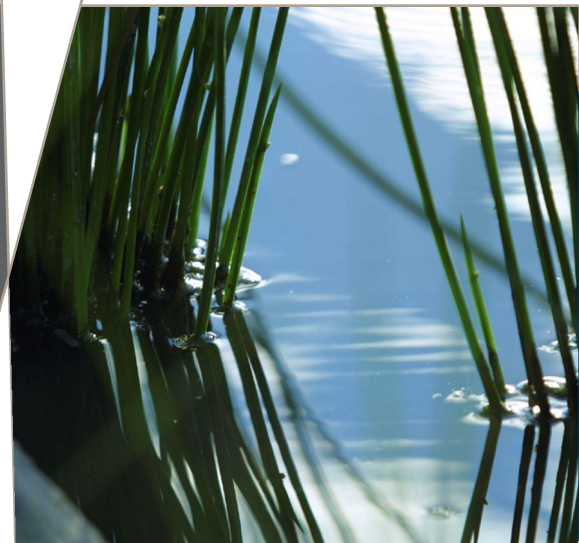


Water and Sewer Analysis

Forresters Beach Planning – Stage 2

80519020



Prepared for
Terrigal Grosvenor Lodge Pty Ltd

23 December 2020

Contact Information

Cardno NSW/ACT Pty Ltd
ABN 95 001 145 035

Suite 34/207 Albany St Nth
Gosford NSW 2250

Telephone: (02) 43201000
Facsimile: (02) 4324 3251
International: 612 4320 1000

gosford@cardno.com.au
www.cardno.com.au

Document Information

Prepared for	Terrigal Grosvenor Lodge Pty Ltd
Project Name	Forresters Beach Planning – Stage 2
File Reference	Forresters Beach Stage 2 - Water and Sewer Analysis
Job Reference	80519020
Date	23 December 2020

Version	Date	Description of Revision	Prepared By	Prepared (Signature)	Reviewed By	Reviewed (Signature)
1	28/01/2016	For Client Review	P.E.J.	Paul Jones	V.C.	Vince Cubis
2	23/12/2020	For Client Review	KA	Khorum Amin	SJB	Sara Belgrove

Version	Reason for Issue	Approved for Release By	Approved (Signature)	Approved Release Date
1	For Client Review	V.C.	Vince Cubis	29/01/2016
2	For Client Review	SJB	Sara Belgrove	23/12/2020

© Cardno 2015. Copyright in the whole and every part of this document belongs to Cardno and may not be used, sold, transferred, copied or reproduced in whole or in part in any manner or form or in or on any media to any person other than by agreement with Cardno.

This document is produced by Cardno solely for the benefit and use by the client in accordance with the terms of the engagement. Cardno does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by any third party on the content of this document.

© Cardno. Copyright in the whole and every part of this document belongs to Cardno and may not be used, sold, transferred, copied or reproduced in whole or in part in any manner or form or in or on any media to any person other than by agreement with Cardno.

This document is produced by Cardno solely for the benefit and use by the client in accordance with the terms of the engagement. Cardno does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by any third party on the content of this document.

Executive Summary

Cardno was engaged by Terrigal Grosvenor Lodge Pty Ltd to undertake a water and sewer analysis of the proposed rezoning application for No 957 and Nos 987-991 The Central Coast Highway (CCH) and Nos 137,139, 143 and 145 Bakali Road, Forresters Beach (Lots 1-4 DP1000694, Lot 51 DP 1028301 and Lot 522 DP 1077907). The rezoning application is to change the zoning of the land to suit low density development.

The water and sewer analysis is required by Central Coast Council to determine any effects of the proposed redevelopment of the rezoning on the existing water and sewer infrastructure and to determine if any upgrades to the water and sewer reticulation are required based on loads and demands.

Table of Contents

1	Existing Site Conditions	1
1.1	Existing Sewer Reticulation	2
1.2	Existing Water Reticulation	2
2	Sewer Analysis	3
2.1	Existing Sewage Pump Stations	3
2.2	Proposed Subdivision Sewer Servicing Arrangement	3
	2.2.1 SPS FB4 Catchment	3
	2.2.2 SPS FB1 Catchment	3
2.3	Existing SPS FB4 Catchment	4
2.4	Existing SPS FB4 Catchment	5
2.5	SPS FB4 Design Flow	6
	2.5.1 SPS FB4 Existing Design Flow	6
	2.5.2 SPS FB4 Catchment Design Flow	6
	2.5.3 SPS FB4 Catchment Design Flow including this Development	6
	2.5.4 SPS FB4 Conclusion	6
2.6	Existing SPS FB1 Catchment	7
2.7	SPS FB1 Design Flow	8
	2.7.1 Existing Design Flow	8
	2.7.2 SPS FB1 Catchment Design Flow	8
	2.7.3 SPS FB1 Catchment Design Flow including this Development	8
	2.7.4 SPS FB1 Conclusion	8
3	Water Analysis	9
3.1	Existing Watermain Service Arrangement	9
3.2	Existing DN100 Watermain Load	10
3.3	Proposed Watermain Service Upgrade	10
4	Recommendations	11
4.1	Sewer Analysis Recommendation	11
4.2	Water Analysis Recommendation	11

Appendices

Appendix A	SEWER SERVICING PLAN
Appendix B	WATER SERVICING PLAN
Appendix C	SPS DESIGN FLOW CALCULATIONS

Tables

Table 2-1	Existing SPS Flows	3
-----------	--------------------	---

Figures

Figure 1-1	Satellite Image of Rezoning Area	1
Figure 1-2	Existing Sewer Reticulation	2
Figure 1-3	Existing Water Reticulation	2
Figure 2-1	SPS FB4 Catchment	4
Figure 2-2	SPS FB4 Development	5
Figure 2-3	SPS FB1 Catchment	7
Figure 3-1	DN100 Watermain Supply Area	9
Figure 3-2	Typical Proposed Watermain Arrangement	10

1 Existing Site Conditions

The land to be rezoned covers an area of 9.855ha and is located between the Central Coast Highway and Bakali Rd. The site is bound to the north by Lot 5 DP 1082979 (which has been rezoned for residential development), to the east and south-east by existing residential properties which front on to the Central Coast Highway and to the west by Bakali Road (formed and unformed sections) as shown in Figure 1-1 below.

Figure 1-1 **Satellite Image of Rezoning Area**



The existing development on the site consists of open rural grassed paddocks with five residences.

1.1 Existing Sewer Reticulation

Three (3) residences being directed to sewer line FP and flow onto SPS FB4 and the remaining two (2) residences being directed to sewer line FR and flow onto SPS FB1.

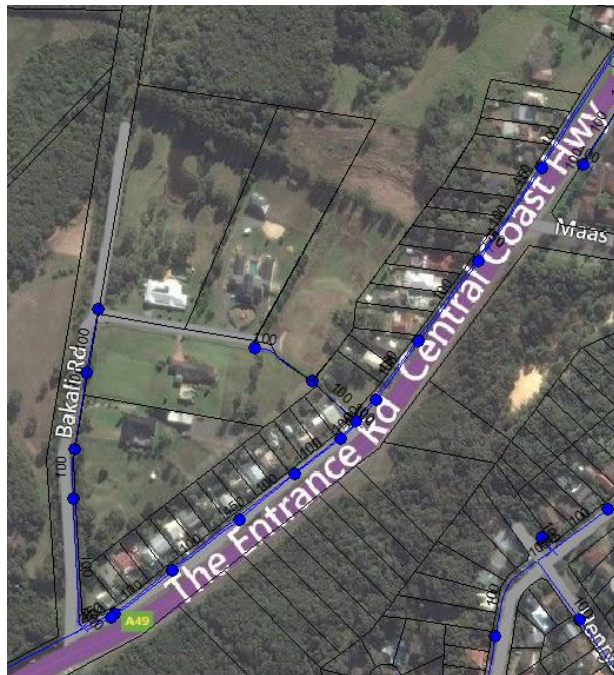
Figure 1-2 Existing Sewer Reticulation



1.2 Existing Water Reticulation

The water supply to the existing five (5) residences is from existing DN100 watermains located on the Central Coast Highway and Bakali Road.

Figure 1-3 Existing Water Reticulation



2 Sewer Analysis

Design Flow calculations have been undertaken to determine the additional sewage load that the proposed subdivision will have on the existing sewage reticulation.

2.1 Existing Sewage Pump Stations

Forresters Beach Sewage Pump Station (SPS) FB1 is the main pumping station for the Forrester Beach Area with 3 supplementary SPS's FB2, FB3 and FB4 flow contributing the SPS FB1 Design Flow Rate. The existing design flow rates of the four (4) Sewage Pump Stations, as supplied by Central Coast Council are shown in Table 2.1 below. The flow represent the maximum capacity of the respective SPS based on the current infrastructure at each SPS.

Table 2-1 Existing SPS Flows

SPS	ADWF	PWWF
FB1	7.233 L/s	75.0 L/s
FB2	0.73 L/s	6.00 L/s
FB3	0.058 L/s	0.50 L/s
FB4	0.324 L/s	20 L/s

2.2 Proposed Subdivision Sewer Servicing Arrangement

The proposed sewer servicing arrangement has been designed for 69 lots that have an approximate average size of 850m² each. For the 69 lots in the proposed subdivision, 52 lots to be connected to the existing sewer infrastructure within the catchment of the existing Forresters Beach SPS FB4 and the remaining 17 lots to be connected to the existing sewer infrastructure within the catchment of the existing Forresters Beach SPS FB1 as follows

The catchments delineation follows the natural fall of the land. Details are contained in Appendix A.

2.2.1 SPS FB4 Catchment

52 lots can be serviced by the existing DN150 and DN225 sewer line FP and FQ within the SPS FB4 catchment.

2.2.2 SPS FB1 Catchment

17 lots can be serviced by the existing DN225 sewer line FR within the SPS FB1 catchment.

2.3 Existing SPS FB4 Catchment

The existing SPS FB4 catchment is generally bounded by the Central Coast Highway, Bakali Road and Bellevue Road as shown in Figure 2.1.

The existing catchment consists of residential allotments, Forresters Beach Retirement Village and various commercial businesses including child minding centres and a gym/swimming complex.

Figure 2-1 **SPS FB4 Catchment**

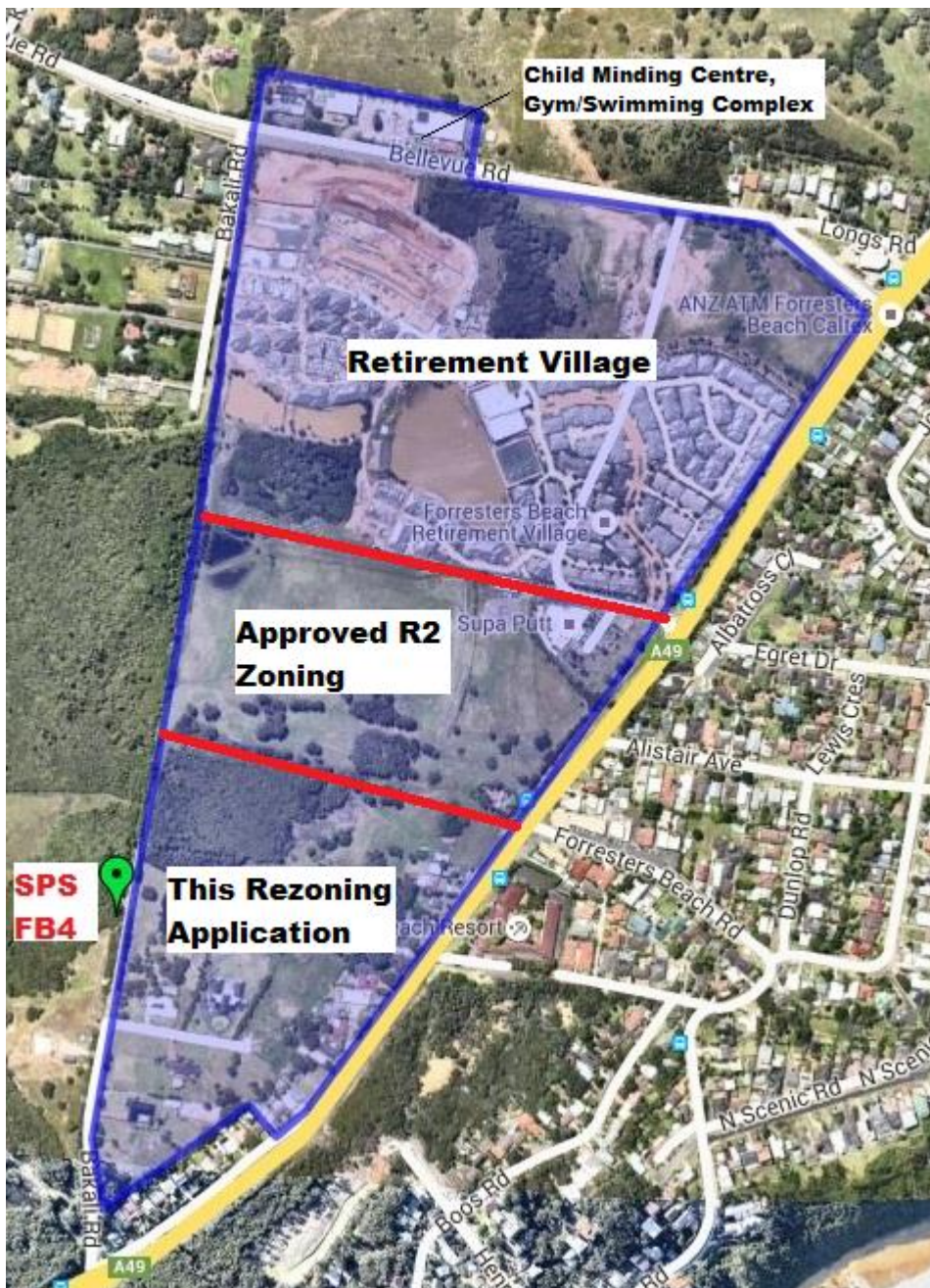


2.4 Existing SPS FB4 Catchment

The future SPS FB4 Catchment as shown in Figure 2.2 could include the following elements:

- > Forresters Beach Retirement Village with approximately 210 villas
- > R2 subdivision which may consist of 105 residential lots.
- > This Development of 52 lots serviced by SPS FB4.
- > Approximately 15 existing residential lots mostly along the Central Coast Highway.
- > Existing child minding centres and gym/swimming complex in Bellevue Road.

Figure 2-2 **SPS FB4 Development**



2.5 SPS FB4 Design Flow

The following design flow calculations are to determine the additional sewage load that the proposed subdivision will have on the pumping capacity of Forresters Beach SPS FB4.

The design flow calculations for Equivalent Persons (EP) are based on SCA WSA 02-2002-2.2 (Sydney Water Edition 1 Version 3) Appendix B Flow Estimation. An allowance of 3.5 EP per single occupancy lots and 2.5 EP per single occupancy high density dwelling units e.g. Forresters Beach Retirement Village.

2.5.1 SPS FB4 Existing Design Flow

The existing SPS FB4 design flow as shown in Table 2.1 is 20 litres per second.

2.5.2 SPS FB4 Catchment Design Flow

The council approved development SPS FB4 design flow is approximately calculated at 18 litres per second as shown in Table 1 Appendix C.

The design flow is based on sewer servicing to:

- > Existing structures;
- > Forrester Beach Retirement Village including existing Villa's and Villa's currently under construction;
- > R2 subdivision which may consist of 105 residential lots.

2.5.3 SPS FB4 Catchment Design Flow including this Development

The anticipated SPS FB4 design flow including this development is calculated at 20 litres per second as shown in Table 2 Appendix C.

The design flow is based on sewer servicing to:

- > Existing structures;
- > Forrester Beach Retirement Village including existing Villa's and Villa's currently under construction
- > R2 subdivision which may consist of 105 residential lots;
- > This proposed 52 lot part subdivision.

2.5.4 SPS FB4 Conclusion

The anticipated increased flow rate (WWPS) of 19.98 litres per second from the proposed part subdivision (52 Lots) on Sewage Pump Station (SPS) FB4 is less than the maximum design flow rate capacity of 20 litres per second PWWF.

No upgrades works are therefore required to flow rates at SPS FB4 as a result of the proposed rezoning and future residential development on this site.

2.6 Existing SPS FB1 Catchment

The existing SPS FB1 catchment is generally bounded by the Central Coast Highway, Whalans Road, the Pacific Ocean and SPS FB2 and FB3 catchments as shown in Figure 2.3.

The existing catchment consists primarily of residential allotments, Forresters Beach Resort and Forresters Beach Shopping Centre.

Figure 2-3 SPS FB1 Catchment



2.7 SPS FB1 Design Flow

The following design flow calculations are to determine the additional sewage load that the proposed subdivision will have on the pumping capacity of Forresters Beach SPS FB1 including the design flows from SPS FB2, FB3 and FB4.

The design flow calculations for Equivalent Persons (EP) are based on SCA WSA 02-2002-2.2 (Sydney Water Edition 1 Version 3) Appendix B Flow Estimation. An allowance of 3.5 EP per single occupancy lots and 2.5 EP per single occupancy high density dwelling units e.g. Forresters Beach Resort

2.7.1 Existing Design Flow

The existing SPS FB1 design flow as shown in Table 2.1 is 75 litres per second.

2.7.2 SPS FB1 Catchment Design Flow

The SPS FB1 design flow is calculated at 69 litres per second as shown in Table 3 Appendix C.

The design flow is based on sewer servicing to:

- > Existing tenements including a 15% allowance;
- > Forrester Beach Resort of 34 Units;
- > Forresters Beach Shopping Centre;
- > SPS FB2, FB3 and FB4 design flow allowances.

2.7.3 SPS FB1 Catchment Design Flow including this Development

The anticipated SPS FB1 design flow including this development is calculated at 71 litres per second as shown in Table 4 Appendix C.

The design flow is based on sewer servicing to:

- > Existing tenement including a 15% allowance;
- > Forrester Beach Resort (34 Units);
- > Forresters Beach Shopping Centre;
- > SPS FB2, FB3 and FB4 design flow allowances;
- > This proposed 17 lot part subdivision.

2.7.4 SPS FB1 Conclusion

The anticipated increased flow rate (WWPS) of 70.11 litres per second from the proposed part subdivision (17 Lots) on Sewage Pump Station (SPS) FB1 is within the current 75 litres per second PWWF existing flow rate.

No upgrades works are therefore required to the flow rates at SPS FB1 as a result of the proposed rezoning and future residential development on this site.

3 Water Analysis

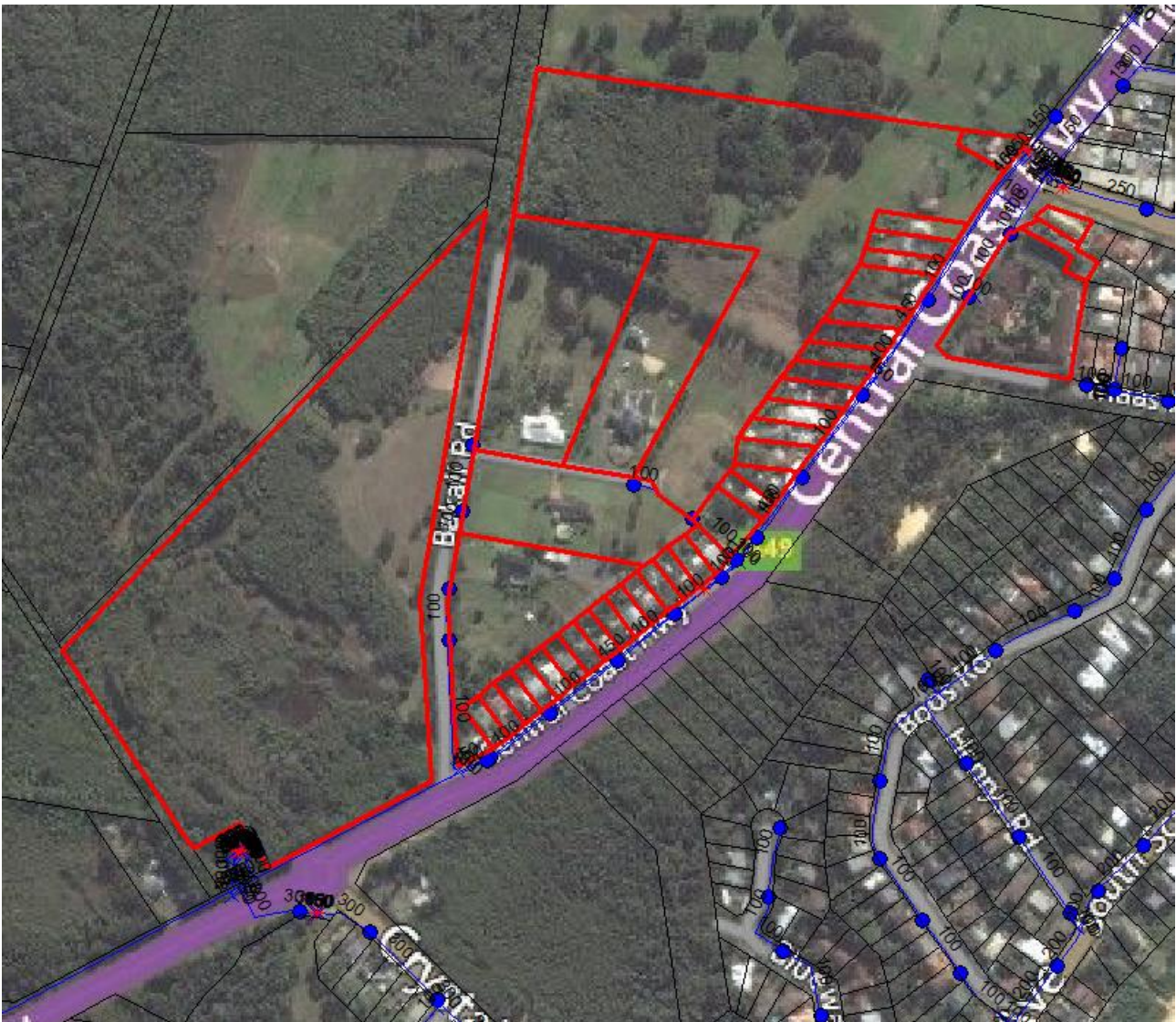
3.1 Existing Watermain Service Arrangement

The watermain analysis is based on WCA WSA 03-2011-3.1 (Sydney Water Edition 2012) Table 3.2 Empirical Guide for Pipe Sizing.

The proposed development area consists of five (5) existing residences which are currently serviced for water by a DN100 watermain which is located in Bakali Road and the Central Coast Highway. Refer Figure 3-1 for the watermain supply area.

The DN100 watermain flow originates from a DN150 watermain at the corner of The Central Coast Highway and Forresters Beach Road. The DN150 watermain flow is from a DN300 watermain and a DN450 Trunk Watermain on the Central Coast Highway.

Figure 3-1 DN100 Watermain Supply Area



3.2 Existing DN100 Watermain Load

The existing DN100 watermain currently supplies potable water to approximately 41 residences and the 34 units in the Forrester Beach Resort.

WCA WSA Table 3.2 indicates that the limit for single end DN100 watermain should be forty (40) residential lots. This indicates that the DN100 watermain requires an upgrade to service the proposed development.

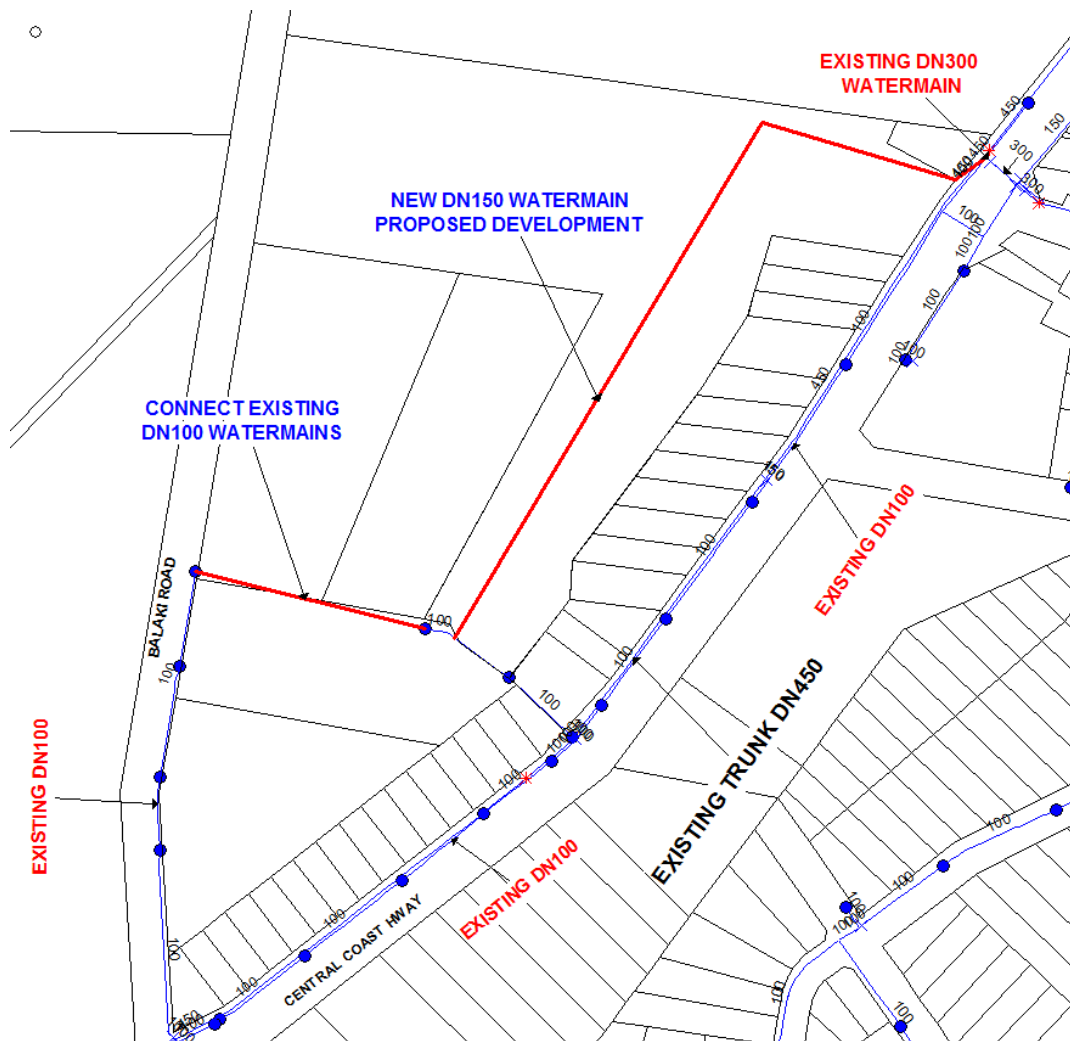
3.3 Proposed Watermain Service Upgrade

The proposed watermain service upgrade has been designed to service 69 lots that have an approximate average size of 840m² each. The proposed development will increase the load on the existing DN100 watermain by approximately 64 residential lots allowing for the reduction of the 5 existing lots to a total of 106 residential lots and the 34 units in the Forrester Beach Resort

It is proposed to construct a new DN150 Watermain from the existing D300 Watermain near the intersection of Forrester Beach Road and Central Coast Highway. The extension of the DN150 Watermain and the looping of the existing D100 watermain in Bakali Road to the existing DN100 watermain will provide capacity to service the water supply area shown in Figure 11.1. Refer to Appendix B for Details.

The proposed solution will also provide relief to existing water users on the existing DN100 watermain including the Forrester Beach Resort 34 Units.

Figure 3-2 Typical Proposed Watermain Arrangement



4 Recommendations

It is recommended that Central Coast Council approve the rezoning application based on the following outcomes of the water and sewer analysis.

4.1 Sewer Analysis Recommendation

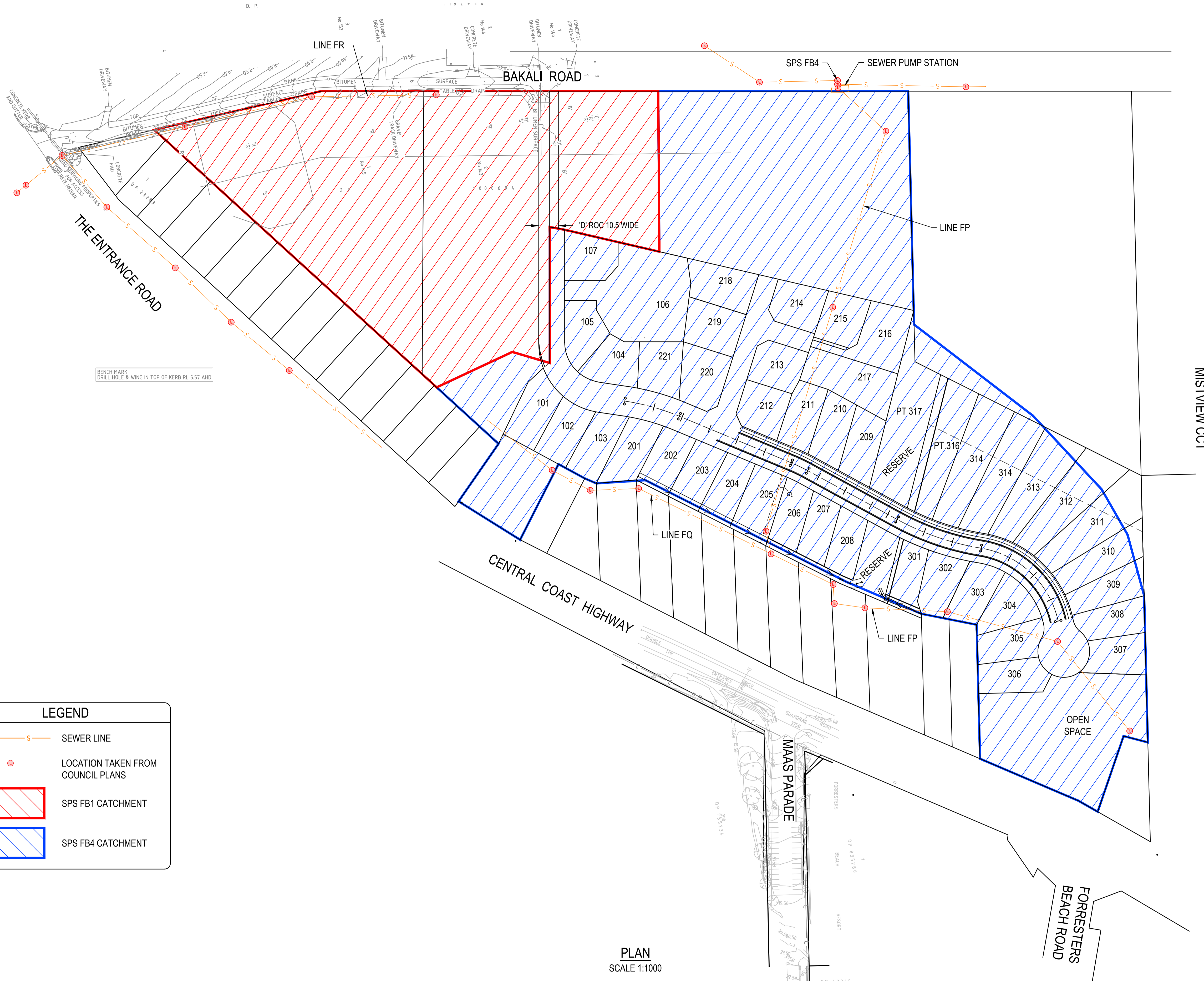
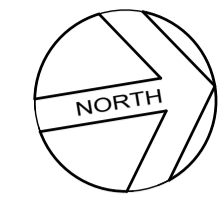
The proposed development could be accommodated on the existing pumping capacities of Forester Beach Sewage Pumping Stations SPS FB1 and SPS FB4 and no upgrades to the flow rates are required to service the proposed development.

4.2 Water Analysis Recommendation

The proposed provision of a DN150 watermain extension to the existing DN100 watermain will provide capacity to service the proposed development with potable water.

APPENDIX A
SEWER SERVICING PLAN

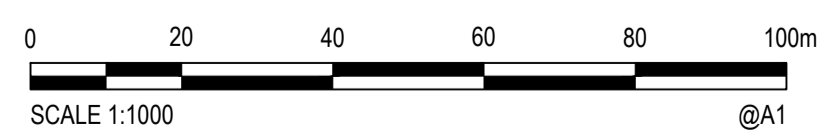
XREFS: x:\0519020_A1\Title_x\0519020_Civil in Survey CAD File: \cardno\opg\ba\AU\NSW\ref\structure\Projects\80519020-CI-120 [1] Sewer Plan.dwg
 CTB File: Grp_Cardno_Full.ctb DEVICE NAME: AutoCAD PDF (General Documentation).pc3
 SAVE DATE: 15-Dec-20 12:24:23 PM BY: Lais de Brito DATE PLOTTED: 23-Dec-20 11:04:46 PM BY: LAIS DE BRITO



BENCH MARK
DRILL HOLE & WING IN TOP OF KERB RL 5.57 AHD

LEGEND	
	SEWER LINE
	LOCATION TAKEN FROM COUNCIL PLANS
	SPS FB1 CATCHMENT
	SPS FB4 CATCHMENT

PLAN
SCALE 1:1000



© Cardno Limited All Rights Reserved.
 This document is produced by Cardno Limited solely for the benefit of and use by the client in accordance with the terms of the retainer. Cardno Limited does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by third party on the content of this document.

Cardno (NSW/ACT) Pty Ltd | ABN 95 001 145 035
 34/205-207 Albany Street North
 Gosford, NSW 2250
 Tel: 02 4323 2558 Fax: 02 4324 3251
 Web: www.cardno.com.au

Drawn	LDB	Date	DEC 2020
Checked	SJB	Date	DEC 2020
Designed	PEJ	Date	DEC 2020
Verified	VC	Date	DEC 2020
Approved		Date	DEC 2020

Client	TERRIGAL GROSVENOR LODGE PTY LTD
Project	FORRESTERS BEACH SUBDIVISION
Title	SEWER SERVICING PLAN

Status	PRELIMINARY			
NOT TO BE USED FOR CONSTRUCTION PURPOSES				
Datum	AHD	Register	-	
Scale	1:1000	Size	A1	
Drawing Number	80519020-CI-120		Revision	1

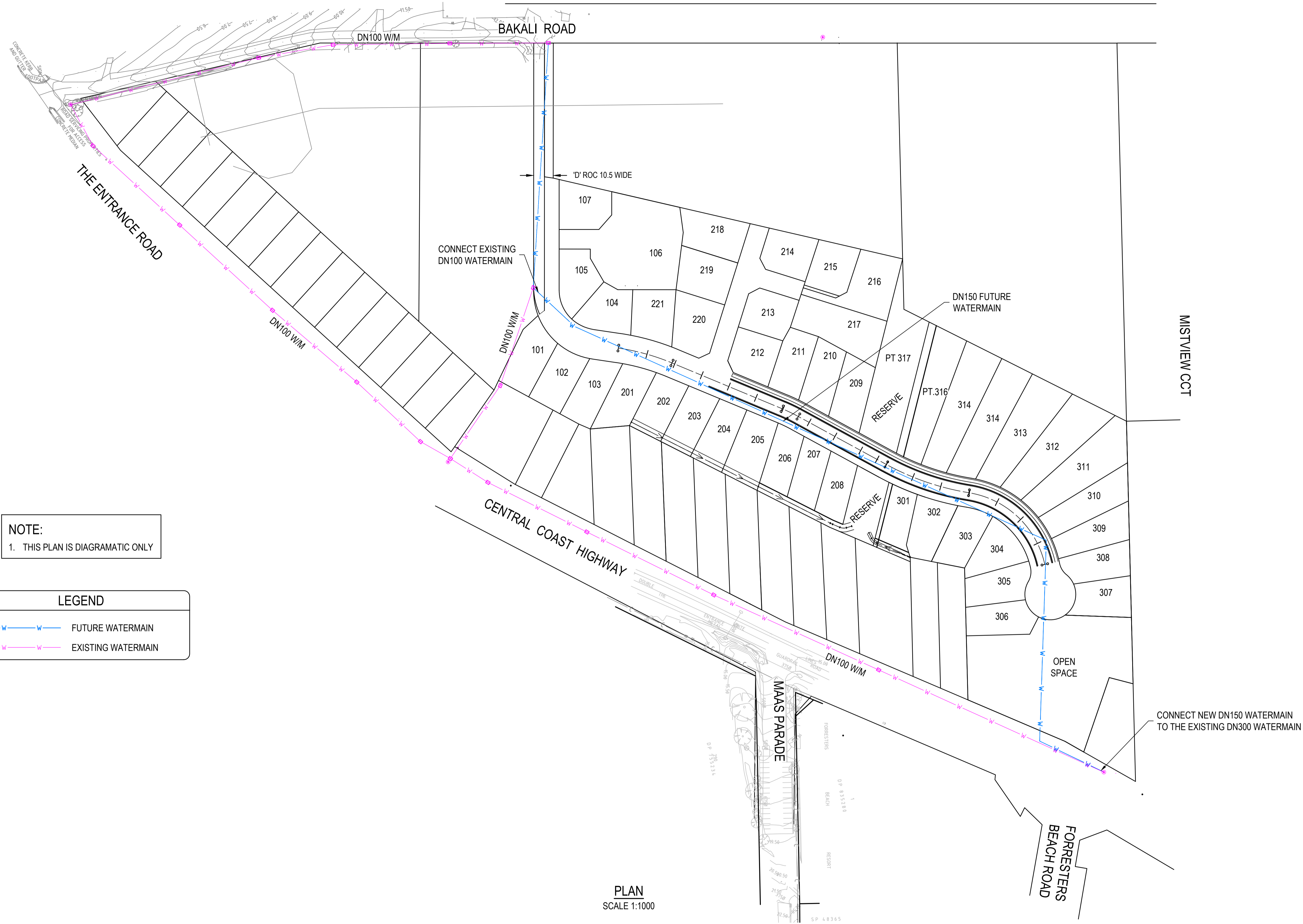
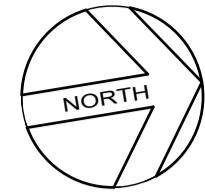
Rev.	Date	Description	Des.	Verif.	Appd.
1	23/12/20	PRELIMINARY AS PART OF WATER & SEWER ASSESSMENT REPORT	PEJ	VC	-

Forresters Beach Planning – Stage 2

APPENDIX B

WATER SERVICING PLAN

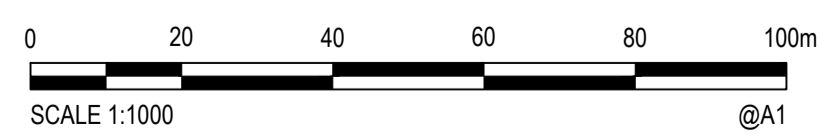
XREFs: x80519020_A1 Title: x80519020_Civil in Survey
 CAD File: \\cardno\cadd\ba\AU\NSW\Water\structure\Projects\80519020-CI-110 [1] Water Plan.dwg
 CTB File: Grp_Cardno_Full.ctb Device Name: AutoCAD PDF (General Documentation).pc3
 SAVE DATE: 23-Dec-20 12:53:57 PM BY: Lais de Brito DATE PLOTTED: 23-Dec-20 11:04:29 PM BY: LAIS DE BRITO



NOTE:
1. THIS PLAN IS DIAGRAMATIC ONLY

LEGEND	
	FUTURE WATERMAIN
	EXISTING WATERMAIN

PLAN
SCALE 1:1000



© Cardno Limited All Rights Reserved.
 This document is produced by Cardno Limited solely for the benefit of and use by the client in accordance with the terms of the retainer. Cardno Limited does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by third party on the content of this document.

Cardno (NSW/ACT) Pty Ltd | ABN 95 001 145 035
 34/205-207 Albany Street North
 Gosford, NSW 2250
 Tel: 02 4323 2558 Fax: 02 4324 3251
 Web: www.cardno.com.au

Drawn	LDB	Date	DEC 2020
Checked	SJB	Date	DEC 2020
Designed	PEJ	Date	DEC 2020
Verified	VC	Date	DEC 2020
Approved		Date	DEC 2020

Client	TERRIGAL GROSVENOR LODGE PTY LTD
Project	FORRESTERS BEACH SUBDIVISION
Title	WATERMAIN DETAILS

Status	PRELIMINARY			
NOT TO BE USED FOR CONSTRUCTION PURPOSES				
Datum	AHD	Register	-	
Scale	1:1000	Size	A1	
Drawing Number	80519020-CI-110		Revision	1

Rev.	Date	Description	Des.	Verif.	Appd.
1	23/12/20	PRELIMINARY AS PART OF WATER & SEWER ASSESSMENT REPORT	PEJ	VC	-

Forresters Beach Planning – Stage 2

APPENDIX C

SPS DESIGN FLOW CALCULATIONS

APPENDIX C - SHEET 1 of 2
TABLE 1

Type	Units	EP/UNIT	EP	ADWWF (0.0021L/s per EP)	A ^A GROSS DEV. AREA (Ha)	d	PDWF (L/s)	Portion Wet	GM (L/s)	Density (EP/Ha)	A eff	I _{1,2}	Factor ^{B1,2a}	Factor ^{Containment}	I	C	IIF (L/s)	PWWF (L/s)
Preschool/Gym/Swimm.			30	0.06	1.12	7.34	0.46	0.50	0.01	26.79	0.47	41.00	1.54	1.00	62.97	0.60	0.50	0.98
Retirement Village	211	2.5	527.5	1.11	21.50	3.43	3.80	0.50	0.27	24.53	8.70	41.00	1.08	1.00	44.17	0.60	6.45	10.52
Approv Subdivision	105	3.5	367.5	0.77	9.40	4.19	3.24	0.50	0.12	39.10	4.80	41.00	1.19	1.00	48.78	0.60	3.93	7.29
Existing Dwellings	15	3.5	52.5	0.11	1.55	6.73	0.74	0.50	0.02	33.87	0.74	41.00	1.48	1.00	60.56	0.60	0.75	1.51
Totals			977.5	2.05	33.57	3.10	6.36	0.50	0.42	29.12	14.79	41.00	1.02	1.00	41.87	0.60	10.40	17.18

L/s

TABLE 2

Type	Units	EP/UNIT	EP	ADWWF (0.0021L/s per EP)	A ^A GROSS DEV. AREA (Ha)	d	PDWF (L/s)	Portion Wet	GM (L/s)	Density (EP/Ha)	A eff	I _{1,2}	Factor ^{B1,2a}	Factor ^{Containment}	I	C	IIF (L/s)	PWWF (L/s)
Preschool/Gym/Swimm.			30	0.06	1.12	7.34	0.46	0.50	0.01	26.79	0.47	41.00	1.54	1.00	62.97	0.60	0.50	0.98
Retirement Village	211	2.5	527.5	1.11	21.50	3.43	3.80	0.50	0.27	24.53	8.70	41.00	1.08	1.00	44.17	0.60	6.45	10.52
Approv Subdivision	105	3.5	367.5	0.77	9.40	4.19	3.24	0.50	0.12	39.10	4.80	41.00	1.19	1.00	48.78	0.60	3.93	7.29
Existing Dwellings	15	3.5	52.5	0.11	1.55	6.73	0.74	0.50	0.02	33.87	0.74	41.00	1.48	1.00	60.56	0.60	0.75	1.51
This Planned Subdivision	52	3.5	182	0.38	7.60	4.43	1.69	0.50	0.10	23.95	3.04	41.00	1.22	1.00	50.04	0.60	2.55	4.34
Totals			1159.5	2.43	41.17	2.96	7.22	0.50	0.51	28.16	17.84	41.00	1.00	1.00	40.86	0.60	12.25	19.98

L/s

APPENDIX C - SHEET 2 of 2

TABLE 3

Type	Units	EP/UNIT	EP	ADWWF (0.0021L/s per EP)	A GROSS DEV. AREA (Ha)	d	PDWWF (L/s)	Portion Wet	GWM (L/s)	Density (EP/Ha)	A _{eff}	I _{1,2}	Factor _{s bar}	Factor _{Comb Inflow Int}	I	C	IIF (L/s)	PWWF (L/s)	
Resort/Shops			120	0.25	0.45	9.36	2.36	0.50	0.01	266.67	0.60	41.00	1.71	1.00	70.25	0.60	0.71	3.07	
Existing Dwellings	955	3.5	3342.5	7.02	29.54	3.19	22.37	0.50	0.37	113.15	25.66	41.00	1.04	1.00	42.52	0.60	18.33	41.07	
Totals			3462.5	7.27	29.99	3.18	23.10	0.50	0.37	115.46	26.31	41.00	1.04	1.00	42.44	0.60	18.76	42.23	
FB2																		6.00	
FB3																		0.50	
FB4																		20.00	
																		PWWF	68.73

L/s

TABLE 3

Type	Units	EP/UNIT	EP	ADWWF (0.0021L/s per EP)	A GROSS DEV. AREA (Ha)	d	PDWWF (L/s)	Portion Wet	GWM (L/s)	Density (EP/Ha)	A _{eff}	I _{1,2}	Factor _{s bar}	Factor _{Comb Inflow Int}	I	C	IIF (L/s)	PWWF (L/s)	
Resort/Shops			120	0.25	0.45	9.36	2.36	0.50	0.01	266.67	0.60	41.00	1.71	1.00	70.25	0.60	0.71	3.07	
Existing Dwellings	955	3.5	3342.5	7.02	29.54	3.19	22.37	0.50	0.37	113.15	25.66	41.00	1.04	1.00	42.52	0.60	18.33	41.07	
Planned Subdivision	17	3.5	59.5	0.12	9.40	4.19	0.52	0.50	0.12	6.33	1.93	41.00	1.19	1.00	48.78	0.60	1.58	2.22	
Totals			3522.0	7.40	39.39	2.99	22.13	0.50	0.49	89.41	30.41	41.00	1.00	1.00	41.08	0.60	20.99	43.61	
FB2																		6.00	
FB3																		0.50	
FB4																		20.00	
																		PWWF	70.11

L/s

About Cardno

Cardno is a professional infrastructure and environmental services company, with expertise in the development and improvement of physical and social infrastructure for communities around the world. Cardno's team includes leading professionals who plan, design, manage and deliver sustainable projects and community programs. Cardno is an international company listed on the Australian Securities Exchange [ASX:CDD].

Contact

Central Coast Office
Suite 34/207 Albany St Nth
Gosford NSW 2250

Phone 61 2 4320 1000
Fax 61 2 4324 3251

cardno@cardno.com
www.cardno.com

