2150 LAKE SHORE INFRASTRUCTURE MASTER PLAN

2150 - 2194 - LAKE SHORE BOULEVARD WEST
23 PARK LAWN ROAD

TORONTO

CPPIB Park Lawn Canada Inc
FCR (Park Lawn) LP

INFRA-STRUCTURE MASTER PLAN

1.1/ INTRODUCTION

This Infrastructure Masterplan has been prepared by Arup on behalf of the land owners, FCR (Park Lawn) LP and CPPIB Park Lawn Canada Inc., in support of an Official Plan Amendment application for the redevelopment of 2150-2194 Lake Shore Boulevard West and 23 Park Lawn Road ("the site" or "2150 Lake Shore"). This document is also intended to provide input into the City's Secondary Plan for the site and immediately adjacent lands.

The purpose of this section is to provide details of the considerations, assumptions and constraints associated with the site wide servicing strategy to be carried out by First Capital.

The 2150 Lake Shore Masterplan requires new services which will be connected to the existing networks that surround the site. Detailed discussions will need to take place with utility companies to determine whether upgrades to existing infrastructure are required. The proposed development will entail the following services:

- Potable water supply
- Sanitary drainage connection
- Stormwater infrastructure
- High Voltage power to supply buildings
- Low Voltage power to supply streetlighting and other public realm features.
- Telecommunications
- Solid Waste Management

An assessment of the capacity of the existing infrastructure has not been carried out within this report.

1.1.1 GUIDING DOCUMENTS

The following guidelines have been used to support the design development:

- The Toronto Green Standard v3 covers a broad range of requirements related to delivering the infrastructure strategy, particularly in relation to reducing potable water use and stormwater runoff while improving the quality of stormwater draining to Lake Ontario
- The City of Toronto's Sewer and Watermain Design Criteria Manual, 2014
- Wet Weather Flow Management Guidelines
- Toronto Long-Term Waste Management Strategy

1.2/ WATER SUPPLY

1.2.1 KNOWN EXISTING INFRASTRUCTURE

Toronto Water operates and maintains over 6,000km of watermains which supply potable water in the City. Figure 1 presents the existing potable water infrastructure near the site. Existing utility information has been ascertained using City Utility Mapping (CUMAP). There are 2 water mains adjacent to the site. A Ø300mm ductile iron water main runs from the north-west boundary along Park Lawn Road. This water main is within the site boundary and may need to be diverted as part of the site enabling works. This pipe is connected to a Ø300mm PVC water main which runs north-east along Marine Parade Drive. The current capacity of these pipes is unknown.

The CUMAP shows multiple branches of the supply network which are formed of cast iron pipes, ductile iron pipes, PVC pipes and asbestos cement pipes. These serve apartments, commercial, retail and leisure facilities to the west of Park Lawn Road and north of Marine Parade Drive.

Additionally, 2 water supply pipes run along Lake Shore Boulevard West; their size and material are unknown.

A water tower is located within the site boundary. The 6m diameter steel tank previously served the Christie Cookie Bakery. The water tower has not been used since the closure of the bakery and a condition report has been carried out by Carvajal Structural Engineers who have identified options for potential restoration. The restored tower is not considered as a storage option for the site, as the capacity is negligible compare to site demands and pumping would be required.

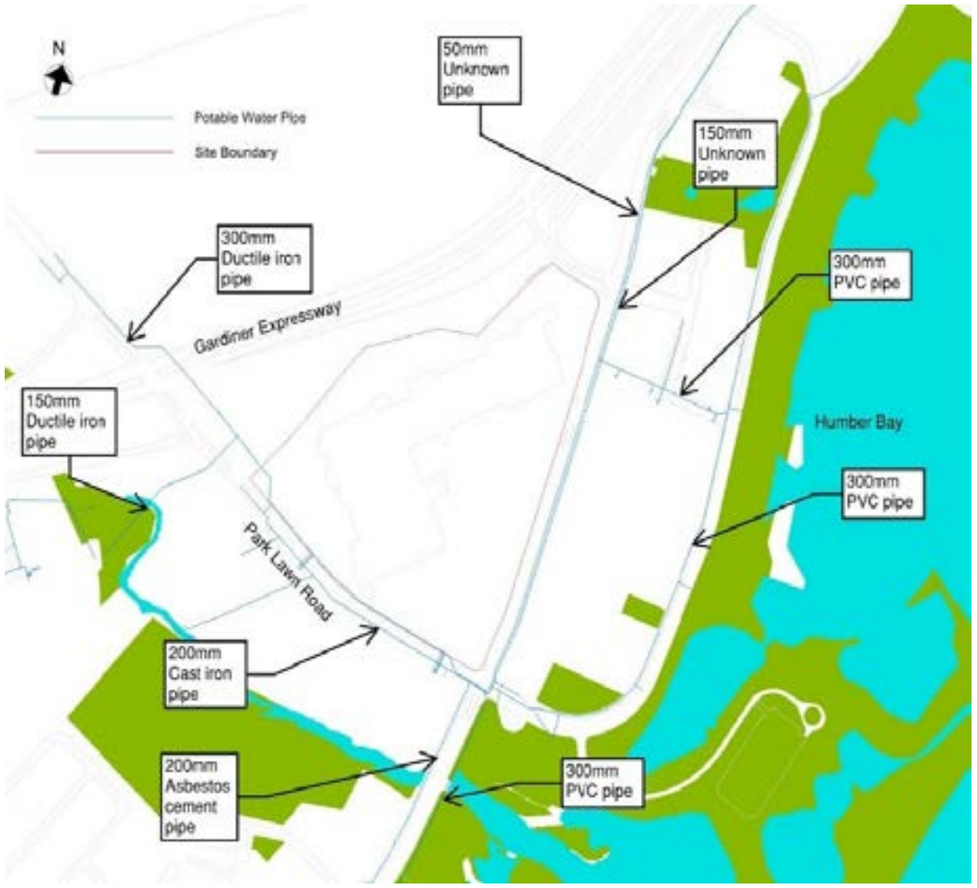

Figure 1 - Existing Potable Water Infrastructure

1.2.2 POTENTIAL STRATEGY

Indoor building demand estimates were calculated using the LEED Indoor Water Use Reduction Calculator v4. Peaking factors taken from The City of Toronto's Sewer and Watermain Design Criteria Manual, were applied to these demands, which were used to indicatively size the water network. It is proposed that there are multiple connections made to the water network for increased resilience.

Refer to drawing LSB-ARP-XX-XX-DR-CU-61001 and Figure 2 for a potential layout of the potable water network.

Figure 2 - Potential Water Supply Strategy

1.2.3 OPPORTUNITIES

The concept design stage has identified the following opportunities for the 2150 Lake Shore Masterplan relating to demand reduction which should be explored further in the developed design stage (summarised in Figure 3):

- TGS Tier 2 WQ 4.3 Water Efficiency specifies a 40% reduction in potable water consumption over the baseline water fixtures demands which is achievable using efficient fixtures and fittings.

- TGS Tier 3 WQ 4.4 Water Efficiency specifies a 50% reduction which could be achieved if a non-potable water source is secured for irrigation and toilet flushing.

The next stages of design will evaluate the value in using a non-potable water source to achieve 50% reduction (Tier 3). This may safeguard freshwater resources, but there are significant additional capital and operating costs, financially and in terms of carbon.

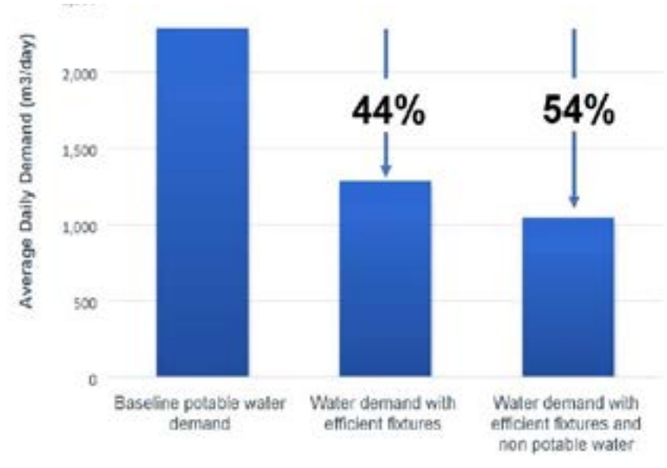

Figure 3 - Water demand reductions

1.3/ SANITARY SEWAGE

1.3.1 KNOWN EXISTING INFRASTRUCTURE

Toronto Water operates and maintains 4,000km of sanitary sewers which convey wastewater. To the north-west of the site a Ø250mm PVC sanitary wastewater pipe conveys flows southeast along Park Lawn Road. The network diverges into a Ø600mm corrugated PE pipe along Marine Parade Drive and a Ø300m vitrified clay sanitary wastewater pipe along Lake Shore Boulevard West. The two pipes run parallel to Gardiner Expressway north-east of the site, in the direction of the Humber Wastewater Treatment Plant.

Figure 4 - Existing Sanitary Sewer Infrastructure

1.3.2 POTENTIAL STRATEGY

Potential Strategy

The initial wastewater production forecast has been carried out for the proposed masterplan.

The City of Toronto's Sewer and Watermain Design Criteria Manual indicates peak flow of 450l/capita/day which was used to calculate the baseline peak flow per block and size the network.

The sanitary drainage strategy utilises the proposed site levels, such that the entire network is gravity-driven whilst ensuring minimum self-cleansing velocities. The first leg of the top end of the network will have a minimum grade of one percent unless advised otherwise by the City. All remaining downstream sections of sanitary sewer will have a minimum grade corresponding to a minimum self-cleansing velocity of 0.6 metre/second.

It is proposed that there are multiple connections made to the municiple sanitary network for increased resilience.

Refer to drawing LSB-ARP-XX-XX-DR-CD-50000 and Figure 5 for a potential layout of the sanitary sewer network.

Figure 5 - Potential Sanitary Drainage Strategy

1.3.3 OPPORTUNITIES

If building water demands are reduced, and grey water is treated and reused locally, the wastewater flows will be reduced. Based on the water demand reduction measures outlined in the Water Supply section, the sanitary water flows can be reduced to those shown in Figure 6.

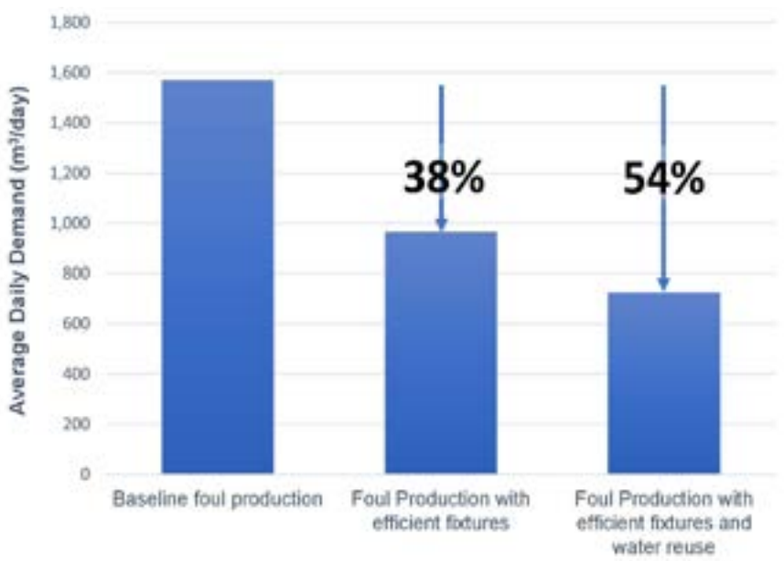

Figure 6- Wastewater demand reductions

1.4/ STORMWATER DRAINAGE

1.4.1 KNOWN EXISTING INFRASTRUCTURE

Existing utility information has been ascertained using City Utility Mapping (CUMAP).

To the north of the site, there is a Ø300mm concrete stormwater pipe which conveys flows in the north-easterly direction, parallel to the Gardiner Expressway.

The southern half of the site conveys the stormwater to Mimico Creek. Although the majority of the pipes in the vicinity of the site are made of concrete, the CUMAP shows some vitrified clay pipes, reinforced concrete pipes and corrugated steel pipes outside the site boundary.

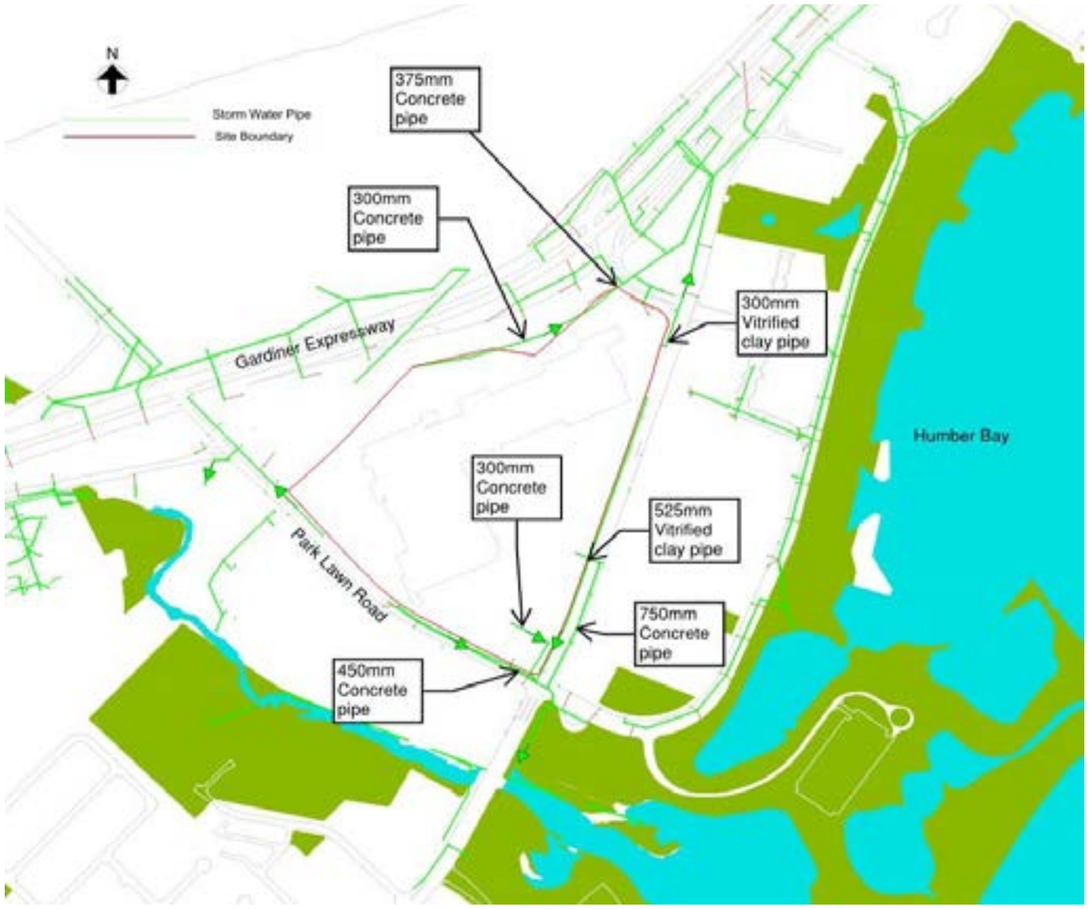

Figure 7 - Existing Stormwater Infrastructure

1.4.2 POTENTIAL STRATEGY

TGS Tier 1 core requirement WQ 2.1 for Stormwater Retention and Reuse requires that the site retain runoff generated from a minimum of 5 mm depth of rainfall from all site surfaces through infiltration, evapotranspiration, water harvesting and reuse. This can be achieved on the site by utilizing green roofs and tree pits in the public realm.

Refer to drawing LSB-ARP-XX-XX-DR-CD-40000 and Figure 8 for a potential layout of the conveyance network. It is proposed that perforated collector pipes are laid underneath tree pits and permeable car park bays which will overflow into a stormwater pipe network under the carriageway. As the site levels fall from the proposed Station Square to Lake Shore Boulevard, the pipe network falls in the same direction. The excess flows may be required to undergo disinfection before being discharged into the lake.

Discharging directly into the Lake would ease the pressure off the existing municipal network, which is beneficial to Toronto Water, and also to adjacent sites. Easing demands on existing municipal infrastructure means that reinforcement and upsizing of the sewers can be delayed or even avoided in the short term.

The alternative to lake discharge is discharging to existing stormwater sewers. Discharging runoff into the existing sewers on Lake Shore Boulevard 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 in accordance with the WWFM. The capacity of the receiving sewer is unknown.

Figure 8 - Potential Stormwater Drainage Strategy

1.4.3 OPPORTUNITIES

TGS Tier 3 WQ 2.3 Stormwater Retention and Reuse requires that the site retain runoff generated from a minimum of 25 mm depth of rainfall from all site surfaces through infiltration, evapotranspiration, water harvesting and reuse. Once site specific infiltration rates are determined through testing, it is hoped that Tier 3 can be achieved on this site, through the use of green infrastructure.

Even if 25mm of retention is achieved across the site, it is estimated that some additional stormwater attenuation will be required. If the capacity of the receiving sewer is less than the allowable release rate to the municipal storm sewer system during a 2-year design storm, then this required attenuation volume could be even greater.

Alternatively, if infiltration rates allow, there is an opportunity to infiltrate all stormwater on site, avoiding lake discharge and connecting to a municipal sewer all together.

1.5/ POWER SUPPLY

1.5.1 KNOWN EXISTING INFRASTRUCTURE

The majority of the distribution network in Toronto is owned and operated by Hydro One Networks Inc (HONI). However, most of Ontario's electricity customers draw power from Toronto Hydro Electric Systems Ltd (THESL) and other Ontario local distribution companies (LDCs). In terms of electricity distribution, the western part of the city has a network of 115 kV transmission lines which emanate from the Manby Transformer Station (TS) towards the west of the site, and Leaside TS towards the north east of the site (see Figure 9). All 115 kV transmission lines in the downtown areas (shown in blue in Figure 9) serve stations with distribution voltages at 13.8 kV. The area not in blue on Figure 9, where the site lies, serve stations with distribution voltages at 27.6 kV.

The nearest transformer station to the site is Horner. According to the Metro Toronto Regional Infrastructure Plan, the capacities of Manby and Horner TS are expected to be exceeded by summer 2020.

The existing power arrangement to the site is through overhead power lines from a nearby switchyard on Park Lawn Road, at North-West. The overhead lines terminate at an on-site transformer (Figure 10), likely serving the former factory facility on the plot.

Existing transformer and supply overhead lines can potentially be used during construction works but should later be decommissioned and removed from the site.

Further liaison with Toronto Hydro as the Local Distribution Company (LDC) in the Queensway-Humber Bay area, is required to establish details of the new incoming power arrangement, including supply voltage, cable routing, capacity and resilience

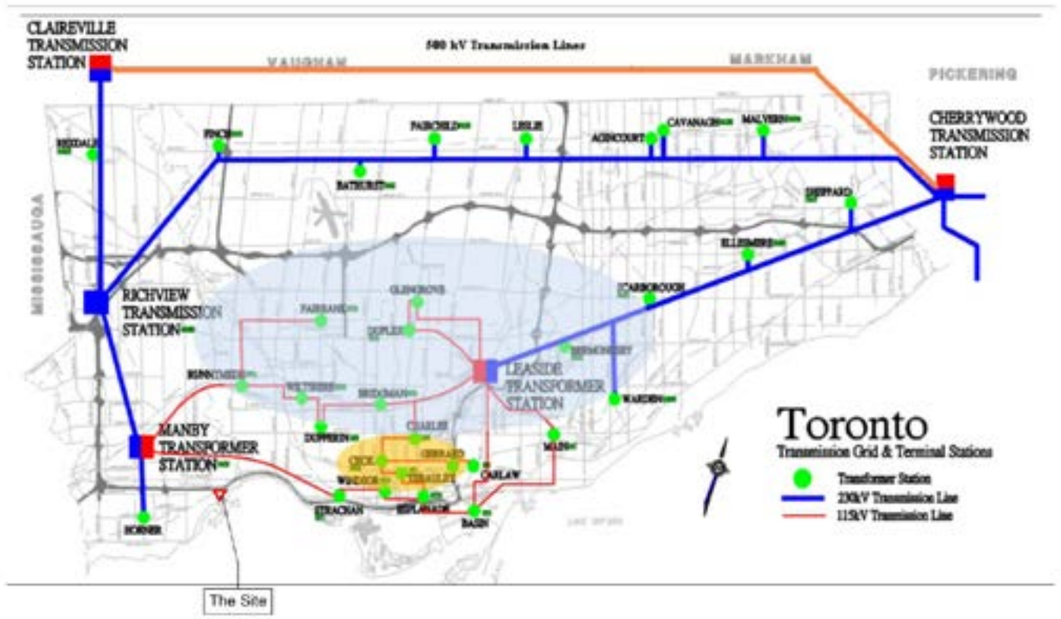

Figure 9 - Toronto Transmission Grid and Terminal Stations

Figure 10- Existing transformer on site plot (Source: GoogleMaps).

1.5.2 POTENTIAL STRATEGY

It is proposed that a new power supply arrangement is established to serve the 2150 Lake Shore site, comprising of a new High Voltage (HV) underground power line to a dedicated incoming distribution substation at 27.6kV. It is assumed that the new supply connection will also be derived from North-West, following the existing power lines. A potential location of the incoming substation is South of the Gardiner Expressway, nearby the new proposed railway station at the plot's boundary. Suitable locations for temporary or intermediate substation locations are also identified at South-West (Park Lawn Rd), North-East (Gardiner Lake Shore West Ramp) and South-East (Lake Shore Boulevard) corners of the plot to allow for flexibility in the staged construction of the site. If secondary supply from an alternative utilities substation can be secured that can be considered as increasing resilience of supply to the site.

Refer to drawing LSB-ARP-XX-XX-DR-CU-61002 and Figure 12 for a potential layout of the power supply network.

Demand estimates per block, including common basement areas are shown in Figure 11 The estimated electrical demand for the development is approximately 15MVA, being the peak capacity that the utility network has to support over a period of 30 minutes. Over imposed loads associated with lighting, general power, heating and cooling, vertical transportation, ICT equipment, electric vehicle charging and other miscellaneous are taken into consideration.

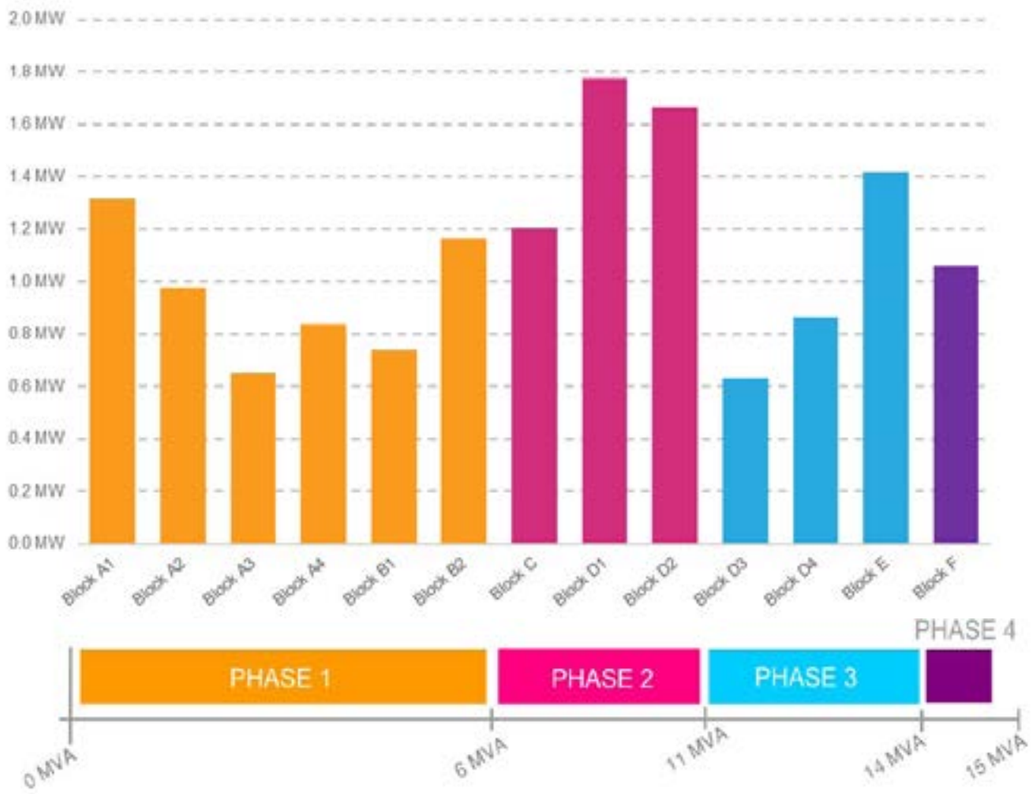

Figure 11 - Diversified Demand per Building and Phased Growth of Electricity Demand

Figure 12 - Potential Power Supply Strategy

Electric Vehicle Charging

Parking for Low Emission Vehicles (LEVs) is required as part of the TGS which drives a need to have 25% of residential parking equipped with electric vehicle charging facilities. Assuming circa 8,000 car parking spaces on the site, 2,000 vehicles may need to be equipped with EV charging facilities. It is therefore important to use a load management system allowing vehicle charging only in times of lower electricity demand e.g. later at night when residential loads usually subside. Providing EV charging points to all parking spaces may add up to 7MVA of additional load to the electrical infrastructure.

Distribution

Site-wide HV distribution should be completed at 13.8kV, as it is recommended to match the incoming voltage level to avoid added capital cost associated with transformers and switchgear.

Typical distribution arrangement for a development of this size is a ring configuration to minimise the required infrastructure and allow for resilient supply to each building. The ring can be operated in closed configuration or with a “movable” open point. The ring configuration further permits expansion works without requirement for major infrastructure reconfigurations and services diversions.

Depending on the overall demand of the site and allocated capacity by the LDC, all buildings may be serviced by a single utility ring. Alternatively, separate rings can be derived from the same or different substations depending on the final power arrangement agreed with the local utility operator.

Underground HV Cabling

It is proposed that all HV utilities distribution is achieved through underground cabling, buried directly or in ducts. Where the HV route runs through a basement, service trenches/ tunnels can be created for added protection and segregation from other services or public areas (e.g. underground parking).

Low Voltage (LV) Infrastructure

Site-wide LV infrastructure is mostly intended to serve:

- Street lighting
- Way-finding
- Site-wide security/CCTV

The design is intended to define a centralised site-wide power and controls system for all shared public services instead of deriving that from adjacent buildings. That will most likely comprise of a dedicated substation to include HV/LV step-down transformer (e.g. 27.6 / 0.347kV) and main distribution board, remotely located sub-distribution boards and appropriately sized underground low voltage cable infrastructure.

If permitted by the capacity of the existing LV network in the area, the power demand associated with street lighting can be diverted away from the customer-owned infrastructure. Further liaison with Toronto Hydro is required to agree ownership and management of the public services infrastructure within the 2150 Lake Shore development.

1.5.3 OPPORTUNITIES

To achieve the targets set out by the energy framework the use of highly efficient equipment and technologies supported by smart load management is incentivised.

Peak electricity demands can be additionally smoothed by deploying batteries and on-site micro generation.

1.6/ TELECOMS

1.6.1 KNOWN EXISTING INFRASTRUCTURE

Several national and regional providers operate on the site and adjacent areas, offering one or several services (e.g. Television, Internet, Mobile and Fixed telephony). The infrastructure in the area grants a good coverage to both residential and business premises.

Table 1 - Communication providers by service in the site area

Provider	TV	Internet	Mobile	Fixed Phone	Business services	Public Wi-Fi
Bell	✔	✔	✔	✔	✔	✗
Telus	✗	✗	✔	✗	✔	✗
Rogers	✔	✔	✔	✔	✔	✗
Zoomer	✗	✗	✔	✗	✗	✗
Cityfone	✗	✗	✔	✗	✗	✗
ISP Telecom	✗	✔	✗	✔	✔	✗
Tucu	✗	✗	✗	✗	✗	✔
Core	✗	✗	✗	✗	✗	✔

The three national operators, as identified in Table 1 have LTE and HSPA+ coverage in the area of the proposed site. These companies own and operate the network and a number of other companies known as “Flanker brands” (for example Zoomer and Cityfone are part of Rogers, Virgin mobile belong to Bell and Koodo to Telus). There are also a number Virtual Mobile Operators and Resellers servicing the area totalling around 20 companies on the offer side of the market.

As part of concept design development, Arup engaged with various Telco service providers to capture information about their current services in the vicinity of the development.

Bell Fixed Broadband

- Bell have existing network along the Lake Shore Boulevard West road serving existing condo buildings in the area;
- Current network is all fibre ensuring the availability of high speed broadband to 2150 Lake Shore site;
- Included in their base price, Bell will extend their network to the telecom rooms of each building (residential or commercial);
- Extending from the Telecom Room in the basement to the residential and commercial tenants will be Building owners responsibility;
- Extending and building the network would take roughly 8-12 months depending on the work involved.

Bell Mobile Coverage

- Bell have existing mobile coverage over the whole area as the Gardiner Expressway is of high priority;
- Their Mobility team monitors usage in the area and deploys new towers as required;
- They handle the cost of this and do this independently of planned developments which may result in a surge of users in the area.

Rogers

Rogers has declined to share any specifics regarding their infrastructure prior to signing an NDA. Rogers have a “One Approach” whereby they assign a PM to be the main liaison between all Rogers departments and ourselves. They foresee next steps following the NDA as a sharing of their drawings in conjunction with the design team sharing the site plans, then working together on a detailed design which will also inform the costing exercise. They will also provide a designer guide at that stage. At this stage, the extent of infrastructure from Rogers around the site is to be determined.

1.6.2 POTENTIAL STRATEGY

The information communication tchnology (ICT) infrastructure design for the 2150 Lake Shore development will be based on the objective of providing resilient connectivity and safeguarding for future expansion and digital initiatives. The approach to implementing telecommunications duct infrastructure across the site is based on the understanding that it will be handed over to the municipality following completion.

The enabling ICT Infrastructure provides a flexible, resilient and easily extensible systems to support the addition of new technologies. The elements in this layer comprise of telecom chambers and duct infrastructure, technology spaces and pathways within the basements and buildings are required to provide residents and businesses with seamless connectivity. The ICT infrastructure is expected to have a long-life span and collectively offer communications capacity and coverage, while providing flexibility that allows them to be maximized over time

Refer to drawing LSB-ARP-XX-XX-DR-CU-61003 and Figure 13 for a potential layout of the telecoms distribution network.

Figure 13 - Potential Telecoms Supply Strategy

1.6.3 OPPORTUNITIES

Whilst digital infrastructure and services offer many opportunities to improve the operation and experience of the urban realm at 2150 Lake Shore, it is critical that any smart-enabled ambitions are aligned with the vision of the district and the wider aspirations of the City of Toronto.

Through project workshops and discussion, themes have begun to emerge that describe the urban ambitions for 2150 Lake Shore, and the desired experience of its tenants, residents and visitors. When paralleled alongside the existing Strategic Themes (2013 – 2018) as identified by the City of Toronto, many synergies emerge. Social development, economic vitality, environmental sustainability, strong governance and participatory city-making have been prioritized by Toronto's City Council and are complementary to many of the key aims identified for the development at 2150 Lake Shore.

1.7/ SOLID WASTE

The solid waste strategy for the proposed development is based on the guiding principles of sustainable resource and waste management: the waste hierarchy and circular economy. These are also in line with the goals of the City's Long-Term Waste Management Strategy and the TGS for operational solid waste.

The waste hierarchy and the circular economy maximise the efficient use of waste materials. This maximises landfill diversion and, minimises the adverse environmental impacts associated with such practices.

It is estimated that a total waste of approximately 12,250 tonnes/annum will be generated on-site once all construction phases will be completed, including:

- 8,000 tonnes/annum of residential waste;
- 3,500 tonnes/annum of non-residential waste;
- 750 tonnes/annum of public realm waste (including garden waste from landscaping).

The waste forecast for residential and non-residential land uses is broken down into the four different construction phases. The waste forecast for public realm waste (including garden waste generated from landscaping activities) is broken down into the different construction phases.

1.7.1 POTENTIAL STRATEGY

The site wide waste reduction and material reuse strategy is as shown in the figure below. It is envisaged that the initiatives implemnted to reduce waste and reuse surplus materials, will be open for use to both residential and non-residential tenants. The selected solid waste strategy is given in the following figures, including:

- Residential waste
- Non-residential waste
- Public realm waste
- Landscaping waste

Figure 14 - Site wide opportunities to reduce waste demands

Figure 15- Potential residential waste strategy

Figure 16 - Potential Non- residential waste strategy

Figure 17- Potential Public realm waste strategy

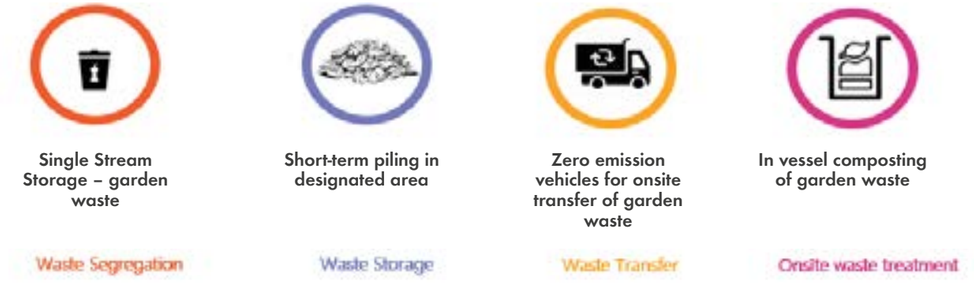

Figure 18- Potential landscaping waste strategy

1.7.2 OPPORTUNITIES

There is a potential for the majority of non-residential food waste and the entirety of garden waste generated from landscaping activities, to be treated onsite via an in-vessel composting (IVC) unit. This is estimated to be around 21 m^3/week, which can be reduced to up to around 4 m^3/week after dewatering.

Furthermore, it may be possible to avoid the need for compaction of residual waste or dry mixed recyclables in the public realm, as space savings could be achieved due to the underground refuse systems (URS) bins. Weekly collections would be carried out from all URS bins across the site.

Local organisations such as the Toronto Tools Library currently exist. There is an opportunity for the site to have it's own tools library and repair cafe, whereby a tool inventory can be available through an online platform. Initiatives such as these extend the useful life of materials, thus minimising waste generation.

1.8/ NEXT STEPS

This section highlights the key tasks and actions that are recommended for the next stage of design and planning. Generally, applicable to all infrastructure, the next steps required are:

- Update demand estimates
- Develop the design, network layouts, plant location and spatial requirements
- Combine the layouts and integrate the layouts within the masterplan

Water Supply

- Consultation with Toronto Water to determine the capacity and pressure in the existing infrastructure

Sanitary Drainage

- Meet with Toronto Water to discuss capacity in existing drainage network
- Discuss the design peak flows with Toronto Water

Stormwater Drainage

- Conduct site specific infiltration / percolation testing to ascertain the ability for infiltration of stormwater
- Discuss the need and requirements for UV disinfection and Lake Discharge with the City
- Conduct watershed specific climate modelling to determine impacts of climate change to flood risk.

Power Supply

- Consultation with Toronto Hydro to ascertain location and capacity of existing power infrastructure

Telecoms

- Further co-ordination and collaboration with fixed telecoms service providers and Cellular service providers to develop the site wide fixed telecom distribution strategy and implementation strategy for sitewide cellular coverage based on the demand assessment, proposed smart city services and considering future proofing for 5G cellular evolution.
- Explore the implementation models for Public Wi-Fi in Toronto and liaise with service providers to explore possibilities and its impact on infrastructure planning.
- Develop the Cable duct distribution layouts and details for telecoms services in public realm, roads and pedestrian paths/footways to support telecom services including fixed broadband, public Wi-Fi, cellular networks and smart city services.

Solid Waste

- Explore further possibilities for forming partnerships with local organisations
- Liaise with potential equipment suppliers (e.g. for reverse vending machines, IVC composters) to make more detailed decisions on sizing and space requirements.
- Carry out a compost demand assessment to decide more specifically the quantity of organic waste (i.e. food and garden waste) to be treated onsite via IVC.

APPENDIX

The following drawings are appended;

- LSB-ARP-XX-XX-DR-CU-60000
- LSB-ARP-XX-XX-DR-CU-60001
- LSB-ARP-XX-XX-DR-CD-50000
- LSB-ARP-XX-XX-DR-CD-40000
- LSB-ARP-XX-XX-DR-CU-60002
- LSB-ARP-XX-XX-DR-CU-60003
- LSB-ARP-XX-XX-DR-CU-60004

A1

N

F G GARDINER XY W

F G GARDINER XY E

GARDINER E LAKE SHORE WEST E RAMP

GARDINER W LAKE SHORE W RAMP

Metrolinx Railway

LAKE SHORE BLVD W

BROOKERS LANE

ANNIE CRAIG DR

MARGINAL BLVD

SILVER MOON DR

SHORE BREEZE DR

PARK LAWN RD

MARINE PARADE DR

Existing water main to be diverted as part of enabling works.

Existing stormwater sewer to be removed as part of enabling works.

0 5 10 20 50 Metres

Scale 1:1000

Do not scale

Notes

1. All dimensions are in metres unless noted otherwise.
2. Existing utilities have been obtained from city utility mapping (CUMAP) and only includes water infrastructure.
3. Location of existing power and telecoms cables are being ascertained and will be shown at the next stage of design

Legend

- Site Boundary
- Existing Surface Water Drainage
- Existing Surface Water Manhole
- Existing Pump Station
- Existing Gully
- Existing Sanitary Drainage
- Existing Sanitary Manhole
- Existing Potable Water

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

Rev	Date	By	Chkd	Appd
03	30/08/19	JD	AP	IC
For Issue				
02	26/07/19	JD	AP	IC
Draft for Information				
01	02/05/19	MP	AP	
Draft for Information				

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Client
Allies & Morrison

Project Title
2150 Lake Shore Boulevard

Key Plan

Drawing Title
Existing Combined Drainage and Utilities Layout

Scale at A1 1:1000

Role Civil

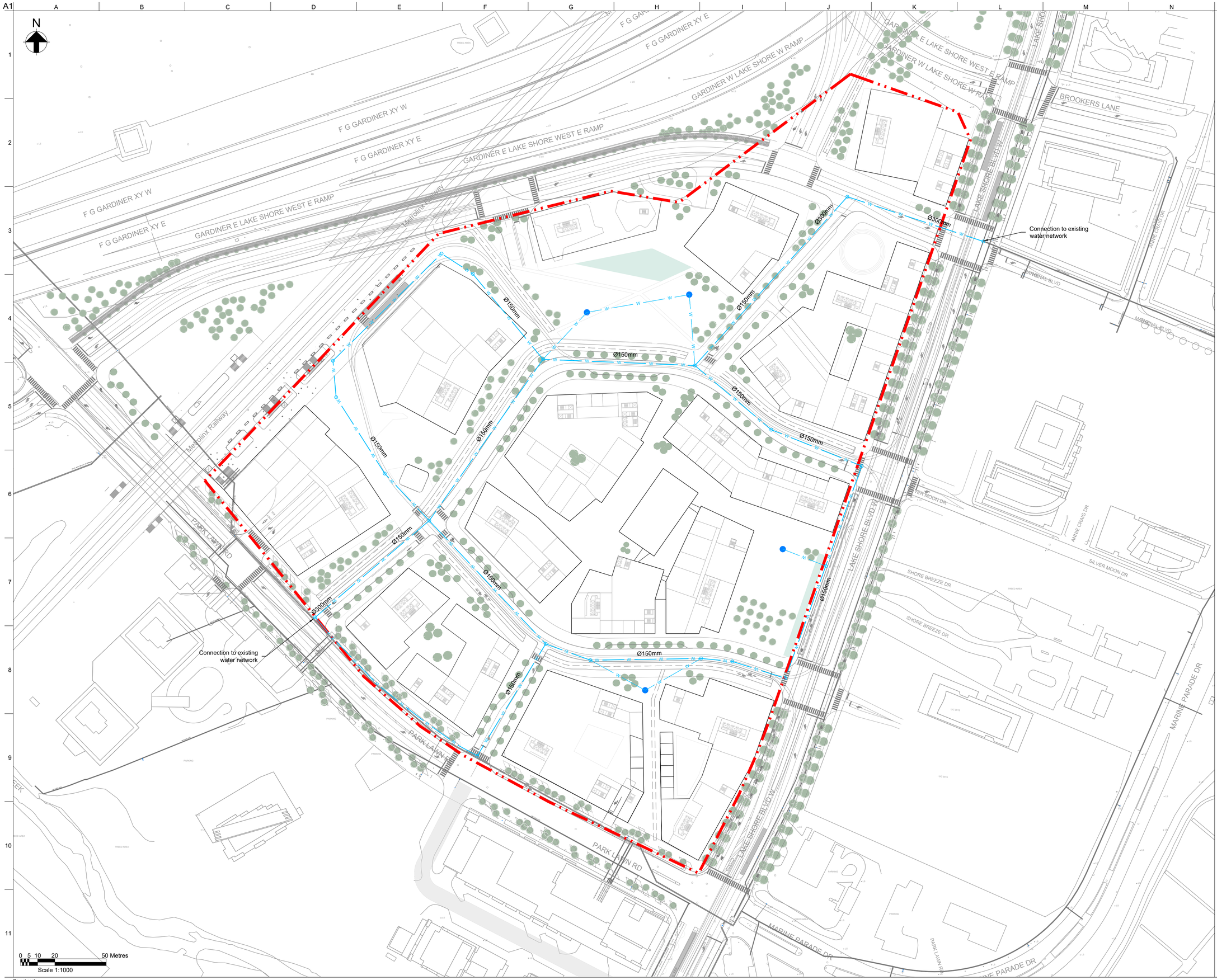
Suitability Concept Design

Arup Job No 264635

Rev 03

Name LSB-ARP-XX-XX-DR-CU-60000

A1



Notes

1. Connections to plots are to be refined at the next stage of design.
2. Existing water infrastructure has been obtained from City Utility Mapping (CUMAP)
3. A minimum pipe size of 150mm has been used as per Chapter 4 of the Design Criteria for Sewers and Watermains, First Edition, March 2014
4. It is assumed that there is one connection into the site from Lake Shore Boulevard, and one from Park Lawn Road so that there is a diverse and resilient supply
5. Pipe sizes are indicative and should be refined at the next stage of design
6. Capacity of the existing water network is unknown
7. It is assumed that Toronto Water will design the water supply network at a later stage of design, and adopt the network
8. In accordance with Toronto's Sewer and Watermain Manual, high-rise residential developments should achieve a fire flow of 19,000 l/min for a maximum duration of 5 hours. The proposed network should be sized such that the residual pressure during the maximum daily demand plus a fire is greater than 140kPa.
9. Any proposed hydrants should have a minimum spacing of 90m from each other, with the maximum allowable distance from a hydrant to a building being 55m.

Legend

- Site Boundary
- Existing Potable Water
- Proposed Potable Water Network
- Proposed Water refill station / drinking fountain

NOTE:
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03	30/08/19	JD	AP	IC
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Draft for Information				

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Client
Allies & Morrison

Project Title
2150 Lake Shore Boulevard

Key Plan

Drawing Title
Proposed Potable Water Layout

Scale at A1 1:1000

Role Civil

Suitability Concept Design

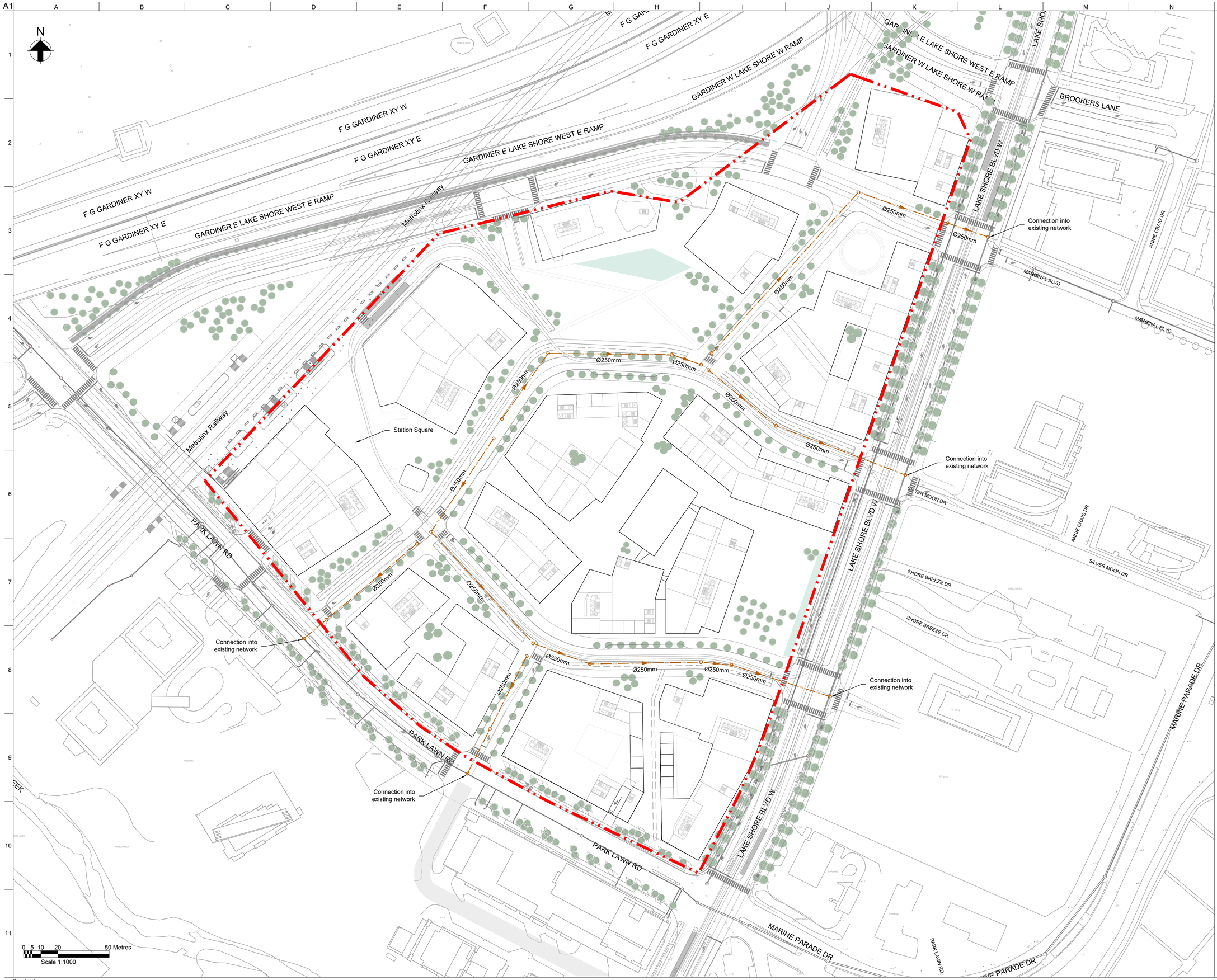
Arup Job No **264635**

Rev **03**

Name **LSB-ARP-XX-XX-DR-CU-61001**

Do not scale

A1



Notes

1. All dimensions are in metres unless noted otherwise.
2. Connections to plots are to be refined at the next stage of design.
3. The minimum allowance size for a sanitary sewer is 250mm according to the Design Criteria for Sewers and Watermains 2014.
4. Pipes to be laid at 0.5-1.0% gradiant.
5. Pipes are sized base on demands of 450L/capita/day as per Design Criteria for Sewers and Watermains 2014.
6. Sewer not shown under proposed Station Square as it is assumed there will be limited cover depth available due to the presence of basement under the Square. Therefore, sanitary flows from buildings should drain into sewers under highways where possible.

Legend:

- Site Boundary
- Existing Sanitary Drainage
- Existing Sanitary Manhole
- FW — Proposed Sanitary Network
- Proposed Sanitary Manhole
- Direction of Flow

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

Rev	Date	By	Chkd	Appd
03	30/08/19	JD	AP	IC
For Issue				
02	26/07/19	JD	AP	IC
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Draft for Information				

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Client
Allies & Morrison

Project Title
2150 Lake Shore Boulevard

Key Plan

Drawing Title
Proposed Sanitary Drainage Layout

Scale at A1 1:1000

Role Civil

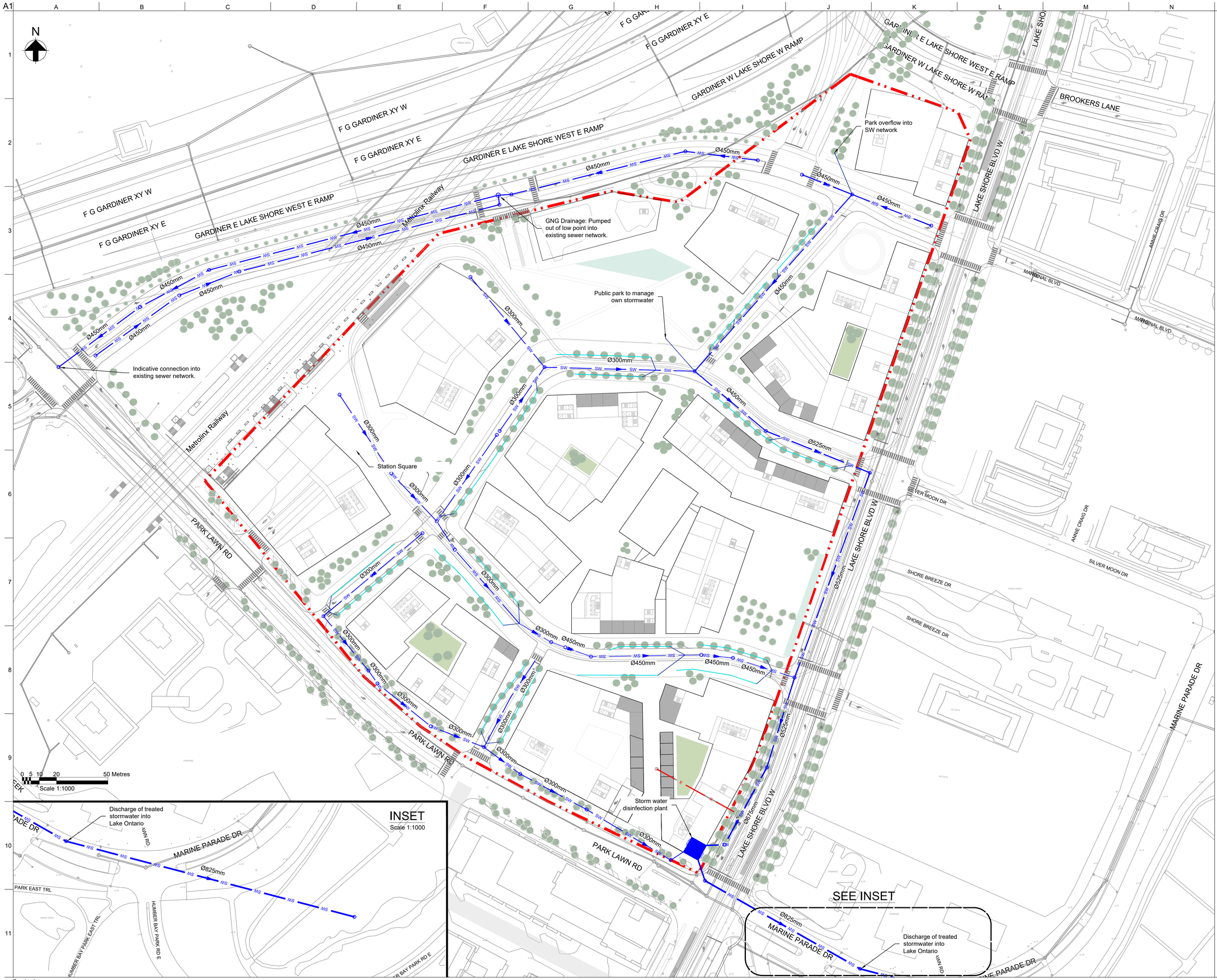
Suitability Concept Design

Arup Job No 264635

Rev 03

Name LSB-ARP-XX-XX-DR-CD-50000

Do not scale



Notes

1. Pipe sizes are indicative and will be refined at next design stage.
2. Connections to plots are to be refined at the next stage of design.
3. Storm water discharge to Lake Ontario is the preferred option, however this strategy is dependent on approvals from TRCA
4. The design of the storm water network should comply with Design Criteria for Sewers and Watermains, First Edition, March 2014 & Wet Weather Flow Management Guidelines, November 2016
5. The shown perforated pipe will collect infiltrated water through tree pits and permeable paving, which connects into the main drainage network. This design allows for suspended solid and hydrocarbon removal from the run-off.
6. Requirement for storm water disinfection plant to be discussed with the City of Toronto at next design stage.
7. Size of pipe under the proposed Station Square to be reviewed at the next stage of design, due to presence of basement under the Square

Legend:

- Site Boundary
- Existing Surface Water Pipe
- Existing Surface Water Pipe (to be removed)
- Existing Surface Water Manhole
- Existing Gully
- Proposed Surface Water Pipe
- Proposed Connection Pipe
- Proposed Perforated Pipe
- Proposed Surface Water Manhole
- Direction of Flow

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03	30/08/19	JD	AP	IC
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Project Title
2150 Lake Shore Boulevard

Key Plan

Drawing Title
Proposed Storm Water Drainage Layout

Scale at A1 1:1000
Role Civil
Suitability Concept Design
Arup Job No 264635
Rev 03
Name LSB-ARP-XX-XX-DR-CD-40000

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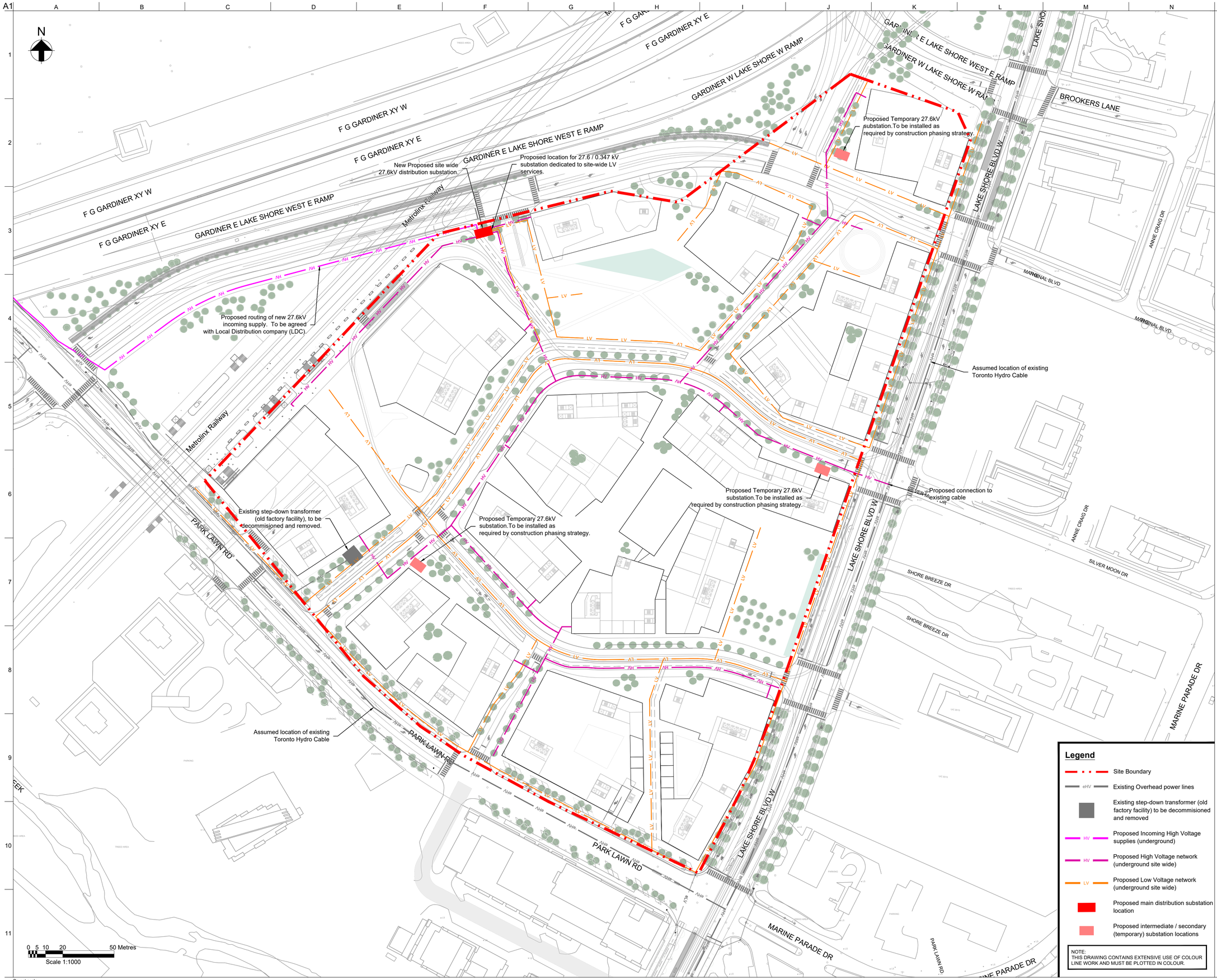

Notes

1. All dimensions are in metres unless noted otherwise.
2. The proposed utilities layout represents design intent for Masterplan design stage. It is therefore subject to development and change during subsequent design stages.
3. The drawings shall be read in conjunction with the concept masterplan report.
4. Location and routes of existing services are indicative and require verification with the Local Distribution Company (LDC). Further underground services investigations are required to identify any other existing services that may impact the proposed utilities layout.
5. All proposed electrical services shall be routed underground, directly buried or in ducts in accordance with local codes. Where feasible HV cables can be run through basement areas, installed with necessary additional marking and mechanical protection.
6. The site will be supplied by a new HV power connection at 27.6kV via new dedicated distribution substation. Further liaison with Local Distribution Company (LDC) is required to establish connection details and configuration.
7. Provision is made for temporary and intermediate substation location to allow for phased development of the site.
8. Site-wide HV distribution network shall be such that connection can be made to all buildings. Customer owned 27.6/0.6kV substation shall be located in the basement of every building or building cluster serving all necessary low voltage services. The substation location shall avoid lower basement levels to mitigate risk of flooding.
9. Site-wide LV distribution network is intended but not limited for supplying street lighting and way-finding. Layout shall be further coordinated with civil and external lighting strategies. It is envisaged that site-wide LV services are managed by the Local Distribution Company (LDC) and derived from a dedicated 27.6/0.347kV substation.

Legend

- Site Boundary
- Existing Overhead power lines
- Existing step-down transformer (old factory facility) to be decommisioned and removed
- Proposed Incoming High Voltage supplies (underground)
- Proposed High Voltage network (underground site wide)
- Proposed Low Voltage network (underground site wide)
- Proposed main distribution substation location
- Proposed intermediate / secondary (temporary) substation locations

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Project Title
2150 Lake Shore Boulevard

Key Plan

Drawing Title
Proposed High Voltage and Low Voltage Layout

Scale at A1 1:1000
Role Civil
Suitability Concept Design
Arup Job No 264635
Rev 03
Name LSB-ARP-XX-XX-DR-CU-61002

Do not scale

A1

F G GARDINER XY W
F G GARDINER XY E
GARDINER E LAKE SHORE WEST E RAMP
GARDINER W LAKE SHORE W RAMP
Metrolinx Railway
LAKE SHORE BLVD W
BROOKERS LANE
ANNIE CRAIG DR
MARGINAL BLVD
SILVER MOON DR
SHORE BREEZE DR
PARK LAWN RD
MARINE PARADE DR
COMMS
Indicative connection to existing network

Notes

1. All dimensions are in metres unless noted otherwise.
2. Connections to plots are to be refined at the next stage of design.
3. Connection location into existing telecomms infrastructure has been assumed.
4. The location of existing telecomms infrastructure is based on communications with Bell and Rogers in May 2019

Legend

- Site Boundary
- COMMS Proposed Comms Duct Network

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Project Title
2150 Lake Shore Boulevard

Key Plan

Drawing Title
Proposed Telecoms Layout

Scale at A1 1:1000

Role Civil

Suitability Concept Design

Arup Job No **264635**

Rev **03**

Name **LSB-ARP-XX-XX-DR-CU-61003**

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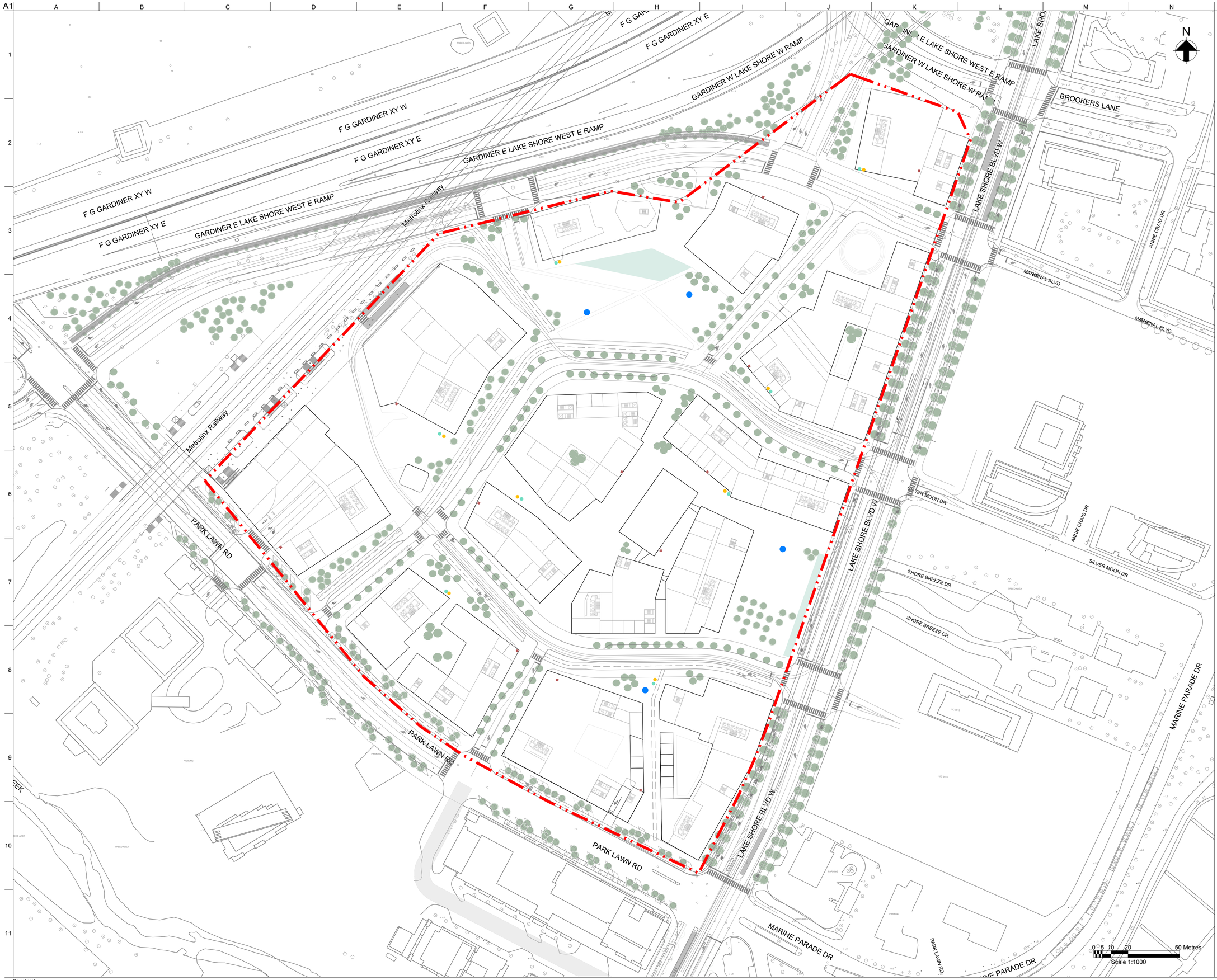
Do not scale



Notes

1. All dimensions are in metres unless noted otherwise.
2. Underground Refuse Bins (URS) is proposed to be used for public realm only.
3. Solid Waste generated by buildings is to be stored and collected from building basements

Legend

- Site Boundary
- URS Bin for dry mixed recyclables in public realm
- URS Bin for residual waste in public realm
- Water refill station
- Tri-sorter vending machine for glass bottles, plastic bottles and cans.

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Draft for Information				

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Client
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Project Title
2150 Lake Shore Boulevard

Key Plan

Drawing Title
Proposed Solid Waste Layout

Scale at A1 1:1000

Role Civil

Suitability Concept Design

Arup Job No **264635**

Rev **03**

Name **LSB-ARP-XX-XX-DR-CU-61004**

0 5 10 20 50 Metres
Scale 1:1000

Do not scale