J.C. Engineers Pty. Ltd.
403, 89 Scarborough Street
SOUTHPORT
QLD 4215

"Practical, Common-Sense Engineers"

FOR PROPOSED RESIDENTIAL DEVELOPMENT

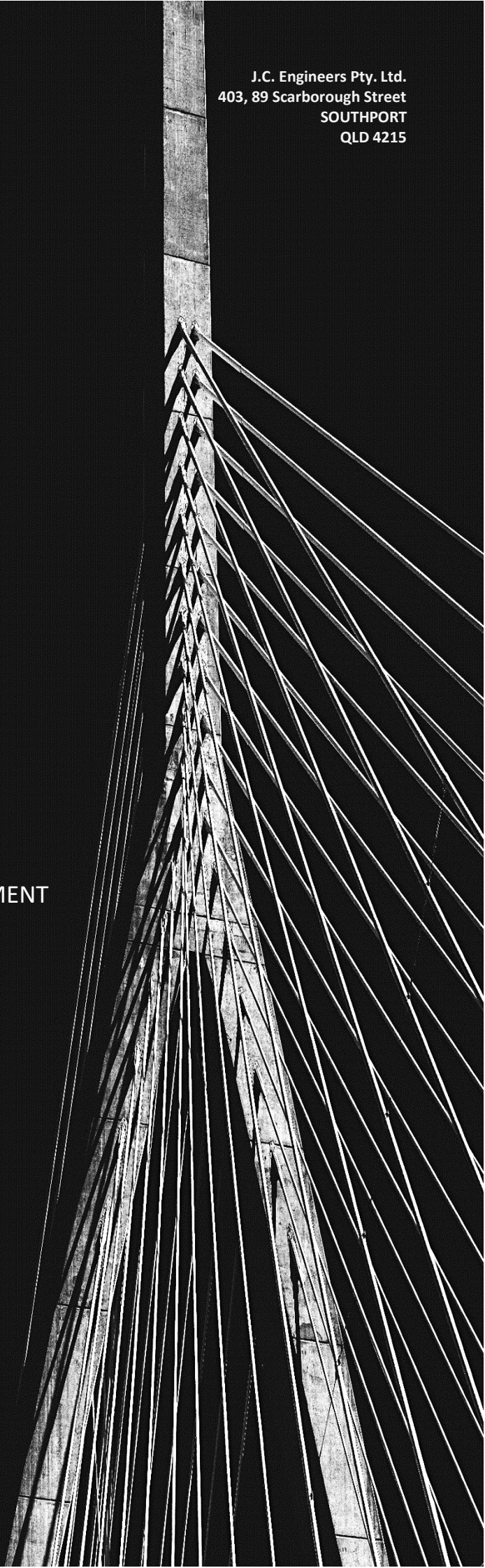
AT 55 TRAFALGAR AVENUE
LINDFIELD NSW 2070

PREPARED FOR

[redacted]

MARCH 2022

JASMIN TRGO
RPEQ 19378



Rohit Khanduja
Civil Engineer
Meng (Civil)

Jasmin Trgo
Civil Engineer
RPEQ, BEng (Civil), NER

J.C. Engineers Pty. Ltd. Project No. **B422**

If you have any queries regarding this report, please contact Jasmin Trgo.

Revision	Date	Description	Author	Rev.	App.
A	March 2022	FINAL	RK	JT	JT

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INTRODUCTION

This report has been developed regarding catchment analysis, hydraulic quantity analysis and stormwater management as a means of proposing infrastructure to manage the stormwater issues that can occur due to the proposed development on the property at 55 Trafalgar Avenue, Lindfield NSW 2070 (J.C Engineers have been engaged to complete a Stormwater Quantity design).

The purpose of this report is to address the management of stormwater quantity to ensure that the proposed development complies with all the necessary state and local government policies.

This report intends to assess the likely impact of the proposed development in relation to stormwater quantity, and the adequacy of the existing stormwater infrastructure to accommodate the proposed development.

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1. SITE CHARACTERISTICS

1.1. LOCATION

The subject site is located at 55 Trafalgar Avenue, Lindfield, NSW, 2070 as indicated within Figure 1 below. The property is bound by Trafalgar Avenue to the West, Middle Harbour Road to the South and by residential properties in all other directions. The property is located within the Ku-ring-gai Council Area.

Figure 1: Locality Plan (Retrieved from NearMap on 10th March 2022)

1.2. SITE DESCRIPTION

The lot contains area of 930m^2 approx. having one large dwelling, paving area, a driveway, and a grass covered lawn.

1.3. TOPOGRAPHY, SITE DRAINAGE AND OVERLAND FLOW

Considering contour, the surface runoff from nearby area surrounding the proposed property is believed to be follow the similar drainage path as shown by red arrows in Figure 2. There is an existing stormwater main buried beneath the ground and it can be seen that based on the contours, the natural fall is on top of the buried stormwater main ground surface line. It is believed that existing stormwater infrastructure and arrangement is adequate enough to withstand worst stormwater runoff scenario. A copy of the detailed survey by Usher & Company Surveying & Land Developments Consultants has been attached to this report as Appendix E.

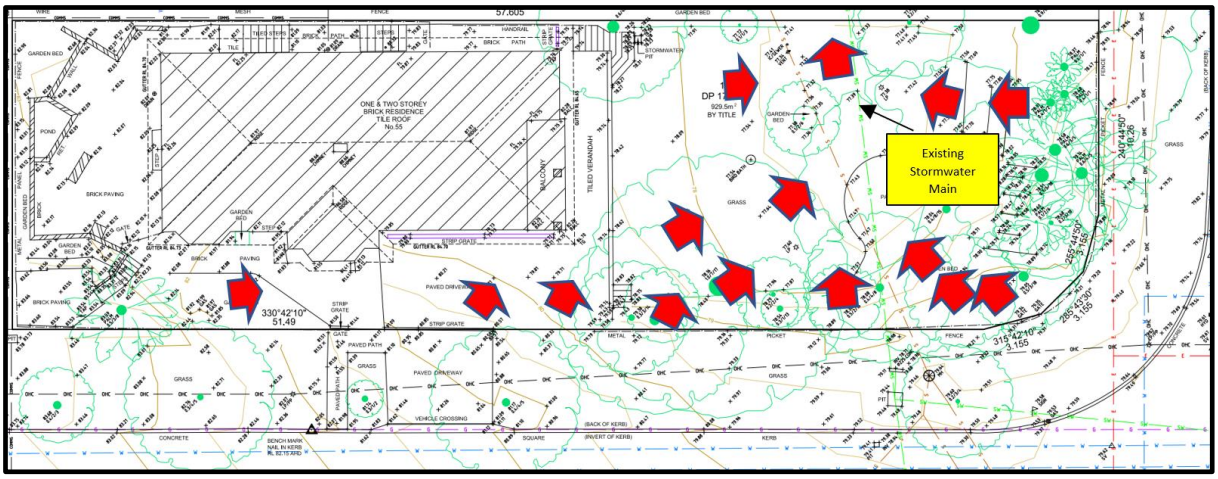

Figure 2. Natural flow direction based on survey contours (Source: Usher & Company Surveying & Land Developments Consultants- Dated – 28/01/2021)

2. STORMWATER QUANTITY

2.1. CATCHMENT ANALYSIS

The pre-development scenario for this Stormwater Management Plan is to consider the existing dwelling, large lawn area, paving area, and a driveway area. For this analysis, the post development scenario contains an addition of proposed granny flat as seen in Figure 3.

Figure 3. Post Development Catchment Areas

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2.1.1 STORMWATER DRAINAGE METHODOLOGY

Calculations have been undertaken to determine the pervious and impervious peak run-off rates with the Best Management Practices (BMPs) incorporated into the site layout for stormwater quantity control.

2.1.2 PEAK FLOW CALCULATIONS

The Rational Method was used to determine the peak flow rate corresponding to the minor storm events for the proposed development.

a) The 10-year discharge coefficient of the impervious catchments is **C_{10} = 0.9.** For overland catchments, 10-year discharge coefficient is **C_{10} = 0.49**, assuming light cover bushland and low soil permeability (conservative).
b) ARI 100 years (**AEP 1%**) has been considered for impervious catchments and permeable (overland) catchments.
c) IFD Design Rainfall Depth from the Australian Bureau of Meteorology shows Rainfall Intensity (Iy) for the development is approximately **74.3mm/hr** (AEP = 1%), with a 1-hour duration to identify the appropriate coefficient of discharge. However, for the purposes of design, a Rainfall Intensity of **256mm/hr** for an AEP = 1% at 5-minute duration has been adopted. The IFD table reference from the Bureau of Meteorology is enclosed in Appendix C.
d) The time of concentration for each catchment was calculated from adding the sheet flow time and concentrated flow time is taken as 5-minute.

Following the Rational Method:

$$Q = \frac{CyIyAy}{360}$$

The flow rate of the total stormwater runoff generated from the catchments is: **Q_{100} = 62.02L/s**, based on the existing conditions and considering the location of the property in a residential area.

Calculations for these figures have been presented in the Appendices A and B.

A study of Pre-Development and Post-Development has been undertaken. The peak flow discharged from the proposed development for all typical storm events have been presented in Table 1.

ARI	F_y	C_y	$^{t}I_y$	Pre-Dev't Discharge		Post-Dev't Q		Q Change
years			mm/hr	m^3/s	L/s	m^3/s	L/s	%
1	0.80	0.59	90.70	0.0150	14.98	0.0156	15.63	4.383159
2	0.85	0.63	110.60	0.0199	19.93	0.0208	20.80	4.383159
5	0.95	0.70	132.80	0.0274	27.38	0.0286	28.58	4.383159
10	1.00	0.74	148.00	0.0327	32.69	0.0341	34.12	4.383159
20	1.05	0.77	167.00	0.0394	39.40	0.0411	41.13	4.383159
50	1.15	0.85	191.00	0.0509	50.94	0.0532	53.17	4.383159
100	1.20	0.88	210.00	0.0594	59.42	0.0620	62.02	4.383159
Q100 (overland)+Q100 (impervious)	N/A	N/A	N/A	0.0594	59.42	0.051433	62.02	4.383159

Table 1. Pre and Post Development Peak Flows

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2.1.3 SUB CATCHMENT STORMWATER INFRASTRUCTURE

An analysis of sub catchments has been done to propose adequate stormwater infrastructure in and around the properties. This has been done in relation to the proposed associated new infrastructure to minimise cost.

For the calculation of adequate stormwater drainage infrastructure, for both the existing and proposed dwelling, the following is proposed:

- The catchment of the existing dwelling is proposed to drain to the legal point of discharge into the existing council's stormwater pipe (buried).
- For the additional granny flat catchment, a rainwater tank as per council requirement sized 2 m^3 is proposed.
- The overflow from rainwater tank on the worst stormwater event is proposed to drain to the legal point of discharge into the existing council's stormwater pipe(buried) via connected pipe of 100 uPVC diameter to the existing stormwater main of the property as shown in Figure 4 below.

2.1.4 DIMESNIONS OF RAINWATER TANK

For the analysis of this catchment considering driveway, the flow rate of the total stormwater runoff generated additional from the proposed development is: **Q_{100} = 4.38 L/s**, based on the dimensions of the catchment. Therefore,

Q_{100} = 4.38 L/s = 0.00438 m^3/s

For 5 min time of concentration, Q_{100} = 1.314 m^3

To counter 1.314 m^3 of runoff discharge, as per 24C.4 Mandatory Rainwater Tank requirements (Ku-ring-gai Council) as shown in Figure 4, a Stormwater rainwater tank with a capacity 2m^3 (2000 L capacity) is required.

Table 24C.4-1: Mandatory Rainwater Tank Requirement by Development Type

Type	Description		Minimum Tank Storage Volume	Minimum Use of Retained Water
Type 1 <20m²	Alts & adds to a single detached dwelling or secondary dwelling. Increase in hard surface area.		A water tank is strongly recommended but not mandatory,	Where installed, must be connected to garden. Connection to toilet and laundry hot water is also encouraged.
20-100m²	Alts and Adds to single or secondary dwellings where the development is increase in hard surface area. *	Where proposal does not involve a bathroom or laundry	The minimum tank storage volume is 2000L, or, compliance with BASIX, whichever is the greater	For garden irrigation only.
		Where proposal involves a bathroom or laundry.	The minimum tank storage volume is 2000L, or, compliance with BASIX, whichever is the greater.	In accordance with 24R.1
Type 2	Alts and Adds or construction of secondary dwellings >100m² increase in hard surface area.		The minimum tank storage volume is 5,000L, or as required in 24R.1, or in compliance with BASIX, whichever is the greater.	In accordance with 24R.1
Type 3	Single Dwellings		The minimum tank storage volume is 5,000L; as required in 24R.1; or in compliance with BASIX. whichever is the greater.	In accordance with 24R.1
Type 4	Dual Occupancy		For any new dwelling: • The minimum tank storage volume is 5,000L ; as required in 24R.1; or in compliance with BASIX. whichever is the greater; plus • 2000 litres for any existing dwelling to be retained	Connection to garden, toilet and laundry and hot water is encouraged for the existing dwelling.
Type 5	High and medium density		The minimum tank storage volume is that required to meet the 50% reduction in runoff days specified in control 24B.3-4, or compliance with BASIX whichever is the greater.	Number of connections required to meet the specified target. Must also be connected to garden, podium plantings, green roofs and walls.

Figure 4. Mandatory Rainwater Tank (Source - Part 24C.4 of the Ku-ring-gai DCP)

3. SUMMARY AND RECOMMENDATIONS

This report discusses the stormwater analysis for the post-development scenario at 55 Trafalgar Avenue, Lindfield, NSW, 2070. The analysis has been conducted in accordance with Ku-ring-gai Council, Australian standards, and other industry regulations. See attached in appendix D for stormwater plan.

The following points summarise the findings and recommendations for the proposed infrastructure:

- The total stormwater run-off flow generated from the proposed development is Q_{100} = 62.02 L/s. Comparing with pre-development scenario, an additional discharge of Q_{100} = 4.38L/s is generated due to the proposed granny flat catchment.
- The roofed and overland impervious catchment area of the existing and proposed dwelling is to drain into the existing council's stormwater pipe (buried).
- The report was prepared in accordance with Implementation Guideline No. "Ku-ring-gai DCP".
- The proposed development results in minor increases to stormwater runoff. As such, rainwater tank is proposed to mitigate the impacts and to re-used internally as required under Part 24C.4 of the Ku-ring-gai DCP. The proposed rainwater tank maintains the runoff from the development to pre-development flows at the lawful points of discharge for all events up to and including 1% AEP.

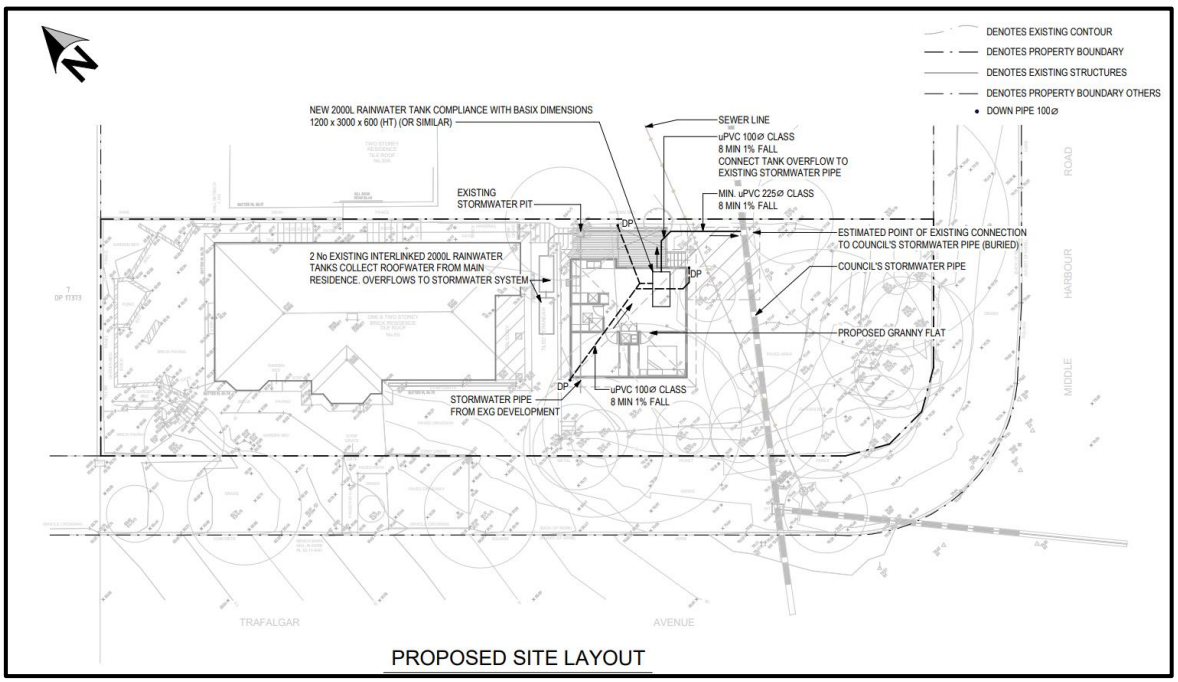
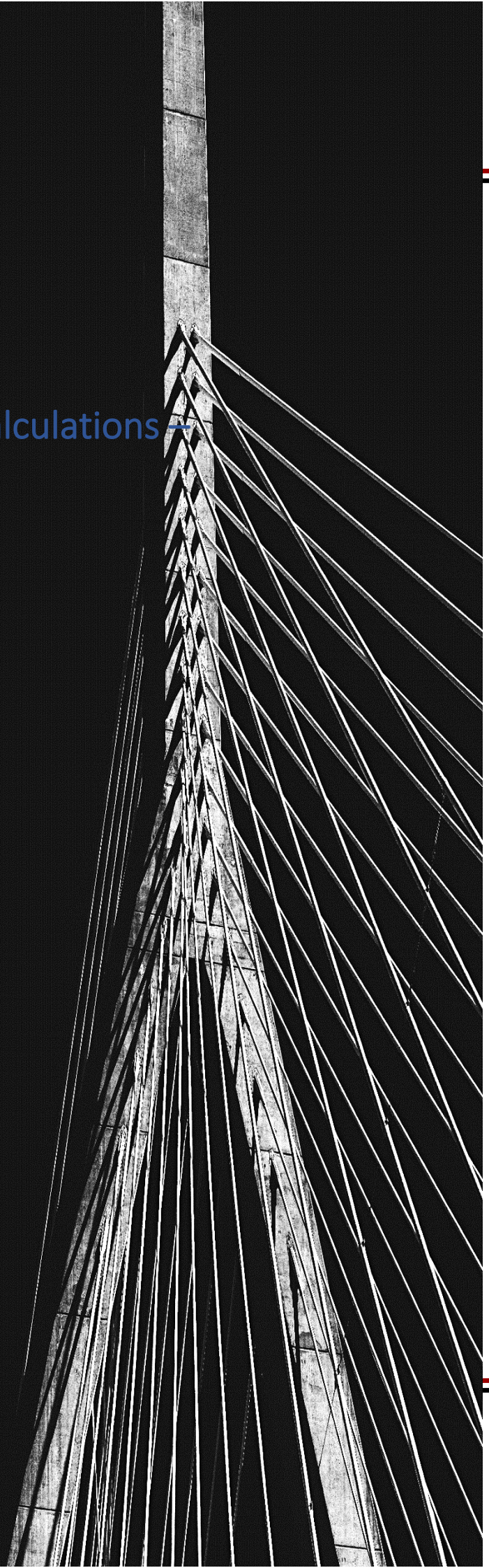


Figure 5. Proposed Site Plan (Source: JCE Drawing No. B422 - C002)

Appendix A – Stormwater Calculations – Pre-Development



Pre-Development Hydrology (Rational Method)

Job No.	:	B422
Project Name	:	Stormwater Quantity Analysis
Location	:	55 Trafalgar Avenue Lindfield NSW 2070
Council	:	Ku-ring-gai Council
Date	:	11 March, 2022

1. Existing Catchment Parameters

The time of concentration (t_c) was determined as per AS3500.3 Section 5.4.4

Catchment Classification: Urban (limits Cy to 1 for Urban catchments)

	Subcatchments				Overall Catchment	
Pre-Development Catchment	Pervious(Grass)	Roof	Driveway+Parking		Impervious	Overfland (if any)
Area (sqm)	451.00	250.00	228.00		478.00	451.00
Area (ha)	0.0451	0.0250	0.0228	0.0000	0.0478	0.0451
Time of concentration, t_c (min)	5	5	5	5	5	5
Fraction impervious, f_i	0.00	1.00	1.00		-	
$^1I_{10}$	48.9					
C_{10}	0.49	0.90	0.90	0.49	0.75	

Land Classification (if fi = 0)	Light Cover Bushland - Low	$C_{10\ (when\ fi=0)}$	0.59	N/A	N/A	0.59

2. Pre-Development Discharge Calculations

Catchment runoff rates were derived using the Rational Method.

$$Q_y = \frac{C_y \cdot {}^tI_y \cdot A}{360}$$

Using the data above, pre-developed discharge rates were summarised in the table below.

ROOF AND IMPERVIOUS CATCHMENTS: Q100

Storm Duration t = 5.00 mins

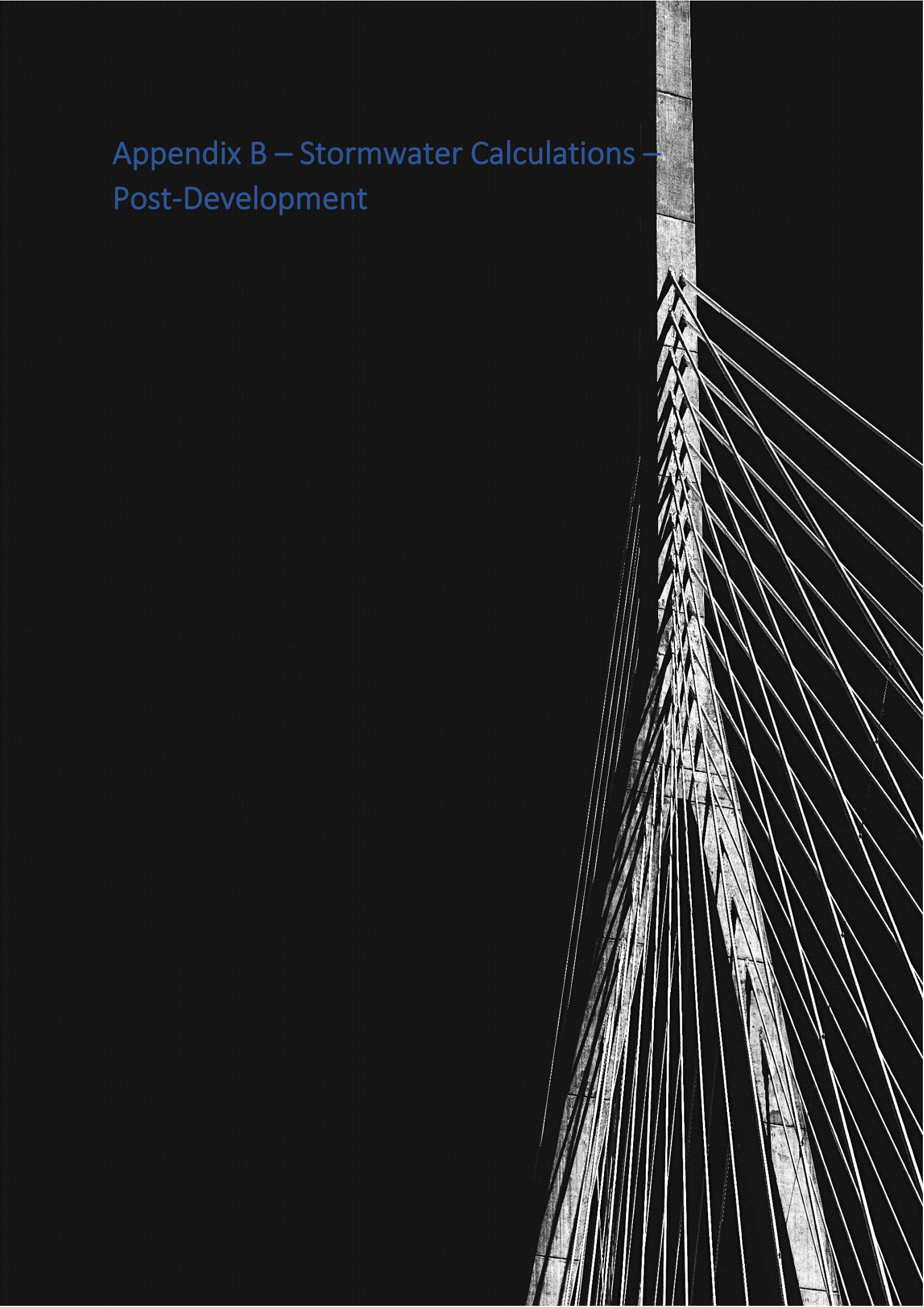
ARI	F_y	C_y	^tI_y	Pre-Dev't Discharge	
years			mm/hr	m^3/s	L/s
1	0.80	0.599603875	96.80	0.0077	7.71
2	0.85	0.637079117	121.20	0.0103	10.25
5	0.95	0.712029602	149.00	0.0141	14.09
10	1.00	0.749504844	169.00	0.0168	16.82
20	1.05	0.786980086	194.00	0.0203	20.27
50	1.15	0.861930571	229.00	0.0262	26.21
100	1.20	0.899405813	256.00	0.0306	30.57

OVERLAND CATCHMENTS: Q100

ARI	F_y	C_y	^tI_y	Pre-Dev't Discharge	
years			mm/hr	m^3/s	L/s
1	0.80	0.599603875	96.80	0.0073	7.27
2	0.85	0.637079117	121.20	0.0097	9.67
5	0.95	0.712029602	149.00	0.0133	13.29
10	1.00	0.749504844	169.00	0.0159	15.87
20	1.05	0.786980086	194.00	0.0191	19.13
50	1.15	0.861930571	229.00	0.0247	24.73
100	1.20	0.899405813	256.00	0.0288	28.84

Q10	32.69
Q20	39.40
Q100	59.42
Combined	59.42

Appendix B – Stormwater Calculations – Post-Development



Post-Development Hydrology (Rational Method)

Job No.	:	B422
Project Name	:	Stormwater Quantity Analysis
Location	:	55 Trafalgar Avenue Lindfield NSW 2070
Council	:	Ku-ring-gai Council
Date	:	11 March, 2022

1. Existing Catchment Parameters

The time of concentration (t_c) was determined as per AS3500.3 Section 5.4.4

Catchment Classification: Urban (limits Cy to 1 for Urban catchments)

Pre-Development Catchment	Subcatchments				Overall Catchment	
	Pervious(Grass)	Roof(Primary + Secondary)	Driveway+Parking		Impervious Catchments	Overfland (if any)
Area (sqm)	352.55	348.45	228.00		576.45	352.55
Area (ha)	0.0353	0.0348	0.0228	0.0000	0.0576	0.0353
Time of concentration, t_c (min)	5	5	5		5	5
Fraction impervious, f_i	0.00	1.00	1.00		-	
$^1I_{10}$			48.9			
C_{10}	0.49	0.90	0.90	0.49	0.78	
$C_{10\ (\text{when fi = 0})}$	0.59	N/A	N/A	0.59		

Land Classification (if fi = 0): Light Cover Bushland - Low

2. Pre-Development Discharge Calculations

Catchment runoff rates were derived using the Rational Method.

$$Q_y = \frac{C_y \cdot {}^{t}I_y \cdot A}{360}$$

Using the data above, pre-developed discharge rates were summarised in the table below.

ROOF AND IMPERVIOUS CATCHMENTS: Q100

Storm Duration t = 5.00 mins

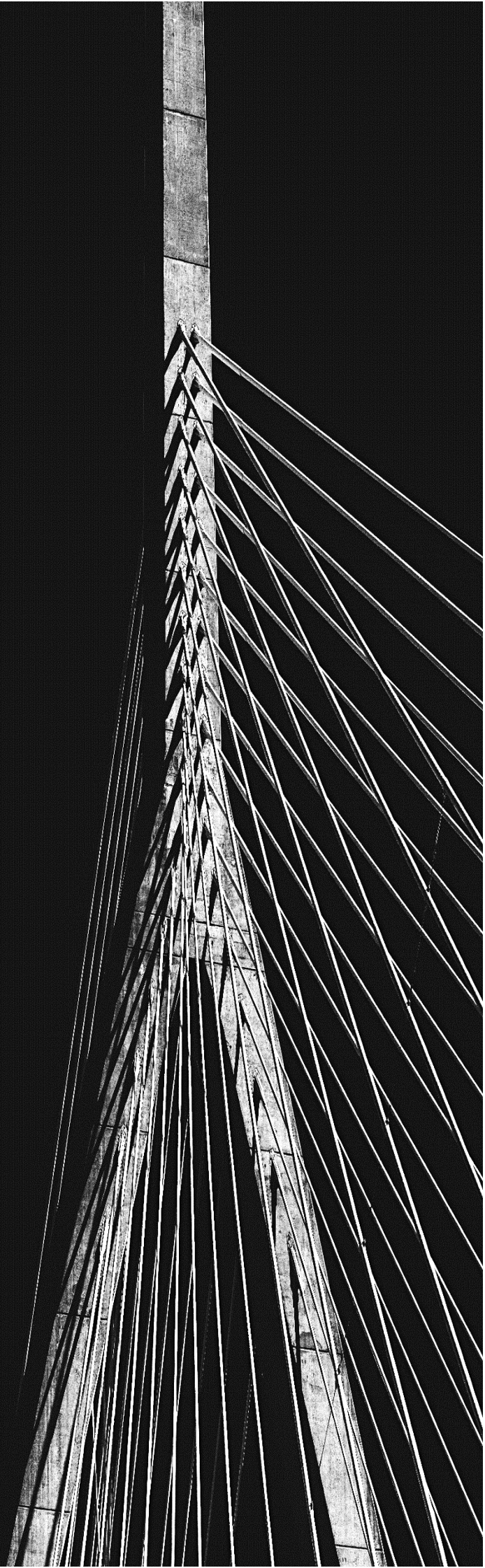
ARI	F_y	C_y	$^{t}I_y$	Post-Dev't Discharge	
years			mm/hr	m^3/s	L/s
1	0.80	0.625885468	96.80	0.0097	9.70
2	0.85	0.66500331	121.20	0.0129	12.91
5	0.95	0.743238994	149.00	0.0177	17.73
10	1.00	0.782356835	169.00	0.0212	21.17
20	1.05	0.821474677	194.00	0.0255	25.52
50	1.15	0.899710361	229.00	0.0330	32.99
100	1.20	0.938828202	256.00	0.0385	38.48

OVERLAND CATCHMENTS: Q100

ARI	F_y	C_y	$^{t}I_y$	Post-Dev't Discharge	
years			mm/hr	m^3/s	L/s
1	0.80	0.625885468	96.80	0.0059	5.93
2	0.85	0.66500331	121.20	0.0079	7.89
5	0.95	0.743238994	149.00	0.0108	10.85
10	1.00	0.782356835	169.00	0.0129	12.95
20	1.05	0.821474677	194.00	0.0156	15.61
50	1.15	0.899710361	229.00	0.0202	20.18
100	1.20	0.938828202	256.00	0.0235	23.54

Q10		34.12
Q20		41.13
Q100		62.02
	Combined	62.02

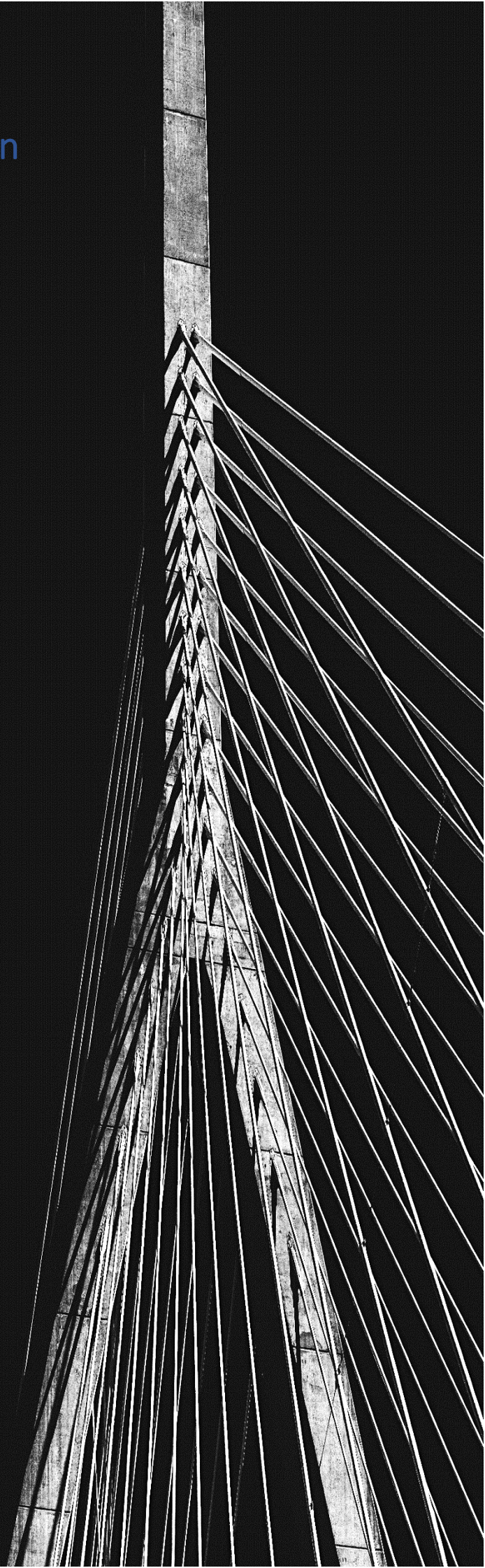
Appendix C – IFD Tables



IFD Design Rainfall Intensity (mm/h)
Issued: 11-Mar-22
Location Label:
Requested Latitude -33.7761 Longitude 151.1732
Nearest gri Latitude 33.7875 (S) Longitude 151.1625 (E)

		Annual Exceedance Probability (AEP)						
Duration	Duration in	63.20%	50%	20%	10%	5%	2%	1%
1 min	1	142	159	213	251	289	340	380
2 min	2	117	130	170	199	227	268	301
3 min	3	109	120	159	186	213	251	282
4 min	4	102	114	151	177	203	239	268
5 min	5	96.8	108	144	169	194	229	256
10 min	10	76.7	86	116	137	157	185	207
15 min	15	63.9	71.7	96.7	114	131	155	173
20 min	20	55.1	61.7	83.1	98	113	133	148
25 min	25	48.6	54.4	73.1	86.2	99.1	117	130
30 min	30	43.6	48.8	65.5	77.1	88.6	104	117
45 min	45	33.9	37.8	50.5	59.3	68.2	80.3	89.9
1 hour	60	28.2	31.4	41.7	48.9	56.2	66.3	74.3
1.5 hour	90	21.6	24	31.7	37.2	42.8	50.6	56.8
2 hour	120	17.9	19.9	26.2	30.8	35.4	41.9	47.2
3 hour	180	13.8	15.3	20.3	23.8	27.5	32.6	36.8
4.5 hour	270	10.8	12	15.9	18.7	21.7	25.8	29.2
6 hour	360	9.11	10.1	13.5	15.9	18.5	22.1	25
9 hour	540	7.23	8.05	10.8	12.9	15	18	20.4
12 hour	720	6.16	6.89	9.33	11.1	13	15.6	17.7
18 hour	1080	4.92	5.54	7.59	9.11	10.7	12.9	14.6
24 hour	1440	4.19	4.73	6.55	7.88	9.27	11.1	12.6
30 hour	1800	3.69	4.18	5.81	7.01	8.25	9.92	11.2
36 hour	2160	3.31	3.76	5.25	6.34	7.46	8.97	10.2
48 hour	2880	2.77	3.16	4.43	5.35	6.29	7.56	8.55
72 hour	4320	2.11	2.41	3.39	4.09	4.8	5.74	6.47
96 hour	5760	1.71	1.95	2.74	3.3	3.86	4.6	5.16
120 hour	7200	1.43	1.63	2.29	2.75	3.2	3.8	4.25
144 hour	8640	1.23	1.4	1.95	2.34	2.72	3.21	3.58
168 hour	10080	1.07	1.22	1.7	2.03	2.36	2.77	3.08

Appendix D – Stormwater Design



PROPOSED STORMWATER MANAGEMENT PLAN

DRAWING LIST			
SHEET	NAME	ISSUE DATE	REV
C000	TITLE SHEET	11/03/2022	A
C001	EXISTING SITE LAYOUT	11/03/2022	A
C002	PROPOSED SITE LAYOUT	11/03/2022	A

55 TRAFALGAR AVENUE
LINDFIELD NSW 2070

SITE LOCALITY

N.T.S.

KU-RING-GAI COUNCIL

THIS IS THE PLAN/S REFERRED TO IN NOTICE OF DETERMINATION OF DEVELOPMENT APPLICATION

No: DA0260/22

Date: 12/09/2022

REV	DESCRIPTION	DATE	DRAWN	CHECKED	APPROVED
A	FOR APPROVAL	11/03/2022	KG	RK	JT

J C E
J.C. Engineers Pty. Ltd.
www.jce.engineering
info@jce.engineering
ABN: 32 616 356 908

Project Details: PROPOSED STORMWATER MANAGEMENT PLAN

Drawn: KG
Designed: RK

ENGINEERING CERTIFICATION

Eng. Area	Name	Signature	No.	Date
CIVIL	JASMIN TRGO		19378	11/03/2022

Project Address: 55 TRAFALGAR AVENUE LINDFIELD NSW 2070

Client: MARINA VAN DER WALT

Job No.: B422

Sheet: TITLE SHEET

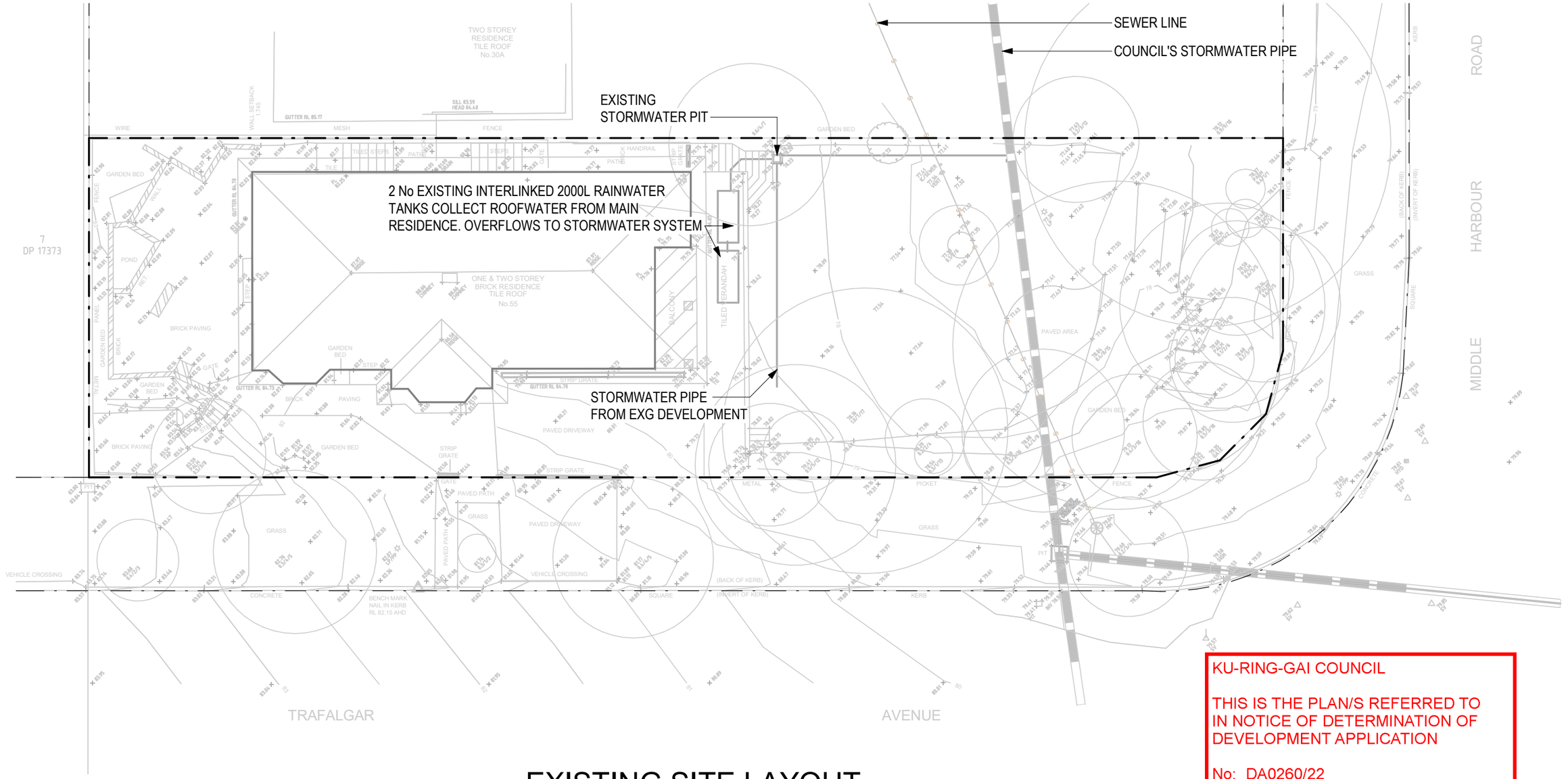
Drawing No.: B422 -C000

REV: A

11/03/2022 8:24:17 am

LEGEND:

- DENOTES EXISTING CONTOUR
- DENOTES PROPERTY BOUNDARY
- DENOTES EXISTING STRUCTURES
- DENOTES PROPERTY BOUNDARY OTHERS



EXISTING SITE LAYOUT

SCALE 1 : 200

KU-RING-GAI COUNCIL

THIS IS THE PLAN/S REFERRED TO IN NOTICE OF DETERMINATION OF DEVELOPMENT APPLICATION

No: DA0260/22

Date: 12/09/2022

REV	DESCRIPTION	DATE	DRAWN	CHECKED	APPROVED
A	FOR APPROVAL	11/03/2022	KG	RK	JT

J C E

J.C. Engineers Pty. Ltd.
www.jce.engineering
info@jce.engineering
ABN: 32 616 356 908

Project Details: PROPOSED STORMWATER MANAGEMENT PLAN

Drawn: KG

Designed: RK

ENGINEERING CERTIFICATION

Eng. Area	Name	Signature	No.	Date
CIVIL	JASMIN TRGO		19378	11/03/2022

Project Address: 55 TRAFALGAR AVENUE LINDFIELD NSW 2070

Client: MARINA VAN DER WALT

Job No.: B422

Sheet: EXISTING SITE LAYOUT

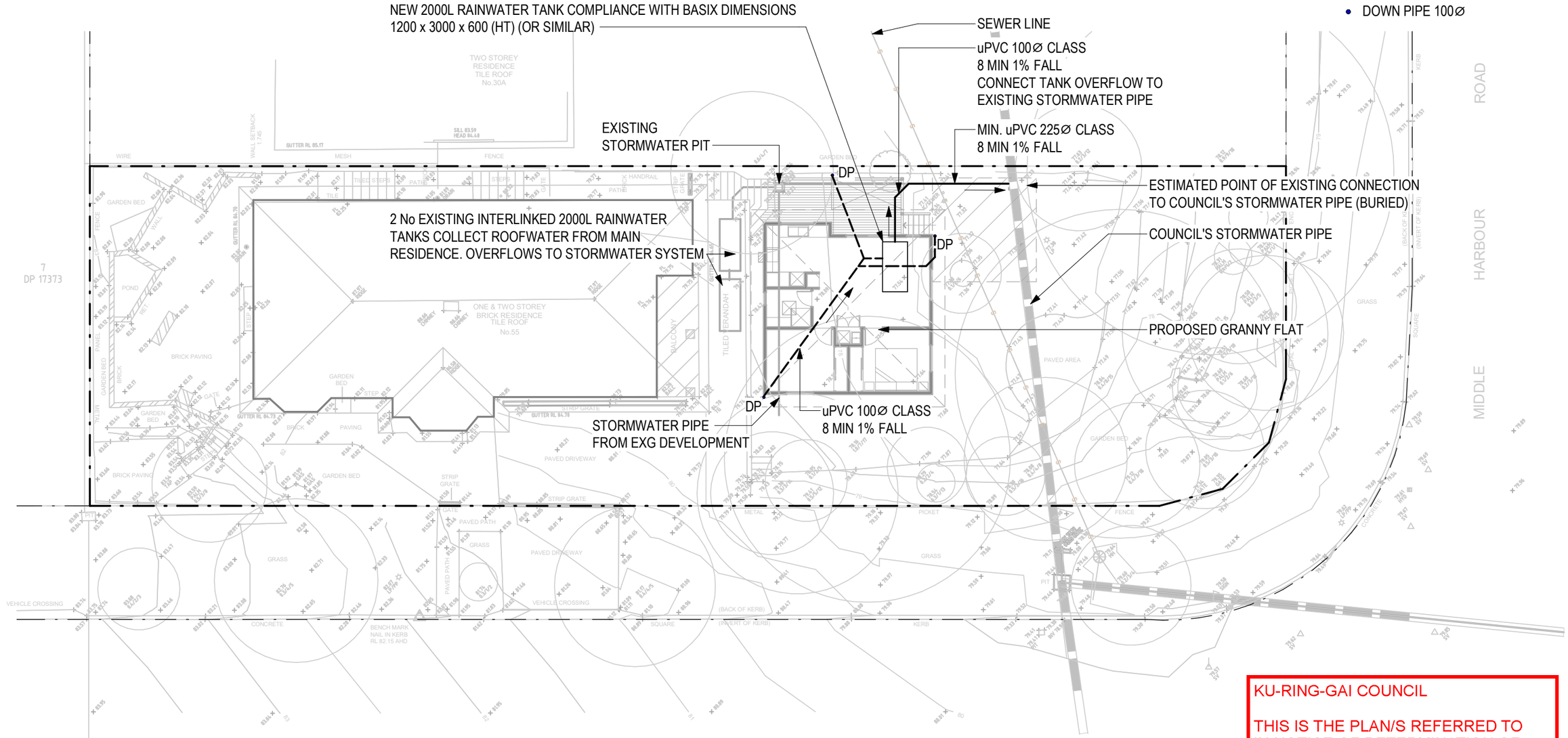
Drawing No.: B422 -C001

REV: A

11/03/2022 8:24:18 am

LEGEND:

- DENOTES EXISTING CONTOUR
- DENOTES PROPERTY BOUNDARY
- DENOTES EXISTING STRUCTURES
- DENOTES PROPERTY BOUNDARY OTHERS
- DOWN PIPE 100⌀



PROPOSED SITE LAYOUT

SCALE 1 : 200

KU-RING-GAI COUNCIL

THIS IS THE PLAN/S REFERRED TO IN NOTICE OF DETERMINATION OF DEVELOPMENT APPLICATION

No: DA0260/22

Date: 12/09/2022

REV	DESCRIPTION	DATE	DRAWN	CHECKED	APPROVED
A	FOR APPROVAL	11/03/2022	KG	RK	JT

J C E

J.C. Engineers Pty. Ltd.
www.jce.engineering
info@jce.engineering
ABN: 32 616 356 908

Project Details: PROPOSED STORMWATER MANAGEMENT PLAN

Drawn: KG

Designed: RK

ENGINEERING CERTIFICATION

Eng. Area	Name	Signature	No.	Date
CIVIL	JASMIN TRGO		19378	11/03/2022

Project Address: 55 TRAFALGAR AVENUE LINDFIELD NSW 2070

Client: MARINA VAN DER WALT

Job No.: B422

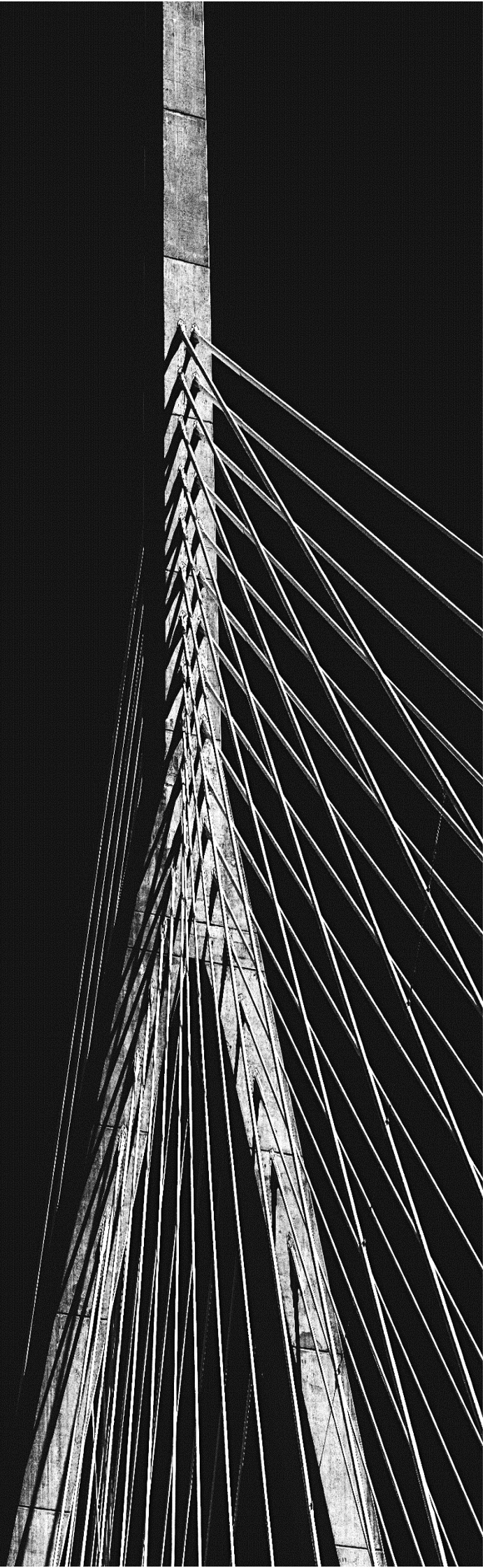
Sheet: PROPOSED SITE LAYOUT

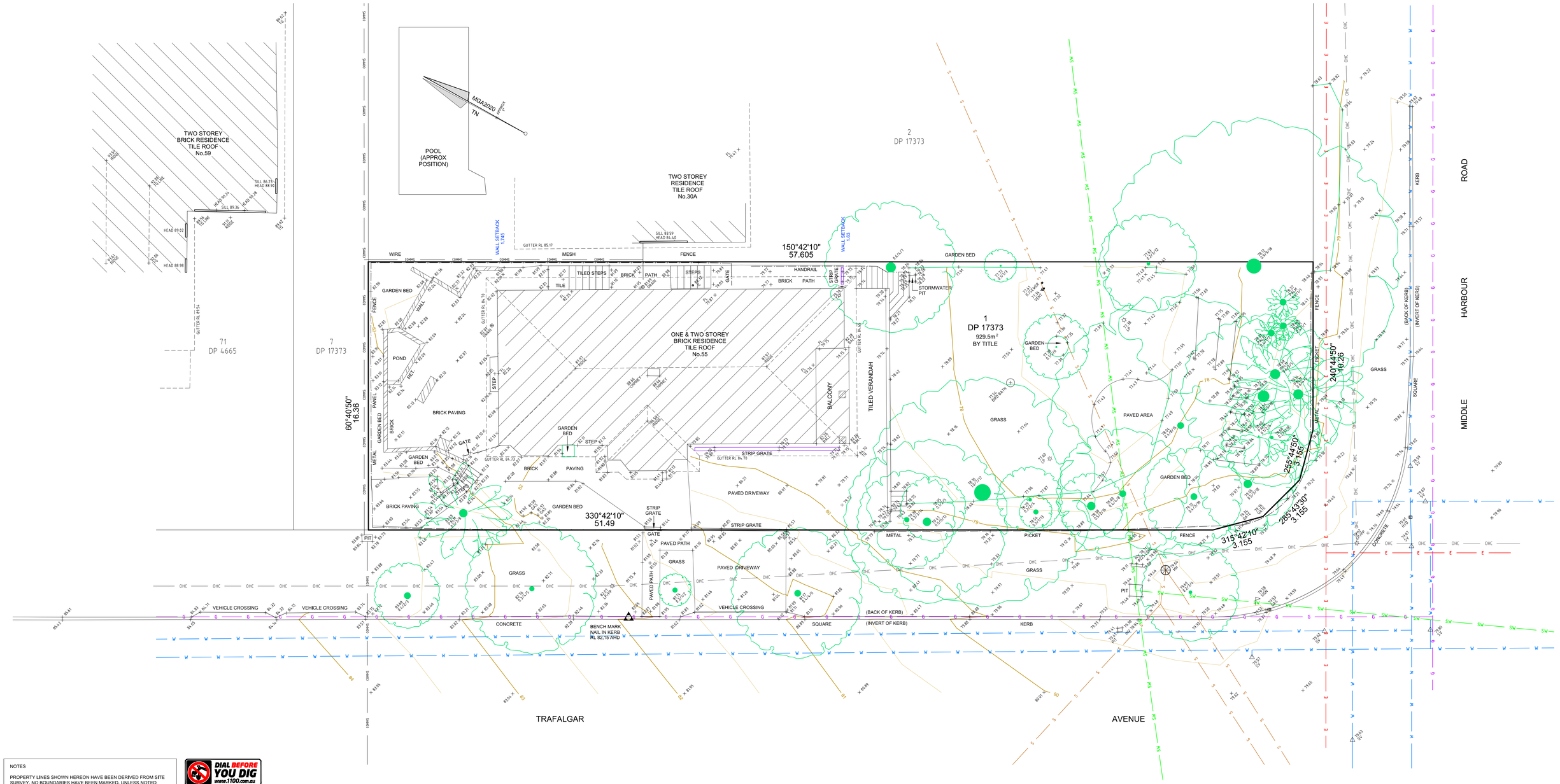
Drawing No.: B422 -C002

REV: A

11/03/2022 8:24:20 am

Appendix E – Survey Plan





NOTES

PROPERTY LINES SHOWN HEREON HAVE BEEN DERIVED FROM SITE SURVEY. NO BOUNDARIES HAVE BEEN MARKED. UNLESS NOTED OTHERWISE THE POSITION OF IMPROVEMENTS RELATIVE TO BOUNDARIES SHOWN HEREON IS DIAGRAMMATIC ONLY.

BEARINGS SHOWN ON THIS PLAN ARE ORIENTATED TO MGA NORTH. IF SHADOW DIAGRAMS ARE TO BE CALCULATED THEY MUST BE CALCULATED USING TRUE NORTH.

NO INVESTIGATION OF UNDERGROUND SERVICE LOCATION HAS BEEN UNDERTAKEN. UNDERGROUND SERVICES SHOWN HEREON ARE APPROXIMATE POSITION AND INTENDED TO INDICATE THE PRESENCE OF SERVICE LINES ONLY. SERVICE PITS, MANHOLES AND COVERS HAVE BEEN LOCATED BY SURVEY WHERE VISIBLE.

UNDERGROUND SERVICE REFERENCE INFORMATION IS FROM PLANS OBTAINED FROM DIAL BEFORE YOU DIG SEARCH No.20819666 DATED 22/12/2020. THIS PLAN DOES NOT GUARANTEE IDENTIFICATION OF ALL UNDERGROUND SERVICES.

WHERE THE EXACT LOCATION OF UNDERGROUND SERVICES IS CRITICAL TO THE DESIGN OR CONSTRUCTION THE RELEVANT PARTY MUST CONTACT SERVICE PROVIDERS, UNDERTAKE FURTHER INVESTIGATION AND AUDIT OF UNDERGROUND SERVICES TO DETERMINE EXACT SERVICE LOCATION. A CURRENT 'DIAL BEFORE YOU DIG' SEARCH MUST BE UNDERTAKEN PRIOR TO ANY EXCAVATION

CONTOURS ARE DIAGRAMMATIC OF LANDFORM ONLY. PREFERENCE SHOULD BE GIVEN TO SPOT HEIGHTS THAT ARE ACCURATE WITHIN THE PURPOSE FOR WHICH THEY HAVE BEEN PROVIDED.

CONTOUR INTERVAL 1.0m MAJOR, 0.5m MINOR.

0.3 TRUNK DIAMETER/3m RADIUS/8m HEIGHT
27.63 RL AT BASE OF TREE
TREE SIZES ARE ESTIMATES ONLY

DIAL BEFORE YOU DIG www.1100.com.au

LEGEND

DIAL BEFORE YOU DIG
- E — ELECTRICITY
- G — GAS
- S — SEWER
- SW — STORMWATER
- COMMS — TELECOMMUNICATION
- W — WATER

OHC — OVERHEAD CABLE

BALC	BALCONY
FL	FLOOR LEVEL
HYD	HYDRANT
IC	INSPECTION COVER
LP	LIGHT POLE
MH	MANHOLE
PP	POWER POLE
SV	STOP VALVE
TG	TOP OF GUTTER

0 1 2 3 4 5 10
SCALE 1:100

USHER & COMPANY
Surveying & Land Development Consultants
A.B.N. 70 128 414 602
Suite 23, 1-3 Havilah Street, Chatswood NSW 2057
PO Box 1199, CHATSWOOD NSW 2057
Phone: (02) 9411 8166
Email: admin@usherssurvey.com.au

APPROVED

Amendments

ISSUE	DATE	DETAILS
INITIAL	28-01-2021	

PLAN:

SHOWING DETAIL AND LEVELS
AT No.55 TRAFALGAR AVENUE, LINDFIELD
BEING LOT 1 IN DP 17373

LGA:	KU-RING-GAI
SUBURB:	LINDFIELD
ORIGIN:	SSM 108348 RL 91.167 AHD CLASS B SCIMS 14/12/2020

REDUCTION RATIO:	1:100
DATUM:	AHD
DATE OF SURVEY:	14-12-2020
SURVEYED BY:	MB
DRAWN BY:	LL

CLIENT: MARINA GROBBELAAR

PLAN REFERENCE: 6321-DET

B1

ISSUE: INITIAL