Appendix B: Gardiner Expressway Maintenance Access Study

Lake Shore Boulevard East Public Realm Vision, Phasing and Implementation Plan

February 2020

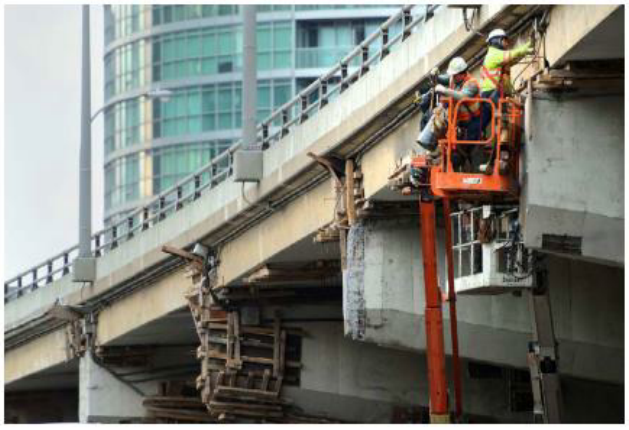
Gardiner Expressway Maintenance Access Study

Introduction

This report supports the Lake Shore Boulevard Public Realm Vision, Phasing and Implementation Plan and provides the results of a study undertaken to assess City of Toronto Gardiner Expressway maintenance access requirements between Jarvis St. and Cherry St. to ensure that the proposed public realm plan does not impede access requirements. The study was focussed on the north side of the Gardiner. Planned improvements to the south side of the Gardiner will not change underside access over existing conditions.

Gardiner Access Requirements

To determine Gardiner access requirements, meetings were held with City Transportation Services. The following provides a summary of the information received regarding Gardiner maintenance activities.



The bents/columns and sections under the Gardiner deck are routinely inspected by the City. Areas inspected include all concrete surfaces. The inspection and maintenance activities occur at least once each year. Gardiner inspection and maintenance activities include: hammer testing, chipping and patching. The photos in this appendix illustrate typical maintenance activities.

Genie Lifts are used to provide access to the underside of the Gardiner. All available areas under the Gardiner are often used by the genie Lifts and other vehicles (i.e. trucks to take concrete away if chipping) unless there are guard rails in place that would restrict access. This includes median and boulevard areas as well as Lake Shore Boulevard lanes which may require lane closures. Lake Shore Boulevard lanes closures are limited to non-peak travel period. Attempts are made to schedule maintenance work at night as much as possible when lane closures are required. It was noted that the narrow centre medians at the east end of the corridor (Parliament St. to Cherry St.) are

not used for inspection/maintenance purposes as they are too narrow and the presence of guard rails inhibits Genie Lift access. LSB lane closures are routinely required in this area for inspection and maintenance.

Finally, the Genie Lift is able to travel up to a 5% grade over a variety of surfaces, including granular material, and over road curbs.

Figure 1 (below) provides the Genie Lift specifications that were considered.

Access Study Results

To accommodate the Gardiner maintenance access requirements within the corridor and Genie Lift specifications, a 3.5 m layby lane has been included as part of the Public Realm Plan along the north edge of the Lake Shore Boulevard westbound lanes (see Figure 2). This layby lane includes a mountable curb and would enable a Genie Lift to travel along much of the corridor. A study was undertaken to demonstrate that much of the underside of the north side of the Gardiner is accessible using a Genie Lift from this layby area (Figures 3A and 3B illustrate this). The exception to this is at the west end of the corridor which a short section of the underside just east of Jarvis Street would require the Genie Lift to travel along the planned north side bike path/walkway. It is noted that the proposed public realm design would not encumber the use of the Lake Shore Boulevard medians by the Genie Lift. Modifications to the medians involves only the replacement of current material, largely compacted soil, with a granular material which the Genie Lift would be able to travel over.

Figure 1 – Genie Lift Specifcations

Genie
A TEREX BRAND

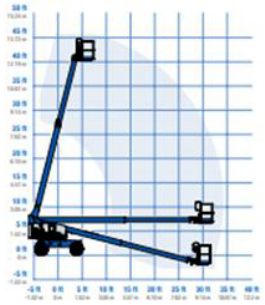
Self-Propelled Telescopic Booms

S™-40 & S™-45

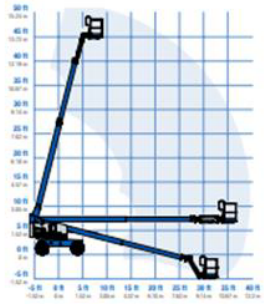
Specifications

Models	S-40		S-45	
Measurements	US	Metric	US	Metric
Working height maximum*	46 ft	14.19 m	51 ft	15.72 m
Platform height maximum	40 ft	12.19 m	45 ft	13.72 m
Horizontal reach maximum	31 ft 8 in	9.67 m	36 ft 8 in	11.12 m
Below ground reach	3 ft 2 in	0.97 m	4 ft 11 in	1.5 m
Platform length - 8 ft model	3 ft	0.91 m	3 ft	0.91 m
Platform length - 6 ft model	2 ft 6 in	0.76 m	2 ft 6 in	0.76 m
Platform width - 8 ft model	8 ft	2.44 m	8 ft	2.44 m
Platform width - 6 ft model	6 ft	1.83 m	6 ft	1.83 m
Height - stowed	8 ft 2 in	2.49 m	8 ft 2 in	2.49 m
- stowed with Trax option	8 ft 2 in	2.49 m	8 ft 2 in	2.49 m
Length - stowed	24 ft 3 in	7.39 m	27 ft 10 in	8.48 m
- transport (jib tucked under)	———	———	22 ft 4 in	6.80 m
Width - standard tires	7 ft 6 in	2.30 m	7 ft 6 in	2.30 m
- Trax option	7 ft 7 in	2.31 m	7 ft 7 in	2.31 m
Wheelbase	7 ft 3 in	2.20 m	7 ft 3 in	2.20 m
Ground clearance - center	1 ft .5 in	0.32 m	1 ft .5 in	0.32 m
Productivity				
Lift capacity	500 lbs	227 kg	500 lbs	227 kg
Platform rotation	160°		160°	
Vertical jib rotation	———		135°	
Turntable rotation	360° continuous		360° continuous	
Turntable tailswing	2 ft 10 in	0.86 m	2 ft 10 in	0.86 m
Drive speed - stowed	4.8 mph	7.7 km/h	4.8 mph	7.7 km/h
- raised or extended	0.68 mph	1.1 km/h	0.68 mph	1.1 km/h
- Trax option stowed	2.5 mph	4.0 km/h	2.5 mph	4.0 km/h
- Trax option raised	0.68 mph	1.1 km/h	0.68 mph	1.1 km/h
Gradeability - 2WD - stowed**	30%		30%	
- 4WD - stowed**	40%		40%	
Turning radius - inside	6 ft 8 in	2.0 m	6 ft 8 in	2.0 m
- outside	15 ft 8 in	4.78 m	15 ft 8 in	4.78 m
- Trax option inside	7 ft 9 in	2.36 m	7 ft 9 in	2.36 m
- Trax option outside	17 ft	5.18 m	17 ft	5.18 m
Controls	12 V DC proportional		12 V DC proportional	
Tires - RT lug	12.5L-16SL front / 12-16.5 NHS rear			
	Trax		Trax	
Power				
Power source	49 hp (36.54 kW) Deutz diesel T4f D2.9L4 49 hp (36.54 kW) Perkins diesel T4f 404D-22 60hp (44.74kW) Ford gas/LPG MSG425			
Auxiliary power unit	12 V DC		12 V DC	
Hydraulic tank capacity	45 gal	170 L	45 gal	170 L
Fuel tank capacity	20 gal	76 L	20 gal	76 L
Weight* **				
Standard	12,310 lbs	5,584 kg	15,270 lbs	6,926 kg
Trax	13,680 lbs	6,205 kg	16,670 lbs	7,561 kg
Standards Compliance	ANSI A92.5, CSA B354.4, EN 280, AS 1418.10			

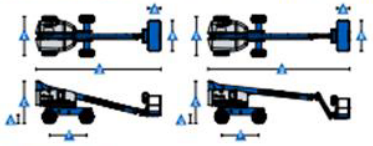
Range Of Motion S-40



Range Of Motion S-45



* The metric equivalent of working height adds 2 m to platform height. U.S. adds 6 ft to platform height.
** Gradeability applies to driving on slopes. See operator's manual for details regarding slope ratings.
*** Weight will vary depending on options and/or country standards.



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Genie
A TEREX BRAND

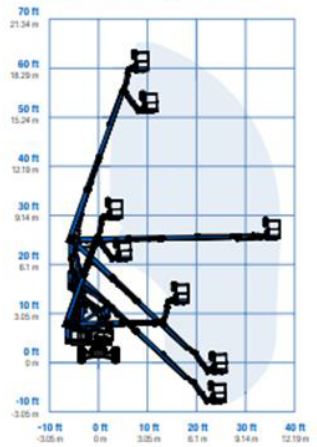
Self-Propelled Articulating Booms

Z™-60/37DC & Z™-60/37FE

Specifications

MODEL	Z-60/37DC & Z-60/37FE	
Measurements	US	Metric
Working height maximum*	65 ft 7 in	20.16 m
Platform height maximum	59 ft 7 in	18.16 m
Horizontal reach maximum	36 ft 7 in	11.15 m
Up and over clearance maximum	24 ft 3 in	7.39 m
Platform length - 8 ft / 6 ft model	3 ft / 2 ft 6 in	0.91 m /0.76 m
Platform width - 8 ft / 6 ft model	8 ft / 6 ft	2.44 m /1.83 m
Height - stowed	8 ft 4 in	2.54 m
Transport Height - stowed (jib tucked under)	8 ft 7 in	2.62 m
Length - stowed	26 ft 9 in	8.15 m
Transport Length-Stowed (jib tucked under)	20 ft 8 in	6.3 m
Width	8 ft 2 in	2.49 m
Wheelbase	8 ft 2 in	2.49 m
Ground clearance - center	1 ft 1 in	0.33 m
Productivity		
Lift capacity	500 lbs	227 kg
Platform rotation	160°	
Vertical jib rotation	135°	
Turntable rotation	355° non-continuous	
Turntable tailswing - riser up	1 ft 11 in	0.58 m
Turntable tailswing - riser down	2 ft 8 in	0.81 m
Drive speed - stowed	4.0 mph	6.44 km/h
Drive speed - raised**	0.68 mph	1.09 km/h
Gradeability - 4WD - stowed***	45%	45%
Turning radius - inside	8 ft 3 in	2.51 m
Turning radius - outside	18 ft 8 in	5.69 m
Controls	24V DC proportional	
Tires	355/55D625, 14 Ply	
Power		
Drive system	34 V 3-Phase AC	
Power source	48 V DC (eight 6V batteries) 390 Ah capacity (FLA standard on DC) 415 Ah capacity (AGM standard on FE) 24.8 HP (18.5kW) Kubota diesel T4f D1105 driven AC generator (FE only)	
Auxiliary power unit	12 V DC	
Hydraulic tank capacity	18 gal	68.14 L
Fuel tank capacity	17 gal	64.35 L
Weight** **		
Z-60/37DC	16,600 lbs	7,530 kg
Z-60/37FE	17,100 lbs	7,756 kg
Standards Compliance	ANSI A92.5, CSA B354.4, EN 280, AS 1418.10	

Range Of Motion Z-60/37DC & Z-60/37FE



* The metric equivalent of working height adds 2 m to platform height. U.S. adds 6 ft to platform height.
** In lift mode (platform raised), the machine is designed to operate on firm, level surfaces only.
*** Gradeability applies to driving on slopes. See operators manual for details regarding slope ratings.
**** Weight will vary depending on options and/or country standards.

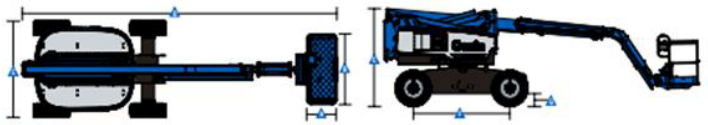


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Figure 2 – Proposed Lake Shore Boulevard Section Drawing Illustrating Maintenance Layby

(Lower Jarvis St. to Lower Sherbourne St.)

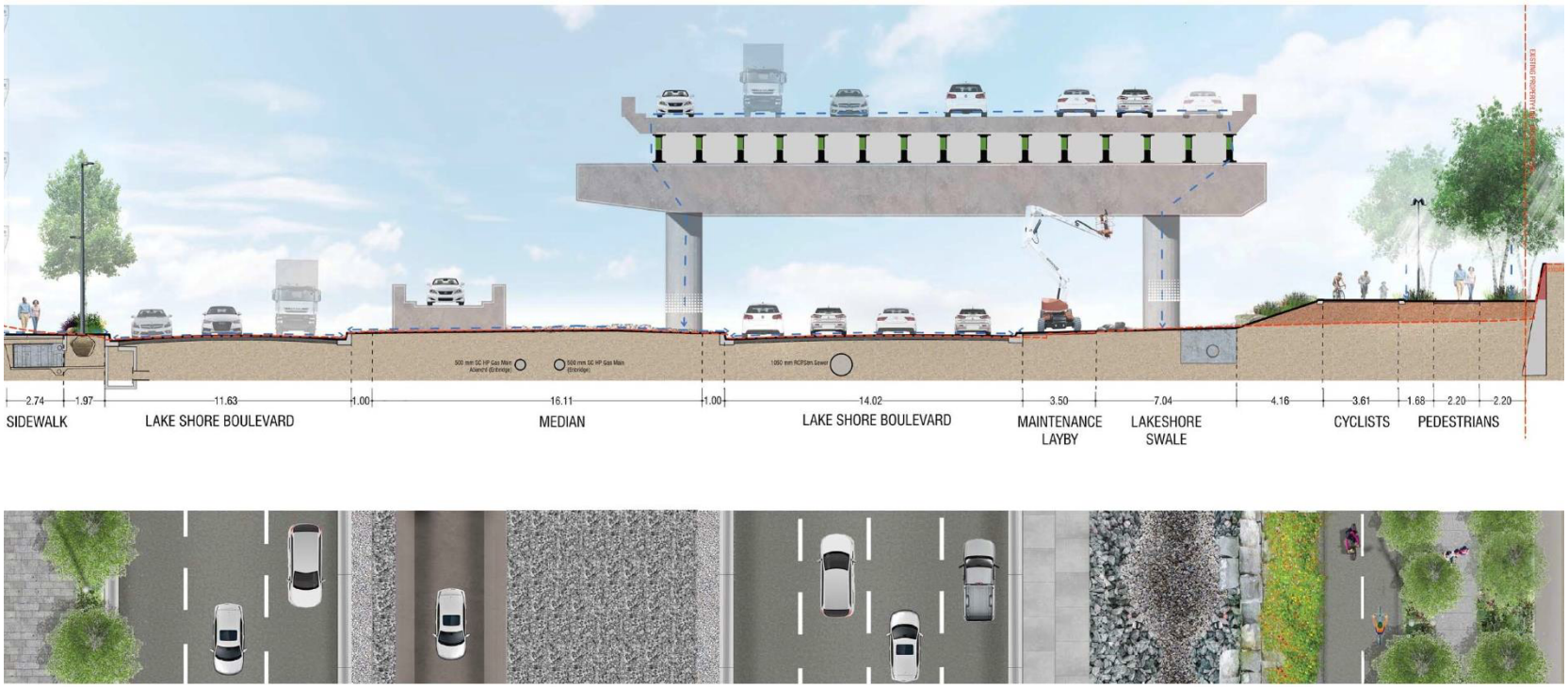

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Figure 3A – Access Study Sections Drawings

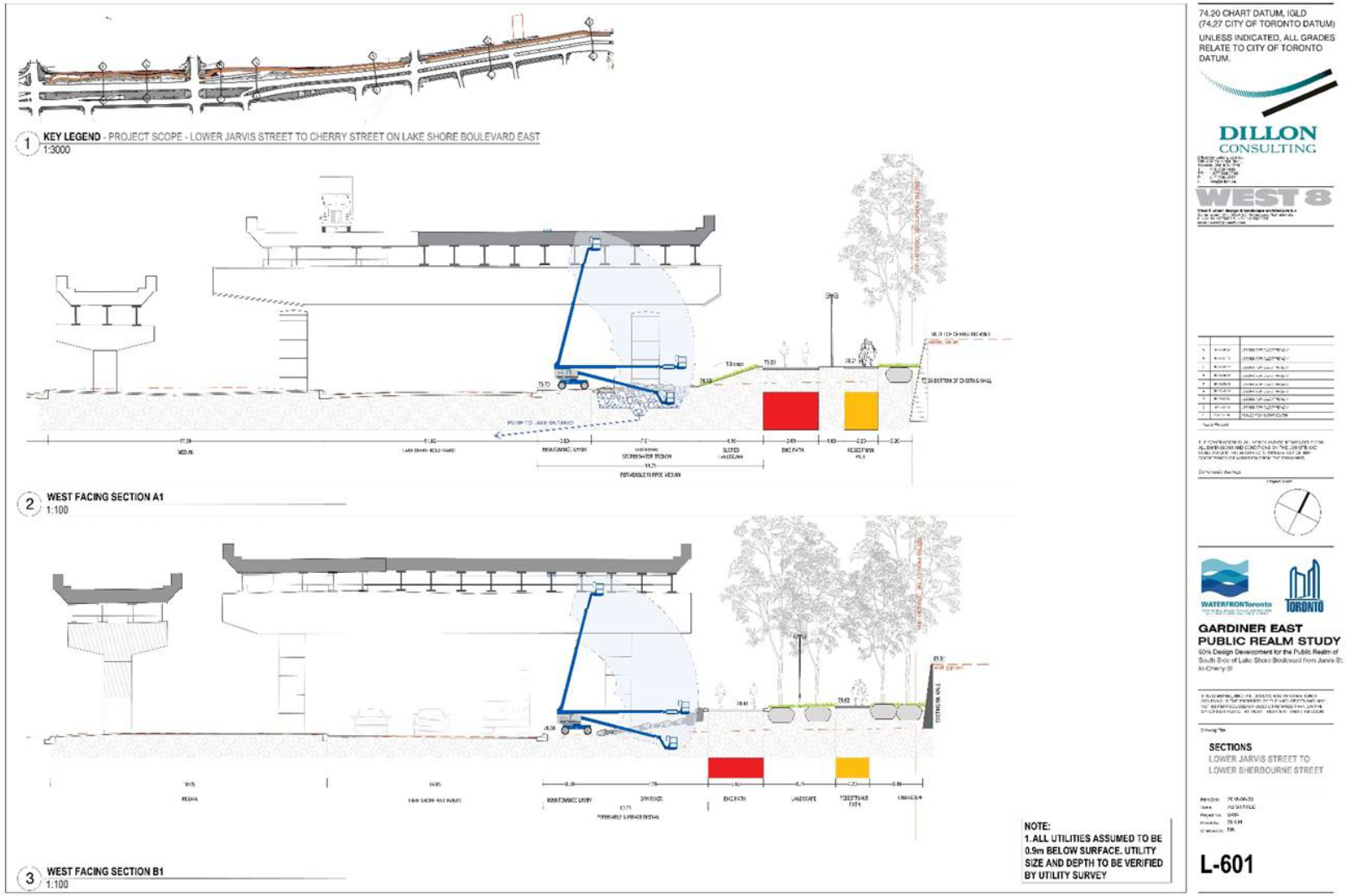

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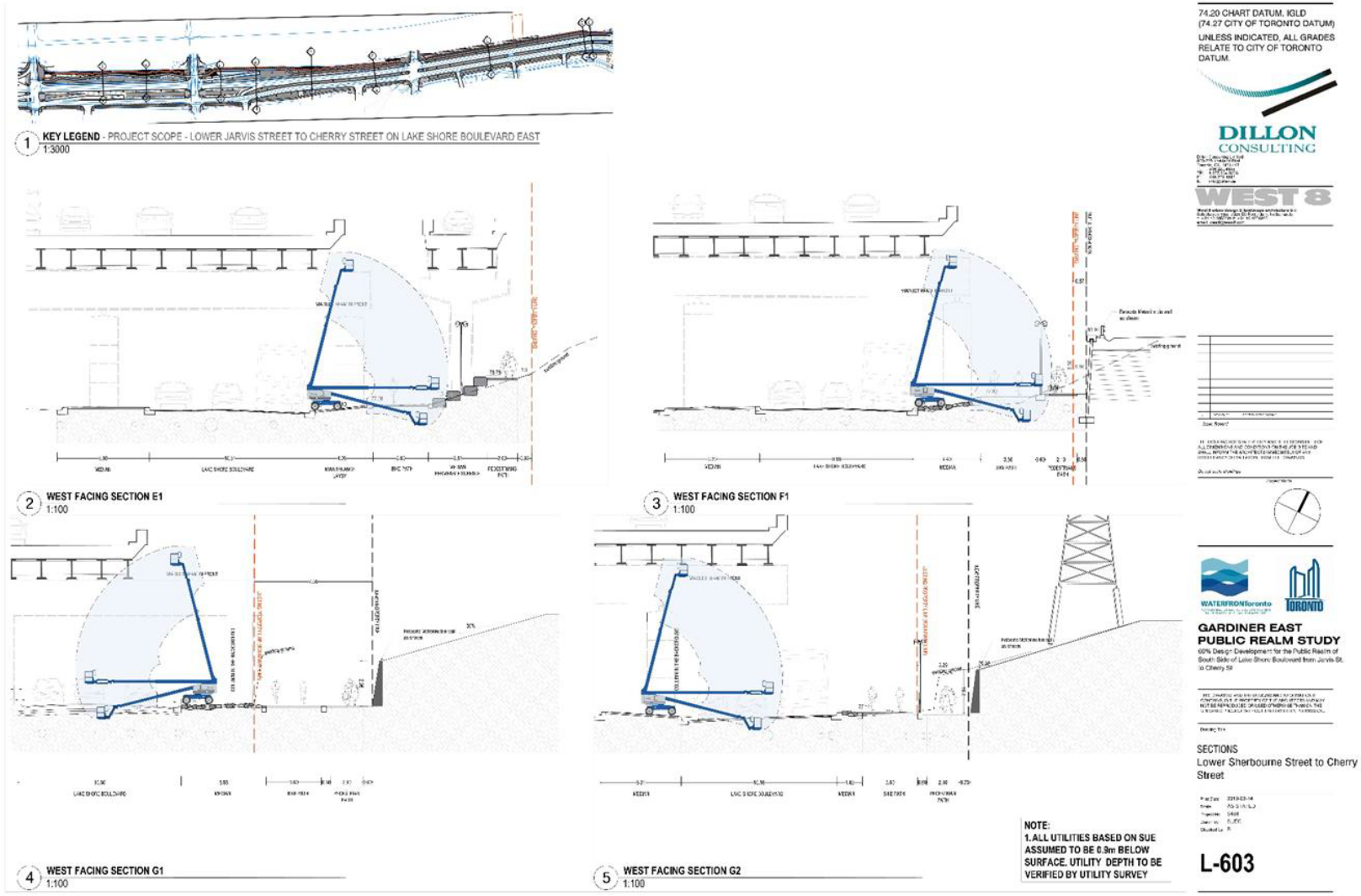
Figure 3B – Access Study Section Drawing



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