

APPENDIX E

- **Storm Sewer Design Sheet (Existing & Proposed Conditions)**
- **Figure 4.1 – Storm Drainage Area Plan – Existing Conditions**
- **Figure 4.2 – Storm Drainage Area Plan – Proposed Conditions**
- **Figure 4.3 – SWM Drainage Schematic**
- **Area A, B and C Drainage Calculations**
- **Cistern Size Calculation**

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STORM SEWER DESIGN SHEET
81 Skeler
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LOCATION										AREA (Ha)								RATIONAL DESIGN FLOW							SEWER DATA					
C _s	C _s	C _s	C _s	C _s	C _s	C _s	C _s	C _s	C _s	IND 278AC	CUM 278AC	INLET 278AC	TIME IN PIPE	TOTAL	(1/2)	(1/5)	(1/10)	(1/100)	100YR PEAK FLOW (L/s)	10YR PEAK FLOW (L/s)	5YR PEAK FLOW (L/s)	2YR PEAK FLOW (L/s)	DESIGN FLOW (L/s)	LENGTH (m)	PIPE SIZE (mm)	SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (2yr) (L/s)	AVAIL CAP (%)	
0.20	0.25	0.40	0.50	0.57	0.65	0.70	0.80	0.90	0.98	0.23	0.23	10.00	0.10	10.10	76.81	104.19	122.14	178.56	17.49	23.72	27.81	40.65	23.72	5.60	250	0.60	0.948	24.33	50.63%	
																							4.76	12.90	200	7.15	2.021	66.73	84.80%	
																							26.48							
										0.13	0.13	10.00	0.10	10.10	76.81	104.19	122.14	178.56	9.72	13.18	15.45	22.59	13.18							
										0.09	0.23	10.00	0.19	10.19	76.81	104.19	122.14	178.56	17.49	23.72	27.81	40.65	23.72							

Notes:
1. Manning's coefficient (n) = 0.013

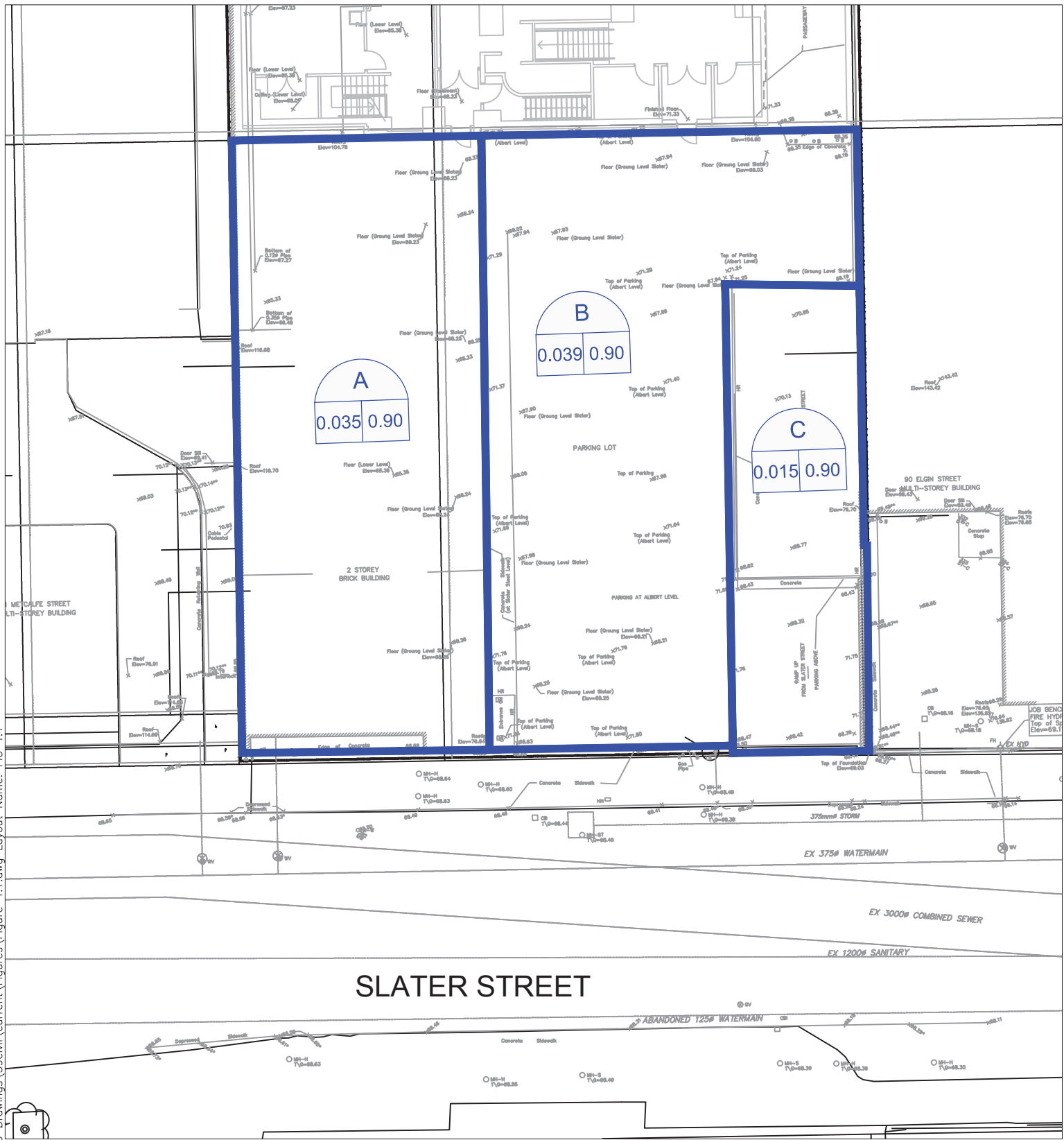
Designed: SEL
Checked: JIM
Dwg. Reference: N/A

Revision:
No. 1. Site Servicing Study Issued for Client Review
Date: March 23, 2019

File Reference: 119386.5.7.1
Date: 2019-03-04
Sheet No: 1 of 1

Definitions:
Q = Peak Flow in Litres per Second (L/s)
A = Area in Hectares (Ha)
i = Rainfall Intensity in millimetres per hour (mm/hr)
[i] = 752.951 / (TC+6-199)(0.810) 2 YEAR
[i] = 353.430 / (TC+6-199)(0.810) 10 YEAR
[i] = 1174.184 / (TC+6.014)(0.816) 10 YEAR
[i] = 1735.688 / (TC+6.014)(0.820) 100 YEAR

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LEGEND:

- DRAINAGE AREA LIMITS
- A AREA ID
- 0.25 0.90 RUNOFF COEFFICIENT
- 0.035 0.90 AREA IN HECTARES



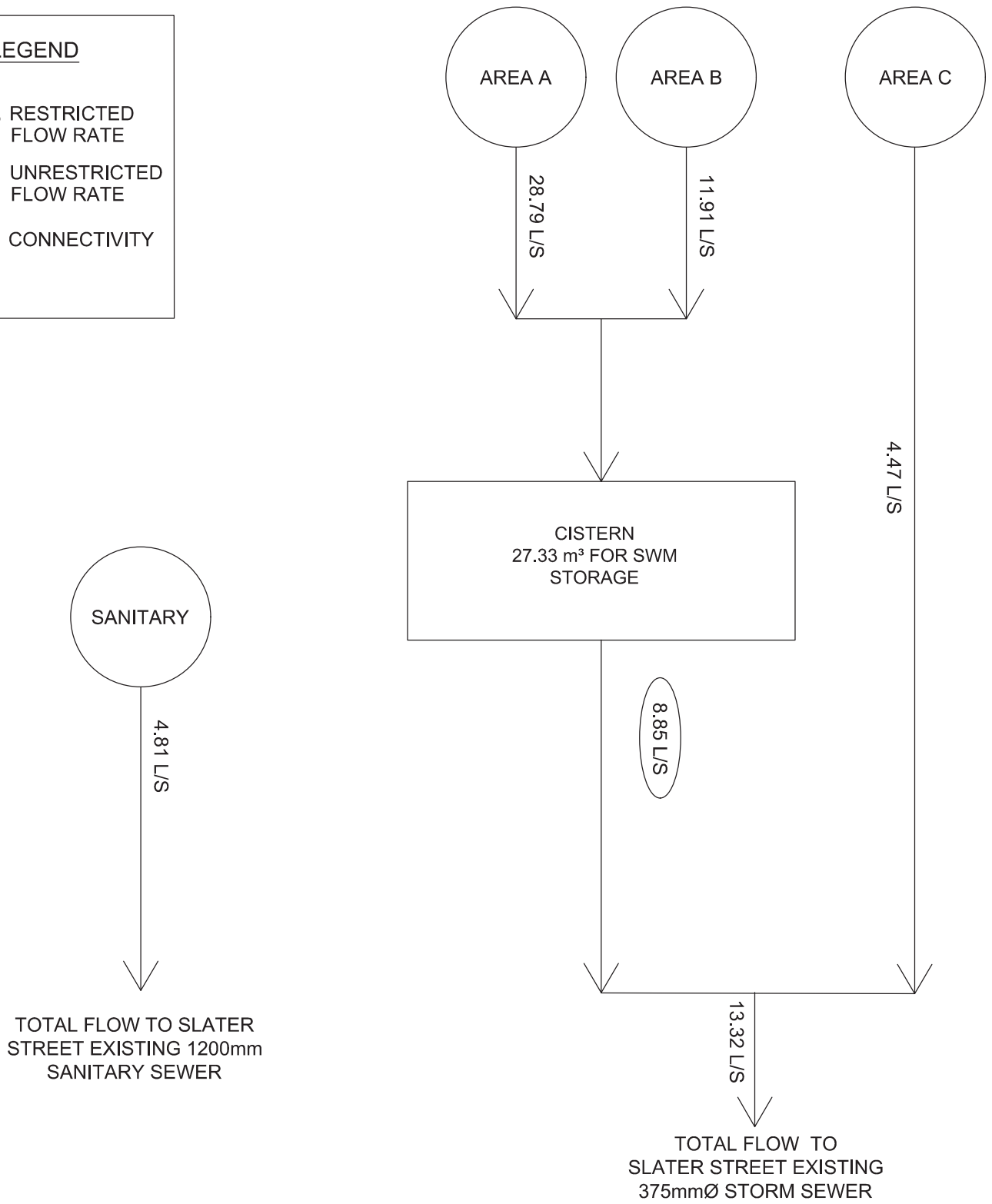
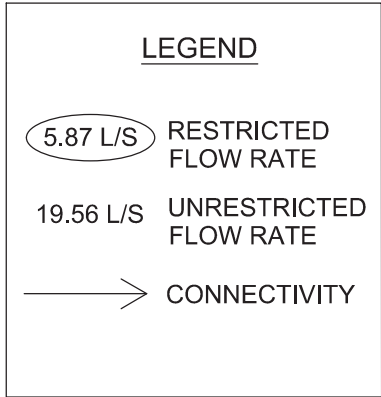
Project Title
81 SLATER STREET

Drawing Title
EXISTING STORMWATER DRAINAGE AREA

Sheet No.

FIGURE 4.1

MAXIMUM SITE RUNOFF RATE = 16.61 L/S



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Stormwater Management - Post-development Area A (All roofs)

Time of Concentration = 10 min
Area = 580 m²

Grass Area =	0 m ²	C = 0.20
Shrub Area =	0 m ²	C = 0.40
Asphalt Area =	580 m ²	C = 0.90
Total =	580 m²	

Runoff Coefficient (C) = $(0.20 \times 0 + 0.40 \times 0 + 0.90 \times 580) / 580$
= 0.90

Runoff Coefficient (C) + 25% (Max 1.00) = 1.00

100-Year Storm Event, T_c = 20 min

Intensity, $i_{100\text{yr}}$ = $1735.688 / (T_c + 6.014)^{0.82}$
= 178.56 mm/hr

Post Development Uncontrolled

$Q_{100\text{yr u/c}}$ = **2.78CiA**
28.79 L/s

Stormwater Management - Post-development Area B (2nd Floor Amenity Deck)

Time of Concentration = 10 min
Area = 240 m²

Grass Area =	0 m ²	C = 0.20
Shrub Area =	0 m ²	C = 0.40
Asphalt Area =	240 m ²	C = 0.90
Total =	240 m²	

Runoff Coefficient (C) = $(0.20 \times 0 + 0.40 \times 0 + 0.90 \times 240) / 240$
= 0.90

Runoff Coefficient (C) + 25% (Max 1.00) = 1.00

100-Year Storm Event, T_c = 20 min

Intensity, $i_{100\text{yr}}$ = $1735.688 / (T_c + 6.014)^{0.82}$
= 178.56 mm/hr

Post Development Uncontrolled

$Q_{100\text{yr u/c}}$ = **2.78CiA**
11.91 L/s

Stormwater Management - Post-development Area C (Uncontrolled Flow to Slater)

Time of Concentration = 10 min

Area = 90 m²

Grass Area = 0 m² C = 0.20

Shrub Area = 0 m² C = 0.40

Asphalt Area = 90 m² C = 0.90

Total = 90 m²

Runoff Coefficient (C) = $(0.20 \times 0 + 0.40 \times 0 + 0.90 \times 90) / 90$
= 0.90

Runoff Coefficient (C) + 25% (Max 1.00) = 1.00

100-Year Storm Event, T_c = 20 min

Intensity, $i_{100\text{yr}}$ = $1735.688 / (T_c + 6.014)^{0.82}$
= 178.56 mm/hr

Post Development Uncontrolled

$Q_{100\text{yr u/c}}$ = **2.78CiA**
4.47 L/s

Stormwater Management - Post-development Controlled 100 Year Flow

Controlled 100 Year Flow

Total Area = 910 m²
0.091 ha

Runoff Coefficient (C) = 1.00

Restricted Release Rate = $Q_{\text{maxallowed}} - Q_{\text{uncontrolled}}$
= 13.18 - 4.47
= 8.71 L/s

Tc Variable (min)	i (mm/hr)	Qp (L/s)	Qm (L/s)	Qp - Qm (L/s)	Volume (m ³)
23	109.68	27.75	8.71	19.04	26.27
24	106.68	26.99	8.71	18.28	26.32
25	103.85	26.27	8.71	17.56	26.34
26	101.18	25.60	8.71	16.89	26.34
27	98.66	24.96	8.71	16.25	26.32
28	96.27	24.36	8.71	15.65	26.28
29	94.01	23.78	8.71	15.07	26.23

Cistern Volume = 26.34 m³