

Memorandum

To: Michael Campbell – Campbell Brown Planning Limited

From: Matt Jones

Date: 17 December 2021

Job No: 1628 M5

Subject: Wastewater Design for the proposed residential subdivision at 2182 East Coast Road, Silverdale, Stages 3 and 4

This Memorandum has been prepared to detail the proposed wastewater drainage for the proposed Build Rich Limited Stage 3 and 4 residential development at 2182 East Coast Road, Silverdale. Stages 3 and 4 form the southern portion of the overall East Coast Heights development, please refer to figure 1 below:



Figure 1: overall East Coast Heights development

Stages 3 and 4 comprise 289 residential lots including two super lots containing 7 and 8 terraced units respectively. This results in a total of 302 household dwellings, please refer to figure 2 below:



Figure 2: extract of ASC Architects site plan of Stages 3 and 4

We have undertaken wastewater flow calculations in accordance with WSL CoP table 5.1.1 and 5.1.4. Please refer to the summary of wastewater flows tabulated in figure 3 below:

Zone	CATCHMENT (m ²)	Gross Floor Area (GFA) (m ²)	NO OF DWELLINGS (1/300m ²)	NO OF DWELLINGS (15/ha)	CATCHMENT POPULATION (assumes 3 persons/dwelling)	ADWF (L/day)	PWWF (L/day)	ADWF (L/sec)	PWWF (L/sec)
Stage 3			164		492	88560	593352	1.03	6.9
Stage 4			53		159	28620	191754	0.33	2.2
Stage 5			70		210	37800	253260	0.44	2.9
Stage 6			7		21	3780	25326	0.04	0.3
Stage 7			8		24	4320	28944	0.05	0.3
TOTAL			302			163080	1092636	1.89	12.65

Figure 3: extract of wastewater flow calculations

The total wastewater flow (PWWF) for all 302 household dwellings is 12.65 litres/sec. The wastewater calculations attached demonstrate that a 150mm diameter uPVC pipe laid at a gradient of 1% has a capacity of 15.5 litres/sec.



Figure 4: preliminary wastewater network layout

It is proposed to provide wastewater drainage to the subdivision predominately with a gravity piped wastewater network and some lots serviced by pressure wastewater reticulation, as shown in Figure 4 above. The subdivision will discharge into the newly installed wastewater manhole in the north western corner of the site. This downstream wastewater system discharges to the new pump station (currently under construction) in the Botanic Retirement Village.



Due to the topography of the site 12 lots in the southwest corner (on Road-1 and Spine Road) of the site and 19 lots off Road-3 on the southern boundary will be serviced by a pressure wastewater reticulation system. Both these pressure systems will pump up into the upstream end wastewater manholes of the gravity system.

The 31 lots (Lots 1 to 4, 153 to 160, 167 to 175, 220 to 225 and 286 to 289 inclusive) above should have a private pump station installed at building consent stage. This requirement should form a consent notice on the title.

All lots and terrace units on the gravity network will be serviced by a 100mm diameter uPVC lot connection. All the 31 lots on pressure wastewater network will be serviced by a wastewater boundary kit.

Please refer to preliminary and general plans 1628-RC-PG101-105 and wastewater plans 1628-RC-WW501 to WW503 attached for the proposed wastewater system layout.

Please feel free to contact us if you require any further information.

Job Number: 1628
Client: Build Rich Limited
Site Details: 2182 East Coast Road, Silverdale (Stages 3 & 4)

1. Use WSL Code of Practice for Subdivision and Development - Part 5 Wastewater

2. Flow Rates from WSL CoP Table 5.1.1 and 5.1.4

ADWF

Urban	180	L/p/day
General Business (GB)	4.33	L/m ² /day

General Business (WR)	15	L/m ² /day
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Peaking Factor	6.7
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Table 5.1.1

Table 5.1.4 Light water users, or up to 2 storeys

Note: m² only relates to GFA, assume 40% of total area

Table 5.1.3 Wet retail

3. Calculate ADWF and PWWF for catchment

Zone	CATCHMENT (m ²)	Gross Floor Area (GFA) (m ²)	NO OF DWELLINGS (1/300m ²)	NO OF DWELLINGS (15/ha)	CATCHMENT POPULATION (assumes 3 persons/dwelling)	ADWF (L/day)	PWWF (L/day)	ADWF (L/sec)	PWWF (L/sec)
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Wastewater Pipe Check



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Post Development Flow Volume (Refer Sheet 1)

$Q_{PWWF} =$ 12.65 l/s

PIPE CAPACITY FORMULA (Full Flow)

Colebrook-White $V = -2\sqrt{(2gDS)} \log(ks/3.7D + 2.51\nu/(D\sqrt{(2gDS)}))$

$\nu = 1.141 \times 10^{-6}$ kinematic viscosity of fluid
(water at 15 degrees)

$k_s = 1.5$ mm (effective roughness)

D= diameter

S= hydraulic gradient

R= $d/4$ (circ. pipes)

$Q = VA$

Capacity Check on 150mm diameter uPVC

Pipe Grade S(%)	Pipe Dia D (m)	Pipe Vel'y (m/s)	PIPE CAP'Y (l/s)
1.0	150	0.88	15.5

Therefore pipe has adequate capacity to cater for development

BUILD RICH LIMITED

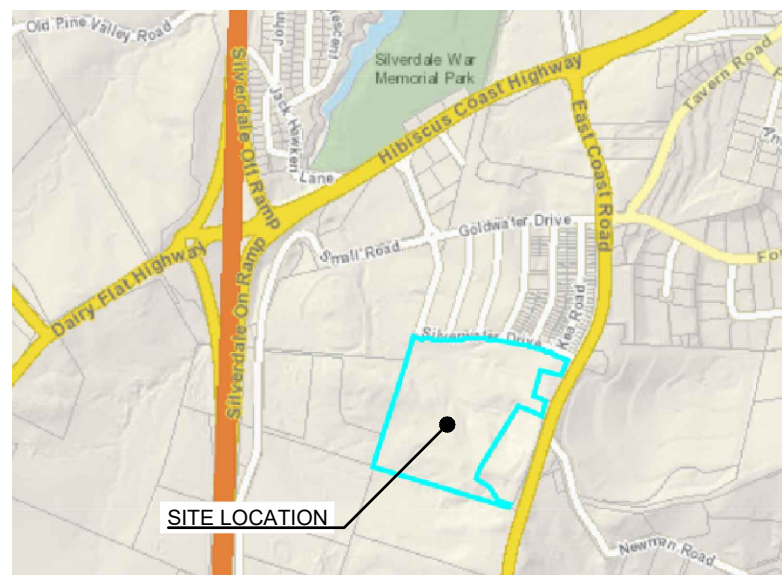
2182 EAST COAST ROAD SILVERDALE

EAST COAST HEIGHTS - STAGE 3 & 4

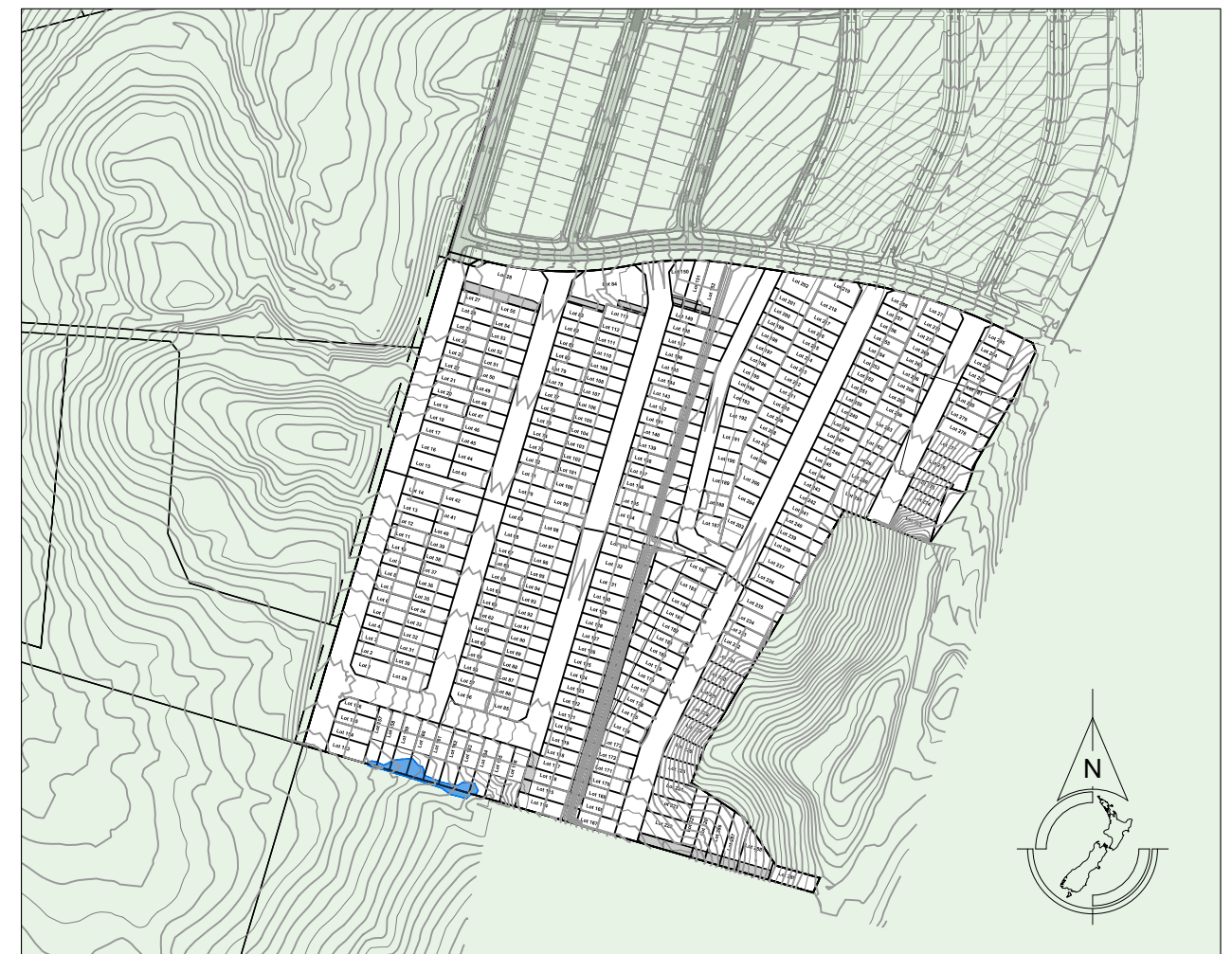
RESOURCE CONSENT PLANS



- PG100 - PRELIMINARY & GENERAL**
- EW200 - EARTHWORKS**
- RD300 - ROADING**
- SW400 - STORMWATER**
- WW500 - WASTEWATER**
- WS600 - WATER SUPPLY**

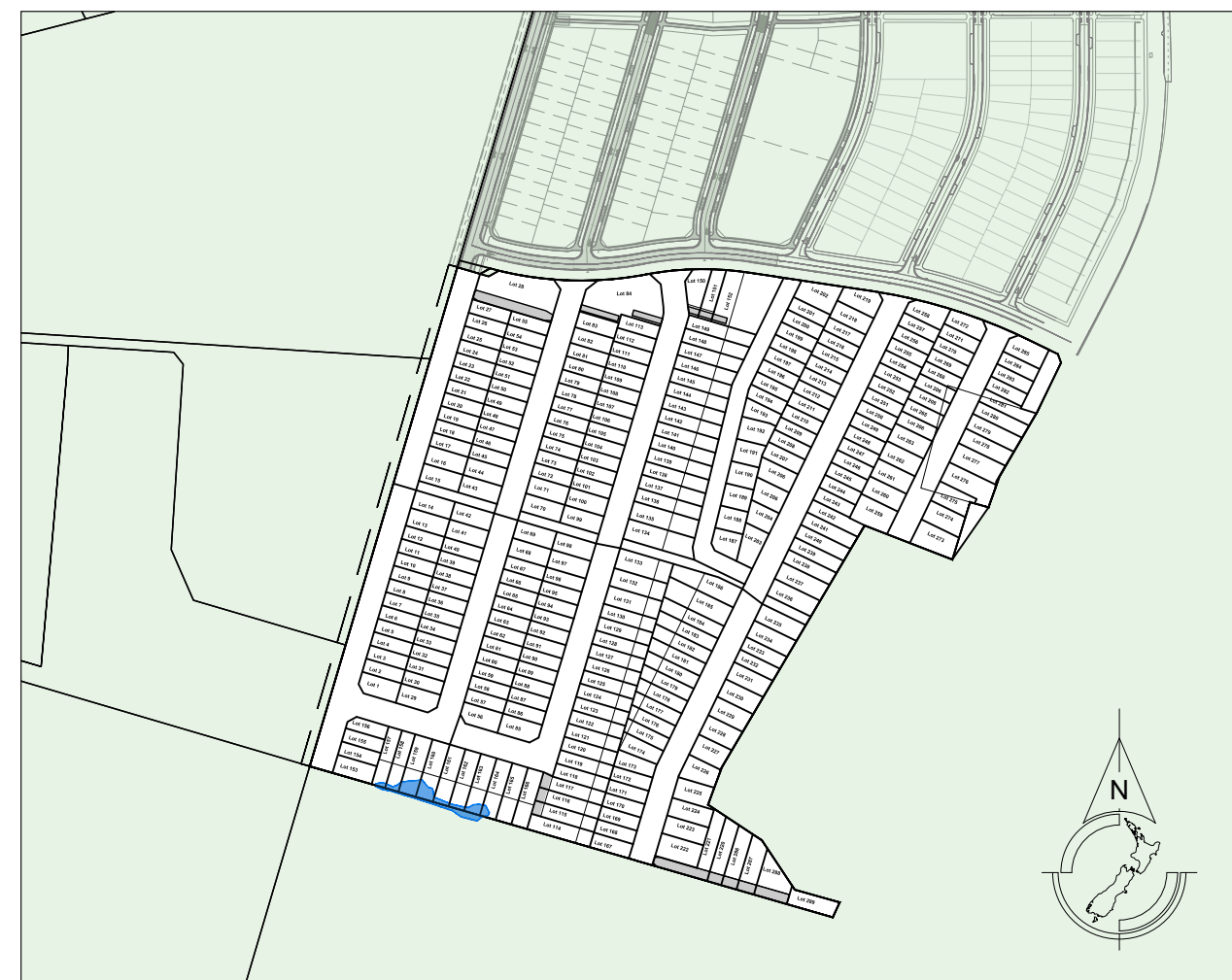


SITE LOCALITY



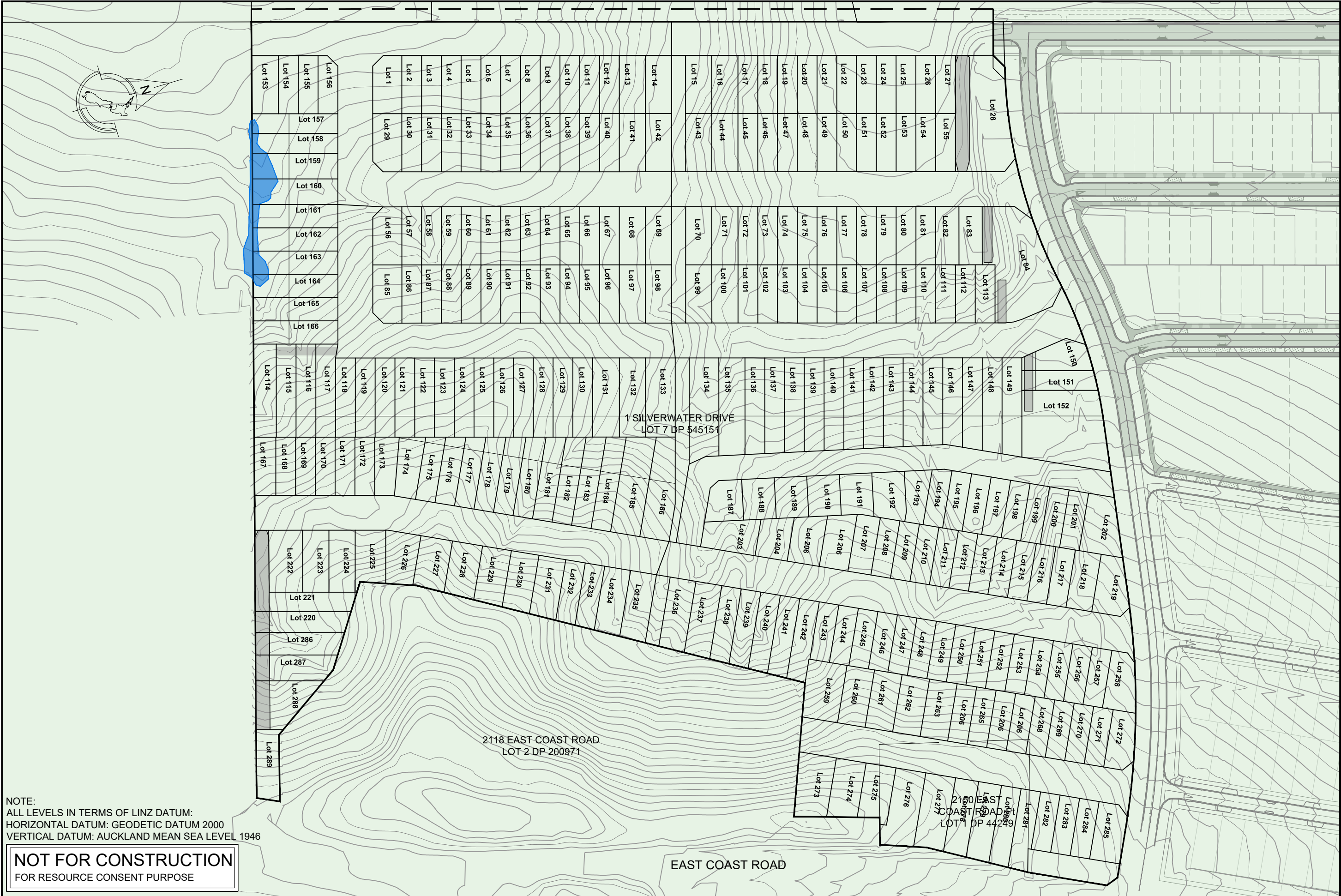
PRELIMINARY & GENERAL PG100

PG101	COVER PAGE
PG102	CONTENTS PAGE
PG103	EXISTING SITE PLAN
PG104	PROPOSED DEVELOPMENT OVERVIEW PLAN
PG105	PROPOSED STAGING PLAN



JOB NUMBER: 1628

REV.	DESCRIPTION	CHECK	APPD	DATE	SCALE	N.T.S AT A3		CLIENT BUILD RICH LIMITED	SITE ADDRESS 2182 EAST COAST ROAD SILVERDALE (STAGE 3 & 4)	DRAWING NUMBER 1628 - RC - PG102		
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					DESIGN CHECK	PF	12.21	Conditions of Use: These drawings shall only be used for the purpose for which they were supplied. Do not measure off this drawing. If doubt please contact Engineer.	DRAWING TITLE CONTENTS PAGE	DATE	REVISION	
					APPROVED	PF	12.21			DEC 2021	-	



NOTE:
ALL LEVELS IN TERMS OF LINZ DATUM:
HORIZONTAL DATUM: GEODETIC DATUM 2000
VERTICAL DATUM: AUCKLAND MEAN SEA LEVEL 1946

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REV.	DESCRIPTION	CHECK	APP'D	DATE	SCALE	1:1500 AT A3	
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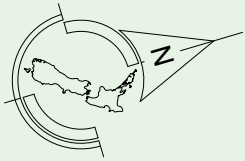
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SITE ADDRESS
2182 EAST COAST ROAD SILVERDALE (STAGE 3 & 4)
DRAWING TITLE
EXISTING SITE PLAN

DRAWING NUMBER	
1628 - RC - PG103	
DATE	REVISION
DEC 2021	-



Ph: 09 426 6552
Web: www.aspeng.co.nz



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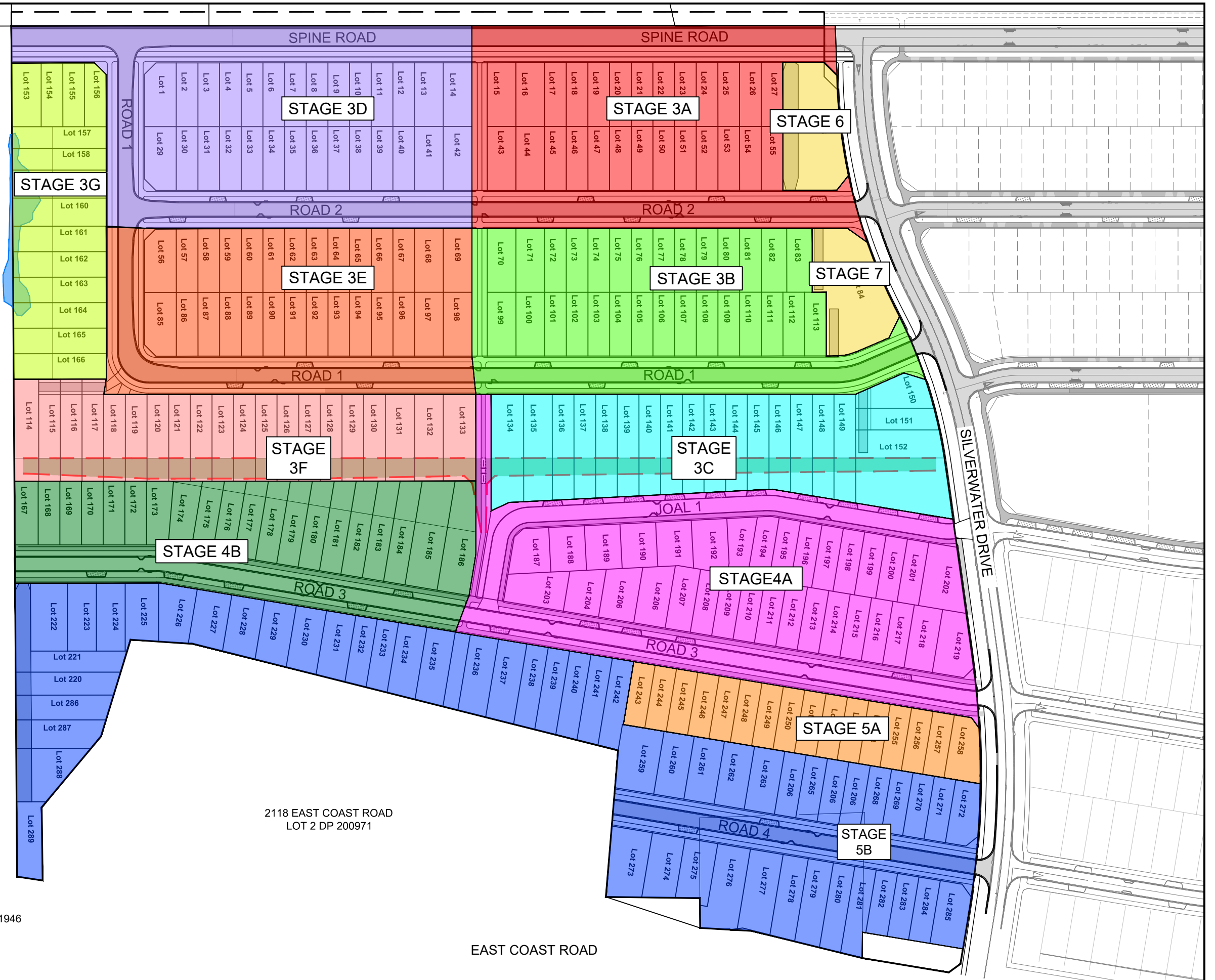
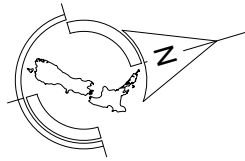
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SITE ADDRESS
2182 EAST COAST ROAD SILVERDALE (STAGE 3 & 4)
DRAWING TITLE
PROPOSED DEVELOPMENT OVERVIEW PLAN

DRAWING NUMBER	
1628 - RC - PG104	
DATE	REVISION
DEC 2021	-

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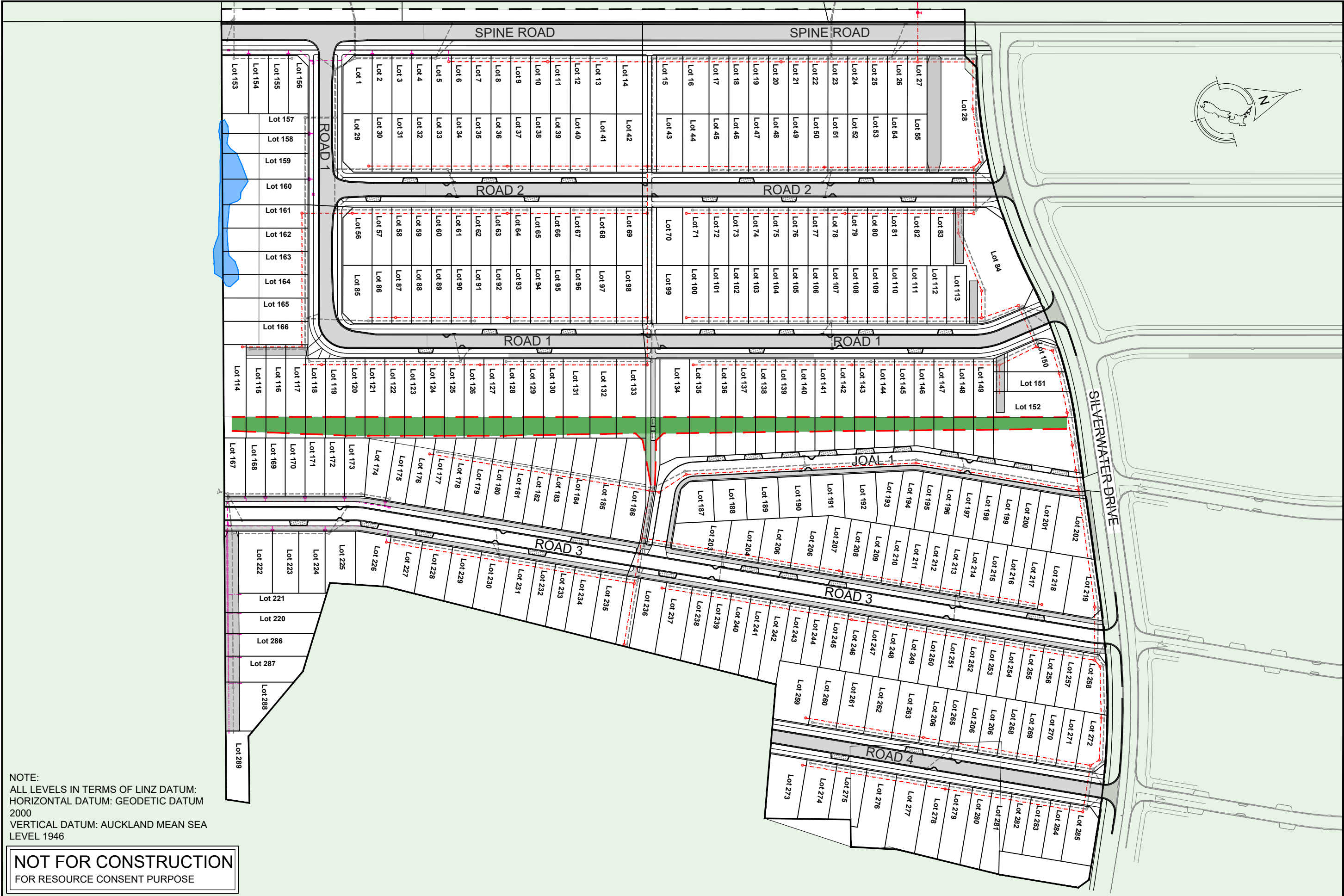
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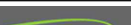
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									DRAWING TITLE PROPOSED DEVELOPMENT STAGING PLAN		DATE DEC 2021		REVISION -	ASPIRE CONSULTING ENGINEERS Ph: 09 426 6552 Web: www.aspeng.co.nz



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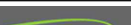
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VERTICAL DATUM: AUCKLAND MEAN SEA LEVEL 1946

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