07	0.10	0.10
Total	**50,427**	**1,129**	**214,580**	**2.48**	**2.09**	**6.10**	**3.21**

Block D

Building D1

Unit Type	Studio	1 BDRM	2 BDRM	3+ BDRM	Total Units
People/Unit	1.4	1.4	2.1	3.1	
D1-1	32	320	224	64	**640**
D1-Podium	0	3	2	0	**5**

Building D1-1

Use/Unit	GFA (m^2)	Population ca	Domestic Demand L/day	Domestic Demand L/s	Peaking Values (L/s) Min Hr	Peak Hr	Max Day
Residential	49,931	1,162	220,704	2.55	2.15	6.39	3.32
Total	49,931	1,162	220,704	2.55	2.15	6.39	3.32

Building D1-2

Use/Unit	GFA (m^2)	Population ca	Domestic Demand L/day	Domestic Demand L/s	Peaking Values (L/s) Min Hr	Peak Hr	Max Day
Employment	6,966	230	43,677	0.51	0.42	0.61	0.56
Total	6,966	230	43,677	0.51	0.42	0.61	0.56

Building D1-3

Use/Unit	GFA (m^2)	Population ca	Domestic Demand L/day	Domestic Demand L/s	Peaking Values (L/s) Min Hr	Peak Hr	Max Day
Employment	14,990	495	93,990	1.09	0.91	1.31	1.20
Total	14,990	495	93,990	1.09	0.91	1.31	1.20

Building D1-Podium

Use/Unit	GFA (m^2)	Population ca	Domestic Demand L/day	Domestic Demand L/s	Peaking Values (L/s) Min Hr	Peak Hr	Max Day
Residential	379	8	1,596	0.02	0.02	0.05	0.02
Retail	1,758	19	3,674	0.04	0.04	0.05	0.05
Employment	1,726	57	10,823	0.13	0.11	0.15	0.14
Total	3,863	85	16,093	0.19	0.16	0.25	0.21

Block D Summary

Building D1

Use/Unit	GFA (m^2)	Population ca	Domestic Demand L/day	Domestic Demand L/s	Peaking Values (L/s) Min Hr	Peak Hr	Max Day
Residential	50,310	1,170	222,300	2.57	2.16	6.43	3.34
Retail	1,758	19	3,674	0.04	0.04	0.05	0.05
Employment	23,683	782	148,490	2	1	2	2
Total	75,751	1,971	374,463	4.33	3.64	8.55	5.28

Building D2

Unit Type	Studio	1 BDRM	2 BDRM	3+ BDRM	Total Units
People/Unit	1.4	1.4	2.1	3.1	
D2-1	29	292	205	58	**584**
D2-Podium	0	3	2	1	**6**

Buildin(D2-1

Use/Unit	GFA (m^2)	Population ca	Domestic Demand L/day	Domestic Demand L/s	Peaking Values (L/s) Min Hr	Peak Hr	Max Day
Residential	45,467	1,060	201,343	2.33	1.96	5.83	3.03
Total	45,467	1,060	201,343	2.33	1.96	5.83	3.03

Buildin(D2-2

Use/Unit	GFA (m^2)	Population ca	Domestic Demand L/day	Domestic Demand L/s	Peaking Values (L/s) Min Hr	Peak Hr	Max Day
Employment	19,455	642	121,985	1.41	1.19	1.69	1.55
Total	19,455	642	121,985	1.41	1.19	1.69	1.55

Buildin(D2-Podium

Use/Unit	GFA (m^2)	Population ca	Domestic Demand L/day	Domestic Demand L/s	Peaking Values (L/s) Min Hr	Peak Hr	Max Day
Residential	423	12	2,185	0.03	0.02	0.06	0.03
Retail	3,809	42	7,960	0.09	0.08	0.11	0.10
Employment	1,621	53	10,163	0.12	0.10	0.14	0.13
Total	5,853	107	20,308	0.24	0.20	0.31	0.26

Block D Summary

Buildin(D2

Use/Unit	GFA (m^2)	Population ca	Domestic Demand L/day	Domestic Demand L/s	Peaking Values (L/s) Min Hr	Peak Hr	Max Day
Residential	45,890	1,071	203,528	2.36	1.98	5.89	3.06
Retail	3,809	42	7,960	0.09	0.08	0.11	0.10
Employment	21,076	696	132,148	1.53	1.28	1.84	1.68
Total	70,775	1,809	343,636	3.98	3.34	7.84	4.85

Building D2

Unit Type	Studio	1 BDRM	2 BDRM	3+ BDRM	Total Units
People/Unit	1.4	1.4	2.1	3.1	
D3-1	29	286	200	57	**572**
D3-2	23	230	161	46	**460**
D3-3	27	274	192	55	**548**
D3-Podium	1	14	9	3	**27**

Buildin(D3-1

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	44,598	1,038	197,163	2.28	1.92	5.70	2.97
Total	44,598	1,038	197,163	2.28	1.92	5.70	2.97

Buildin(D3-2

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	35,986	835	158,631	1.84	1.54	4.59	2.39
Total	35,986	835	158,631	1.84	1.54	4.59	2.39

Buildin(D3-3

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	42,764	995	189,069	2.19	1.84	5.47	2.84
Total	42,764	995	189,069	2.19	1.84	5.47	2.84

Buildin(D3-Podium

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	2,123	49	9,348	0.11	0.09	0.27	0.14
Retail	775	9	1,620	0.02	0.02	0.02	0.02
School	8,841	1,100	115,500	1.34	1.12	1.60	1.47
Community	1,355	15	2,831	0.03	0.03	0.04	0.04
Total	13,094	1,173	129,298	1.50	1.26	1.94	1.67

Block D Summary

Buildin(D3

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	125,472	2,917	554,211	6.41	5.39	16.04	8.34
Retail	2,129	23	4,450	0.05	0.04	0.06	0.06
School	8,841	1,100	115,500	1.34	1.12	1.60	1.47
Total	136,442	4,040	674,161	7.80	6.55	17.70	9.87

Block D Summary

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	221,673	5,158	980,039	11.34	9.53	28.36	14.75
Retail	7,696	85	16,084	0.19	0.16	0.22	0.20
Employment	44,759	1,477	280,638	3.25	2.73	3.90	3.57
School	8,841	1,100	115,500	1.34	1.12	1.60	1.47
Total	**282,968**	**7,820**	**1,392,261**	**16.11**	**13.54**	**34.08**	**19.99**

Block E

Building E

Unit Type	Studio	1 BDRM	2 BDRM	3+ BDRM	Total Units
People/Unit	1.4	1.4	2.1	3.1	
E-1	27	268	187	54	**536**
E-2	4	42	30	8	**84**
E-Podium	0	4	3	1	**8**

Building E-1

Use/Unit	GFA (m^2)	Population ca	Domestic Demand L/day	Domestic Demand L/s	Peaking Values (L/s) Min Hr	Peak Hr	Max Day
Residential	41,745	973	184,889	2.14	1.80	5.35	2.78
Total	41,745	973	184,889	2.14	1.80	5.35	2.78

Building E-2

Use/Unit	GFA (m^2)	Population ca	Domestic Demand L/day	Domestic Demand L/s	Peaking Values (L/s) Min Hr	Peak Hr	Max Day
Residential	6,538	152	28,918	0.33	0.28	0.84	0.44
Total	6,538	152	28,918	0.33	0.28	0.84	0.44

Building E-Podium

Use/Unit	GFA (m^2)	Population ca	Domestic Demand L/day	Domestic Demand L/s	Peaking Values (L/s) Min Hr	Peak Hr	Max Day
Residential	621	15	2,850	0.03	0.03	0.08	0.04
Retail	3,084	34	6,446	0.07	0.06	0.09	0.08
Community	6,039	66	12,622	0.15	0.12	0.18	0.16
Total	9,745	115	21,918	0.25	0.21	0.35	0.29

Block E Summary

Building E

Use/Unit	GFA (m^2)	Population ca	Domestic Demand L/day	Domestic Demand L/s	Peaking Values (L/s) Min Hr	Peak Hr	Max Day
Residential	48,905	1,140	216,657	2.51	2.11	6.27	3.26
Retail	9,123	100	6,446	0.07	0.06	0.09	0.08
Total	58,028	1,241	223,103	2.58	2.17	6.36	3.34

Block E Summary

Use/Unit	GFA (m^2)	Population ca	Domestic Demand L/day	Domestic Demand L/s	Peaking Values (L/s) Min Hr	Peak Hr	Max Day
Residential	48,905	1,140	216,657	2.51	2.11	6.27	3.26
Retail	9,123	100	6,446	0.07	0.06	0.09	0.08
Total	**58,028**	**1,241**	**223,103**	**2.58**	**2.17**	**6.36**	**3.34**

ARUP	Job No.		Rev.
	277167	First Capital Realty	01
	Member/Location	City of Toronto	
Job Title: 2150 Lake Shore Boulevard	Drg. Ref.	See Appendix B	
Calculation: Domestic Water Demand	Made by: C.G.	Date: 13/01/2021	Chd.: F.F.

Block F

Building F

Unit Type	Studio	1 BDRM	2 BDRM	3+ BDRM	Total Units
People/Unit	1.4	1.4	2.1	3.1	
F-1	30	301	210	60	**601**
F-2	2	16	11	3	**32**
F-Podium	2	24	17	5	**48**

Building F-1

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	46,899	1,090	207,176	2.40	2.01	5.99	3.12
Total	46,899	1,090	207,176	2.40	2.01	5.99	3.12

Building F-2

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	2,521	58	10,944	0.13	0.11	0.32	0.16
Total	2,521	58	10,944	0.13	0.11	0.32	0.16

Building F-Podium

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	3,780	88	16,644	0.19	0.16	0.48	0.25
Retail	2,863	31	5,983	0.07	0.06	0.08	0.08
Total	6,643	119	22,627	0.26	0.22	0.56	0.33

Block F Summary

Building F

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	53,200	1,236	234,764	2.72	2.28	6.79	3.53
Retail	2,863	31	5,983	0.07	0.06	0.08	0.08
Total	56,063	1,267	240,747	2.79	2.34	6.88	3.61

Block F Summary

	GFA	Population	Domestic Demand		Peaking Values (L/s)		
Use/Unit	(m^2)	ca	L/day	L/s	Min Hr	Peak Hr	Max Day
Residential	53,200	1,236	234,764	2.72	2.28	6.79	3.53
Retail	2,863	31	5,983	0.07	0.06	0.08	0.08
Total	**56,063**	**1,267**	**240,747**	**2.79**	**2.34**	**6.88**	**3.61**

FIRE FLOW CALCULATIONS - INPUTS & ASSUMPTIONS

Fire Flow Formula: $F = 220C\sqrt{A}$

Fire Underwriters Survey (FUS)
Water Supply for Public Fire Protection

where
F = Required Fire Flow (L/min.)
A = Effective Area (m^2)
C = Construction Type Coeffecient

C - Construction Type Coefficient

1.5	Wood Frame
1	Ordinary Construction
0.8	Non-combustible Construction
0.6	Fire-resistive Construction

All buildings for the 2150 Lake Shore Boulevard Development site are assumed to meet fire-resistive construction (i.e. fully protected frame, floors, and roofs).

A - Effective Area

The total floor area (including all storeys, but excluding basements at least 50% below grade) in the building being considered. For fire-resistive buildings, consider the two largest adjoining floors plus 50% of each of any floors immediately above them up to eight, when the vertical openings are inadequately protected. If the vertical openings and exterior vertical communications are properly protected (one hour rating), consider only the area of the largest floor plus 25% of each of the two immediately adjoining floors.

All buildings for the 2150 Lake Shore Boulevard Development site are assumed to meet fire-resistive construction, and therefore the value for A is considered to be the area of the largest floor plus 25% of the two adjoining floors, excluding basements. The podium for each building is up to two floors tall and is considered the largest floor area.

Reduction and Surcharge Factors:

1) Assessment of Contents Fire Hazard:

The value calculated above can be reduced for occupancies having a low fire hazard, or increased for high fire hazard. According to the FUS Appendix, Apartments, Dwellings, Institutions, Libraries, Office Buildings, Public Buildings, and Schools are considered low hazard (-15%). Examples of high hazard occupancies include industrial items such as chemical works, solvent extracting, varnish and paint works, and woodworking.

-25%	Non-Combustible	**Low Hazard**
-15%	Limited Combustible	↓
0%	Combustible	
15%	Free Burning	
25%	Rapid Burning	**High Hazard**

Buildings for the 2150 Lake Shore Boulevard Development site contain a mix of residential apartments, employment, schools, and retail. A 15% surcharge has been applied to each building in order to conservatively assess the required fire flow until the exact nature of the retail is known.

2) Sprinkler Reduction System:

A reduction of up to 50% for complete automatic sprinkler protection (applied to the result after reduction/surcharge 1) depending upon adequacy of the system. The credit for the system with be a maximum of 30% for an adequately designed system confirming to NFPA 13 and other NFPA sprinkler standards. Additional credit of up to 10% may be granted if the water supply is standard for both the system and fire department hose lines required. The percentage reduction made for an automatic sprinkler system will depend upon the extent to which the system is judged to reduce the possibility of fires spreading within and beyond the fire area. Normally this reduction will not be the maximum allowed without proper system supervision including water flow and conrol valve alarm service. Additional credit may be given of up to 10% for a fully supervised system.

All buildings for the 2150 Lake Shore Boulevard Development site will have NFPA 13 sprinkler systems (30%). The water supply is a new network and therefore standard water connections are assumed to be provided (10%). System is assumed to be fully supervised (10%). A total credit of 50% reduction has been applied.

3) Fire Separation Charge

A surcharge (applied to the result after reduction/surcharge 1) applied for structures exposed within 45 meters of the fire area under consideration. The percentage shall depend on the height, area, and construction of the buildings being exposed, the separation, openings in the exposed buildings, length and height of exposure, provision of automatic sprinklers and/or outside sprinklers in the buildings exposed, the occupany of the exposed buildings, and the effect of hillside locations on the possible spread of the fire. The charge for any one side generally should not exceed the following limits:

Separation	Charge
0 to 3m	25%
3.1 to 10m	20%
10.1m to 20m	15%
20.1m to 30m	10%
30.1m to 45m	5%

The total percentage shall be the sum for all sides, but shall not exceed 75%.

For all buildings for the 2150 Lake Shore Boulevard Development site, the separation surcharges indicated above have been applied for adjacent buildings, not considering reductions for new construction and provision of automatic sprinklers.

FIRE FLOW CALCULATIONS - SUMMARY

Using the above noted calculation and reduction/surcharge factors, the required fire flow was calculated for each building, as shown on the following pages. A summary of required fire flow (FF) is below:

Building	FF (L/min)	FF (L/s)	US GPM	
A1	13000	220	3434	<--Use for test case
A1 Market	7000	120	1849	
A2	8000	127	2113	
A3	9000	147	2378	
A4	9000	150	2378	
B1	8000	138	2113	
B2	10000	163	2642	
C1	9000	153	2378	
D1	8000	134	2113	
D2	8000	134	2113	
D3	10000	161	2642	
E1	10000	163	2642	
F1	6000	92	1585	

To test the network on a worst-case scenario, a fire will be applied at Building A1, along with Maximum Day Demands across the development and surrounding neighbourhoods.

ARUP	Job No.	Sheet No.	Rev.
	277167	First Capital Realty	
	Member/Location	City of Toronto	
Job Title: 2150 Lake Shore Boulevard	Drg. Ref.	See Appendix B	
Calculation: Fire Protection Requirements	Made by: C.G.	Date: 14/01/2021	Chd.: F.F.

FIRE FLOW CALCULATIONS - BLOCK A SUMMARY

Building	Fire Flow (L/s)	
A1	220	<- Worst Case
A1 Market	120	
A2	127	
A3	147	
A4	153	

ARUP	Job No.	Sheet No.	Rev.
	277167	First Capital Realty	
	Member/Location	City of Toronto	
Job Title: 2150 Lake Shore Boulevard	Drg. Ref.	See Appendix B	
Calculation: Fire Protection Requirements	Made by: C.G.	Date: 14/01/2021	Chd.: F.F.

FIRE FLOW CALCULATIONS - A1

1) Fire Flow Formula: $F = 220C\sqrt{A}$ — *Fire Underwriters Survey (FUS)*

Water Supply for Public Fire Protection

where

F = Required Fire Flow (L/min.)

A = Effective Area (m^2)

C = Construction Type Coeffecient

	1.5	Wood Frame
	1	Ordinary Construction
	0.8	Non-combustible Construction
Select	0.6	Fire-resistive Construction

Effective Area: For fire-resistive buildings with 1-hour fire rating, the area shall be the total area of the largest floor plus 25% of the two adjoining floors.

Largest Floor	4210.3	m^2
Adjacent Floor	4210.3	m^2
Adjacent Floor	2456	m^2
Total Floor Area, A =	5876.88	m^2

F_1 = 10119 L/min

F_1 = 10000 *(nearest 1000 L/min.)*

Reduction and Surcharge Factors:

2) Assessment of Contents Fire Hazard:

	-25%	Non-Combustible
	-15%	Limited Combustible
	0%	Combustible
	15%	Free Burning
Select	25%	Rapid Burning

Reduction (2) = 1500 L/min

F_2 = 11500 L/min

3) Sprinkler Reduction System:

50% Reduction for Automatic Sprinkler System per NFPA 13

Reduction (3) = -5750 L/min

F_3 = 5750 L/min

4) Fire Separation Charge

Separation	Building Face	Quantity	Charge
0 to 3m			25%
3.1 to 10m	N, NW	2	20%
10.1m to 20m	W	1	15%
20.1m to 30m	S	1	10%
30.1m to 45m			5%
		Surcharge Factor (4)	65%

$F_4 = F_2$ x Surcharge Factor

F_4 = 7475 L/min

5) Fire Flow Requirements:

F=	**13225** L/min.	$F = F_3 + F_4$	*(with reduction and surcharge factors)*
F=	**13000** L/min.	*(nearest 1000 L/min.)*	*(2,000 L/min. < F < 45,000 L/min.)*
F=	3434 US GPM		
F=	220 L/s		

FIRE FLOW CALCULATIONS - A1 Market

1) Fire Flow Formula: $F = 220C\sqrt{A}$ — *Fire Underwriters Survey (FUS)*

where — *Water Supply for Public Fire Protection*

F = Required Fire Flow (L/min.)

A = Effective Area (m^2)

C = Construction Type Coeffecient

	1.5	Wood Frame
	1	Ordinary Construction
	0.8	Non-combustible Construction
Select	0.6	Fire-resistive Construction

Effective Area: For fire-resistive buildings with 1-hour fire rating, the area shall be the total area of the largest floor plus 25% of the two adjoining floors.

Largest Floor	1060	m^2
Adjacent Floor	1060	m^2
Adjacent Floor	1060	m^2
Total Floor Area, A =	1590.00	m^2

F_1 = 5263 L/min

F_1 = 5000 *(nearest 1000 L/min.)*

Reduction and Surcharge Factors:

2) Assessment of Contents Fire Hazard:

	-25%	Non-Combustible
	-15%	Limited Combustible
	0%	Combustible
	15%	Free Burning
Select	25%	Rapid Burning

Reduction (2) = 750 L/min

F_2 = 5750 L/min

3) Sprinkler Reduction System:

50%	Reduction for Automatic Sprinkler System per NFPA 13

Reduction (3) = -2875 L/min

F_3 = 2875 L/min

4) Fire Separation Charge

Separation	Building Face	Quantity	Charge
0 to 3m			25%
3.1 to 10m	E,W,S	3	20%
10.1m to 20m	N	1	15%
20.1m to 30m			10%
30.1m to 45m			5%
		Surcharge Factor (4)	75%

$F_4 = F_2$ x Surcharge Factor

F_4 = 4313 L/min

5) Fire Flow Requirements:

F=	**7188** L/min.	$F = F_3 + F_4$	*(with reduction and surcharge factors)*
F=	**7000** L/min.	*(nearest 1000 L/min.)*	*(2,000 L/min. < F < 45,000 L/min.)*
F=	1849 US GPM		
F=	120 L/s		

ARUP	Job No.	Sheet No.	Rev.
	277167	First Capital Realty	
	Member/Location	City of Toronto	
Job Title: 2150 Lake Shore Boulevard	Drg. Ref.	See Appendix B	
Calculation: Fire Protection Requirements	Made by: C.G.	Date: 14/01/2021	Chd.: F.F.

FIRE FLOW CALCULATIONS - A2

1) Fire Flow Formula: $F = 220C\sqrt{A}$ — *Fire Underwriters Survey (FUS)*

where — *Water Supply for Public Fire Protection*

F = Required Fire Flow (L/min.)

A = Effective Area (m^2)

C = Construction Type Coeffecient

	1.5	Wood Frame
	1	Ordinary Construction
	0.8	Non-combustible Construction
Select	0.6	Fire-resistive Construction

Effective Area: For fire-resistive buildings with 1-hour fire rating, the area shall be the total area of the largest floor plus 25% of the two adjoining floors.

Largest Floor	2120.8	m^2
Adjacent Floor	2120.8	m^2
Adjacent Floor	1772.5	m^2
Total Floor Area, A =	3094.13	m^2

F_1 = 7342 L/min

F_1 = 7000 *(nearest 1000 L/min.)*

Reduction and Surcharge Factors:

2) Assessment of Contents Fire Hazard:

	-25%	Non-Combustible
	-15%	Limited Combustible
	0%	Combustible
	15%	Free Burning
Select	25%	Rapid Burning

Reduction (2) = 1050 L/min

F_2 = 8050 L/min

3) Sprinkler Reduction System:

50% Reduction for Automatic Sprinkler System per NFPA 13

Reduction (3) = -4025 L/min

F_3 = 4025 L/min

4) Fire Separation Charge

Separation	Building Face	Quantity	Charge
0 to 3m			25%
3.1 to 10m			20%
10.1m to 20m	NE,SE	2	15%
20.1m to 30m	W	1	10%
30.1m to 45m	S	1	5%
	Surcharge Factor (4)		45%

$F_4 = F_2$ x Surcharge Factor

F_4 = 3623 L/min

5) Fire Flow Requirements:

F=	**7648** L/min.	$F = F_3 + F_4$	*(with reduction and surcharge factors)*
F=	**8000** L/min.	*(nearest 1000 L/min.)*	*(2,000 L/min. < F < 45,000 L/min.)*
F=	2113 US GPM		
F=	127 L/s		

ARUP	Job No.	Sheet No.	Rev.
	277167	First Capital Realty	
	Member/Location	City of Toronto	
Job Title: 2150 Lake Shore Boulevard	Drg. Ref.	See Appendix B	
Calculation: Fire Protection Requirements	Made by: C.G.	Date: 14/01/2021	Chd.: F.F.

FIRE FLOW CALCULATIONS - A3

1) Fire Flow Formula: $F = 220C\sqrt{A}$ — *Fire Underwriters Survey (FUS)*

Water Supply for Public Fire Protection

where

F = Required Fire Flow (L/min.)

A = Effective Area (m^2)

C = Construction Type Coeffecient

	1.5	Wood Frame
	1	Ordinary Construction
	0.8	Non-combustible Construction
Select	0.6	Fire-resistive Construction

Effective Area: For fire-resistive buildings with 1-hour fire rating, the area shall be the total area of the largest floor plus 25% of the two adjoining floors.

Largest Floor	3140.4	m^2
Adjacent Floor	3140.4	m^2
Adjacent Floor	2366.8	m^2
Total Floor Area, A =	4517.20	m^2

F_1 = 8872 L/min

F_1 = 9000 *(nearest 1000 L/min.)*

Reduction and Surcharge Factors:

2) Assessment of Contents Fire Hazard:

	-25%	Non-Combustible
	-15%	Limited Combustible
	0%	Combustible
	15%	Free Burning
Select	25%	Rapid Burning

Reduction (2) = 1350 L/min

F_2 = 10350 L/min

3) Sprinkler Reduction System:

50%	Reduction for Automatic Sprinkler System per NFPA 13

Reduction (3) = -5175 L/min

F_3 = 5175 L/min

4) Fire Separation Charge

Separation	Building Face	Quantity	Charge
0 to 3m			25%
3.1 to 10m			20%
10.1m to 20m	E, W	2	15%
20.1m to 30m			10%
30.1m to 45m	S	1	5%
		Surcharge Factor (4)	35%

$F_4 = F_2$ x Surcharge Factor

F_4 = 3623 L/min

5) Fire Flow Requirements:

F=	**8798** L/min.	$F = F_3 + F_4$	*(with reduction and surcharge factors)*
F=	**9000** L/min.	*(nearest 1000 L/min.)*	*(2,000 L/min. < F < 45,000 L/min.)*
F=	2378 US GPM		
F=	147 L/s		

ARUP	Job No.	Sheet No.	Rev.
	277167	First Capital Realty	
	Member/Location	City of Toronto	
Job Title: 2150 Lake Shore Boulevard	Drg. Ref.	See Appendix B	
Calculation: Fire Protection Requirements	Made by: C.G.	Date: 14/01/2021	Chd.: F.F.

FIRE FLOW CALCULATIONS - A4

1) Fire Flow Formula: $F = 220C\sqrt{A}$

where

F = Required Fire Flow (L/min.)

A = Effective Area (m^2)

C = Construction Type Coeffecient

Fire Underwriters Survey (FUS)

Water Supply for Public Fire Protection

	1.5	Wood Frame
	1	Ordinary Construction
	0.8	Non-combustible Construction
Select	0.6	Fire-resistive Construction

Effective Area: For fire-resistive buildings with 1-hour fire rating, the area shall be the total area of the largest floor plus 25% of the two adjoining floors.

Largest Floor	2605.5	m^2
Adjacent Floor	2605.5	m^2
Adjacent Floor	2163.3	m^2
Total Floor Area, A =	3797.70	m^2

F_1 = 8135 L/min

F_1 = 8000 *(nearest 1000 L/min.)*

Reduction and Surcharge Factors:

2) Assessment of Contents Fire Hazard:

	-25%	Non-Combustible
	-15%	Limited Combustible
	0%	Combustible
	15%	Free Burning
Select	25%	Rapid Burning

Reduction (2) = 1200 L/min

F_2 = 9200 L/min

3) Sprinkler Reduction System:

50%	Reduction for Automatic Sprinkler System per NFPA 13

Reduction (3) = -4600 L/min

F_3 = 4600 L/min

4) Fire Separation Charge

Separation	Building Face	Quantity	Charge
0 to 3m			25%
3.1 to 10m	S	1	20%
10.1m to 20m	W	1	15%
20.1m to 30m	N	1	10%
30.1m to 45m	E	1	5%
	Surcharge Factor (4)		50%

$F_4 = F_2$ x Surcharge Factor

F_4 = 4600 L/min

5) Fire Flow Requirements:

F=	**9200** L/min.	$F = F_3 + F_4$	*(with reduction and surcharge factors)*
F=	**9000** L/min.	*(nearest 1000 L/min.)*	*(2,000 L/min. < F < 45,000 L/min.)*
F=	2378 US GPM		
F=	153 L/s		

ARUP	Job No.	Sheet No.	Rev.
	277167	First Capital Realty	
	Member/Location	City of Toronto	
Job Title: 2150 Lake Shore Boulevard	Drg. Ref.	See Appendix B	
Calculation: Fire Protection Requirements	Made by: C.G.	Date: 14/01/2021	Chd.: F.F.

FIRE FLOW CALCULATIONS - BLOCK B SUMMARY

Building	Fire Flow (L/s)	
B1	138	
B2	163	<- Worst Case

ARUP	Job No.	Sheet No.	Rev.
	277167	First Capital Realty	
	Member/Location	City of Toronto	
Job Title: 2150 Lake Shore Boulevard	Drg. Ref.	See Appendix B	
Calculation: Fire Protection Requirements	Made by: C.G.	Date: 14/01/2021	Chd.: F.F.

FIRE FLOW CALCULATIONS - B1

1) Fire Flow Formula: $F = 220C\sqrt{A}$ — *Fire Underwriters Survey (FUS)*

where — *Water Supply for Public Fire Protection*

F = Required Fire Flow (L/min.)

A = Effective Area (m^2)

C = Construction Type Coeffecient

	1.5	Wood Frame
	1	Ordinary Construction
	0.8	Non-combustible Construction
Select	0.6	Fire-resistive Construction

Effective Area: For fire-resistive buildings with 1-hour fire rating, the area shall be the total area of the largest floor plus 25% of the two adjoining floors.

Largest Floor	3554.7	m^2
Adjacent Floor	3554.7	m^2
Adjacent Floor	2643.1	m^2
Total Floor Area, A =	5104.15	m^2

F_1 = 9431 L/min

F_1 = 9000 *(nearest 1000 L/min.)*

Reduction and Surcharge Factors:

2) Assessment of Contents Fire Hazard:

	-25%	Non-Combustible
	-15%	Limited Combustible
	0%	Combustible
	15%	Free Burning
Select	25%	Rapid Burning

Reduction (2) = 1350 L/min

F_2 = 10350 L/min

3) Sprinkler Reduction System:

50%	Reduction for Automatic Sprinkler System per NFPA 13

Reduction (3) = -5175 L/min

F_3 = 5175 L/min

4) Fire Separation Charge

Separation	Building Face	Quantity	Charge
0 to 3m			25%
3.1 to 10m			20%
10.1m to 20m	E	1	15%
20.1m to 30m	W	1	10%
30.1m to 45m	N	1	5%
	Surcharge Factor (4)		30%

$F_4 = F_2$ x Surcharge Factor

F_4 = 3105 L/min

5) Fire Flow Requirements:

F=	**8280** L/min.	$F = F_3 + F_4$	*(with reduction and surcharge factors)*
F=	**8000** L/min.	*(nearest 1000 L/min.)*	*(2,000 L/min. < F < 45,000 L/min.)*
F=	2113 US GPM		
F=	138 L/s		

ARUP	Job No.	Sheet No.	Rev.
	277167	First Capital Realty	
	Member/Location	City of Toronto	
Job Title: 2150 Lake Shore Boulevard	Drg. Ref.	See Appendix B	
Calculation: Fire Protection Requirements	Made by: C.G.	Date: 14/01/2021	Chd.: F.F.

FIRE FLOW CALCULATIONS - B2

1) Fire Flow Formula: $F = 220C\sqrt{A}$ — *Fire Underwriters Survey (FUS)*

Water Supply for Public Fire Protection

where

F = Required Fire Flow (L/min.)

A = Effective Area (m^2)

C = Construction Type Coeffecient

	1.5	Wood Frame
	1	Ordinary Construction
	0.8	Non-combustible Construction
Select	0.6	Fire-resistive Construction

Effective Area: For fire-resistive buildings with 1-hour fire rating, the area shall be the total area of the largest floor plus 25% of the two adjoining floors.

Largest Floor	3741.1	m^2
Adjacent Floor	3741.1	m^2
Adjacent Floor	3076.9	m^2
Total Floor Area, A =	5445.60	m^2

F_1 = 9741 L/min

F_1 = 10000 *(nearest 1000 L/min.)*

Reduction and Surcharge Factors:

2) Assessment of Contents Fire Hazard:

	-25%	Non-Combustible
	-15%	Limited Combustible
	0%	Combustible
	15%	Free Burning
Select	25%	Rapid Burning

Reduction (2) = 1500 L/min

F_2 = 11500 L/min

3) Sprinkler Reduction System:

50%	Reduction for Automatic Sprinkler System per NFPA 13

Reduction (3) = -5750 L/min

F_3 = 5750 L/min

4) Fire Separation Charge

Separation	Building Face	Quantity	Charge
0 to 3m			25%
3.1 to 10m			20%
10.1m to 20m	W	1	15%
20.1m to 30m	N	1	10%
30.1m to 45m	E, S	2	5%
		Surcharge Factor (4)	35%

$F_4 = F_2$ x Surcharge Factor

F_4 = 4025 L/min

5) Fire Flow Requirements:

F=	**9775** L/min.	$F = F_3 + F_4$	*(with reduction and surcharge factors)*
F=	**10000** L/min.	*(nearest 1000 L/min.)*	*(2,000 L/min. < F < 45,000 L/min.)*
F=	2642 US GPM		
F=	163 L/s		

ARUP	Job No.	Sheet No.	Rev.
	277167	First Capital Realty	
	Member/Location	City of Toronto	
Job Title: 2150 Lake Shore Boulevard	Drg. Ref.	See Appendix B	
Calculation: Fire Protection Requirements	Made by: C.G.	Date: 14/01/2021	Chd.: F.F.

FIRE FLOW CALCULATIONS - BLOCK C SUMMARY

Building	Fire Flow (L/s)	
C	153	<- Worst Case

FIRE FLOW CALCULATIONS - C

1) Fire Flow Formula: $F = 220C\sqrt{A}$

Fire Underwriters Survey (FUS)

Water Supply for Public Fire Protection

where

F = Required Fire Flow (L/min.)

A = Effective Area (m^2)

C = Construction Type Coeffecient

	1.5	Wood Frame
	1	Ordinary Construction
	0.8	Non-combustible Construction
Select	0.6	Fire-resistive Construction

Effective Area: For fire-resistive buildings with 1-hour fire rating, the area shall be the total area of the largest floor plus 25% of the two adjoining floors.

Largest Floor	4432.9	m^2
Adjacent Floor	4432.9	m^2
Adjacent Floor	2626	m^2
Total Floor Area, A =	6197.63	m^2

F_1 = 10392 L/min

F_1 = 10000 *(nearest 1000 L/min.)*

Reduction and Surcharge Factors:

2) Assessment of Contents Fire Hazard:

	-25%	Non-Combustible
	-15%	Limited Combustible
	0%	Combustible
	15%	Free Burning
Select	25%	Rapid Burning

Reduction (2) = 1500 L/min

F_2 = 11500 L/min

3) Sprinkler Reduction System:

50%	Reduction for Automatic Sprinkler System per NFPA 13

Reduction (3) = -5750 L/min

F_3 = 5750 L/min

4) Fire Separation Charge

Separation	Building Face	Quantity	Charge
0 to 3m			25%
3.1 to 10m			20%
10.1m to 20m			15%
20.1m to 30m	N,E	2	10%
30.1m to 45m	W,S	2	5%
	Surcharge Factor (4)		30%

$F_4 = F_2$ x Surcharge Factor

F_4 = 3450 L/min

5) Fire Flow Requirements:

F=	**9200** L/min.	$F = F_3 + F_4$	*(with reduction and surcharge factors)*
F=	**9000** L/min.	*(nearest 1000 L/min.)*	*(2,000 L/min. < F < 45,000 L/min.)*
F=	2378 US GPM		
F=	153 L/s		

ARUP	Job No.	Sheet No.	Rev.
	277167	First Capital Realty	
	Member/Location	City of Toronto	
Job Title: 2150 Lake Shore Boulevard	Drg. Ref.	See Appendix B	
Calculation: Fire Protection Requirements	Made by: C.G.	Date: 14/01/2021	Chd.: F.F.

FIRE FLOW CALCULATIONS - BLOCK D SUMMARY

Building	Fire Flow (L/s)	
D1	134	
D2	134	
D3	161	<- Worst Case

ARUP	Job No.	Sheet No.	Rev.
	277167	First Capital Realty	
	Member/Location	City of Toronto	
Job Title: 2150 Lake Shore Boulevard	Drg. Ref.	See Appendix B	
Calculation: Fire Protection Requirements	Made by: C.G.	Date: 14/01/2021	Chd.: F.F.

FIRE FLOW CALCULATIONS - D1

1) Fire Flow Formula: $F = 220C\sqrt{A}$

Fire Underwriters Survey (FUS)
Water Supply for Public Fire Protection

where
F = Required Fire Flow (L/min.)
A = Effective Area (m^2)
C = Construction Type Coeffecient

	1.5	Wood Frame
	1	Ordinary Construction
	0.8	Non-combustible Construction
Select	0.6	Fire-resistive Construction

Effective Area: For fire-resistive buildings with 1-hour fire rating, the area shall be the total area of the largest floor plus 25% of the two adjoining floors.

Largest Floor	4415.5	m^2
Adjacent Floor	3943	m^2
Adjacent Floor	3452	m^2
Total Floor Area, A =	6264.25	m^2

F_1 = 10447 L/min
F_1 = 10000 *(nearest 1000 L/min.)*

Reduction and Surcharge Factors:

2) Assessment of Contents Fire Hazard:

	-25%	Non-Combustible
	-15%	Limited Combustible
	0%	Combustible
	15%	Free Burning
Select	25%	Rapid Burning

Reduction (2) = 1500 L/min
F_2 = 11500 L/min

3) Sprinkler Reduction System:

50%	Reduction for Automatic Sprinkler System per NFPA 13

Reduction (3) = -5750 L/min
F_3 = 5750 L/min

4) Fire Separation Charge

Separation	Building Face	Quantity	Charge
0 to 3m			25%
3.1 to 10m			20%
10.1m to 20m			15%
20.1m to 30m	E	1	10%
30.1m to 45m	S,W	2	5%
		Surcharge Factor (4)	20%

$F_4 = F_2$ x Surcharge Factor
F_4 = 2300 L/min

5) Fire Flow Requirements:

F=	**8050** L/min.	$F = F_3 + F_4$	*(with reduction and surcharge factors)*
F=	**8000** L/min.	*(nearest 1000 L/min.)*	*(2,000 L/min. < F < 45,000 L/min.)*
F=	2113 US GPM		
F=	134 L/s		

ARUP	Job No.	Sheet No.	Rev.
	277167	First Capital Realty	
	Member/Location	City of Toronto	
Job Title: 2150 Lake Shore Boulevard	Drg. Ref.	See Appendix B	
Calculation: Fire Protection Requirements	Made by: C.G.	Date: 14/01/2021	Chd.: F.F.

FIRE FLOW CALCULATIONS - D2

1) Fire Flow Formula: $F = 220C\sqrt{A}$

Fire Underwriters Survey (FUS)
Water Supply for Public Fire Protection

where
F = Required Fire Flow (L/min.)
A = Effective Area (m^2)
C = Construction Type Coeffecient

	1.5	Wood Frame
	1	Ordinary Construction
	0.8	Non-combustible Construction
Select	0.6	Fire-resistive Construction

Effective Area: For fire-resistive buildings with 1-hour fire rating, the area shall be the total area of the largest floor plus 25% of the two adjoining floors.

Largest Floor	4387.3	m^2
Adjacent Floor	3201.1	m^2
Adjacent Floor	3201.1	m^2
Total Floor Area, A =	5987.85	m^2

F_1 = 10214 L/min
F_1 = 10000 *(nearest 1000 L/min.)*

Reduction and Surcharge Factors:

2) Assessment of Contents Fire Hazard:

	-25%	Non-Combustible
	-15%	Limited Combustible
	0%	Combustible
	15%	Free Burning
Select	25%	Rapid Burning

Reduction (2) = 1500 L/min
F_2 = 11500 L/min

3) Sprinkler Reduction System:

50%	Reduction for Automatic Sprinkler System per NFPA 13

Reduction (3) = -5750 L/min
F_3 = 5750 L/min

4) Fire Separation Charge

Separation	Building Face	Quantity	Charge
0 to 3m			25%
3.1 to 10m			20%
10.1m to 20m			15%
20.1m to 30m	E	1	10%
30.1m to 45m	W,S	2	5%
		Surcharge Factor (4)	20%

$F_4 = F_2$ x Surcharge Factor
F_4 = 2300 L/min

5) Fire Flow Requirements:

F=	**8050** L/min.	$F = F_3 + F_4$	*(with reduction and surcharge factors)*
F=	**8000** L/min.	*(nearest 1000 L/min.)*	*(2,000 L/min. < F < 45,000 L/min.)*
F=	2113 US GPM		
F=	134 L/s		

ARUP	Job No.	Sheet No.	Rev.
	277167	First Capital Realty	
	Member/Location	City of Toronto	
Job Title: 2150 Lake Shore Boulevard	Drg. Ref.	See Appendix B	
Calculation: Fire Protection Requirements	Made by: C.G.	Date: 14/01/2021	Chd.: F.F.

FIRE FLOW CALCULATIONS - D3

1) Fire Flow Formula: $F = 220C\sqrt{A}$

Fire Underwriters Survey (FUS)
Water Supply for Public Fire Protection

where
F = Required Fire Flow (L/min.)
A = Effective Area (m^2)
C = Construction Type Coeffecient

	1.5	Wood Frame
	1	Ordinary Construction
	0.8	Non-combustible Construction
Select	0.6	Fire-resistive Construction

Effective Area: For fire-resistive buildings with 1-hour fire rating, the area shall be the total area of the largest floor plus 25% of the two adjoining floors.

Largest Floor	5350.6	m^2
Adjacent Floor	5350.6	m^2
Adjacent Floor	3994.9	m^2
Total Floor Area, A =	7686.98	m^2

F_1 = 11573 L/min
F_1 = 12000 *(nearest 1000 L/min.)*

Reduction and Surcharge Factors:

2) Assessment of Contents Fire Hazard:

	-25%	Non-Combustible
	-15%	Limited Combustible
	0%	Combustible
	15%	Free Burning
Select	25%	Rapid Burning

Reduction (2) = 1800 L/min
F_2 = 13800 L/min

3) Sprinkler Reduction System:

50%	Reduction for Automatic Sprinkler System per NFPA 13

Reduction (3) = -6900 L/min
F_3 = 6900 L/min

4) Fire Separation Charge

Separation	Building Face	Quantity	Charge
0 to 3m			25%
3.1 to 10m			20%
10.1m to 20m			15%
20.1m to 30m	E, W	2	10%
30.1m to 45m			5%
		Surcharge Factor (4)	20%

$F_4 = F_2$ x Surcharge Factor
F_4 = 2760 L/min

5) Fire Flow Requirements:

F=	**9660** L/min.	$F = F_3 + F_4$	*(with reduction and surcharge factors)*
F=	**10000** L/min.	*(nearest 1000 L/min.)*	*(2,000 L/min. < F < 45,000 L/min.)*
F=	2642 US GPM		
F=	161 L/s		

FIRE FLOW CALCULATIONS - BLOCK E SUMMARY

Building	Fire Flow (L/s)	
E	163	<- Worst Case

FIRE FLOW CALCULATIONS - E

1) Fire Flow Formula: $F = 220C\sqrt{A}$ — *Fire Underwriters Survey (FUS)*, *Water Supply for Public Fire Protection*

where

F = Required Fire Flow (L/min.)

A = Effective Area (m^2)

C = Construction Type Coeffecient

	1.5	Wood Frame
	1	Ordinary Construction
	0.8	Non-combustible Construction
Select	0.6	Fire-resistive Construction

Effective Area: For fire-resistive buildings with 1-hour fire rating, the area shall be the total area of the largest floor plus 25% of the two adjoining floors.

Largest Floor	4114.3	m^2
Adjacent Floor	4114.3	m^2
Adjacent Floor	3757.1	m^2
Total Floor Area, A =	6082.15	m^2

F_1 = 10294 L/min

F_1 = 10000 *(nearest 1000 L/min.)*

Reduction and Surcharge Factors:

2) Assessment of Contents Fire Hazard:

	-25%	Non-Combustible
	-15%	Limited Combustible
	0%	Combustible
	15%	Free Burning
Select	25%	Rapid Burning

Reduction (2) = 1500 L/min

F_2 = 11500 L/min

3) Sprinkler Reduction System:

50%	Reduction for Automatic Sprinkler System per NFPA 13

Reduction (3) = -5750 L/min

F_3 = 5750 L/min

4) Fire Separation Charge

Separation	Building Face	Quantity	Charge
0 to 3m			25%
3.1 to 10m			20%
10.1m to 20m			15%
20.1m to 30m	N,E,S	3	10%
30.1m to 45m	W	1	5%
		Surcharge Factor (4)	35%

F_4 = F_2 x Surcharge Factor

F_4 = 4025 L/min

5) Fire Flow Requirements:

F=	**9775** L/min.	$F = F_3 + F_4$	*(with reduction and surcharge factors)*
F=	**10000** L/min.	*(nearest 1000 L/min.)*	*(2,000 L/min. < F < 45,000 L/min.)*
F=	2642 US GPM		
F=	163 L/s		

FIRE FLOW CALCULATIONS - BLOCK F SUMMARY

Building	Fire Flow (L/s)	
F	92	<- Worst Case

FIRE FLOW CALCULATIONS - F

1) Fire Flow Formula: $F = 220C\sqrt{A}$ — *Fire Underwriters Survey (FUS)*, *Water Supply for Public Fire Protection*

where

F = Required Fire Flow (L/min.)

A = Effective Area (m^2)

C = Construction Type Coeffecient

	1.5	Wood Frame
	1	Ordinary Construction
	0.8	Non-combustible Construction
Select	0.6	Fire-resistive Construction

Effective Area: For fire-resistive buildings with 1-hour fire rating, the area shall be the total area of the largest floor plus 25% of the two adjoining floors.

Largest Floor	2753.8	m^2
Adjacent Floor	2753.8	m^2
Adjacent Floor	2753.8	m^2
Total Floor Area, A =	4130.70	m^2

F_1 = 8484 L/min

F_1 = 8000 *(nearest 1000 L/min.)*

Reduction and Surcharge Factors:

2) Assessment of Contents Fire Hazard:

	-25%	Non-Combustible
	-15%	Limited Combustible
	0%	Combustible
	15%	Free Burning
Select	25%	Rapid Burning

Reduction (2) = 1200 L/min

F_2 = 9200 L/min

3) Sprinkler Reduction System:

50%	Reduction for Automatic Sprinkler System per NFPA 13

Reduction (3) = -4600 L/min

F_3 = 4600 L/min

4) Fire Separation Charge

Separation	Building Face	Quantity	Charge
0 to 3m			25%
3.1 to 10m			20%
10.1m to 20m			15%
20.1m to 30m			10%
30.1m to 45m	S,E	2	5%
		Surcharge Factor (4)	10%

$F_4 = F_2$ x Surcharge Factor

F_4 = 920 L/min

5) Fire Flow Requirements:

F= **5520** L/min. $F = F_3 + F_4$ *(with reduction and surcharge factors)*

F= **6000** L/min. *(nearest 1000 L/min.)* *(2,000 L/min. < F < 45,000 L/min.)*

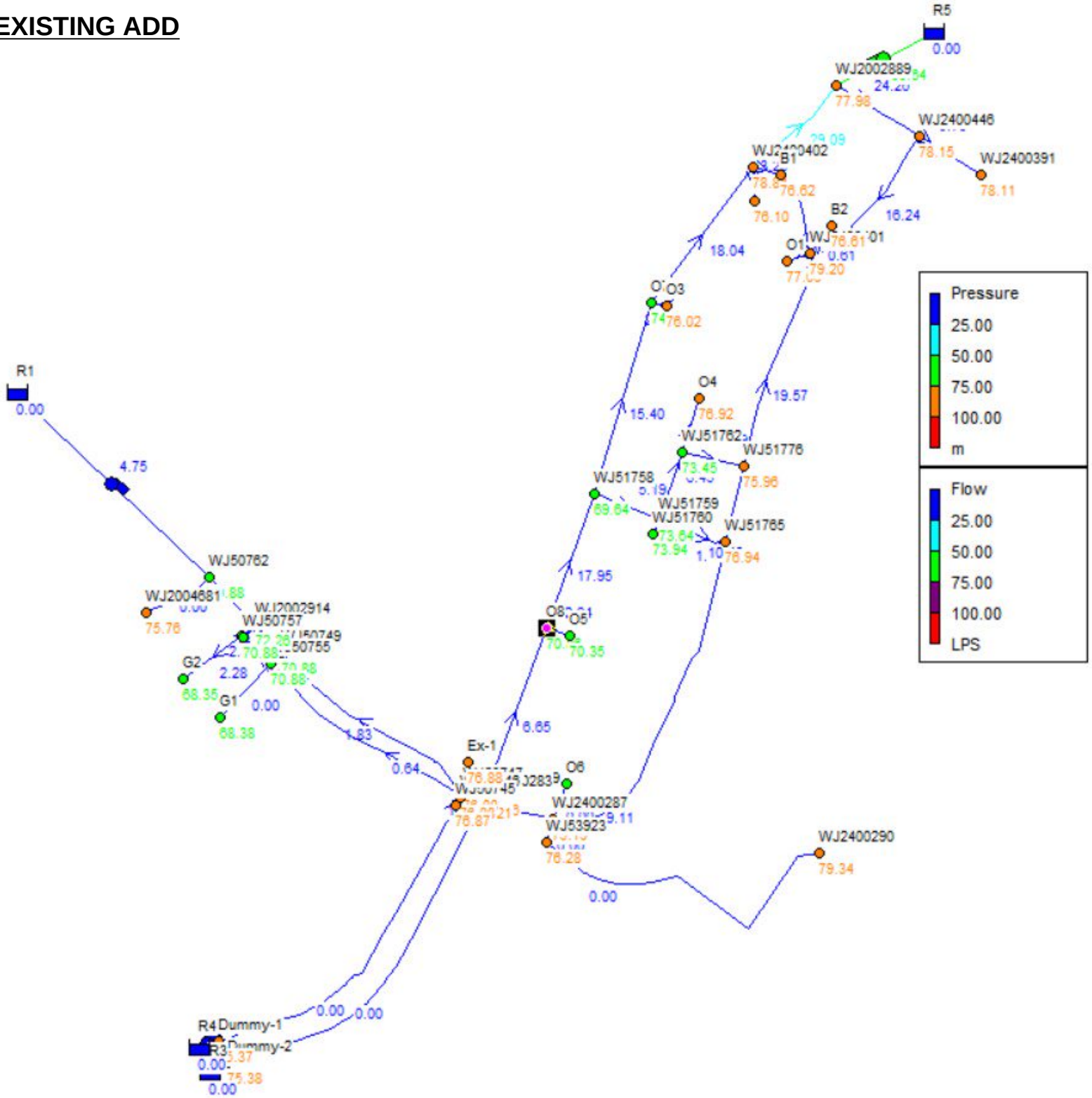
F= 1585 US GPM

F= 92 L/s

Appendix E

Water Modelling Output

SCENARIO 0 - EXISTING ADD



```
*********************************************************************
*                          E P A N E T                              *
*                   Hydraulic and Water Quality                     *
*                   Analysis for Pipe Networks                      *
*                         Version 2.2                               *
*********************************************************************
```

Input File: LS_WM_0.net

Existing Water Demand based on Consmption data as provided by CoT

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
LN2447328	Dummy-1	WJ50745	462.127	200
LN50930	WJ2002914	WJ50762	86.4	300
LN2447196	WJ50747	WJ50749	300.3	300
LN52048	WJ51759	WJ51765	93.5	300
LN50926	WJ50749	WJ2002914	49.8	300
LN50933	WJ50755	WJ50749	21.2	200
LN50918	WJ50746	WJ50755	305.2	200
LN2446937	WJ2002889	WJ2400446	126.4	300
LN52047	WJ51759	WJ51762	94.1	300
LN52040	WJ51758	WJ51759	91.547	300
LN2447335	WJ2400283	Dummy-2	505.846	300
LN2446950	WJ2400446	WJ2400391	93.5	200
LN2447275	WJ2400446	WJ2400401	214.5	300
LN52039	WJ51759	WJ51760	20.2	300
LN50915	WJ50746	WJ50747	10.1	200
LN2400279	WJ2400289	WJ2400283	15.257	300
LN52059	WJ51776	WJ2400401	292.4	300
LN2447317	WJ2400287	WJ51765	465	300
LN50919	WJ50757	WJ50758	2.8	200
LN2400324	WJ2400401	WJ2400402	146.849	300
LN4048079	WJ2400402	WJ2002889	152.105	300
LN52057	WJ51762	WJ51776	83.4	300
LN52051	WJ51765	WJ51776	100.2	300
LN2400276	WJ2400287	WJ53923	30.6	150
LN2447230	WJ53923	WJ2400290	446.3	150
LN50927	WJ2400283	WJ50747	20.6	300
LN50916	WJ50745	WJ50746	11.3	200
LN2400277	WJ2400289	WJ2400287	95.108	300
LN50920	WJ50755	WJ50757	50.2	200
LN50922	WJ50757	WJ2002914	22.1	200
LN2448313	WJ2004681	WJ50762	97.1	300
C11	WJ50755	G1	93	150
C12	WJ50758	G2	95	150
C16	WJ2400401	O1	30.5	150
C17	WJ2400402	O2	44.568	150
C18	O3	O7	19.6	150
C19	WJ51762	O4	72.354	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm	
C20	O8	O5	30.82	150	
C21	WJ2400287	O6	49.41	150	
C22	WJ51758	O7	259.273	300	
C23	O7	WJ2400402	219.96	300	
C24	WJ2400289	O8	229.82	300	
C25	O8	WJ51758	185.97	300	
C27	WJ2400401	B2	45.75	150	
C26	WJ2400402	B1	37.41	150	
1	Ex-1	WJ50747	32.62	150	
P1	R4	Dummy-1	#N/A	#N/A	Pump
P3	R1	WJ50762	#N/A	#N/A	Pump
P2	R3	Dummy-2	#N/A	#N/A	Pump
P5	R5	WJ2002889	#N/A	#N/A	Pump

Energy Usage:

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
P1	0.00	0.00	0.00	0.00	0.00	0.00
P3	100.00	75.00	0.22	3.82	3.82	0.00
P2	0.00	0.00	0.00	0.00	0.00	0.00
P5	100.00	75.00	0.23	45.80	45.80	0.00
				Demand Charge:		0.00
				Total Cost:		0.00

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
O8	21.96	152.56	70.86	0.00
O7	0.00	152.73	74.03	0.00
O3	2.64	152.72	76.02	0.00
O5	2.64	152.55	70.35	0.00
O6	0.00	152.59	71.89	0.00
O4	2.64	152.62	76.92	0.00
O2	3.25	152.80	76.10	0.00
O1	3.25	152.79	77.09	0.00
G2	2.28	152.55	68.35	0.00
G1	0.00	152.58	68.38	0.00
Dummy-2	0.00	152.58	75.38	0.00
Dummy-1	0.00	152.57	75.37	0.00
WJ50758	0.00	152.58	70.88	0.00
WJ50762	0.00	152.58	70.88	0.00
WJ2004681	0.00	152.58	75.76	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
WJ2400290	0.00	152.59	79.34	0.00	
WJ51776	0.00	152.66	75.96	0.00	
WJ51765	0.00	152.64	76.94	0.00	
WJ51762	0.00	152.65	73.45	0.00	
WJ51759	0.00	152.64	73.64	0.00	
WJ51760	2.64	152.64	73.94	0.00	
WJ51758	2.64	152.64	69.64	0.00	
WJ2400287	0.00	152.59	75.19	0.00	
WJ53923	0.00	152.59	76.28	0.00	
WJ2400289	2.64	152.58	77.06	0.00	
WJ2400283	0.00	152.58	77.21	0.00	
WJ50747	0.00	152.58	76.88	0.00	
WJ50746	0.00	152.58	76.88	0.00	
WJ50745	2.28	152.57	76.87	0.00	
WJ50749	0.00	152.58	70.88	0.00	
WJ50755	0.00	152.58	70.88	0.00	
WJ2002914	0.00	152.58	72.26	0.00	
WJ50757	0.00	152.58	70.88	0.00	
WJ2002889	2.29	152.98	77.98	0.00	
WJ2400401	0.00	152.81	79.20	0.00	
WJ2400402	0.00	152.82	78.84	0.00	
WJ2400391	5.73	152.85	78.11	0.00	
WJ2400446	2.29	152.89	78.15	0.00	
B1	0.61	152.82	76.62	0.00	
B2	0.61	152.81	76.61	0.00	
Ex-1	0.00	152.58	76.88	0.00	
R1	-4.75	91.00	0.00	0.00	Reservoir
R3	0.00	100.00	0.00	0.00	Reservoir
R4	0.00	100.00	0.00	0.00	Reservoir
R5	-55.64	90.00	0.00	0.00	Reservoir

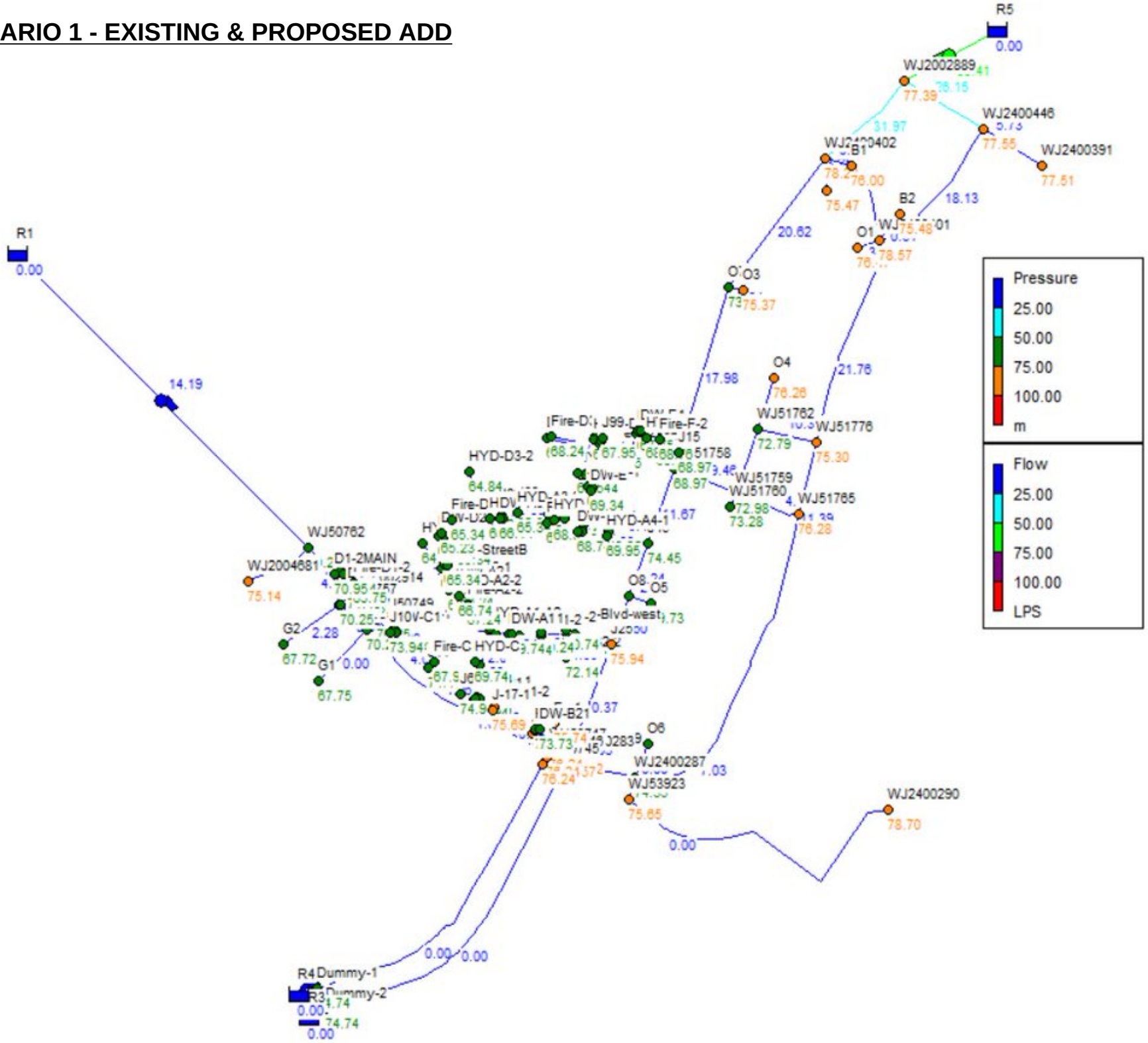
Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
LN2447328	0.00	0.00	0.00	Open
LN50930	4.75	0.07	0.04	Open
LN2447196	1.83	0.03	0.01	Open
LN52048	1.38	0.02	0.00	Open
LN50926	2.82	0.04	0.01	Open
LN50933	0.99	0.03	0.01	Open
LN50918	0.64	0.02	0.01	Open
LN2446937	24.26	0.34	0.76	Open
LN52047	6.45	0.09	0.07	Open
LN52040	5.19	0.07	0.04	Open
LN2447335	0.00	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
LN2446950	5.73	0.18	0.38	Open
LN2447275	16.24	0.23	0.36	Open
LN52039	2.64	0.04	0.01	Open
LN50915	1.64	0.05	0.04	Open
LN2400279	0.19	0.00	0.00	Open
LN52059	19.57	0.28	0.51	Open
LN2447317	9.11	0.13	0.12	Open
LN50919	2.28	0.07	0.07	Open
LN2400324	7.19	0.10	0.08	Open
LN4048079	29.09	0.41	1.06	Open
LN52057	9.09	0.13	0.12	Open
LN52051	10.48	0.15	0.16	Open
LN2400276	0.00	0.00	0.00	Open
LN2447230	0.00	0.00	0.00	Open
LN50927	0.19	0.00	0.00	Open
LN50916	2.28	0.07	0.07	Open
LN2400277	9.11	0.13	0.12	Open
LN50920	0.35	0.01	0.00	Open
LN50922	1.93	0.06	0.05	Open
LN2448313	0.00	0.00	0.00	Open
C11	0.00	0.00	0.00	Open
C12	2.28	0.13	0.28	Open
C16	3.25	0.18	0.54	Open
C17	3.25	0.18	0.54	Open
C18	2.64	0.15	0.36	Open
C19	2.64	0.15	0.36	Open
C20	2.64	0.15	0.36	Open
C21	0.00	0.00	0.00	Open
C22	15.40	0.22	0.33	Open
C23	18.04	0.26	0.44	Open
C24	6.65	0.09	0.07	Open
C25	17.95	0.25	0.43	Open
C27	0.61	0.03	0.02	Open
C26	0.61	0.03	0.02	Open
1	0.00	0.00	0.00	Open
P1	0.00	0.00	0.00	Closed Pump
P3	4.75	0.00	-61.58	Open Pump
P2	0.00	0.00	0.00	Closed Pump
P5	55.64	0.00	-62.98	Open Pump

SCENARIO 1 - EXISTING & PROPOSED ADD



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*********************************************************************
*                          E P A N E T                              *
*                   Hydraulic and Water Quality                     *
*                   Analysis for Pipe Networks                      *
*                         Version 2.2                               *
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Input File: LS_WM_1.net

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
LN2447328	Dummy-1	WJ50745	462.132	200
LN50930	WJ2002914	D1-1	8.686	300
C130	WJ50747	J17	34.482	300
LN52048	WJ51759	WJ51765	93.531	300
LN50926	WJ50749	WJ2002914	49.806	300
LN50933	WJ50755	WJ50749	21.248	200
LN50918	WJ50746	WJ50755	305.232	200
LN2446937	WJ2002889	WJ2400446	126.405	300
LN52047	WJ51759	WJ51762	94.103	300
LN52040	WJ51758	WJ51759	91.548	300
LN2447335	WJ2400283	Dummy-2	505.851	300
LN2446950	WJ2400446	WJ2400391	93.517	200
LN2447275	WJ2400446	WJ2400401	214.556	300
LN52039	WJ51759	WJ51760	20.162	300
LN50915	WJ50746	WJ50747	10.092	200
LN2400279	WJ2400289	WJ2400283	15.257	300
LN52059	WJ51776	WJ2400401	292.409	300
LN2447317	WJ2400287	WJ51765	465.017	300
LN50919	WJ50757	WJ50758	2.801	200
LN2400324	WJ2400401	WJ2400402	146.849	300
LN4048079	WJ2400402	WJ2002889	152.105	300
LN52057	WJ51762	WJ51776	83.414	300
LN52051	WJ51765	WJ51776	100.252	300
LN2400276	WJ2400287	WJ53923	30.567	150
LN2447230	WJ53923	WJ2400290	446.308	150
LN50927	WJ2400283	WJ50747	20.647	300
LN50916	WJ50745	WJ50746	11.346	200
LN2400277	WJ2400289	WJ2400287	95.108	300
LN50920	WJ50755	WJ50757	50.199	200
LN50922	WJ50757	WJ2002914	22.084	200
LN2448313	WJ2004681	WJ50762	97.151	300
C11	WJ50755	G1	96.33	150
C12	WJ50758	G2	95.294	150
C16	WJ2400401	O1	30.267	150
C17	WJ2400402	O2	44.568	150
C18	O3	O7	19.592	150
C19	WJ51762	O4	72.355	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
C20	O8	O5	30.818	150
C21	WJ2400287	O6	49.417	150
C23	O7	WJ2400402	219.955	300
C24	WJ2400289	J25	159.916	300
C25	O8	J45	76.163	300
C27	WJ2400401	B2	45.75	150
C26	WJ2400402	B1	37.409	150
1	Ex-1	WJ50747	36.981	150
C28	Fire-D1-1	J100	7.179	200
C29	D1-1	D1-2MAIN	26.248	300
C30	J100	DW-D1	10.176	150
C32	D1-1	Fire-D1-2	9.573	200
C33	J10	J6	2.815	200
C34	J6	Fire-C1-1	3.323	200
C35	J25	O8	69.9	300
C36	J6	DW-C1	6.087	150
C37	J11	Fire-C1-2	12.35	200
C38	J13	J19	2.376	200
C39	J19	Fire-B1-1	3.582	200
C41	J19	DW-B1	9	150
C42	J17	J18	4.922	200
C43	J18	Fire-B2-1	3.279	200
C40	J45	WJ51758	109.807	300
C45	J18	DW-B2	6.117	150
C46	J23	Fire-B2-2	34.685	200
C47	J25	J23	52.535	300
C48	J23	HYD-W-BLVD	12.301	300
C49	HYD-W-BLVD	J28	34.121	300
C50	J28	HYD-A1	29.808	300
C51	HYD-A1	J30	16.173	300
C52	J30	J96	19.413	300
C53	J96	J31	10.945	300
C54	J31	J101	44.111	300
C55	J101	J33	16.014	300
C56	J33	J34	15.21	300
C57	J34	J35	9.88	200
C58	J35	Fire-A2-1	4.389	200
C59	HYD-W-BLVD	HYD-Blvd-west	4.273	150
C60	J35	DW-A2	10.86	150
C61	J34	J24	36.093	300
C62	J24	J26	7.371	300
C63	J26	J27	31.775	300
C64	J27	J29	21.907	300
C65	J29	J32	29.017	300
C66	J32	J37	9.784	300
C67	J37	J38	16.889	300
C68	J38	J39	25.879	300

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
C69	J39	J40	42.468	300
C70	J40	J41	10.097	300
C71	J41	J42	12.985	300
C72	J42	J43	26.626	300
C73	J43	J44	35.817	300
C74	J44	J45	55.817	300
C75	J42	J46	53.208	300
C76	J46	J47	13.265	300
C77	J47	J48	36.828	300
C78	J48	J49	5.261	300
C79	J49	J97	4.277	300
C80	J50	J51	15.633	300
C81	J51	J52	16.602	300
C82	J52	J15	31.451	300
C83	J28	Fire-A1-2	5.709	200
C84	HYD-A1	HYD-A1-2	5.093	150
C85	J30	J57	5.443	200
C86	J57	Fire-A1-1	3.553	200
C87	J57	DW-A1	6.004	150
C88	J64	J63	47.332	300
C89	J63	J96	47.197	300
C90	J63	HYD-C	7.44	150
C91	J31	HYD-A1-A2	3.06	150
C92	J101	Fire-A2-2	3.244	200
C93	J33	HYD-A2-2	4.604	150
C94	J24	HYD-Station	43.361	200
C95	J26	HYD-StreetB	4.626	150
C96	J27	J66	21.436	200
C97	J66	Fire-D2-1	7.441	200
C98	J66	DW-D2	9.761	150
C99	J29	Fire-D2-2	24.207	200
C100	J32	HYD-D3-2	66.384	200
C101	J37	HYD-A3-1	5.307	150
C102	J38	J72	7.048	200
C103	J72	Fire-A3	5.201	200
C104	J72	DW-A3	5.859	150
C105	J39	HYD-A3-2	5.585	150
C106	J40	Fire-A4-2	12.434	200
C107	J41	HYD-A4-2	6.561	150
C108	J43	J78	6.743	200
C109	J78	DW-A4	10.59	150
HYD-A4-1	J44	HYD-A4-1	6.591	150
C111	J78	Fire-A4-1	3.608	200
C112	J46	J83	9.869	200
C113	J83	Fire-E-1	5.979	200
C114	J83	DW-E	7.76	150
C115	J47	HYD-Park	9.173	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm	
C116	J48	DW-D3	71.399	200	
C117	J49	Fire-D3-1	66.369	200	
C118	J98	HYD-D3-1	10.466	150	
C119	J97	J98	5.062	300	
C120	J98	J99	5.099	300	
C121	J99	Fire-D3-2	10.219	200	
C122	J97	Fire-E-2	13.465	200	
C123	J99	J50	49.94	300	
C124	J50	J91	6.075	200	
C125	J91	Fire-F-1	5.544	200	
C126	J91	DW-F	8.796	150	
C127	J51	HYD-F	4.697	200	
C128	J52	Fire-F-2	7.737	200	
C31	D1-2MAIN	J100	2.626	200	
C129	D1-2MAIN	WJ50762	51.51	300	
C131	J17	J-17-1	92.928	300	
C132	J13	J64	20.492	300	
C133	J64	J11	56.711	300	
C134	J11	J10	70.153	300	
C135	J10	WJ50749	25.771	300	
C22_1	WJ51758	J15	21.283	300	
C22_2	J15	O7	237.991	300	
2	J-17-1	J13	20.76	300	
3	J-17-1	Fire-B1-2	15	200	
P1	R4	Dummy-1	#N/A	#N/A	Pump
P3	R1	WJ50762	#N/A	#N/A	Pump
P2	R3	Dummy-2	#N/A	#N/A	Pump
P5	R5	WJ2002889	#N/A	#N/A	Pump

Energy Usage:

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
P1	0.00	0.00	0.00	0.00	0.00	0.00
P3	100.00	75.00	0.22	11.31	11.31	0.00
P2	0.00	0.00	0.00	0.00	0.00	0.00
P5	100.00	75.00	0.23	49.26	49.26	0.00
				Demand Charge:		0.00
				Total Cost:		0.00

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
O8	0.00	151.94	70.24	0.00
O7	0.00	152.07	73.37	0.00
O3	2.64	152.07	75.37	0.00
O5	2.64	151.93	69.73	0.00
O6	0.00	151.95	71.25	0.00
O4	2.64	151.96	76.26	0.00
O2	3.25	152.17	75.47	0.00
O1	3.25	152.17	76.47	0.00
G2	2.28	151.92	67.72	0.00
G1	0.00	151.94	67.75	0.00
Dummy-2	0.00	151.94	74.74	0.00
Dummy-1	0.00	151.94	74.74	0.00
WJ50758	0.00	151.95	70.25	0.00
WJ50762	0.00	151.97	70.27	0.00
WJ2004681	0.00	151.97	75.14	0.00
WJ2400290	0.00	151.95	78.70	0.00
WJ51776	0.00	152.00	75.30	0.00
WJ51765	0.00	151.98	76.28	0.00
WJ51762	0.00	151.99	72.79	0.00
WJ51759	0.00	151.98	72.98	0.00
WJ51760	2.64	151.98	73.28	0.00
WJ51758	2.64	151.97	68.97	0.00
WJ2400287	0.00	151.95	74.55	0.00
WJ53923	0.00	151.95	75.65	0.00
WJ2400289	2.64	151.94	76.42	0.00
WJ2400283	0.00	151.94	76.57	0.00
WJ50747	0.00	151.94	76.24	0.00
WJ50746	0.00	151.94	76.24	0.00
WJ50745	2.28	151.94	76.24	0.00
WJ50749	0.00	151.94	70.25	0.00
WJ50755	0.00	151.94	70.25	0.00
WJ2002914	0.00	151.95	71.63	0.00
WJ50757	0.00	151.95	70.25	0.00
WJ2002889	2.29	152.39	77.39	0.00
WJ2400401	0.00	152.18	78.57	0.00
WJ2400402	0.00	152.20	78.22	0.00
WJ2400391	5.73	152.24	77.51	0.00
WJ2400446	2.29	152.28	77.55	0.00
B1	0.61	152.20	76.00	0.00
B2	0.61	152.18	75.48	0.00
Ex-1	0.00	151.94	75.74	0.00
J100	0.00	151.95	65.75	0.00
Fire-D1-1	0.00	151.95	65.75	0.00
DW-D1	4.33	151.94	65.74	0.00
D1-1	0.00	151.95	71.45	0.00
Fire-D1-2	0.00	151.95	65.75	0.00
J6	0.00	151.94	67.94	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
Fire-C1-1	0.00	151.94	67.94	0.00
DW-C1	2.48	151.94	67.94	0.00
J10	0.00	151.94	73.94	0.00
J11	0.00	151.94	74.44	0.00
Fire-C1-2	0.00	151.94	67.94	0.00
J13	0.00	151.94	75.44	0.00
Fire-B1-1	0.00	151.94	69.74	0.00
DW-B1	1.70	151.94	69.74	0.00
J17	0.00	151.94	75.94	0.00
J18	0.00	151.94	73.74	0.00
J19	0.00	151.94	69.94	0.00
Fire-B2-1	0.00	151.94	73.74	0.00
DW-B2	3.86	151.93	73.73	0.00
J23	0.00	151.94	70.74	0.00
Fire-B2-2	0.00	151.94	72.14	0.00
J25	0.00	151.94	75.94	0.00
J96	0.00	151.94	68.74	0.00
HYD-W-BLVD	0.00	151.94	70.74	0.00
J28	0.00	151.94	70.24	0.00
HYD-A1	0.00	151.94	70.24	0.00
J30	0.00	151.94	67.84	0.00
J31	0.00	151.94	67.84	0.00
J101	0.00	151.94	67.24	0.00
J33	0.00	151.94	66.74	0.00
J34	0.00	151.94	66.24	0.00
J35	0.00	151.94	66.24	0.00
HYD-Station	0.00	151.94	64.84	0.00
Fire-A2-1	0.00	151.94	66.24	0.00
DW-A2	1.48	151.94	66.24	0.00
J24	0.00	151.94	65.34	0.00
J26	0.00	151.94	65.34	0.00
J27	0.00	151.94	65.34	0.00
J29	0.00	151.94	65.34	0.00
J32	0.00	151.94	65.24	0.00
J37	0.00	151.94	65.24	0.00
J38	0.00	151.94	66.14	0.00
J39	0.00	151.94	65.34	0.00
J40	0.00	151.94	68.94	0.00
J41	0.00	151.94	68.94	0.00
J42	0.00	151.94	68.74	0.00
J43	0.00	151.94	68.74	0.00
J44	0.00	151.95	69.95	0.00
J45	0.00	151.95	74.45	0.00
J46	0.00	151.94	69.34	0.00
J47	0.00	151.94	69.54	0.00
J48	0.00	151.94	68.24	0.00
J49	0.00	151.94	68.24	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J50	0.00	151.95	67.75	0.00
J51	0.00	151.96	68.76	0.00
J52	0.00	151.96	68.76	0.00
HYD-Blvd-west	0.00	151.94	70.74	0.00
Fire-A1-2	0.00	151.94	70.24	0.00
HYD-A1-2	0.00	151.94	70.24	0.00
J57	0.00	151.94	67.84	0.00
HYD-A1-A2	0.00	151.94	67.84	0.00
Fire-A1-1	0.00	151.94	69.74	0.00
DW-A1	3.04	151.94	69.74	0.00
Fire-A2-2	0.00	151.94	67.24	0.00
HYD-A2-2	0.00	151.94	66.74	0.00
J63	0.00	151.94	69.74	0.00
J64	0.00	151.94	74.94	0.00
HYD-StreetB	0.00	151.94	65.34	0.00
J66	0.00	151.93	65.23	0.00
Fire-D2-1	0.00	151.93	65.23	0.00
DW-D2	3.98	151.93	65.23	0.00
Fire-D2-2	0.00	151.94	65.34	0.00
HYD-D3-2	0.00	151.94	64.84	0.00
HYD-A3-1	0.00	151.94	65.24	0.00
J72	0.00	151.94	66.14	0.00
Fire-A3	0.00	151.94	66.14	0.00
DW-A3	1.37	151.94	66.14	0.00
HYD-A3-2	0.00	151.94	65.34	0.00
Fire-A4-2	0.00	151.94	68.94	0.00
HYD-A4-2	0.00	151.94	68.94	0.00
J78	0.00	151.94	68.74	0.00
Fire-A4-1	0.00	151.94	68.74	0.00
DW-A4	1.39	151.94	68.74	0.00
HYD-A4-1	0.00	151.95	69.95	0.00
HYD-Park	0.00	151.94	69.54	0.00
J83	0.00	151.94	69.34	0.00
Fire-E-1	0.00	151.94	69.34	0.00
DW-E	2.73	151.94	69.34	0.00
DW-D3	7.02	151.90	68.20	0.00
Fire-D3-1	0.00	151.94	68.24	0.00
Fire-E-2	0.00	151.95	68.25	0.00
Fire-D3-2	0.00	151.95	68.25	0.00
HYD-D3-1	0.00	151.95	68.25	0.00
J91	0.00	151.95	67.75	0.00
Fire-F-1	0.00	151.95	67.75	0.00
DW-F	2.79	151.95	67.75	0.00
HYD-F	0.00	151.96	68.76	0.00
Fire-F-2	0.00	151.96	68.76	0.00
HYD-C	0.00	151.94	69.74	0.00
J97	0.00	151.95	67.95	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
J98	0.00	151.95	67.95	0.00	
J99	0.00	151.95	67.95	0.00	
D1-2MAIN	0.00	151.95	70.95	0.00	
J15	0.00	151.97	68.97	0.00	
Fire-B1-2	0.00	151.94	75.69	0.00	
J-17-1	0.00	151.94	75.69	0.00	
R1	-14.19	91.00	0.00	0.00	Reservoir
R3	0.00	100.00	0.00	0.00	Reservoir
R4	0.00	100.00	0.00	0.00	Reservoir
R5	-60.41	90.00	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
LN2447328	0.00	0.00	0.00	Open
LN50930	9.86	0.14	0.14	Open
C130	3.52	0.05	0.02	Open
LN52048	4.36	0.06	0.03	Open
LN50926	6.67	0.09	0.07	Open
LN50933	0.13	0.00	0.00	Open
LN50918	1.04	0.03	0.02	Open
LN2446937	26.15	0.37	0.87	Open
LN52047	7.73	0.11	0.09	Open
LN52040	9.46	0.13	0.13	Open
LN2447335	0.00	0.00	0.00	Open
LN2446950	5.73	0.18	0.38	Open
LN2447275	18.13	0.26	0.44	Open
LN52039	2.64	0.04	0.01	Open
LN50915	1.24	0.04	0.02	Open
LN2400279	4.75	0.07	0.04	Open
LN52059	21.76	0.31	0.62	Open
LN2447317	7.03	0.10	0.08	Open
LN50919	2.28	0.07	0.07	Open
LN2400324	7.50	0.11	0.09	Open
LN4048079	31.97	0.45	1.26	Open
LN52057	10.37	0.15	0.16	Open
LN52051	11.39	0.16	0.19	Open
LN2400276	0.00	0.00	0.00	Open
LN2447230	0.00	0.00	0.00	Open
LN50927	4.75	0.07	0.04	Open
LN50916	2.28	0.07	0.07	Open
LN2400277	7.03	0.10	0.08	Open
LN50920	0.91	0.03	0.01	Open
LN50922	3.19	0.10	0.13	Open
LN2448313	0.00	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
C11	0.00	0.00	0.00	Open
C12	2.28	0.13	0.28	Open
C16	3.25	0.18	0.54	Open
C17	3.25	0.18	0.54	Open
C18	2.64	0.15	0.36	Open
C19	2.64	0.15	0.36	Open
C20	2.64	0.15	0.36	Open
C21	0.00	0.00	0.00	Open
C23	20.62	0.29	0.56	Open
C24	0.37	0.01	0.00	Open
C25	6.24	0.09	0.06	Open
C27	0.61	0.03	0.02	Open
C26	0.61	0.03	0.02	Open
1	0.00	0.00	0.00	Open
C28	0.00	0.00	0.00	Open
C29	9.86	0.14	0.14	Open
C30	4.33	0.25	0.91	Open
C32	0.00	0.00	0.00	Open
C33	2.48	0.08	0.08	Open
C34	0.00	0.00	0.00	Open
C35	3.60	0.05	0.02	Open
C36	2.48	0.14	0.32	Open
C37	0.00	0.00	0.00	Open
C38	1.70	0.05	0.04	Open
C39	0.00	0.00	0.00	Open
C41	1.70	0.10	0.16	Open
C42	3.86	0.12	0.18	Open
C43	0.00	0.00	0.00	Open
C40	11.67	0.17	0.20	Open
C45	3.86	0.22	0.74	Open
C46	0.00	0.00	0.00	Open
C47	3.23	0.05	0.02	Open
C48	3.23	0.05	0.02	Open
C49	3.23	0.05	0.02	Open
C50	3.23	0.05	0.02	Open
C51	3.23	0.05	0.02	Open
C52	0.19	0.00	0.00	Open
C53	2.21	0.03	0.01	Open
C54	2.21	0.03	0.01	Open
C55	2.21	0.03	0.01	Open
C56	2.21	0.03	0.01	Open
C57	1.48	0.05	0.03	Open
C58	0.00	0.00	0.00	Open
C59	0.00	0.00	0.00	Open
C60	1.48	0.08	0.12	Open
C61	0.73	0.01	0.00	Open
C62	0.73	0.01	0.00	Open

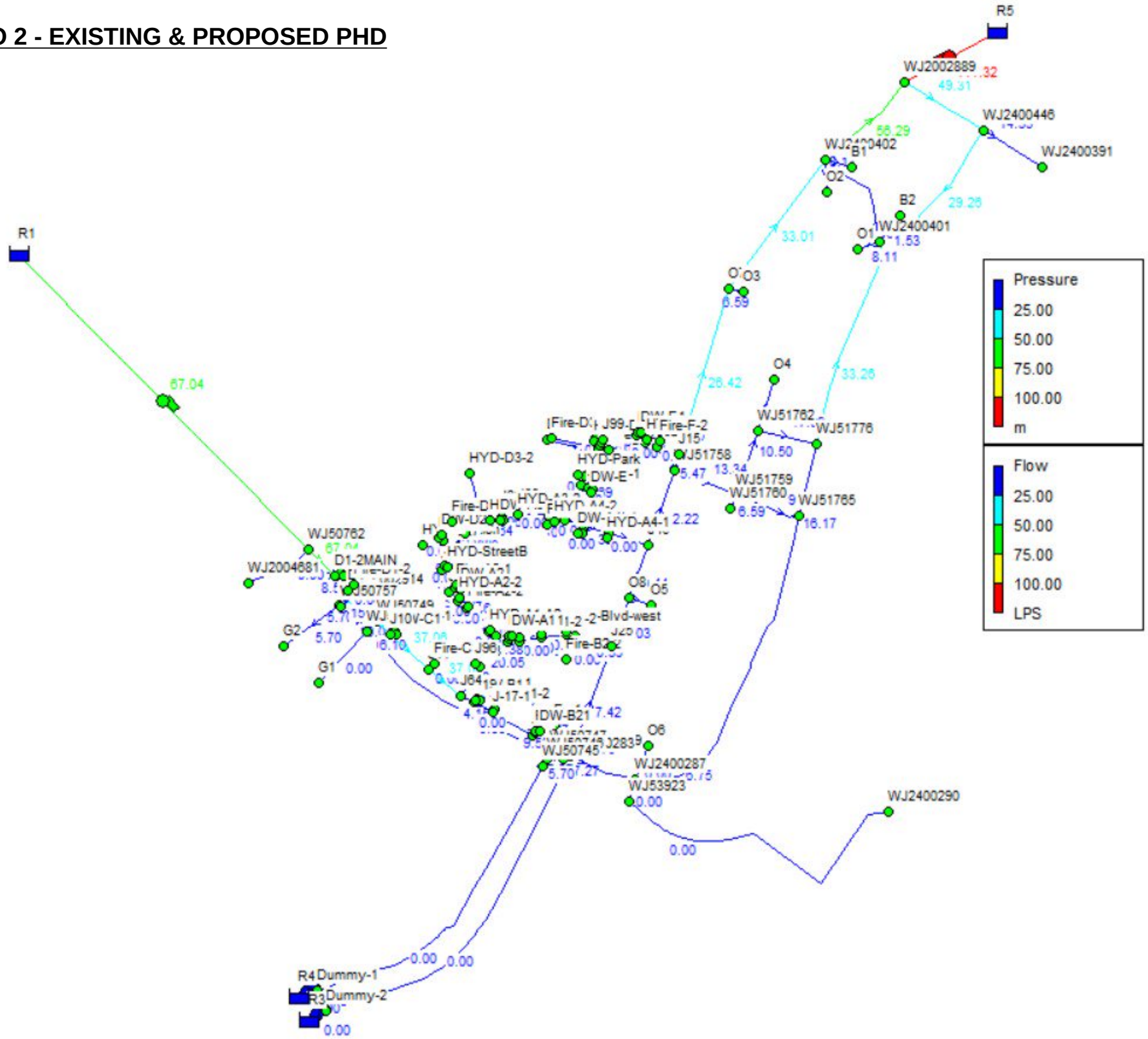
Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
C63	0.73	0.01	0.00	Open
C64	3.25	0.05	0.02	Open
C65	3.25	0.05	0.02	Open
C66	3.25	0.05	0.02	Open
C67	3.25	0.05	0.02	Open
C68	4.62	0.07	0.04	Open
C69	4.62	0.07	0.04	Open
C70	4.62	0.07	0.04	Open
C71	4.62	0.07	0.04	Open
C72	4.04	0.06	0.03	Open
C73	5.43	0.08	0.05	Open
C74	5.43	0.08	0.05	Open
C75	0.59	0.01	0.00	Open
C76	3.32	0.05	0.02	Open
C77	3.32	0.05	0.02	Open
C78	10.34	0.15	0.16	Open
C79	10.34	0.15	0.16	Open
C80	13.13	0.19	0.24	Open
C81	13.13	0.19	0.24	Open
C82	13.13	0.19	0.24	Open
C83	0.00	0.00	0.00	Open
C84	0.00	0.00	0.00	Open
C85	3.04	0.10	0.12	Open
C86	0.00	0.00	0.00	Open
C87	3.04	0.17	0.47	Open
C88	2.01	0.03	0.01	Open
C89	2.01	0.03	0.01	Open
C90	0.00	0.00	0.00	Open
C91	0.00	0.00	0.00	Open
C92	0.00	0.00	0.00	Open
C93	0.00	0.00	0.00	Open
C94	0.00	0.00	0.00	Open
C95	0.00	0.00	0.00	Open
C96	3.98	0.13	0.19	Open
C97	0.00	0.00	0.00	Open
C98	3.98	0.23	0.78	Open
C99	0.00	0.00	0.00	Open
C100	0.00	0.00	0.00	Open
C101	0.00	0.00	0.00	Open
C102	1.37	0.04	0.03	Open
C103	0.00	0.00	0.00	Open
C104	1.37	0.08	0.11	Open
C105	0.00	0.00	0.00	Open
C106	0.00	0.00	0.00	Open
C107	0.00	0.00	0.00	Open
C108	1.39	0.04	0.03	Open
C109	1.39	0.08	0.11	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
HYD-A4-1	0.00	0.00	0.00	Open
C111	0.00	0.00	0.00	Open
C112	2.73	0.09	0.10	Open
C113	0.00	0.00	0.00	Open
C114	2.73	0.15	0.39	Open
C115	0.00	0.00	0.00	Open
C116	7.02	0.22	0.55	Open
C117	0.00	0.00	0.00	Open
C118	0.00	0.00	0.00	Open
C119	10.34	0.15	0.16	Open
C120	10.34	0.15	0.16	Open
C121	0.00	0.00	0.00	Open
C122	0.00	0.00	0.00	Open
C123	10.34	0.15	0.16	Open
C124	2.79	0.09	0.10	Open
C125	0.00	0.00	0.00	Open
C126	2.79	0.16	0.40	Open
C127	0.00	0.00	0.00	Open
C128	0.00	0.00	0.00	Open
C31	4.33	0.14	0.22	Open
C129	14.19	0.20	0.28	Open
C131	0.34	0.00	0.00	Open
C132	2.04	0.03	0.01	Open
C133	4.06	0.06	0.03	Open
C134	4.06	0.06	0.03	Open
C135	6.54	0.09	0.07	Open
C22_1	4.85	0.07	0.04	Open
C22_2	17.98	0.25	0.44	Open
2	0.34	0.00	0.00	Open
3	0.00	0.00	0.00	Open
P1	0.00	0.00	0.00	Closed Pump
P3	14.19	0.00	-60.97	Open Pump
P2	0.00	0.00	0.00	Closed Pump
P5	60.41	0.00	-62.39	Open Pump

SCENARIO 2 - EXISTING & PROPOSED PHD



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******************************************************************
*                          E P A N E T                           *
*                   Hydraulic and Water Quality                  *
*                   Analysis for Pipe Networks                   *
*                         Version 2.2                            *
******************************************************************
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Input File: LS_WM_2.net

Scenario 2 - Proposed PHD + Existing PHD
Propose and Existing Peak hour Demand

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
LN2447328	Dummy-1	WJ50745	462.132	200
LN50930	D1-1	WJ2002914	8.686	300
C130	J17	WJ50747	34.482	300
LN52048	WJ51759	WJ51765	93.531	300
LN50926	WJ2002914	WJ50749	49.806	300
LN50933	WJ50755	WJ50749	21.248	200
LN50918	WJ50746	WJ50755	305.232	200
LN2446937	WJ2002889	WJ2400446	126.405	300
LN52047	WJ51759	WJ51762	94.103	300
LN52040	WJ51758	WJ51759	91.548	300
LN2447335	WJ2400283	Dummy-2	505.851	300
LN2446950	WJ2400446	WJ2400391	93.517	200
LN2447275	WJ2400446	WJ2400401	214.556	300
LN52039	WJ51759	WJ51760	20.162	300
LN50915	WJ50746	WJ50747	10.092	200
LN2400279	WJ2400289	WJ2400283	15.257	300
LN52059	WJ51776	WJ2400401	292.409	300
LN2447317	WJ2400287	WJ51765	465.017	300
LN50919	WJ50757	WJ50758	2.801	200
LN2400324	WJ2400401	WJ2400402	146.849	300
LN4048079	WJ2400402	WJ2002889	152.105	300
LN52057	WJ51762	WJ51776	83.414	300
LN52051	WJ51765	WJ51776	100.252	300
LN2400276	WJ2400287	WJ53923	30.567	150
LN2447230	WJ53923	WJ2400290	446.308	150
LN50927	WJ2400283	WJ50747	20.647	300
LN50916	WJ50745	WJ50746	11.346	200
LN2400277	WJ2400289	WJ2400287	95.108	300
LN50920	WJ50755	WJ50757	50.199	200
LN50922	WJ50757	WJ2002914	22.084	200
LN2448313	WJ2004681	WJ50762	97.151	300
C11	WJ50755	G1	96.33	150
C12	WJ50758	G2	95.294	150
C16	WJ2400401	O1	30.267	150
C17	WJ2400402	O2	44.568	150
C18	O3	O7	19.592	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
C19	WJ51762	O4	72.355	150
C20	O8	O5	30.818	150
C21	WJ2400287	O6	49.417	150
C23	O7	WJ2400402	219.955	300
C24	WJ2400289	J25	159.916	300
C25	O8	J45	76.163	300
C27	WJ2400401	B2	45.75	150
C26	WJ2400402	B1	37.409	150
1	Ex-1	WJ50747	36.981	150
C28	Fire-D1-1	J100	7.179	200
C29	D1-2MAIN	D1-1	26.248	300
C30	J100	DW-D1	10.176	150
C32	D1-1	Fire-D1-2	9.573	200
C33	J10	J6	2.815	200
C34	J6	Fire-C1-1	3.323	200
C35	J25	O8	69.9	300
C36	J6	DW-C1	6.087	150
C37	J11	Fire-C1-2	12.35	200
C38	J13	J19	2.376	200
C39	J19	Fire-B1-1	3.582	200
C41	J19	DW-B1	9	150
C42	J17	J18	4.922	200
C43	J18	Fire-B2-1	3.279	200
C40	J45	WJ51758	109.807	300
C45	J18	DW-B2	6.117	150
C46	J23	Fire-B2-2	34.685	200
C47	J25	J23	52.535	300
C48	J23	HYD-W-BLVD	12.301	300
C49	HYD-W-BLVD	J28	34.121	300
C50	J28	HYD-A1	29.808	300
C51	HYD-A1	J30	16.173	300
C52	J30	HYD-A2	19.413	300
C53	HYD-A2	J31	10.945	300
C54	J31	J101	44.111	300
C55	J101	J33	16.014	300
C56	J33	J34	15.21	300
C57	J34	J35	9.88	200
C58	J35	Fire-A2-1	4.389	200
C59	HYD-W-BLVD	HYD-Blvd-west	4.273	150
C60	J35	DW-A2	10.86	150
C61	J34	J24	36.093	300
C62	J24	J26	7.371	300
C63	J26	J27	31.775	300
C64	J27	J29	21.907	300
C65	J29	J32	29.017	300
C66	J32	J37	9.784	300
C67	J37	J38	16.889	300

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
C68	J38	J39	25.879	300
C69	J39	J40	42.468	300
C70	J40	J41	10.097	300
C71	J41	J42	12.985	300
C72	J42	J43	26.626	300
C73	J43	J44	35.817	300
C74	J44	J45	55.817	300
C75	J42	J46	53.208	300
C76	J46	J47	13.265	300
C77	J47	J48	36.828	300
C78	J48	J49	5.261	300
C79	J49	J97	4.277	300
C80	J50	J51	15.633	300
C81	J51	J52	16.602	300
C82	J52	J15	31.451	300
C83	J28	Fire-A1-2	5.709	200
C84	HYD-A1	HYD-A1-2	5.093	150
C85	J30	J57	5.443	200
C86	J57	Fire-A1-1	3.553	200
C87	J57	DW-A1	6.004	150
C88	J64	J63	47.332	300
C89	J63	HYD-A2	47.197	300
C90	J63	J96	7.44	150
C91	J31	HYD-A1-A2	3.06	150
C92	J101	Fire-A2-2	3.244	200
C93	J33	HYD-A2-2	4.604	150
C94	J24	HYD-Station	43.361	200
C95	J26	HYD-StreetB	4.626	150
C96	J27	J66	21.436	200
C97	J66	Fire-D2-1	7.441	200
C98	J66	DW-D2	9.761	150
C99	J29	Fire-D2-2	24.207	200
C100	J32	HYD-D3-2	66.384	200
C101	J37	HYD-A3-1	5.307	150
C102	J38	J72	7.048	200
C103	J72	Fire-A3	5.201	200
C104	J72	DW-A3	5.859	150
C105	J39	HYD-A3-2	5.585	150
C106	J40	Fire-A4-2	12.434	200
C107	J41	HYD-A4-2	6.561	150
C108	J43	J78	6.743	200
C109	J78	DW-A4	10.59	150
HYD-A4-1	J44	HYD-A4-1	6.591	150
C111	J78	Fire-A4-1	3.608	200
C112	J46	J83	9.869	200
C113	J83	Fire-E-1	5.979	200
C114	J83	DW-E	7.76	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm	
C115	J47	HYD-Park	9.173	150	
C116	J48	DW-D3	71.399	200	
C117	J49	Fire-D3-1	66.369	200	
C118	J98	HYD-D3-1	10.466	150	
C119	J97	J98	5.062	300	
C120	J98	J99	5.099	300	
C121	J99	Fire-D3-2	10.219	200	
C122	J97	Fire-E-2	13.465	200	
C123	J99	J50	49.94	300	
C124	J50	J91	6.075	200	
C125	J91	Fire-F-1	5.544	200	
C126	J91	DW-F	8.796	150	
C127	J51	HYD-F	4.697	200	
C128	J52	Fire-F-2	7.737	200	
C31	D1-2MAIN	J100	2.626	200	
C129	WJ50762	D1-2MAIN	51.51	300	
C131	J-17-1	J17	92.928	300	
C132	J64	J13	20.492	300	
C133	J11	J64	56.711	300	
C134	J10	J11	70.153	300	
C135	WJ50749	J10	25.771	300	
C22_1	WJ51758	J15	21.283	300	
C22_2	J15	O7	237.991	300	
2	J13	J-17-1	20.76	300	
3	J-17-1	Fire-B1-2	15	200	
P1	R4	Dummy-1	#N/A	#N/A	Pump
P3	R1	WJ50762	#N/A	#N/A	Pump
P2	R3	Dummy-2	#N/A	#N/A	Pump
P5	R5	WJ2002889	#N/A	#N/A	Pump

Energy Usage:

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
P1	0.00	0.00	0.00	0.00	0.00	0.00
P3	100.00	75.00	0.20	47.46	47.46	0.00
P2	0.00	0.00	0.00	0.00	0.00	0.00
P5	100.00	75.00	0.20	80.65	80.65	0.00
					Demand Charge:	0.00
					Total Cost:	0.00

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
O8	0.00	144.35	67.85	0.00
O7	0.00	144.58	61.58	0.00
O3	6.59	144.55	61.55	0.00
O5	6.59	144.29	68.77	0.00
O6	0.00	144.37	66.97	0.00
O4	6.59	144.27	65.07	0.00
O2	8.11	144.75	70.77	0.00
O1	8.11	144.75	71.14	0.00
G2	5.70	144.58	62.88	0.00
G1	0.00	144.67	62.97	0.00
Dummy-2	0.00	144.37	66.37	0.00
Dummy-1	0.00	144.37	66.37	0.00
WJ50758	0.00	144.73	63.03	0.00
WJ50762	0.00	145.17	63.47	0.00
WJ2004681	0.00	145.17	68.35	0.00
WJ2400290	0.00	144.37	71.13	0.00
WJ51776	0.00	144.44	67.44	0.00
WJ51765	0.00	144.41	68.71	0.00
WJ51762	0.00	144.41	65.21	0.00
WJ51759	0.00	144.39	65.39	0.00
WJ51760	6.59	144.39	65.69	0.00
WJ51758	6.59	144.37	61.37	0.00
WJ2400287	0.00	144.37	66.97	0.00
WJ53923	0.00	144.37	68.07	0.00
WJ2400289	6.59	144.37	68.85	0.00
WJ2400283	0.00	144.37	69.00	0.00
WJ50747	0.00	144.37	68.67	0.00
WJ50746	0.00	144.37	68.67	0.00
WJ50745	5.70	144.37	68.67	0.00
WJ50749	0.00	144.67	62.97	0.00
WJ50755	0.00	144.67	62.97	0.00
WJ2002914	0.00	144.78	64.46	0.00
WJ50757	0.00	144.73	63.03	0.00
WJ2002889	5.72	145.43	70.43	0.00
WJ2400401	0.00	144.84	71.23	0.00
WJ2400402	0.00	144.88	70.90	0.00
WJ2400391	14.33	144.88	70.14	0.00
WJ2400446	5.72	145.07	70.34	0.00
B1	1.53	144.87	68.67	0.00
B2	1.53	144.83	68.13	0.00
Ex-1	0.00	144.37	68.17	0.00
J100	0.00	144.91	58.71	0.00
Fire-D1-1	0.00	144.91	58.71	0.00
DW-D1	8.55	144.88	58.68	0.00
D1-1	0.00	144.81	64.31	0.00
Fire-D1-2	0.00	144.81	58.61	0.00
J6	0.00	144.62	60.62	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
Fire-C1-1	0.00	144.62	60.62	0.00
DW-C1	6.10	144.60	60.60	0.00
J10	0.00	144.62	66.62	0.00
J11	0.00	144.50	67.00	0.00
Fire-C1-2	0.00	144.50	60.50	0.00
J13	0.00	144.40	67.90	0.00
Fire-B1-1	0.00	144.40	62.20	0.00
DW-B1	4.15	144.39	62.19	0.00
J17	0.00	144.37	68.37	0.00
J18	0.00	144.37	66.17	0.00
J19	0.00	144.40	62.40	0.00
Fire-B2-1	0.00	144.37	66.17	0.00
DW-B2	9.52	144.34	66.14	0.00
J23	0.00	144.35	63.15	0.00
Fire-B2-2	0.00	144.35	64.55	0.00
J25	0.00	144.35	68.35	0.00
HYD-A2	0.00	144.36	61.16	0.00
HYD-W-BLVD	0.00	144.35	63.15	0.00
J28	0.00	144.35	62.65	0.00
HYD-A1	0.00	144.35	62.65	0.00
J30	0.00	144.35	60.25	0.00
J31	0.00	144.35	60.25	0.00
J101	0.00	144.34	59.64	0.00
J33	0.00	144.34	59.14	0.00
J34	0.00	144.33	58.63	0.00
J35	0.00	144.33	58.63	0.00
HYD-Station	0.00	144.33	57.23	0.00
Fire-A2-1	0.00	144.33	58.63	0.00
DW-A2	3.64	144.33	58.63	0.00
J24	0.00	144.33	57.73	0.00
J26	0.00	144.33	57.73	0.00
J27	0.00	144.32	57.72	0.00
J29	0.00	144.32	57.72	0.00
J32	0.00	144.32	57.62	0.00
J37	0.00	144.32	57.62	0.00
J38	0.00	144.32	58.52	0.00
J39	0.00	144.32	57.72	0.00
J40	0.00	144.32	61.32	0.00
J41	0.00	144.32	61.32	0.00
J42	0.00	144.32	61.12	0.00
J43	0.00	144.33	61.13	0.00
J44	0.00	144.34	62.34	0.00
J45	0.00	144.35	66.85	0.00
J46	0.00	144.32	61.72	0.00
J47	0.00	144.32	61.92	0.00
J48	0.00	144.32	60.62	0.00
J49	0.00	144.32	60.62	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J50	0.00	144.34	60.14	0.00
J51	0.00	144.35	61.15	0.00
J52	0.00	144.35	61.15	0.00
HYD-Blvd-west	0.00	144.35	63.15	0.00
Fire-A1-2	0.00	144.35	62.65	0.00
HYD-A1-2	0.00	144.35	62.65	0.00
J57	0.00	144.35	60.25	0.00
HYD-A1-A2	0.00	144.35	60.25	0.00
Fire-A1-1	0.00	144.35	62.15	0.00
DW-A1	7.38	144.34	62.14	0.00
Fire-A2-2	0.00	144.34	59.64	0.00
HYD-A2-2	0.00	144.34	59.14	0.00
J63	0.00	144.38	62.18	0.00
J64	0.00	144.41	67.41	0.00
HYD-StreetB	0.00	144.33	57.73	0.00
J66	0.00	144.31	57.61	0.00
Fire-D2-1	0.00	144.31	57.61	0.00
DW-D2	7.84	144.28	57.58	0.00
Fire-D2-2	0.00	144.32	57.72	0.00
HYD-D3-2	0.00	144.32	57.22	0.00
HYD-A3-1	0.00	144.32	57.62	0.00
J72	0.00	144.32	58.52	0.00
Fire-A3	0.00	144.32	58.52	0.00
DW-A3	1.64	144.32	58.52	0.00
HYD-A3-2	0.00	144.32	57.72	0.00
Fire-A4-2	0.00	144.32	61.32	0.00
HYD-A4-2	0.00	144.32	61.32	0.00
J78	0.00	144.33	61.13	0.00
Fire-A4-1	0.00	144.33	61.13	0.00
DW-A4	3.38	144.32	61.12	0.00
HYD-A4-1	0.00	144.34	62.34	0.00
HYD-Park	0.00	144.32	61.92	0.00
J83	0.00	144.31	61.71	0.00
Fire-E-1	0.00	144.31	61.71	0.00
DW-E	6.53	144.30	61.70	0.00
DW-D3	16.76	144.12	60.42	0.00
Fire-D3-1	0.00	144.32	60.62	0.00
Fire-E-2	0.00	144.32	60.62	0.00
Fire-D3-2	0.00	144.32	60.62	0.00
HYD-D3-1	0.00	144.32	60.62	0.00
J91	0.00	144.33	60.13	0.00
Fire-F-1	0.00	144.33	60.13	0.00
DW-F	6.88	144.31	60.11	0.00
HYD-F	0.00	144.35	61.15	0.00
Fire-F-2	0.00	144.35	61.15	0.00
J96	0.00	144.38	62.18	0.00
J97	0.00	144.32	60.32	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
J98	0.00	144.32	60.32	0.00	
J99	0.00	144.32	60.32	0.00	
D1-2MAIN	0.00	144.92	63.92	0.00	
J15	0.00	144.37	61.37	0.00	
Fire-B1-2	0.00	144.39	68.14	0.00	
J-17-1	0.00	144.39	68.14	0.00	
R1	-67.04	91.00	0.00	0.00	Reservoir
R3	0.00	100.00	0.00	0.00	Reservoir
R4	0.00	100.00	0.00	0.00	Reservoir
R5	-111.32	90.00	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
LN2447328	0.00	0.00	0.00	Open
LN50930	58.49	0.83	3.87	Open
C130	3.34	0.05	0.02	Open
LN52048	9.43	0.13	0.13	Open
LN50926	42.74	0.60	2.16	Open
LN50933	0.42	0.01	0.00	Open
LN50918	9.63	0.31	0.99	Open
LN2446937	49.31	0.70	2.82	Open
LN52047	10.50	0.15	0.16	Open
LN52040	13.34	0.19	0.25	Open
LN2447335	0.00	0.00	0.00	Open
LN2446950	14.33	0.46	2.06	Open
LN2447275	29.26	0.41	1.07	Open
LN52039	6.59	0.09	0.07	Open
LN50915	3.93	0.12	0.19	Open
LN2400279	7.27	0.10	0.08	Open
LN52059	33.26	0.47	1.36	Open
LN2447317	6.75	0.10	0.07	Open
LN50919	5.70	0.18	0.37	Open
LN2400324	13.65	0.19	0.26	Open
LN4048079	56.29	0.80	3.60	Open
LN52057	17.09	0.24	0.40	Open
LN52051	16.17	0.23	0.36	Open
LN2400276	0.00	0.00	0.00	Open
LN2447230	0.00	0.00	0.00	Open
LN50927	7.27	0.10	0.08	Open
LN50916	5.70	0.18	0.37	Open
LN2400277	6.75	0.10	0.07	Open
LN50920	10.04	0.32	1.07	Open
LN50922	15.74	0.50	2.45	Open
LN2448313	0.00	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
C11	0.00	0.00	0.00	Open
C12	5.70	0.32	1.52	Open
C16	8.11	0.46	2.92	Open
C17	8.11	0.46	2.92	Open
C18	6.59	0.37	1.99	Open
C19	6.59	0.37	1.99	Open
C20	6.59	0.37	1.99	Open
C21	0.00	0.00	0.00	Open
C23	33.01	0.47	1.34	Open
C24	7.42	0.11	0.08	Open
C25	0.44	0.01	0.00	Open
C27	1.53	0.09	0.13	Open
C26	1.53	0.09	0.13	Open
1	0.00	0.00	0.00	Open
C28	0.00	0.00	0.00	Open
C29	58.49	0.83	3.87	Open
C30	8.55	0.48	3.22	Open
C32	0.00	0.00	0.00	Open
C33	6.10	0.19	0.42	Open
C34	0.00	0.00	0.00	Open
C35	7.03	0.10	0.08	Open
C36	6.10	0.35	1.72	Open
C37	0.00	0.00	0.00	Open
C38	4.15	0.13	0.21	Open
C39	0.00	0.00	0.00	Open
C41	4.15	0.23	0.84	Open
C42	9.52	0.30	0.97	Open
C43	0.00	0.00	0.00	Open
C40	12.22	0.17	0.21	Open
C45	9.52	0.54	3.92	Open
C46	0.00	0.00	0.00	Open
C47	0.39	0.01	0.00	Open
C48	0.39	0.01	0.00	Open
C49	0.39	0.01	0.00	Open
C50	0.39	0.01	0.00	Open
C51	0.39	0.01	0.00	Open
C52	6.99	0.10	0.08	Open
C53	13.06	0.18	0.24	Open
C54	13.06	0.18	0.24	Open
C55	13.06	0.18	0.24	Open
C56	13.06	0.18	0.24	Open
C57	3.64	0.12	0.16	Open
C58	0.00	0.00	0.00	Open
C59	0.00	0.00	0.00	Open
C60	3.64	0.21	0.66	Open
C61	9.42	0.13	0.13	Open
C62	9.42	0.13	0.13	Open

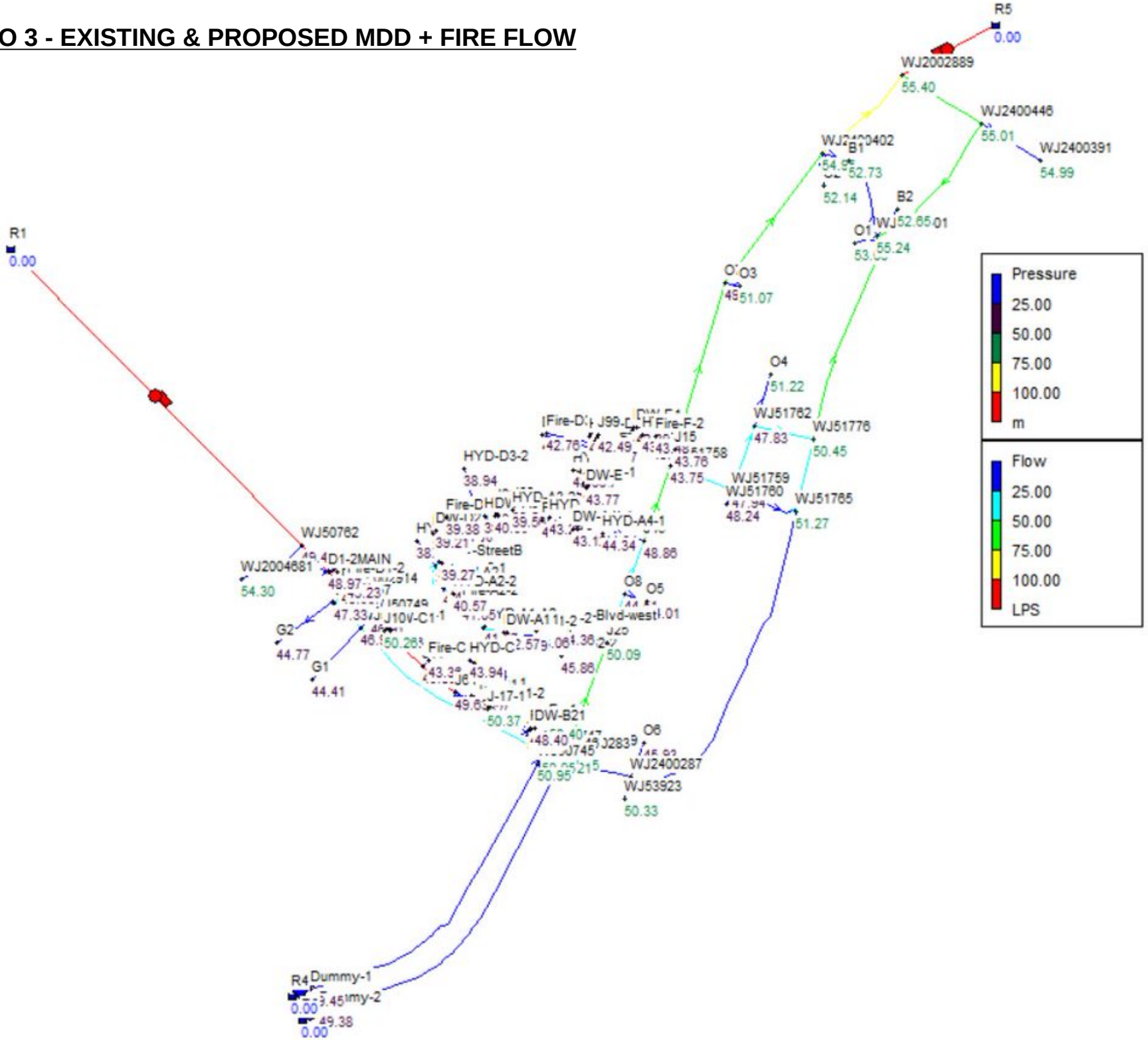
Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
C63	9.42	0.13	0.13	Open
C64	1.58	0.02	0.00	Open
C65	1.58	0.02	0.00	Open
C66	1.58	0.02	0.00	Open
C67	1.58	0.02	0.00	Open
C68	0.06	0.00	0.00	Open
C69	0.06	0.00	0.00	Open
C70	0.06	0.00	0.00	Open
C71	0.06	0.00	0.00	Open
C72	9.28	0.13	0.13	Open
C73	12.66	0.18	0.23	Open
C74	12.66	0.18	0.23	Open
C75	9.22	0.13	0.13	Open
C76	2.69	0.04	0.01	Open
C77	2.69	0.04	0.01	Open
C78	14.07	0.20	0.28	Open
C79	14.07	0.20	0.28	Open
C80	20.95	0.30	0.58	Open
C81	20.95	0.30	0.58	Open
C82	20.95	0.30	0.58	Open
C83	0.00	0.00	0.00	Open
C84	0.00	0.00	0.00	Open
C85	7.38	0.23	0.60	Open
C86	0.00	0.00	0.00	Open
C87	7.38	0.42	2.45	Open
C88	20.05	0.28	0.53	Open
C89	20.05	0.28	0.53	Open
C90	0.00	0.00	0.00	Open
C91	0.00	0.00	0.00	Open
C92	0.00	0.00	0.00	Open
C93	0.00	0.00	0.00	Open
C94	0.00	0.00	0.00	Open
C95	0.00	0.00	0.00	Open
C96	7.84	0.25	0.67	Open
C97	0.00	0.00	0.00	Open
C98	7.84	0.44	2.74	Open
C99	0.00	0.00	0.00	Open
C100	0.00	0.00	0.00	Open
C101	0.00	0.00	0.00	Open
C102	1.64	0.05	0.04	Open
C103	0.00	0.00	0.00	Open
C104	1.64	0.09	0.15	Open
C105	0.00	0.00	0.00	Open
C106	0.00	0.00	0.00	Open
C107	0.00	0.00	0.00	Open
C108	3.38	0.11	0.14	Open
C109	3.38	0.19	0.58	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
HYD-A4-1	0.00	0.00	0.00	Open
C111	0.00	0.00	0.00	Open
C112	6.53	0.21	0.48	Open
C113	0.00	0.00	0.00	Open
C114	6.53	0.37	1.95	Open
C115	0.00	0.00	0.00	Open
C116	16.76	0.53	2.75	Open
C117	0.00	0.00	0.00	Open
C118	0.00	0.00	0.00	Open
C119	14.07	0.20	0.28	Open
C120	14.07	0.20	0.28	Open
C121	0.00	0.00	0.00	Open
C122	0.00	0.00	0.00	Open
C123	14.07	0.20	0.28	Open
C124	6.88	0.22	0.53	Open
C125	0.00	0.00	0.00	Open
C126	6.88	0.39	2.15	Open
C127	0.00	0.00	0.00	Open
C128	0.00	0.00	0.00	Open
C31	8.55	0.27	0.79	Open
C129	67.04	0.95	4.98	Open
C131	12.86	0.18	0.23	Open
C132	17.01	0.24	0.39	Open
C133	37.06	0.52	1.66	Open
C134	37.06	0.52	1.66	Open
C135	43.16	0.61	2.20	Open
C22_1	5.47	0.08	0.05	Open
C22_2	26.42	0.37	0.89	Open
2	12.86	0.18	0.23	Open
3	0.00	0.00	0.00	Open
P1	0.00	0.00	0.00	Closed Pump
P3	67.04	0.00	-54.17	Open Pump
P2	0.00	0.00	0.00	Closed Pump
P5	111.32	0.00	-55.43	Open Pump

SCENARIO 3 - EXISTING & PROPOSED MDD + FIRE FLOW



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*********************************************************************
*                          E P A N E T                              *
*                   Hydraulic and Water Quality                     *
*                   Analysis for Pipe Networks                      *
*                         Version 2.2                               *
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Input File: LS_WM_3 (MD+FF).net

Scenario 3 - Max Day Demand + Fire Demand
Propose and Existing Max Day Demand + Fire Demand

Link - Node Table:

Link ID	Start Node	End Node	Length m	Diameter mm
LN2447328	Dummy-1	WJ50745	462.132	200
LN50930	D1-1	WJ2002914	8.686	300
C130	J17	WJ50747	34.482	300
LN52048	WJ51759	WJ51765	93.531	300
LN50926	WJ2002914	WJ50749	49.806	300
LN50933	WJ50749	WJ50755	21.248	200
LN50918	WJ50746	WJ50755	305.232	200
LN2446937	WJ2002889	WJ2400446	126.405	300
LN52047	WJ51759	WJ51762	94.103	300
LN52040	WJ51758	WJ51759	91.548	300
LN2447335	WJ2400283	Dummy-2	505.851	300
LN2446950	WJ2400446	WJ2400391	93.517	200
LN2447275	WJ2400446	WJ2400401	214.556	300
LN52039	WJ51759	WJ51760	20.162	300
LN50915	WJ50746	WJ50747	10.092	200
LN2400279	WJ2400289	WJ2400283	15.257	300
LN52059	WJ51776	WJ2400401	292.409	300
LN2447317	WJ2400287	WJ51765	465.017	300
LN50919	WJ50757	WJ50758	2.801	200
LN2400324	WJ2400401	WJ2400402	146.849	300
LN4048079	WJ2400402	WJ2002889	152.105	300
LN52057	WJ51762	WJ51776	83.414	300
LN52051	WJ51765	WJ51776	100.252	300
LN2400276	WJ2400287	WJ53923	30.567	150
LN50927	WJ2400283	WJ50747	20.647	300
LN50916	WJ50745	WJ50746	11.346	200
LN2400277	WJ2400289	WJ2400287	95.108	300
LN50920	WJ50755	WJ50757	50.199	200
LN50922	WJ2002914	WJ50757	22.084	200
LN2448313	WJ2004681	WJ50762	97.151	300
C11	WJ50755	G1	96.33	150
C12	WJ50758	G2	95.294	150
C16	WJ2400401	O1	30.267	150
C17	WJ2400402	O2	44.568	150
C18	O3	O7	19.592	150
C19	WJ51762	O4	72.355	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
C20	O8	O5	30.818	150
C21	WJ2400287	O6	49.417	150
C23	O7	WJ2400402	219.955	300
C24	WJ2400289	J25	159.916	300
C25	O8	J45	76.163	300
C27	WJ2400401	B2	45.75	150
C26	WJ2400402	B1	37.409	150
1	Ex-1	WJ50747	36.981	150
C28	Fire-D1-1	J100	7.179	200
C29	D1-2MAIN	D1-1	26.248	300
C30	J100	DW-D1	10.176	150
C32	D1-1	Fire-D1-2	9.573	200
C33	J10	J6	2.815	200
C34	J6	Fire-C1-1	3.323	200
C35	J25	O8	69.9	300
C36	J6	DW-C1	6.087	150
C37	J11	Fire-C1-2	12.35	200
C38	J13	J19	2.376	200
C39	J19	Fire-B1-1	3.582	200
C41	J19	DW-B1	9	150
C42	J17	J18	4.922	200
C43	J18	Fire-B2-1	3.279	200
C40	J45	WJ51758	109.807	300
C45	J18	DW-B2	6.117	150
C46	J23	Fire-B2-2	34.685	200
C47	J25	J23	52.535	300
C48	J23	HYD-W-BLVD	12.301	300
C49	HYD-W-BLVD	J28	34.121	300
C50	J28	HYD-A1	29.808	300
C51	HYD-A1	J30	16.173	300
C52	J30	J96	19.413	300
C53	J96	J31	10.945	300
C54	J31	J101	44.111	300
C55	J101	J33	16.014	300
C56	J33	J34	15.21	300
C57	J34	J35	9.88	200
C58	J35	Fire-A2-1	4.389	200
C59	HYD-W-BLVD	HYD-Blvd-west	4.273	150
C60	J35	DW-A2	10.86	150
C61	J34	J24	36.093	300
C62	J24	J26	7.371	300
C63	J26	J27	31.775	300
C64	J27	J29	21.907	300
C65	J29	J32	29.017	300
C66	J32	J37	9.784	300
C67	J37	J38	16.889	300
C68	J38	J39	25.879	300

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm
C69	J39	J40	42.468	300
C70	J40	J41	10.097	300
C71	J41	J42	12.985	300
C72	J42	J43	26.626	300
C73	J43	J44	35.817	300
C74	J44	J45	55.817	300
C75	J42	J46	53.208	300
C76	J46	J47	13.265	300
C77	J47	J48	36.828	300
C78	J48	J49	5.261	300
C79	J49	J97	4.277	300
C80	J50	J51	15.633	300
C81	J51	J52	16.602	300
C82	J52	J15	31.451	300
C83	J28	Fire-A1-2	5.709	200
C84	HYD-A1	HYD-A1-2	5.093	150
C85	J30	J57	5.443	200
C86	J57	Fire-A1-1	3.553	200
C87	J57	DW-A1	6.004	150
C88	J64	J63	47.332	300
C89	J63	J96	47.197	300
C90	J63	HYD-C	7.44	150
C91	J31	HYD-A1-A2	3.06	150
C92	J101	Fire-A2-2	3.244	200
C93	J33	HYD-A2-2	4.604	150
C94	J24	HYD-Station	43.361	200
C95	J26	HYD-StreetB	4.626	150
C96	J27	J66	21.436	200
C97	J66	Fire-D2-1	7.441	200
C98	J66	DW-D2	9.761	150
C99	J29	Fire-D2-2	24.207	200
C100	J32	HYD-D3-2	66.384	200
C101	J37	HYD-A3-1	5.307	150
C102	J38	J72	7.048	200
C103	J72	Fire-A3	5.201	200
C104	J72	DW-A3	5.859	150
C105	J39	HYD-A3-2	5.585	150
C106	J40	Fire-A4-2	12.434	200
C107	J41	HYD-A4-2	6.561	150
C108	J43	J78	6.743	200
C109	J78	DW-A4	10.59	150
HYD-A4-1	J44	HYD-A4-1	6.591	150
C111	J78	Fire-A4-1	3.608	200
C112	J46	J83	9.869	200
C113	J83	Fire-E-1	5.979	200
C114	J83	DW-E	7.76	150
C115	J47	HYD-Park	9.173	150

Link - Node Table: (continued)

Link ID	Start Node	End Node	Length m	Diameter mm	
C116	J48	DW-D3	71.399	200	
C117	J49	Fire-D3-1	66.369	200	
C118	J98	HYD-D3-1	10.466	150	
C119	J97	J98	5.062	300	
C120	J98	J99	5.099	300	
C121	J99	Fire-D3-2	10.219	200	
C122	J97	Fire-E-2	13.465	200	
C123	J99	J50	49.94	300	
C124	J50	J91	6.075	200	
C125	J91	Fire-F-1	5.544	200	
C126	J91	DW-F	8.796	150	
C127	J51	HYD-F	4.697	200	
C128	J52	Fire-F-2	7.737	200	
C31	D1-2MAIN	J100	2.626	200	
C129	WJ50762	D1-2MAIN	51.51	300	
C131	J-17-1	J17	92.928	300	
C132	J64	J13	20.492	300	
C133	J11	J64	56.711	300	
C134	J10	J11	70.153	300	
C135	WJ50749	J10	25.771	300	
C22_1	WJ51758	J15	21.283	300	
C22_2	J15	O7	237.991	300	
2	J13	J-17-1	20.76	300	
3	J-17-1	Fire-B1-2	1000	12	
P1	R4	Dummy-1	#N/A	#N/A	Pump
P3	R1	WJ50762	#N/A	#N/A	Pump
P2	R3	Dummy-2	#N/A	#N/A	Pump
P5	R5	WJ2002889	#N/A	#N/A	Pump

Energy Usage:

Pump	Usage Factor	Avg. Effic.	Kw-hr /m3	Avg. Kw	Peak Kw	Cost /day
P1	0.00	0.00	0.00	0.00	0.00	0.00
P3	100.00	75.00	0.15	78.86	78.86	0.00
P2	0.00	0.00	0.00	0.00	0.00	0.00
P5	100.00	75.00	0.15	91.79	91.79	0.00
				Demand Charge:		0.00
				Total Cost:		0.00

Node Results:

Node ID	Demand LPS	Head m	Pressure m	Quality
O8	0.00	126.21	44.51	0.00
O7	0.00	127.80	49.10	0.00
O3	5.78	127.77	51.07	0.00
O5	1.75	126.21	44.01	0.00
O6	0.00	126.63	45.93	0.00
O4	5.78	126.92	51.22	0.00
O2	6.80	128.84	52.14	0.00
O1	6.80	128.79	53.09	0.00
G2	3.44	128.97	44.77	0.00
G1	0.00	128.61	44.41	0.00
Dummy-2	0.00	126.58	49.38	0.00
Dummy-1	0.00	126.65	49.45	0.00
WJ50758	0.00	129.03	47.33	0.00
WJ50762	0.00	131.12	49.42	0.00
WJ2004681	0.00	131.12	54.30	0.00
WJ51776	0.00	127.15	50.45	0.00
WJ51765	0.00	126.97	51.27	0.00
WJ51762	0.00	127.03	47.83	0.00
WJ51759	0.00	126.94	47.94	0.00
WJ51760	1.75	126.94	48.24	0.00
WJ51758	1.75	126.75	43.75	0.00
WJ2400287	0.00	126.63	49.23	0.00
WJ53923	0.00	126.63	50.33	0.00
WJ2400289	1.75	126.57	51.05	0.00
WJ2400283	0.00	126.58	51.21	0.00
WJ50747	0.00	126.60	50.90	0.00
WJ50746	0.00	126.65	50.95	0.00
WJ50745	3.44	126.65	50.95	0.00
WJ50749	0.00	128.61	46.91	0.00
WJ50755	0.00	128.61	46.92	0.00
WJ2002914	0.00	129.25	48.92	0.00
WJ50757	0.00	129.03	47.33	0.00
WJ2002889	9.49	130.40	55.40	0.00
WJ2400401	0.00	128.85	55.24	0.00
WJ2400402	0.00	128.93	54.95	0.00
WJ2400391	3.78	129.73	54.99	0.00
WJ2400446	3.78	129.75	55.01	0.00
B1	1.03	128.93	52.73	0.00
B2	1.03	128.85	52.65	0.00
Ex-1	0.00	126.60	50.40	0.00
J100	0.00	129.97	43.77	0.00
Fire-D1-1	0.00	129.97	43.77	0.00
DW-D1	5.28	129.96	43.76	0.00
D1-1	0.00	129.43	48.93	0.00
Fire-D1-2	0.00	129.43	43.23	0.00
J6	0.00	128.26	44.26	0.00
Fire-C1-1	0.00	128.26	44.26	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
DW-C1	3.23	128.26	44.26	0.00
J10	0.00	128.26	50.26	0.00
J11	0.00	127.36	49.86	0.00
Fire-C1-2	0.00	127.36	43.36	0.00
J13	0.00	126.62	50.12	0.00
Fire-B1-1	0.00	126.62	44.42	0.00
DW-B1	2.21	126.62	44.42	0.00
J17	0.00	126.60	50.60	0.00
J18	0.00	126.60	48.40	0.00
J19	0.00	126.62	44.62	0.00
Fire-B2-1	0.00	126.60	48.40	0.00
DW-B2	5.03	126.60	48.40	0.00
J23	0.00	125.66	44.46	0.00
Fire-B2-2	0.00	125.66	45.86	0.00
J25	0.00	126.09	50.09	0.00
J96	0.00	125.66	42.46	0.00
HYD-W-BLVD	0.00	125.56	44.36	0.00
J28	0.00	125.27	43.57	0.00
HYD-A1	0.00	125.29	43.59	0.00
J30	0.00	125.30	41.20	0.00
J31	0.00	125.67	41.57	0.00
J101	0.00	125.75	41.05	0.00
J33	0.00	125.77	40.57	0.00
J34	0.00	125.80	40.10	0.00
J35	0.00	125.80	40.10	0.00
HYD-Station	0.00	125.86	38.76	0.00
Fire-A2-1	0.00	125.80	40.10	0.00
DW-A2	1.91	125.79	40.09	0.00
J24	0.00	125.86	39.26	0.00
J26	0.00	125.87	39.27	0.00
J27	0.00	125.93	39.33	0.00
J29	0.00	125.98	39.38	0.00
J32	0.00	126.04	39.34	0.00
J37	0.00	126.06	39.36	0.00
J38	0.00	126.10	40.30	0.00
J39	0.00	126.16	39.56	0.00
J40	0.00	126.26	43.26	0.00
J41	0.00	126.29	43.29	0.00
J42	0.00	126.32	43.12	0.00
J43	0.00	126.32	43.12	0.00
J44	0.00	126.34	44.34	0.00
J45	0.00	126.36	48.86	0.00
J46	0.00	126.38	43.78	0.00
J47	0.00	126.39	43.99	0.00
J48	0.00	126.45	42.75	0.00
J49	0.00	126.46	42.76	0.00
J50	0.00	126.60	42.40	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality
J51	0.00	126.64	43.44	0.00
J52	0.00	126.68	43.48	0.00
HYD-Blvd-west	0.00	125.56	44.36	0.00
Fire-A1-2	110.00	124.76	43.06	0.00
HYD-A1-2	0.00	125.29	43.59	0.00
J57	0.00	124.78	40.68	0.00
HYD-A1-A2	0.00	125.67	41.57	0.00
Fire-A1-1	110.00	124.46	42.26	0.00
DW-A1	3.92	124.77	42.57	0.00
Fire-A2-2	0.00	125.75	41.05	0.00
HYD-A2-2	0.00	125.77	40.57	0.00
J63	0.00	126.14	43.94	0.00
J64	0.00	126.63	49.63	0.00
HYD-StreetB	0.00	125.87	39.27	0.00
J66	0.00	125.92	39.22	0.00
Fire-D2-1	0.00	125.92	39.22	0.00
DW-D2	4.85	125.91	39.21	0.00
Fire-D2-2	0.00	125.98	39.38	0.00
HYD-D3-2	0.00	126.04	38.94	0.00
HYD-A3-1	0.00	126.06	39.36	0.00
J72	0.00	126.10	40.30	0.00
Fire-A3	0.00	126.10	40.30	0.00
DW-A3	1.52	126.10	40.30	0.00
HYD-A3-2	0.00	126.16	39.56	0.00
Fire-A4-2	0.00	126.26	43.26	0.00
HYD-A4-2	0.00	126.29	43.29	0.00
J78	0.00	126.32	43.12	0.00
Fire-A4-1	0.00	126.32	43.12	0.00
DW-A4	1.80	126.32	43.12	0.00
HYD-A4-1	0.00	126.34	44.34	0.00
HYD-Park	0.00	126.39	43.99	0.00
J83	0.00	126.37	43.77	0.00
Fire-E-1	0.00	126.37	43.77	0.00
DW-E	3.50	126.37	43.77	0.00
DW-D3	9.23	126.38	42.68	0.00
Fire-D3-1	0.00	126.46	42.76	0.00
Fire-E-2	0.00	126.47	42.77	0.00
Fire-D3-2	0.00	126.49	42.79	0.00
HYD-D3-1	0.00	126.48	42.78	0.00
J91	0.00	126.60	42.40	0.00
Fire-F-1	0.00	126.60	42.40	0.00
DW-F	3.61	126.59	42.39	0.00
HYD-F	0.00	126.64	43.44	0.00
Fire-F-2	0.00	126.68	43.48	0.00
HYD-C	0.00	126.14	43.94	0.00
J97	0.00	126.47	42.47	0.00
J98	0.00	126.48	42.48	0.00

Node Results: (continued)

Node ID	Demand LPS	Head m	Pressure m	Quality	
J99	0.00	126.49	42.49	0.00	
D1-2MAIN	0.00	129.97	48.97	0.00	
J15	0.00	126.76	43.76	0.00	
Fire-B1-2	0.00	126.62	50.37	0.00	
J-17-1	0.00	126.62	50.37	0.00	
R1	-150.40	91.00	0.00	0.00	Reservoir
R3	0.00	100.00	0.00	0.00	Reservoir
R4	0.00	100.00	0.00	0.00	Reservoir
R5	-173.85	90.00	0.00	0.00	Reservoir

Link Results:

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
LN2447328	0.00	0.00	0.00	Open
LN50930	145.11	2.05	20.82	Open
C130	5.61	0.08	0.05	Open
LN52048	15.29	0.22	0.32	Open
LN50926	111.47	1.58	12.77	Open
LN50933	3.72	0.12	0.17	Open
LN50918	26.49	0.84	6.43	Open
LN2446937	68.43	0.97	5.17	Open
LN52047	28.21	0.40	1.00	Open
LN52040	41.75	0.59	2.07	Open
LN2447335	0.00	0.00	0.00	Open
LN2446950	3.78	0.12	0.17	Open
LN2447275	60.87	0.86	4.17	Open
LN52039	1.75	0.02	0.01	Open
LN50915	23.05	0.73	4.97	Open
LN2400279	28.65	0.41	1.03	Open
LN52059	72.89	1.03	5.82	Open
LN2447317	23.62	0.33	0.72	Open
LN50919	3.44	0.11	0.15	Open
LN2400324	19.85	0.28	0.52	Open
LN4048079	95.92	1.36	9.67	Open
LN52057	33.99	0.48	1.42	Open
LN52051	38.90	0.55	1.82	Open
LN2400276	0.00	0.00	0.00	Open
LN50927	28.65	0.41	1.03	Open
LN50916	3.44	0.11	0.15	Open
LN2400277	23.62	0.33	0.72	Open
LN50920	30.20	0.96	8.20	Open
LN50922	33.64	1.07	10.01	Open
LN2448313	0.00	0.00	0.00	Open
C11	0.00	0.00	0.00	Open
C12	3.44	0.19	0.60	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
C16	6.80	0.38	2.10	Open
C17	6.80	0.38	2.10	Open
C18	5.78	0.33	1.56	Open
C19	5.78	0.33	1.56	Open
C20	1.75	0.10	0.17	Open
C21	0.00	0.00	0.00	Open
C23	68.24	0.97	5.15	Open
C24	50.52	0.71	2.95	Open
C25	39.58	0.56	1.88	Open
C27	1.03	0.06	0.06	Open
C26	1.03	0.06	0.06	Open
1	0.00	0.00	0.00	Open
C28	0.00	0.00	0.00	Open
C29	145.11	2.05	20.82	Open
C30	5.28	0.30	1.32	Open
C32	0.00	0.00	0.00	Open
C33	3.23	0.10	0.13	Open
C34	0.00	0.00	0.00	Open
C35	37.83	0.54	1.73	Open
C36	3.23	0.18	0.53	Open
C37	0.00	0.00	0.00	Open
C38	2.21	0.07	0.06	Open
C39	0.00	0.00	0.00	Open
C41	2.21	0.13	0.26	Open
C42	5.03	0.16	0.30	Open
C43	0.00	0.00	0.00	Open
C40	56.02	0.79	3.57	Open
C45	5.03	0.28	1.20	Open
C46	0.00	0.00	0.00	Open
C47	88.35	1.25	8.31	Open
C48	88.35	1.25	8.31	Open
C49	88.35	1.25	8.31	Open
C50	21.65	0.31	0.61	Open
C51	21.65	0.31	0.61	Open
C52	135.57	1.92	18.35	Open
C53	36.46	0.52	1.61	Open
C54	36.46	0.52	1.61	Open
C55	36.46	0.52	1.61	Open
C56	36.46	0.52	1.61	Open
C57	1.91	0.06	0.05	Open
C58	0.00	0.00	0.00	Open
C59	0.00	0.00	0.00	Open
C60	1.91	0.11	0.20	Open
C61	38.37	0.54	1.77	Open
C62	38.37	0.54	1.77	Open
C63	38.37	0.54	1.77	Open
C64	43.22	0.61	2.21	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
C65	43.22	0.61	2.21	Open
C66	43.22	0.61	2.21	Open
C67	43.22	0.61	2.21	Open
C68	44.74	0.63	2.36	Open
C69	44.74	0.63	2.36	Open
C70	44.74	0.63	2.36	Open
C71	44.74	0.63	2.36	Open
C72	14.64	0.21	0.30	Open
C73	16.44	0.23	0.37	Open
C74	16.44	0.23	0.37	Open
C75	30.10	0.43	1.13	Open
C76	33.60	0.48	1.39	Open
C77	33.60	0.48	1.39	Open
C78	42.83	0.61	2.17	Open
C79	42.83	0.61	2.17	Open
C80	46.44	0.66	2.52	Open
C81	46.44	0.66	2.52	Open
C82	46.44	0.66	2.52	Open
C83	110.00	3.50	89.82	Open
C84	0.00	0.00	0.00	Open
C85	113.92	3.63	95.84	Open
C86	110.00	3.50	89.82	Open
C87	3.92	0.22	0.76	Open
C88	99.11	1.40	10.28	Open
C89	99.11	1.40	10.28	Open
C90	0.00	0.00	0.00	Open
C91	0.00	0.00	0.00	Open
C92	0.00	0.00	0.00	Open
C93	0.00	0.00	0.00	Open
C94	0.00	0.00	0.00	Open
C95	0.00	0.00	0.00	Open
C96	4.85	0.15	0.28	Open
C97	0.00	0.00	0.00	Open
C98	4.85	0.27	1.13	Open
C99	0.00	0.00	0.00	Open
C100	0.00	0.00	0.00	Open
C101	0.00	0.00	0.00	Open
C102	1.52	0.05	0.03	Open
C103	0.00	0.00	0.00	Open
C104	1.52	0.09	0.13	Open
C105	0.00	0.00	0.00	Open
C106	0.00	0.00	0.00	Open
C107	0.00	0.00	0.00	Open
C108	1.80	0.06	0.04	Open
C109	1.80	0.10	0.18	Open
HYD-A4-1	0.00	0.00	0.00	Open
C111	0.00	0.00	0.00	Open

Link Results: (continued)

Link ID	Flow LPS	Velocity m/s	Unit Headloss m/km	Status
C112	3.50	0.11	0.15	Open
C113	0.00	0.00	0.00	Open
C114	3.50	0.20	0.62	Open
C115	0.00	0.00	0.00	Open
C116	9.23	0.29	0.91	Open
C117	0.00	0.00	0.00	Open
C118	0.00	0.00	0.00	Open
C119	42.83	0.61	2.17	Open
C120	42.83	0.61	2.17	Open
C121	0.00	0.00	0.00	Open
C122	0.00	0.00	0.00	Open
C123	42.83	0.61	2.17	Open
C124	3.61	0.11	0.16	Open
C125	0.00	0.00	0.00	Open
C126	3.61	0.20	0.65	Open
C127	0.00	0.00	0.00	Open
C128	0.00	0.00	0.00	Open
C31	5.28	0.17	0.32	Open
C129	150.39	2.13	22.24	Open
C131	10.64	0.15	0.16	Open
C132	12.85	0.18	0.23	Open
C133	111.96	1.58	12.88	Open
C134	111.96	1.58	12.88	Open
C135	115.19	1.63	13.57	Open
C22_1	16.03	0.23	0.35	Open
C22_2	62.46	0.88	4.37	Open
2	10.64	0.15	0.16	Open
3	0.00	0.00	0.00	Open
P1	0.00	0.00	0.00	Closed Pump
P3	150.40	0.00	-40.12	Open Pump
P2	0.00	0.00	0.00	Closed Pump
P5	173.85	0.00	-40.40	Open Pump

Appendix F

Sanitary Flow Calculations

ARUP	Job No.		Rev.
	277167	First Capital Realty	02
	Member/Location	City of Toronto	
Job Title: 2150 Lake Shore Boulevard	Drg. Ref.	See Appendix B	
Calculation: Sanitary Flow Analysis	Made by: C.H	Date: 26/02/2021	Chd.: F.F.

General Assumptions & Calculations

Population Mix

Unit	Population	% Mix
Bachelor	1.4	5%
1 BDRM	1.4	50%
2 BDRM	2.1	35%
3 BDRM	3.1	10%

Occupancy Assumptions

Criteria	Value	Unit	Notes
Average Residential Population	1.815	People per uni	Calculated from Population Mix
Commercial	0.011	persons/m2	City of Toronto Design Criteria
School	0.025	persons/m2	City of Toronto Design Criteria

Calculation Inputs

Existing Residential Average Flow	240	L/person/day	City of Toronto Design Criteria
Proposed Residential Average Flow	250	L/person/day	City of Toronto Design Criteria
Existing Commercial Peak Flow	250	L/person/day	City of Toronto Design Criteria
Proposed Commercial Peak Flow	180,000	L/Ha/day	City of Toronto Design Criteria
Extraneous Flows	0.26	L/Ha/sec	City of Toronto Design Criteria

Flow calculations for Designing New Local Sewers

Block	Residential		Commericial			Total
	Population	Peak flow (l/sec)	GFA	Eq. Population	Peak flow (l/sec)	Peak Flow (l/sec)
A	2,551	50	32,053	764	6.7	56.3
B	2,444	49	7,937	87	1.7	50.9
C	1,089	22	3,606	40	0.8	22.7
E	1,140	22	9,123	100	1.9	24.1
F	1,236	24	2,863	31	0.6	24.6
Total	13,617	268	116,877	2,813	24.3	292.5

ARUP	Job No.		Rev.
	277167	First Capital Realty	02
	Member/Location	City of Toronto	
Job Title: 2150 Lake Shore Boulevard	Drg. Ref.	See Appendix B	
Calculation: Sanitary Flow Analysis	Made by: C.H	Date: 26/02/2021	Chd.: F.F.

Downstream Flow Analysis Calculations

Existing Buildings Sanitary Flow Generation

		Residential				Commercial		Extraneous		Total
	Asset ID	Catchment Population	Additional Flow	PF	Peak Flow	Population Equivalent	Peak Flow	Area	Infiltration	Peak Flow
			l/day		l/sec		l/sec	m2	l/sec	l/sec
Park Lawn	MH3003421	0	0	4.0	0.0	0	0.00	1,932	0.05	0.05
	MH3003422	0	0	4.0	0.0	0	0.00	1,540	0.04	0.04
	MH3003423	0	0	4.0	0.0	0	0.00	612	0.02	0.02
	MH3003426	0	0	4.0	0.0	0	0.00	1,793	0.05	0.05
	MH3003427	4,303	1,032,720	3.3	39.4	0	0.00	789	0.02	39.46
	MH3003428	0	0	3.3	0.0	0	0.00	15,894	0.41	0.41
	MH3003429	0	0	3.3	0.0	0	0.00	1,752	0.05	0.05
	MH3003430	900	215,880	3.3	8.2	8	0.02	11,238	0.29	8.56
	MH3003431	1,581	379,344	3.3	14.5	13	0.04	8,842	0.23	14.76
	Along SL200947	0	0	3.3	0.0	0	0.00	2,181	0.06	0.06
	MH3003432	0	0	3.3	0.0	0	0.00	14,483	0.38	0.38
	Along SL200958	0	0	3.3	0.0	0	0.00	1,419	0.04	0.04
	MH3003433	0	0	3.3	0.0	0	0.00	372	0.01	0.01
	MH3122906287	0	0	3.3	0.0	0	0.00	981	0.03	0.03
Marine Parade Drive	MH3121606317	3,648	875,520	2.9	29.4	0	0.00	1,069	0.03	29.41
	MH3119506363	0	0	2.9	0.0	0	0.00	5,362	0.14	0.14
	MH3117706428	0	0	2.9	0.0	0	0.00	5,599	0.15	0.15
	MH3119906489	0	0	2.9	0.0	0	0.00	1,080	0.03	0.03
	MH3124206524	2,140	513,528	2.9	17.2	43	0.12	10,047	0.26	17.62
	MH3134106567	503	120,792	2.9	4.1	8	0.02	9,969	0.26	4.34
	MH3139006593	1,042	250,152	2.9	8.4	39	0.11	15,339	0.40	8.91
	MH3143906608	1,054	253,008	2.9	8.5	37	0.11	1,906	0.05	8.65
	MH3154606634	1,273	305,544	2.7	9.5	43	0.13	11,501	0.30	9.97
	MH3164206658	0	0	2.7	0.0	0	0.00	8,676	0.23	0.23
	MH3174806685	0	0	2.7	0.0	0	0.00	10,770	0.28	0.28
	MH3183006719	0	0	2.7	0.0	0	0.00	9,599	0.25	0.25
	MH3192706752	0	0	2.7	0.0	0	0.00	353	0.01	0.01
	MH3194806739	0	0	2.7	0.0	0	0.00	10,078	0.26	0.26
	MH3199006716	0	0	2.7	0.0	0	0.00	10,189	0.26	0.26
	MH3201506669	0	0	2.7	0.0	0	0.00	292	0.01	0.01
	MH3203106656	0	0	2.7	0.0	0	0.00	0	0.00	0.00
	MH3209906731	0	0	2.7	0.0	0	0.00	0	0.00	0.00
	MH3214406765	492	117,960	2.7	3.7	0	0.00	0	3.69	7.37
	MH3216306785	1,553	372,720	2.6	11.2	0	0.00	30,758	0.80	12.02
	MH3221506814	492	117,960	4.0	5.5	0	0.00	0	0.00	5.46
Lakeshore	MH3157006418	0	0	4.0	0.0	0	0.00	1,079	0.03	0.03
	MH3148306388	0	0	4.0	0.0	0	0.00	1,018	0.03	0.03
	MH3139606358	0	0	4.0	0.0	0	0.00	674	0.02	0.02
	CB3137606351	0	0	4.0	0.0	0	0.00	5,333	0.14	0.14
	MH3130906328	0	0	4.0	0.0	0	0.00	604	0.02	0.02
	MH3122906287	0	0	4.0	0.0	0	0.00	0	0.00	0.00
	MH3131506351	0	0	4.0	0.0	0	0.00	1,440	0.04	0.04
	MH3139806381	0	0	4.0	0.0	0	0.00	1,580	0.04	0.04
	MH3148606410	0	0	4.0	0.0	0	0.00	14,257	0.37	0.37
	MH3157006440	0	0	4.0	0.0	0	0.00	1,151	0.03	0.03
	Along SL2004916	0	0	4.0	0.0	0	0.00	0	0.00	0.00
	MH3164206465	0	0	4.0	0.0	0	0.00	9,685	0.25	0.25
	MH3170706488	0	0	4.0	0.0	0	0.00	7,885	0.21	0.21
	MH3175206501	0	0	4.0	0.0	0	0.00	10,061	0.26	0.26
	MH3186206526	0	0	4.0	0.0	0	0.00	10,363	0.27	0.27
	MH3195006587	0	0	4.0	0.0	0	0.00	14,197	0.37	0.37
	MH3202606639	0	0	4.0	0.0	0	0.00	1,819	0.00	0.00
	MH3210706728	0	0	4.0	0.0	0	0.00	2,405	0.06	0.06
Combined	MH3216306785	1,553	372,720	2.7	11.6	0	0	11,444	0.30	11.95
	MH3224006653	5	1,200	4.0	0.1	0	0	14,132	0.37	0.42

ARUP	Job No.		Rev.
	277167	First Capital Realty	02
	Member/Location	City of Toronto	
Job Title: 2150 Lake Shore Boulevard	Drg. Ref.	See Appendix B	
Calculation: Sanitary Flow Analysis	Made by: C.H	Date: 26/02/2021	Chd.: F.F.

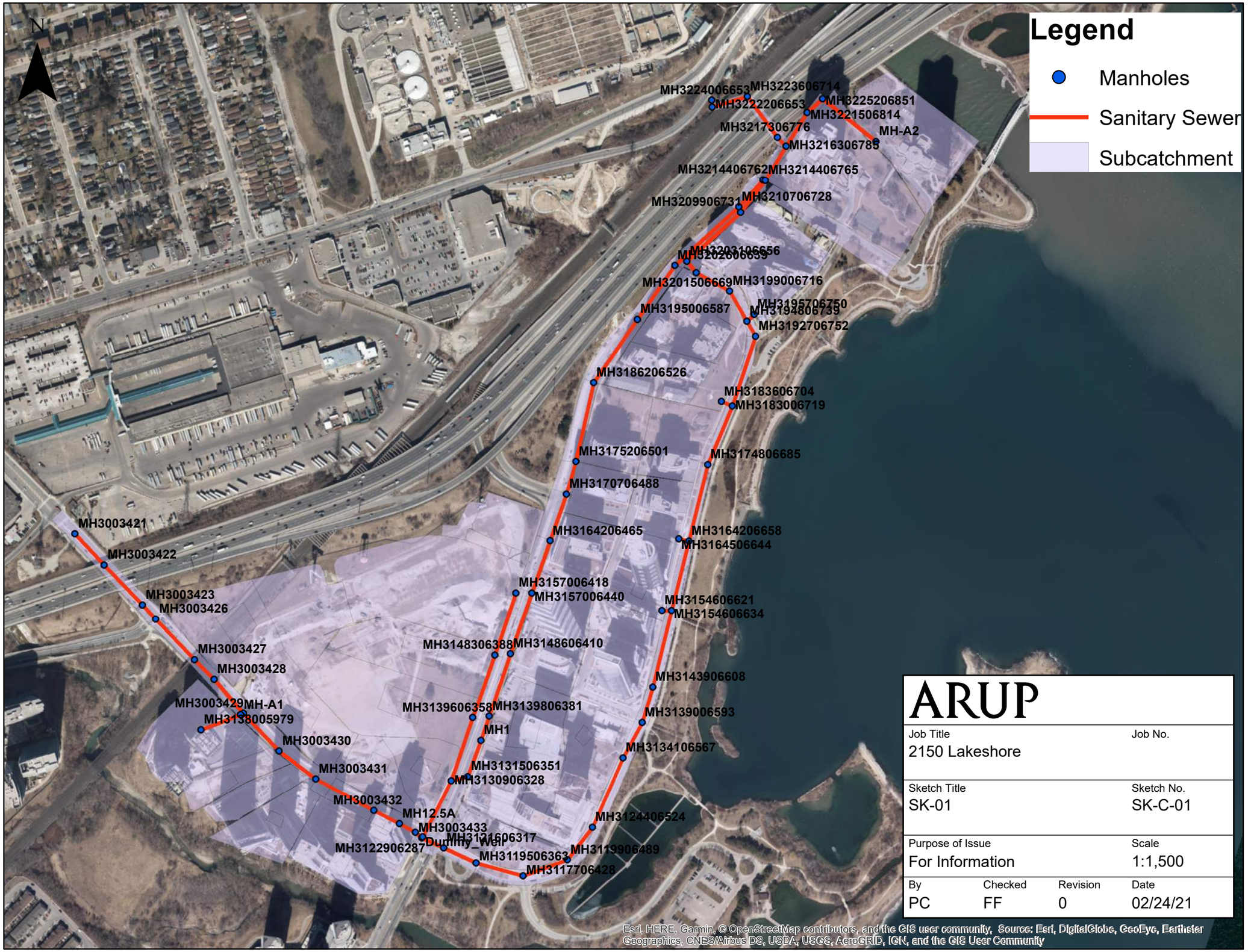
Downstream Flow Analysis Calculations

Existing Buildings Sanitary Flow Generation

		Residential				Commercial		Extraneous		Total
	Asset ID	Additional Population	Additional Flow	PF	Peak Flow	GFA	Peak Flow	Area	Infiltration	Peak Flow
			l/day		l/sec		l/sec	m2	l/sec	l/sec
Park Lawn	MH3003421	0	0	4.00	0.0	0	0.00	1,932	0.05	0.05
	MH3003422	0	0	4.00	0.0	0	0.00	1,540	0.04	0.04
	MH3003423	0	0	4.00	0.0	0	0.00	612	0.02	0.02
	MH3003426	0	0	4.00	0.0	0	0.00	1,793	0.05	0.05
	MH3003427	4,303	1032720	3.30	39.4	0	0.00	14,270	0.37	39.82
	MH3003428	1,170	526500	3.30	20.1	25440	5.30	27,954	0.73	26.14
	MH3003429	0	0	3.30	0.0	0	0.00	13,512	0.35	0.35
	MH3003430	899.5	215880	3.3	8.2	0	0.02	11,238	0.29	8.56
	MH3003431	1580.6	379344	3.3	14.5	0	0.04	8,842	0.23	14.76
	Along SL200947	1089	490050	2.9	16.4	3606	0.75	2,181	0.06	17.26
	MH3003432	0	0	2.9	0.0	0	0.00	28,709	0.75	0.75
	Along SL200958	736	331200	2.9	11.1	3526	0.73	1,419	0.04	11.89
	MH3003433	0	0	2.9	0.0	0	0.00	372	0.01	0.01
Marine Parade Drive	MH3122906287	0	0	2.9	0.0	0	0.00	981	0.03	0.03
	MH3121606317	3648	875520	2.7	27.4	0	0.00	1,069	0.03	27.39
	MH3119506363	0	0	2.7	0.0	0	0.00	5,362	0.14	0.14
	MH3117706428	0	0	2.7	0.0	0	0.00	5,599	0.15	0.15
	MH3119906489	0	0	2.7	0.0	0	0.00	1,080	0.03	0.03
	MH3124206524	2139.7	513528	2.7	16.0	0	0.12	10,047	0.26	16.43
	MH3134106567	503.3	120792	2.7	3.8	0	0.02	9,969	0.26	4.06
	MH3139006593	1042.3	250152	2.7	7.8	0	0.11	15,339	0.40	8.33
	MH3143906608	1054.2	253008	2.7	7.9	0	0.11	1,906	0.05	8.06
	MH3154606634	1273.1	305544	2.7	9.5	0	0.13	11,501	0.30	9.97
	MH3164206658	0	0	2.7	0.0	0	0.00	8,676	0.23	0.23
	MH3174806685	0	0	2.7	0.0	0	0.00	10,770	0.28	0.28
	MH3183006719	0	0	2.7	0.0	0	0.00	9,599	0.25	0.25
	MH3192706752	0	0	2.7	0.0	0	0.00	353	0.01	0.01
	MH3194806739	0	0	2.7	0.0	0	0.00	19,439	0.51	0.51
	MH3199006716	0	0	2.7	0.0	0	0.00	19,550	0.51	0.51
	MH3201506669	0	0	2.7	0.0	0	0.00	292	0.01	0.01
	MH3203106656	0	0	2.7	0.0	0	0.00	0	0.00	0.00
	MH3209906731	0	0	2.7	0.0	0	0.00	0	0.00	0.00
	MH3214406765	983	235920	2.7	7.4	0	0.00	711	0.02	7.39
	MH3216306785	1553	372720	2.7	11.6	0	0.00	11,444	0.30	11.95
	MH3221506814	776.5	186360	3.9	8.4	0	0.00	30,758	0.80	9.21
Lakeshore	MH3157006418	0	0	4	0.0	0	0.00	29,060	0.76	0.76
	MH3148306388	6962.49	3133120.5	3.3	119.7	70922	14.78	15,289	0.40	134.84
	MH3139606358	0	0	3.3	0.0	0	0.00	19,807	0.51	0.51
	CB3137606351	1952	468480	2.9	15.7	8972	1.87	5,333	0.14	17.73
	MH3130906328	1707.915	409899.6	2.9	13.8	4411	0.92	604	0.02	14.69
	MH3122906287	0	0	2.9	0.0	0	0.00		0.00	0.00
	MH3131506351	0	0	2.9	0.0	0	0.00	1,440	0.04	0.04
	MH3139806381	0	0	2.9	0.0	0	0.00	1,580	0.04	0.04
	MH3148606410	0	0	2.9	0.0	0	0.00	14,257	0.37	0.37
	MH3157006440	0	0	2.9	0.0	0	0.00	1,151	0.03	0.03
	Along SL2004916	0	0	2.9	0.0	0	0.00		0.00	0.00
	MH3164206465	0	0	2.9	0.0	0	0.00	15,014	0.39	0.39
	MH3170706488	0	0	2.9	0.0	0	0.00	7,885	0.21	0.21
	MH3175206501	0	0	2.9	0.0	0	0.00	10,061	0.26	0.26
	MH3186206526	0	0	2.9	0.0	0	0.00	10,363	0.27	0.27
	MH3195006587	0	0	2.9	0.0	0	0.00	14,197	0.37	0.37
	MH3202606639	0	0	2.9	0.0	0	0.00	1,819	0.05	0.05
Combined	MH3216306785	1,553	372,720	2.7	11.6	0	0	11,444	0.30	11.95
	MH3224006653	5	1,200	4.0	0.1	0	0	14,132	0.37	0.42

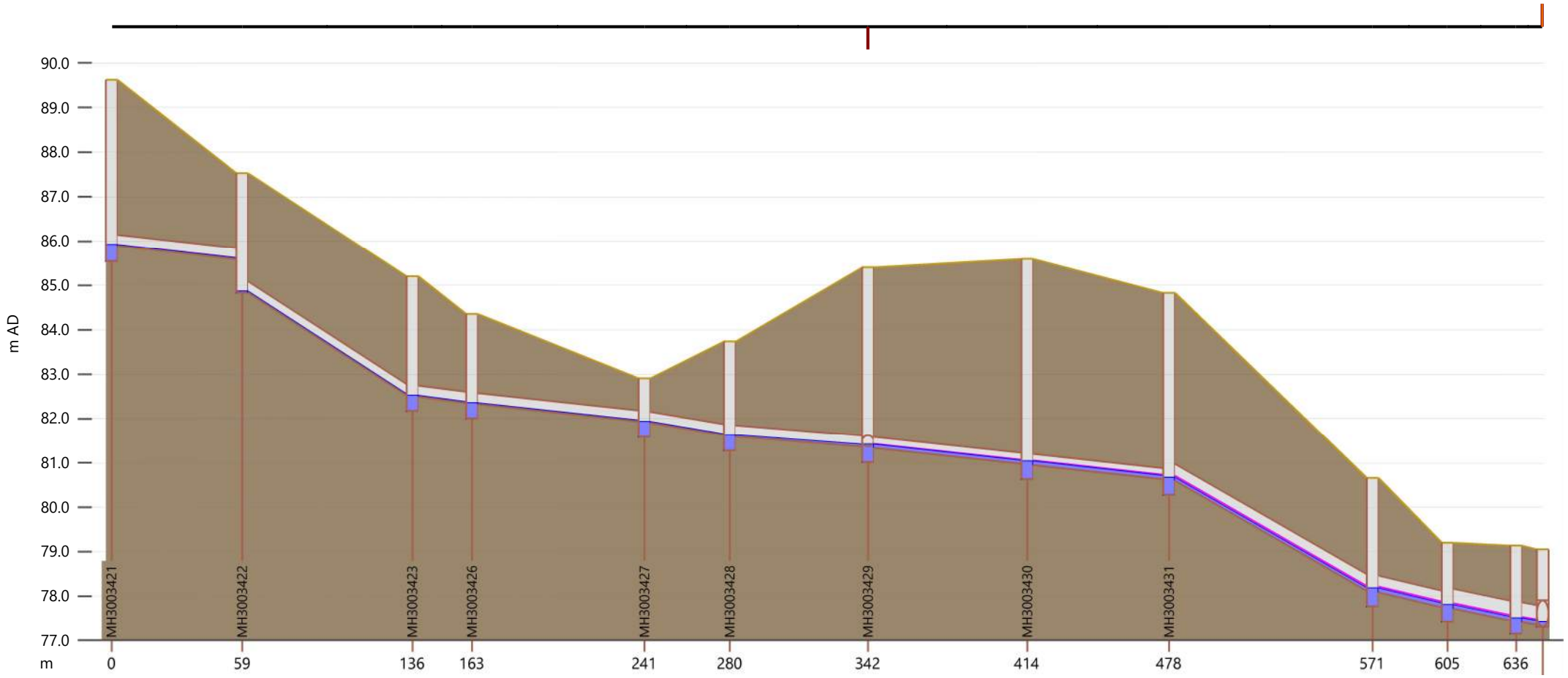
Appendix G

Sanitary Modelling Output



ARUP

Job Title: 2150 Lakeshore			Job No.
Sketch Title: SK-01			Sketch No.: SK-C-01
Purpose of Issue: For Information			Scale: 1:1,500
By: PC	Checked: FF	Revision: 0	Date: 02/24/21

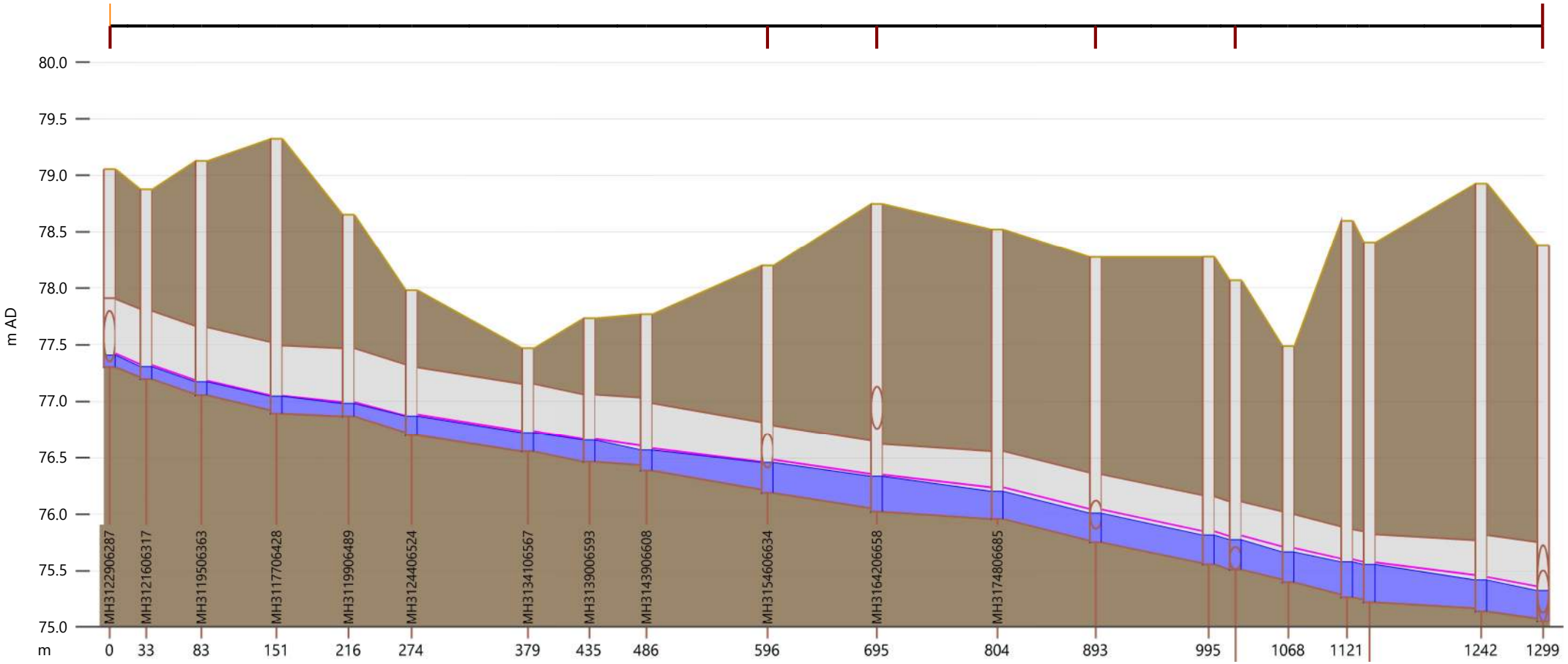


Link		MH3003421.1	MH3003422.1	-	MH3003426.1	-	MH3003428.1	MH3003429.1	MH3003430.1	MH3003431.1	-	-	-
length (m)		59.1	77.0	27.0	78.0	38.6	62.5	72.1	64.2	92.1	34.0	31.0	-
height (mm)		250	250	250	250	250	250	250	250	375	375	450	-
grad (m/m)		0.00507	0.03000	-	0.00500	0.00726	0.00368	0.00499	0.00499	0.02693	0.01000	0.00871	-
pfc (m3/s)		0.042	0.103	0.043	0.042	0.051	0.036	0.042	0.042	0.288	0.175	0.266	-
surc		0.08	0.10	0.09	0.09	0.09	0.17	0.29	0.33	0.17	0.24	0.19	-
US flow (m3/s)		0.00005	0.00010	-	0.00017	0.00019	0.00023	0.00690	0.00905	0.01200	0.01867	0.01867	-
US velocity (m/s)		0.028	0.037	0.055	0.075	0.086	0.093	0.598	0.648	0.971	0.914	0.911	-
DS flow (m3/s)		0.00005	0.00010	-	0.00017	0.00019	0.00023	0.00690	0.00905	0.01200	0.01867	0.01867	-
DS velocity (m/s)		0.028	0.037	0.056	0.076	0.086	0.043	0.639	0.698	0.971	0.914	0.911	-

Node	-	MH3003422	MH3003423	MH3003426	MH3003427	MH3003428	MH3003429	MH3003430	MH3003431	MH3003432	-	-
ground (m AD)	89.620	87.531	85.210	84.360	82.910	83.740	85.410	85.600	84.831	80.660	79.200	-
level (m AD)	85.921	84.866	82.522	82.353	81.933	81.624	81.411	81.032	80.663	78.180	77.804	-

2150 LAKESHORE BLVD._PARK LAWN EXISTING

ARUP

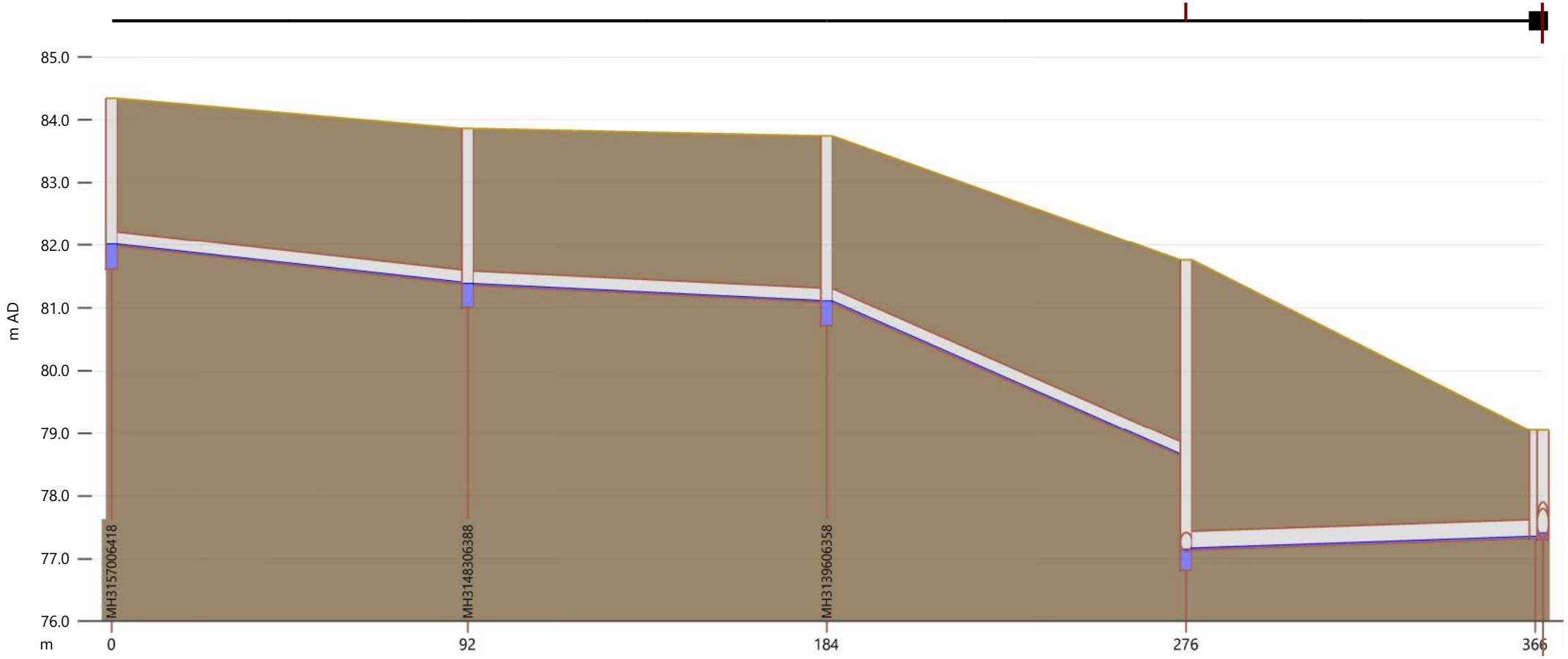


Link	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
length (m)	33.3	50.0	67.9	65.2	57.1	105.6	55.5	51.8	109.5	99.1	109.3	88.9	102.2	-	47.9	53.2	-	101.1	56.1
height (mm)	600	600	600	600	600	600	600	600	600	600	600	600	600	-	600	600	-	600	675
grad (m/m)	-	-	0.00193	0.00038	0.00252	0.00137	0.00166	-	0.00153	0.00136	0.00059	0.00216	0.00181	-	-	-	-	0.00051	0.00109
pfc (m3/s)	-	0.317	0.270	0.120	0.308	0.228	0.250	0.143	0.241	0.227	0.149	0.285	0.261	-	0.262	0.278	-	0.139	0.277
surc	0.17	0.18	0.20	0.25	0.24	0.28	0.32	0.32	0.40	0.46	0.51	0.40	0.42	-	0.43	0.48	-	0.55	0.41
US flow (m3/s)	-	-	0.01998	0.02065	0.02078	0.03746	0.03746	-	0.04424	0.09112	0.09219	0.09353	0.09666	-	-	-	-	0.10580	0.10591
US velocity (m/s)	-	0.591	0.527	0.374	0.582	0.580	0.596	0.551	0.626	0.749	0.630	0.888	0.845	-	0.899	0.883	-	0.662	0.774
DS flow (m3/s)	-	-	0.01998	0.02065	0.02078	0.03746	0.03746	-	0.04424	0.09112	0.09219	0.09353	0.09666	-	-	-	-	0.10580	0.10591
DS velocity (m/s)	-	0.593	0.497	0.578	0.404	0.596	0.489	0.934	0.426	0.710	0.875	0.886	0.883	-	1.007	0.795	-	0.975	0.919

Node	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ground (m AD)	-	79.128	79.322	78.652	77.981	77.471	-	77.768	78.199	78.747	78.522	78.274	78.276	-	-	-	78.408	78.926	-
level (m AD)	-	77.171	77.045	76.980	76.869	76.720	-	76.565	76.455	76.331	76.198	76.007	75.813	-	-	-	75.554	75.416	-

2150 LAKESHORE BLVD._MARINE PARADE DRIVE EXISTING

ARUP

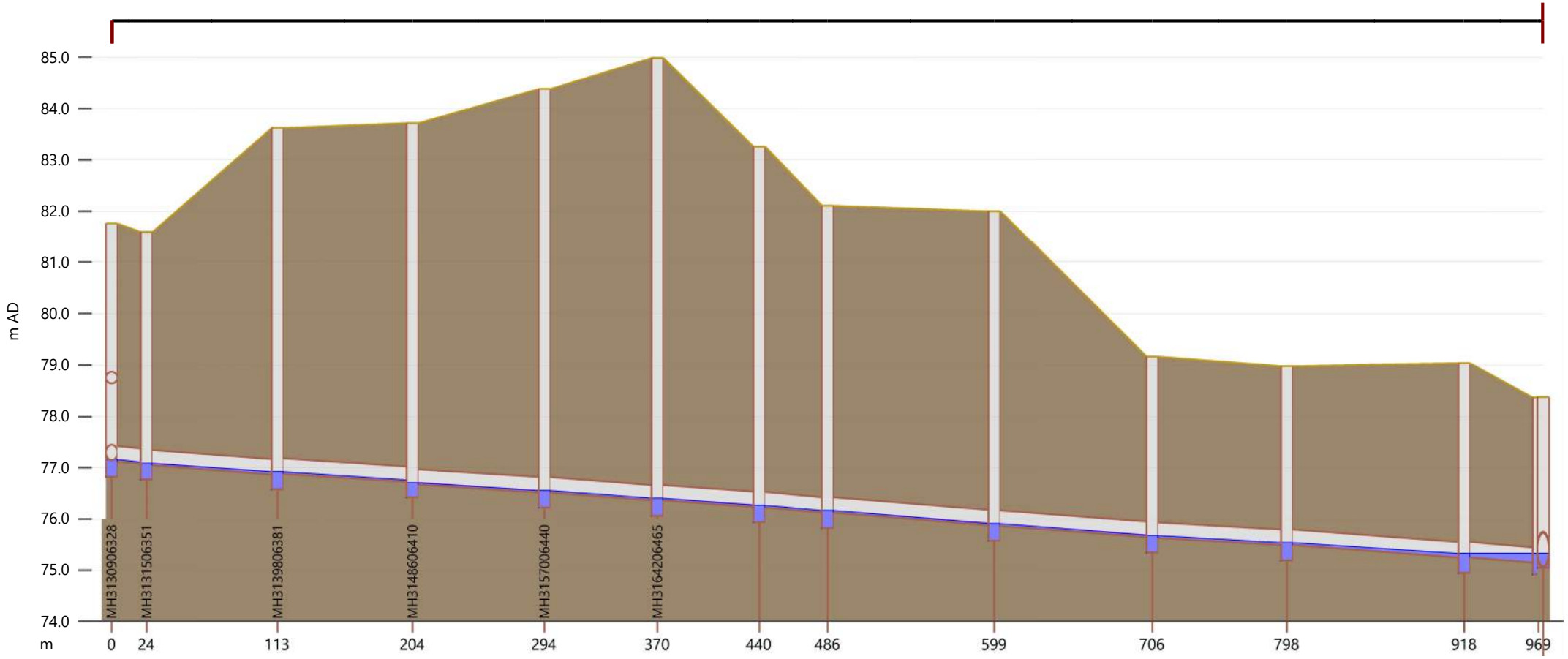


Link	MH3157006418.1	MH3148306388.1	MH3139606358.1	Dummy_Weir.2
length (m)	91.5	92.2	92.4	89.7
height (mm)	225	225	225	300
grad (m/m)	0.00665	0.00291	0.02633	0.00204
pfc (m3/s)	0.037	0.024	0.073	0.044
surc	0.09	0.09	0.10	0.09
US flow (m3/s)	0.00000	0.00000	0.00005	0.00034
US velocity (m/s)	0.000	0.000	0.024	0.110
DS flow (m3/s)	0.00000	-0.00000	0.00005	0.00034
DS velocity (m/s)	0.000	0.000	0.024	0.125

Node	MH3157006418	MH3148306388	MH3139606358	MH3130906328	Dummy_Weir
ground (m AD)	84.341	83.864	83.746	81.762	79.056
level (m AD)	82.011	81.380	81.103	77.148	77.355

2150 LAKESHORE BLVD._LAKESHORE BLVD. N EXISTING

ARUP

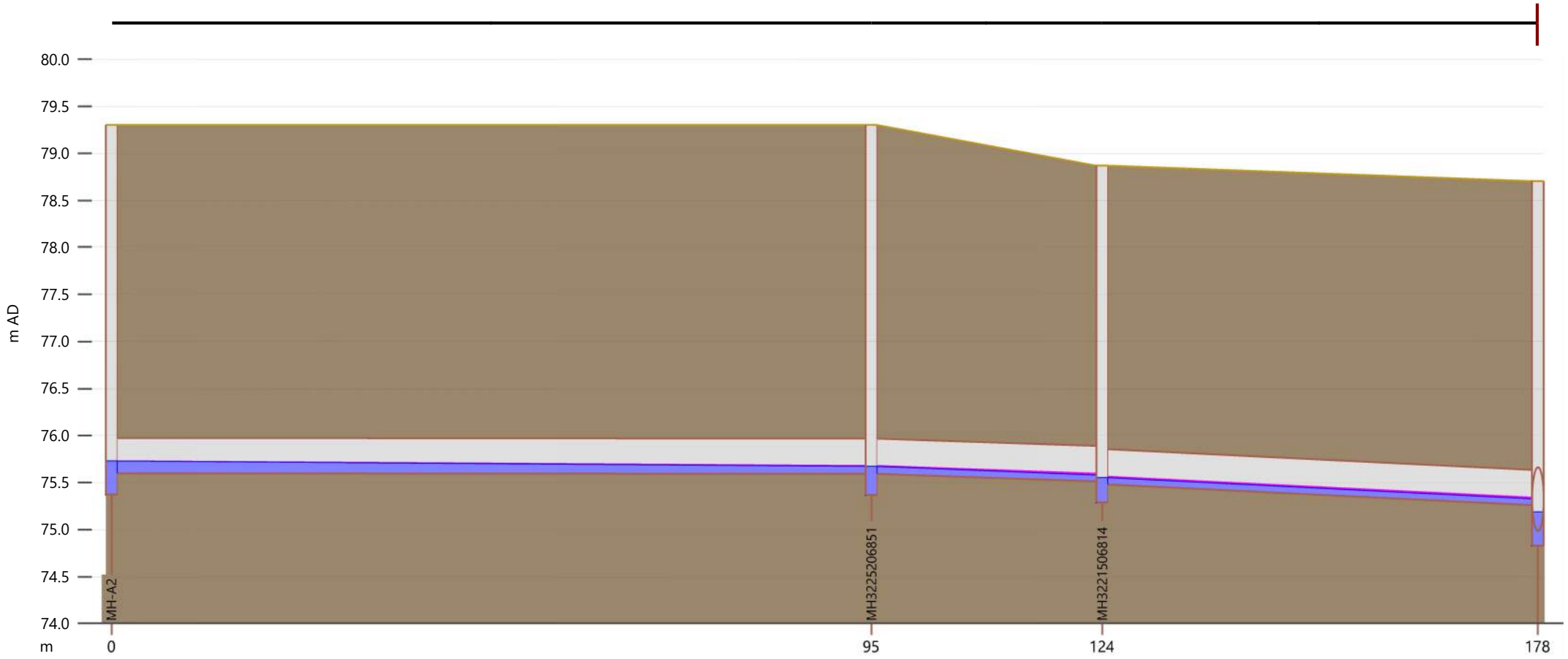


Link	-	MH3131506351.1	MH3139806381.1	MH3148606410.1	-	-	-	MH3175206501.1	MH3186206526.1	MH3195006587.1	MH3202606639.1	-
length (m)	23.8	88.8	91.7	89.4	76.7	69.1	46.5	113.0	107.3	91.3	120.4	50.4
height (mm)	300	300	300	300	300	300	300	300	300	300	300	300
grad (m/m)	-	0.00200	0.00170	0.00166	0.00198	0.00181	0.00222	0.00216	0.00202	0.00150	0.00202	0.00203
pfc (m3/s)	-	0.043	0.040	0.039	0.043	0.041	0.046	0.045	0.043	0.037	0.043	0.044
surc	0.09	0.15	0.10	0.10	0.11	0.11	0.11	0.11	0.11	0.12	0.23	0.57
US flow (m3/s)	-	0.00049	0.00049	0.00054	0.00058	0.00062	0.00064	0.00070	0.00077	0.00081	0.00081	0.00081
US velocity (m/s)	-	0.136	0.131	0.137	0.149	0.150	0.161	0.167	0.173	0.165	0.177	0.064
DS flow (m3/s)	-	0.00049	0.00049	0.00054	0.00058	0.00062	0.00064	0.00070	0.00077	0.00081	0.00081	0.00081
DS velocity (m/s)	-	0.075	0.161	0.173	0.141	0.190	0.154	0.207	0.220	0.177	0.064	0.019

Node	-	MH3139806381	MH3148606410	-	-	-	-	MH3186206526	MH3195006587	MH3202606639	-	-
ground (m AD)	81.595	83.622	83.716	84.378	84.980	83.256	82.108	81.997	79.165	78.982	79.040	-
level (m AD)	77.074	76.910	76.699	76.545	76.394	76.259	76.157	75.902	75.669	75.531	75.323	-

2150 LAKESHORE BLVD._LAKESHORE BLVD. S EXISTING

ARUP

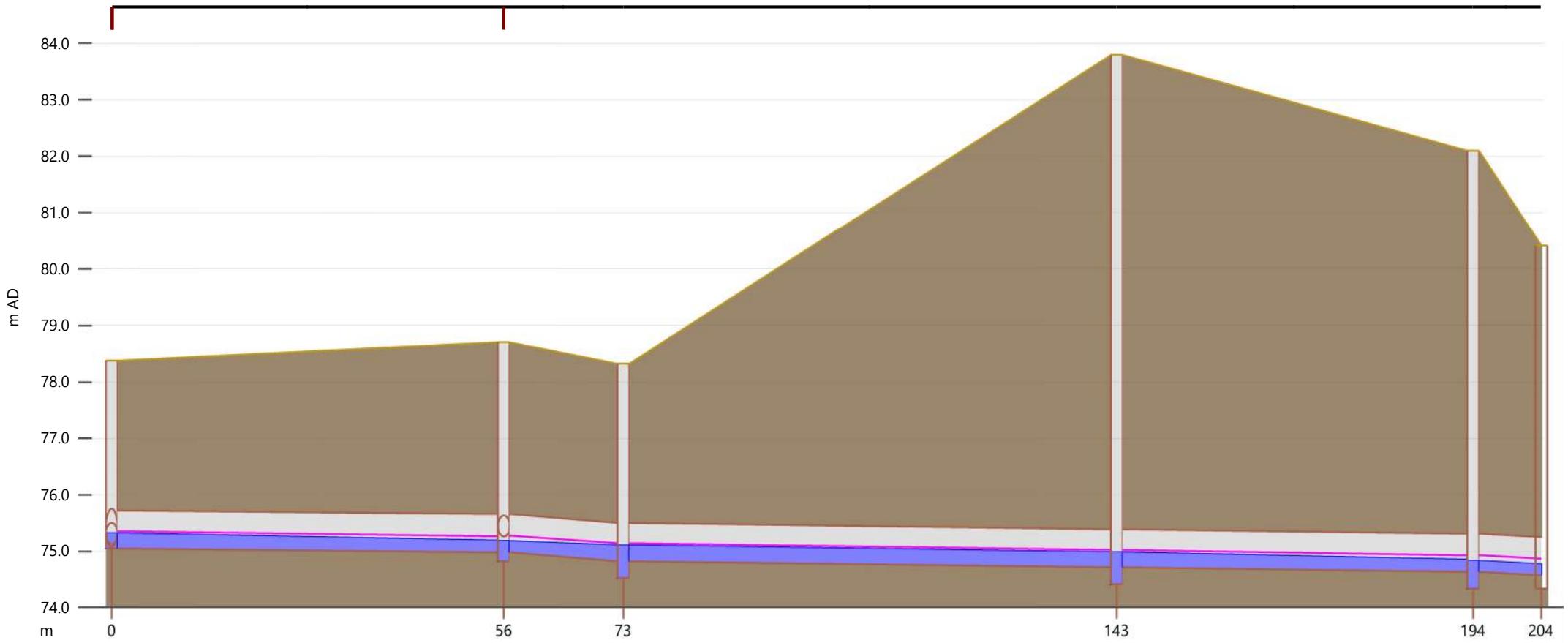


Link	MH-A2.1	MH3225206851.1	MH3221506814.1
length (m)	95.0	28.9	54.4
height (mm)	375	375	375
grad (m/m)	0.00007	0.00274	0.00404
pfc (m3/s)	0.015	0.092	0.111
surc	0.33	0.20	0.18
US flow (m3/s)	0.00712	0.00735	0.00735
US velocity (m/s)	0.220	0.472	0.536
DS flow (m3/s)	0.00712	0.00735	0.00735
DS velocity (m/s)	0.458	0.612	0.606

Node	MH-A2	MH3225206851	MH3221506814	MH3216306785
ground (m AD)	79.303	79.303	78.871	78.707
level (m AD)	75.725	75.667	75.549	75.184

2150 LAKESHORE BLVD._PALACE PIER EXISTING

ARUP

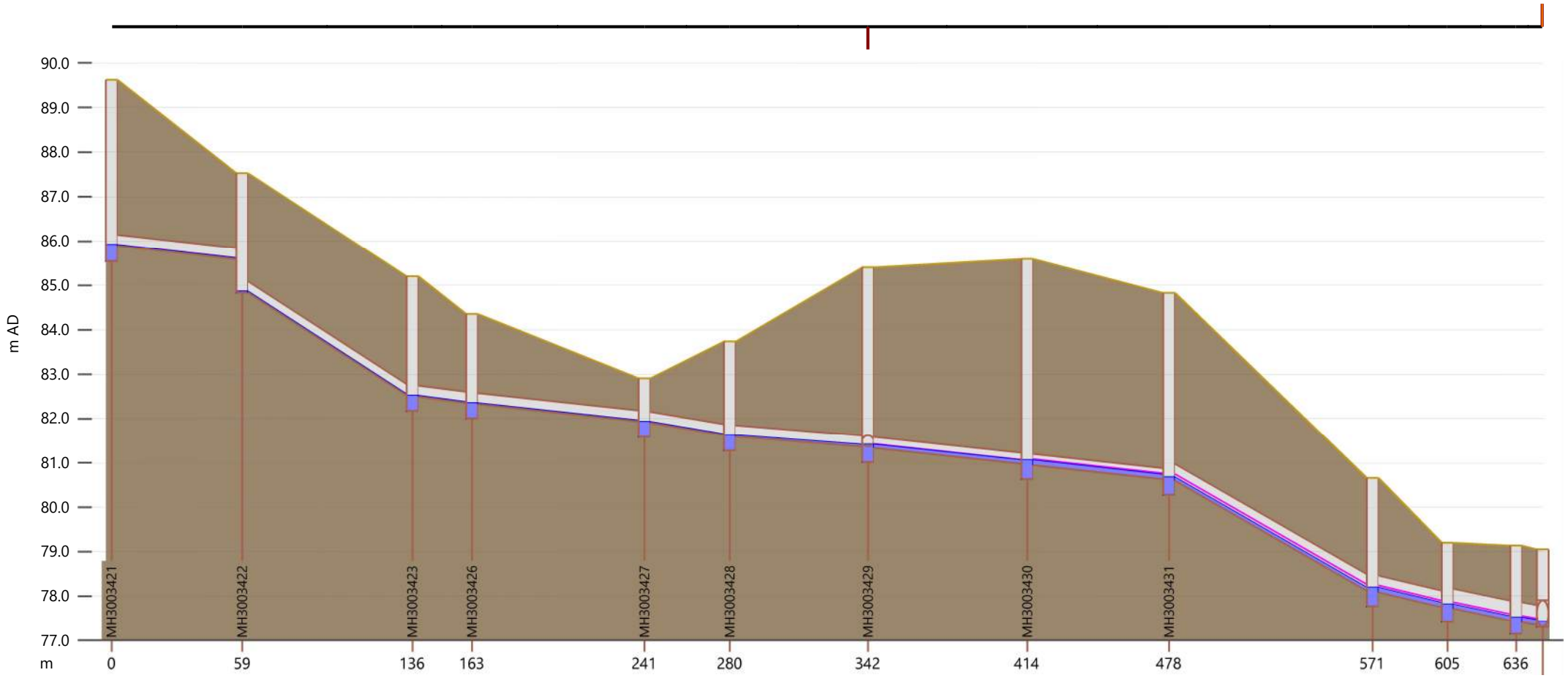


Link		MH3214406765.1	-	MH3217306776.1	MH3223606714.1	-	
length (m)		55.9	17.0	70.3	50.8	9.7	
height (mm)		675	675	675	675	675	
grad (m/m)		0.00115	0.00921	0.00157	0.00158	0.00620	
pfc (m3/s)		0.285	0.807	0.333	0.334	0.662	
surc		0.40	0.42	0.42	0.39	0.29	
US flow (m3/s)		0.11285	0.12041	0.12041	0.12054	0.12077	
US velocity (m/s)		0.841	1.384	0.853	0.922	1.392	
DS flow (m3/s)		0.11285	0.12041	0.12041	0.12054	0.12077	
DS velocity (m/s)		1.202	0.853	0.921	1.224	1.392	

Node	MH3214406765	MH3216306785	MH3217306776	MH3223606714	MH3222206653	-
ground (m AD)	78.383	78.707	78.330	83.793	82.096	-
level (m AD)	75.322	75.184	75.111	74.986	74.837	

2150 LAKESHORE BLVD._GARDINER EXISTING

ARUP

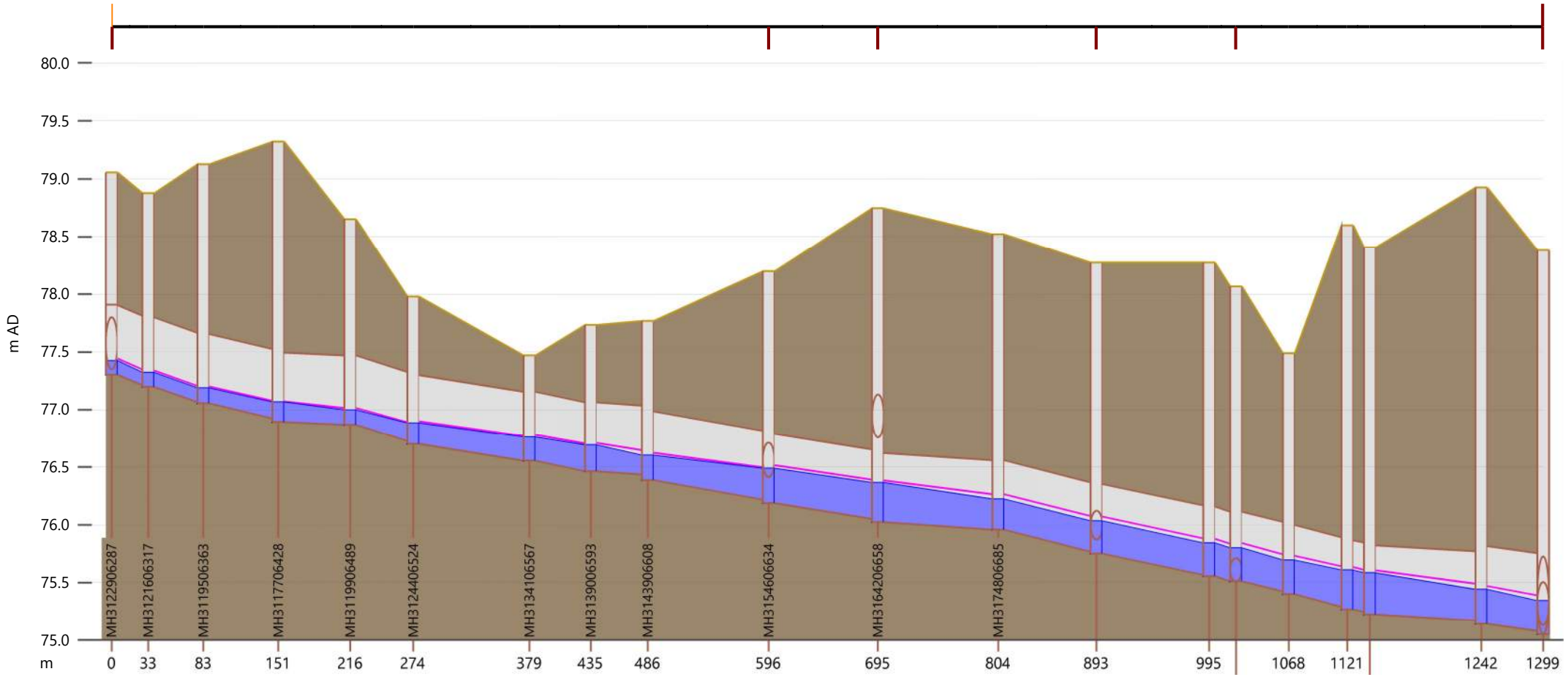


Link		MH3003421.1	MH3003422.1	-	MH3003426.1	-	MH3003428.1	MH3003429.1	MH3003430.1	MH3003431.1	-	-	-
length (m)		59.1	77.0	27.0	78.0	38.6	62.5	72.1	64.2	92.1	34.0	31.0	-
height (mm)		250	250	250	250	250	250	250	250	375	375	450	-
grad (m/m)		0.00507	0.03000	-	0.00500	0.00726	0.00368	0.00499	0.00499	0.02693	0.01000	0.00871	-
pfc (m3/s)		0.042	0.103	0.043	0.042	0.051	0.036	0.042	0.042	0.288	0.175	0.266	-
surc		0.08	0.10	0.09	0.09	0.09	0.17	0.31	0.43	0.20	0.28	0.21	-
US flow (m3/s)		0.00005	0.00010	-	0.00017	0.00019	0.00023	0.00690	0.01558	0.01858	0.02525	0.02525	-
US velocity (m/s)		0.028	0.037	0.055	0.075	0.086	0.093	0.598	0.773	1.187	1.016	1.019	-
DS flow (m3/s)		0.00005	0.00010	-	0.00017	0.00019	0.00023	0.00690	0.01558	0.01858	0.02525	0.02525	-
DS velocity (m/s)		0.028	0.037	0.056	0.076	0.086	0.043	0.533	0.834	1.187	1.016	1.019	-

Node	-	MH3003422	MH3003423	MH3003426	MH3003427	MH3003428	MH3003429	MH3003430	MH3003431	MH3003432	-	-
ground (m AD)	89.620	87.531	85.210	84.360	82.910	83.740	85.410	85.600	84.831	80.660	79.200	-
level (m AD)	85.921	84.866	82.522	82.353	81.933	81.624	81.411	81.057	80.675	78.194	77.816	-

2150 LAKESHORE BLVD._PARK LAWN INTERMEDIATE

ARUP

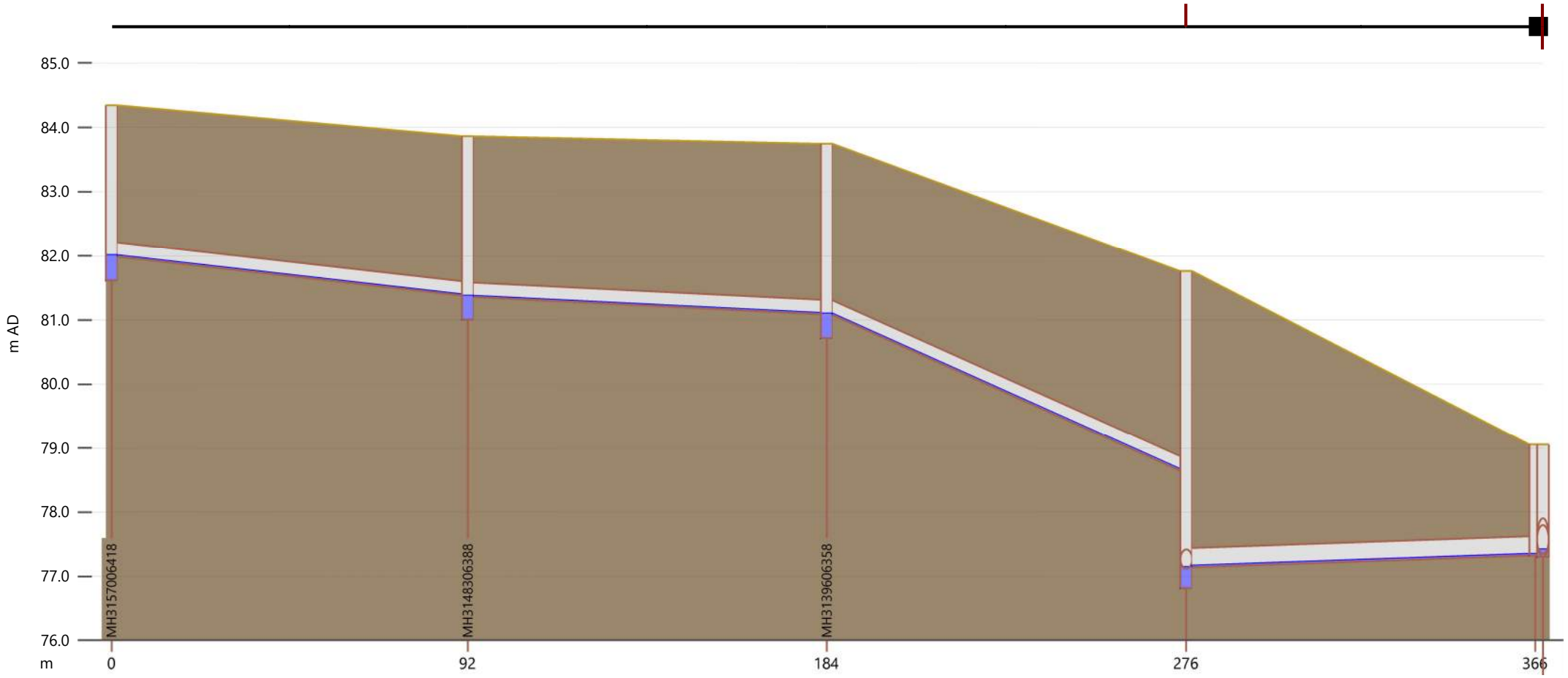


Link	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
length (m)	33.3	50.0	67.9	65.2	57.1	105.6	55.5	51.8	109.5	99.1	109.3	88.9	102.2	-	47.9	53.2	-	101.1	56.1
height (mm)	600	600	600	600	600	600	600	600	600	600	600	600	600	-	600	600	-	600	675
grad (m/m)	-	-	0.00193	0.00038	0.00252	0.00137	0.00166	-	0.00153	0.00136	0.00059	0.00216	0.00181	-	-	-	-	0.00051	0.00109
pfc (m3/s)	-	0.317	0.270	0.120	0.308	0.228	0.250	0.143	0.241	0.227	0.149	0.285	0.261	-	0.262	0.278	-	0.139	0.277
surc	0.20	0.20	0.23	0.28	0.26	0.34	0.38	0.38	0.45	0.52	0.57	0.44	0.47	-	0.48	0.53	-	0.60	0.44
US flow (m3/s)	-	-	0.02655	0.02723	0.02736	0.04404	0.05574	-	0.06252	0.10939	0.11047	0.11180	0.11494	-	-	-	-	0.12407	0.12419
US velocity (m/s)	-	0.645	0.590	0.414	0.641	0.612	0.668	0.623	0.688	0.780	0.670	0.945	0.887	-	0.931	0.905	-	0.703	0.818
DS flow (m3/s)	-	-	0.02655	0.02723	0.02736	0.04404	0.05574	-	0.06252	0.10939	0.11047	0.11180	0.11494	-	-	-	-	0.12407	0.12419
DS velocity (m/s)	-	0.655	0.531	0.638	0.467	0.527	0.573	0.962	0.511	0.744	0.934	0.926	0.916	-	1.016	0.820	-	1.019	0.966

Node	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ground (m AD)	-	79.128	79.322	78.652	77.981	77.471	-	77.768	78.199	78.747	78.522	78.274	78.276	-	-	-	78.408	78.926	-
level (m AD)	-	77.186	77.065	76.995	76.882	76.758	-	76.601	76.486	76.363	76.220	76.032	75.840	-	-	-	75.583	75.438	-

2150 LAKESHORE BLVD._MARINE PARADE DRIVE INTERMEDIATE

ARUP

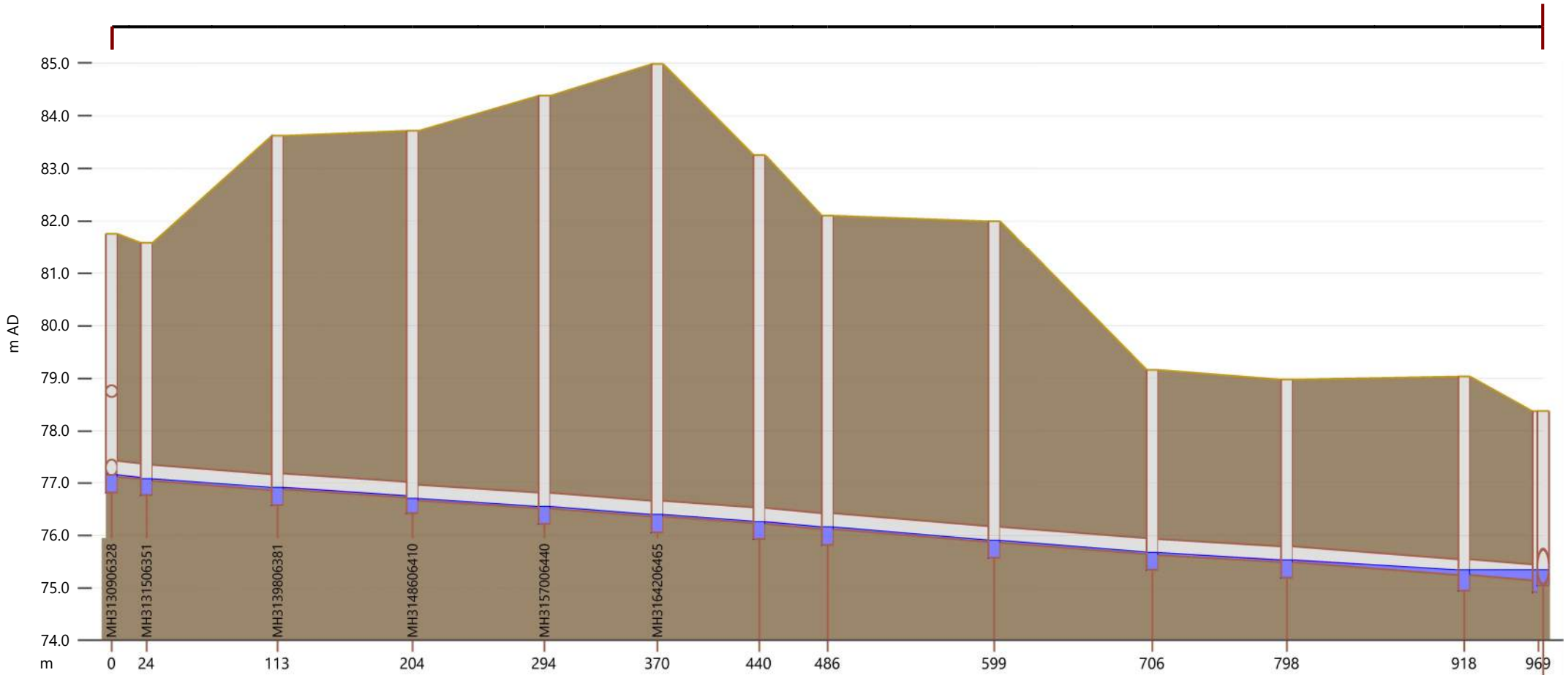


Link	MH3157006418.1	MH3148306388.1	MH3139606358.1	Dummy_Weir.2
length (m)	91.5	92.2	92.4	89.7
height (mm)	225	225	225	300
grad (m/m)	0.00665	0.00291	0.02633	0.00204
pfc (m3/s)	0.037	0.024	0.073	0.044
surc	0.09	0.09	0.10	0.09
US flow (m3/s)	0.00000	0.00000	0.00005	0.00034
US velocity (m/s)	0.000	0.000	0.024	0.110
DS flow (m3/s)	-0.00000	-0.00000	0.00005	0.00034
DS velocity (m/s)	0.000	0.000	0.024	0.125

Node	MH3157006418	MH3148306388	MH3139606358	MH3130906328	Dummy_Weir
ground (m AD)	84.341	83.864	83.746	81.762	79.056
level (m AD)	82.011	81.380	81.103	77.148	77.355

2150 LAKESHORE BLVD._LAKESHORE BLVD. N INTERMEDIATE

ARUP

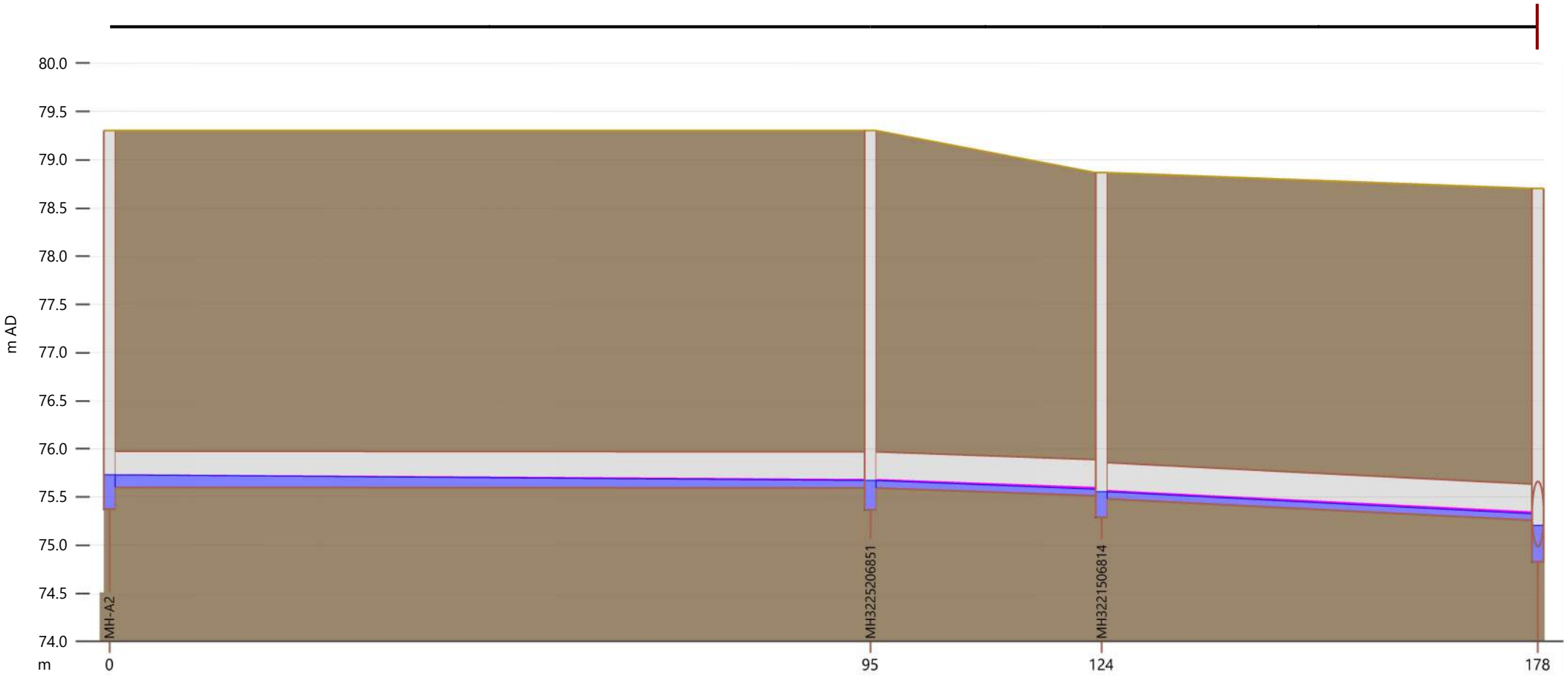


Link	-	MH3131506351.1	MH3139806381.1	MH3148606410.1	-	-	-	MH3175206501.1	MH3186206526.1	MH3195006587.1	MH3202606639.1	-
length (m)	23.8	88.8	91.7	89.4	76.7	69.1	46.5	113.0	107.3	91.3	120.4	50.4
height (mm)	300	300	300	300	300	300	300	300	300	300	300	300
grad (m/m)	-	0.00200	0.00170	0.00166	0.00198	0.00181	0.00222	0.00216	0.00202	0.00150	0.00202	0.00203
pfc (m3/s)	-	0.043	0.040	0.039	0.043	0.041	0.046	0.045	0.043	0.037	0.043	0.044
surc	0.09	0.15	0.10	0.10	0.11	0.11	0.11	0.11	0.11	0.12	0.30	0.64
US flow (m3/s)	-	0.00049	0.00049	0.00054	0.00058	0.00062	0.00064	0.00070	0.00077	0.00081	0.00081	0.00081
US velocity (m/s)	-	0.136	0.131	0.137	0.149	0.150	0.161	0.167	0.173	0.165	0.177	0.045
DS flow (m3/s)	-	0.00049	0.00049	0.00054	0.00058	0.00062	0.00064	0.00070	0.00077	0.00081	0.00081	0.00081
DS velocity (m/s)	-	0.075	0.161	0.173	0.141	0.190	0.154	0.207	0.220	0.177	0.045	0.017

Node	-	MH3139806381	MH3148606410	-	-	-	-	MH3186206526	MH3195006587	MH3202606639	-	-
ground (m AD)	81.595	83.622	83.716	84.378	84.980	83.256	82.108	81.997	79.165	78.982	79.040	-
level (m AD)	77.074	76.910	76.699	76.545	76.394	76.259	76.157	75.902	75.669	75.531	75.343	-

2150 LAKESHORE BLVD._LAKESHORE BLVD. S INTERMEDIATE

ARUP

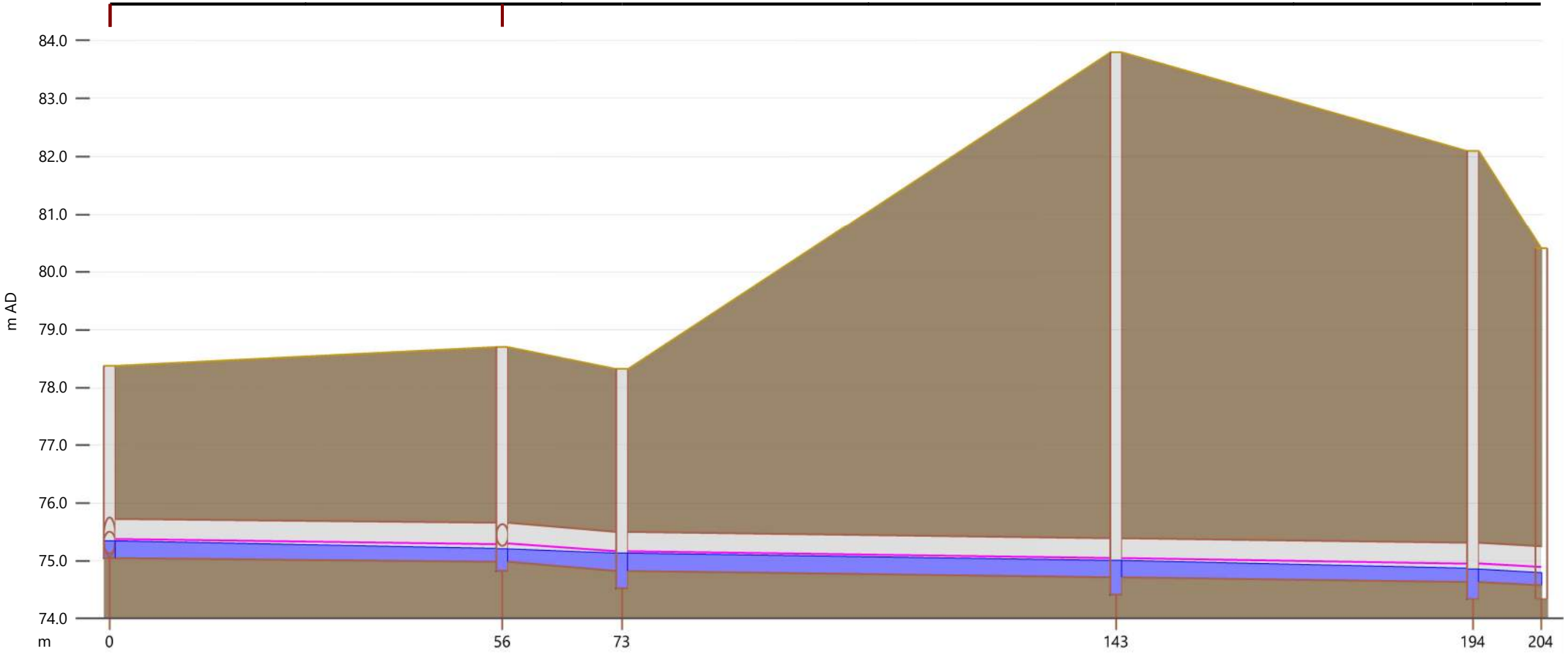


Link	MH-A2.1	MH3225206851.1	MH3221506814.1
length (m)	95.0	28.9	54.4
height (mm)	375	375	375
grad (m/m)	0.00007	0.00274	0.00404
pfc (m3/s)	0.015	0.092	0.111
surc	0.33	0.20	0.18
US flow (m3/s)	0.00712	0.00735	0.00735
US velocity (m/s)	0.220	0.472	0.536
DS flow (m3/s)	0.00712	0.00735	0.00735
DS velocity (m/s)	0.458	0.612	0.606

Node	MH-A2	MH3225206851	MH3221506814	MH3216306785
ground (m AD)	79.303	79.303	78.871	78.707
level (m AD)	75.725	75.667	75.549	75.202

2150 LAKESHORE BLVD._PALACE PIER INTERMEDIATE

ARUP



Link		MH3214406765.1	-	MH3217306776.1	MH3223606714.1	-	
length (m)		55.9	17.0	70.3	50.8	9.7	
height (mm)		675	675	675	675	675	
grad (m/m)		0.00115	0.00921	0.00157	0.00158	0.00620	
pfc (m3/s)		0.285	0.807	0.333	0.334	0.662	
surc		0.43	0.44	0.44	0.42	0.31	
US flow (m3/s)		0.13113	0.13869	0.13869	0.13881	0.13904	
US velocity (m/s)		0.887	1.417	0.902	0.963	1.445	
DS flow (m3/s)		0.13113	0.13869	0.13869	0.13881	0.13904	
DS velocity (m/s)		1.257	0.902	0.962	1.277	1.445	
Node	MH3214406765		MH3216306785	MH3217306776	MH3223606714	MH3222206653	-
ground (m AD)	78.383		78.707	78.330	83.793	82.096	-
level (m AD)	75.342		75.202	75.130	75.006	74.852	

2150 LAKESHORE BLVD._GARDINER INTERMEDIATE

ARUP