

Our Ref: NW30076/L001:PDT
Contact: P.D Treloar

18 November 2020

On behalf of Mr Tim Donovan
12A John Street
Avalon NSW 2107

Attention: Tim West – Director THW Architects

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ABN 95 001 145 035

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Dear Sir,

ESTURINE RISK MANAGEMENT REPORT: 12A JOHN STREET, AVALON

Preamble

This technical letter presents a summary of our analyses undertaken in support of your submission for Subdivision Approval to Northern Beaches (formerly Pittwater) Council in relation to your proposed subdivision at 12A John Street, Avalon. **Figure 1-1** shows the location of the site at the southern end of Careel Creek. **Figure 1-2** provides a close-up view of the subject site at the Careel Creek boundary and illustrates the presence of mangrove and she-oak trees and hence the generally sheltered nature of this site.

This report presents summary findings of analyses of severe ARI storm tide levels, wave heights and run-up levels on the Careel Creek side of the block.

Details of the site are shown on the survey prepared by Bee and Lethbridge Pty Ltd, and which is presented in **Appendix A**. Land levels are about 2m AHD along the Careel Creek shoreline, rising to about 3.1m AHD halfway west along the block at the proposed subdivision line. **Appendix A** also includes the indicative footprints of proposed buildings on the site. There is an existing residence on the western 'half' of the block with floor levels in habitable areas of 5.5m AHD or higher.

The purpose of this report is to set down the estuary planning level (EPL) required for future finished floor levels in habitable areas on the subdivided block.

Site Visit

Senior Principal Coastal Engineer Doug Treloar undertook a site visit on Tuesday 10 November 2020, arriving at the site around 09:00 am. Weather conditions were sunny, with a clear sky and no wind. The predicted tidal level at Fort Denison at the time of the visit was approximately +0.8 m LAT (~-0.1 m AHD), with a tidal lag at this site. The property is situated on the south-western foreshore of Careel Creek, in the Careel Bay South precinct of the Pittwater EPL study, see Cardno (2012) and **Figure 1-1**. It has an easterly aspect with a very short fetch to the east-northeast. This is a relatively sheltered location within the upstream region of Careel Creek, with many trees along the local shoreline and short fetches – in the order of 100m or less.

Figure 1-2 and **Figure 1-3** describe the main shoreline and site features on this relatively flat block. The shoreline is protected to some extent by trees and riverine debris. The 2100 design still water level in this precinct is 2.72m AHD and so there is a high possibility that the subdivided area would be inundated in periods of future Tasman Sea storms that raise the water level in Pittwater and Careel Creek. Designated wave run-up would increase the estuary planning level to 3.07m AHD at 2100, including 0.3m freeboard.

However, the location and orientation of the property means that it is in a low wave energy environment, with the property generally protected from wind waves by the local geography, and only small, low energy waves would approach from the short fetches from the general easterly direction. Note that the general Careel Creek South precinct has a 100-years ARI peak storm wave height of 0.69m (Hs), but a site-specific analysis was undertaken for this site, because it is much more protected than the main precinct area, leading to a reduced, nominal 100-years ARI Hs of 0.2m. This leads to a site-specific EPL of 2.82m AHD at 2100.

Note that Barrenjoey Consulting (2019) advise a Flood Planning Level of 3.05m AHD, which is higher than the EPL. Cardno have been advised that the floor levels of habitable areas will be set at 3.05m AHD. **Figure 1-4** describes the footings under the nursing home at 14 John Street. They show that floor levels on that site are raised above the natural surface to an extent similar to what is advised by Barrenjoey Consulting and this report.



Figure 1-1 Locality Plan



Figure 1-2 Careel Creek Shoreline



Figure 1-3 Careel Creek Shoreline



Figure 1-4 Footings at 14 John Street

Provided that finished floor levels for all buildings on the subdivided land are set at 3.05m AHD or above, there will be no wave forces on the sides of buildings because there will be no green water wave overtopping.

Additional Safety Considerations

The design FPL and EPL conditions related to the requirements presented above would be expected to last for less than 6 hours because water level is dominated by the astronomical tide and wind direction changes over such a duration. Although this represents a relatively small amount of time in comparison to the overall length of the year, we note that exterior power supplies on the eastern side of a future building should be located at a level of 3.5m AHD to avoid water contact from splashing.

Yours faithfully,



Doug Treloar
Senior Principal Coastal Engineering
for Cardno
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References

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Appendix A

Site Survey and Development Footprint

STREET

JOHN



TREE TABLE			
No.	TREE TYPE	DIAMETER	HEIGHT
1	PALM	0.20	10
2	PALM	0.20	10
3	PALM	0.20	10
4	MELALEUCA	0.60	12
5	TREE	0.30	8
6	PALM	0.20	10
7	PALM	0.30	8
8	EUCALYPT	0.70	11
9	PALM	0.20	10
10	PALM	0.20	10
11	BLUE GUM	0.40	12
12	PALM	0.20	8
13	CASUARINA	0.40	15
14	CASUARINA	0.40	15
15	BANANA	0.90	7
16	PALM	0.20	8
17	CASUARINA	0.40	15
18	CASUARINA	0.40	15
19	CASUARINA	0.40	13
20	CASUARINA	0.50	14
21	PALM	0.20	9
22	TREE	0.30	7
23	JACARANDA	0.35	9
24	TREE	MULTI 0.50	7
25	TREE	0.40	12
26	PALM	0.30	13
27	TREE	2x0.30	7
28	PALM	0.40	15
29	TREE	0.30	8
30	AVOCADO	MULTI 0.90	6
31	PALM	0.10	6
32	TREE	0.20	9
33	BANKSIA	0.50	12
34	BANANA	MULTI 0.90	6
35	TREE	2x0.20	7
36	JACARANDA	0.20	8
37	TREE	MULTI 0.40	4
38	TREE	0.40	14
39	TREE	2x0.50	15
40	BANANA	MULTI 0.80	7
41	JACARANDA	0.60	7
42	TREE	2x0.50	16
43	TREE	0.30	8
44	PALM	0.20	9
45	TREE	2x0.40	14
46	CASUARINA	2x0.20	12
47	JACARANDA	0.30	14
48	CASUARINA	0.20	10
49	CASUARINA	0.30	8
50	CASUARINA	0.30	12
51	CASUARINA	0.30	10
52	TREE	0.40	6

NOTES:

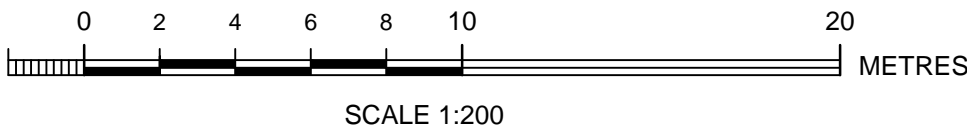
- CAUTION: SHOULD ANY DEVELOPMENT OR CONSTRUCTION BE PLANNED ON OR NEAR THE BOUNDARIES, THE BOUNDARIES SHOULD BE CLEARLY MARKED ON SITE.
- AREA AND DIMENSIONS HAVE BEEN SURVEYED FROM PLANS MADE AVAILABLE AT LAND REGISTRY SERVICES.
- ORIGIN OF LEVELS ON A.H.D. IS TAKEN FROM P.M. 250 RL 10.257 A.H.D.
- TREE SPREADS ARE DIAGRAMMATIC ONLY AND ARE NOT SYMMETRICAL.
- UNDERGROUND (NON VISIBLE) SERVICE LINES HAVE BEEN SHOWN FROM "DIAL BEFORE YOU DIG" SERVICE AUTHORITY RECORDS & ARE DIAGRAMMATIC ONLY IN REGARD TO THEIR POSITION & WIDTH UNLESS STATED OTHERWISE.
- SPOT LEVELS ARE ACCURATE.
- BEARINGS SHOWN ARE ON M.G.A.-(MAP GRID OF AUSTRALIA).

INVESTIGATION OF "DIAL BEFORE YOU DIG" UNDERGROUND SERVICES HAS BEEN MADE. DETECTION OF UNDERGROUND SERVICES IS NOT AN INTEGRAL PART OF THIS SURVEY. ALL RELEVANT AUTHORITIES SHOULD BE NOTIFIED PRIOR TO ANY EXCAVATION ON OR NEAR THE SITE

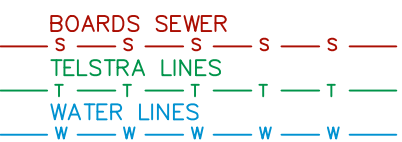
DEVELOPERS & EXCAVATORS MAY BE HELD FINANCIALLY RESPONSIBLE BY THE ASSET OWNER SHOULD THEY DAMAGE UNDERGROUND NETWORKS.

CARELESS DIGGING CAN:
- CAUSE DEATH OR SERIOUS INJURY TO WORKERS AND THE GENERAL PUBLIC
- INCONVENIENCE USERS OF ELECTRICITY, GAS, WATER AND COMMUNICATIONS
- LEAD TO CRIMINAL PROSECUTION AND DAMAGES CLAIMS
- CAUSE EXPENSIVE FINANCIAL LOSSES TO BUSINESS
- CUT OFF EMERGENCY SERVICES
- DELAY PROJECT COMPLETION TIMES WHILE THE DAMAGE IS REPAIRED

MINIMISE YOUR RISK AND DIAL BEFORE YOU DIG.
TEL. 1100



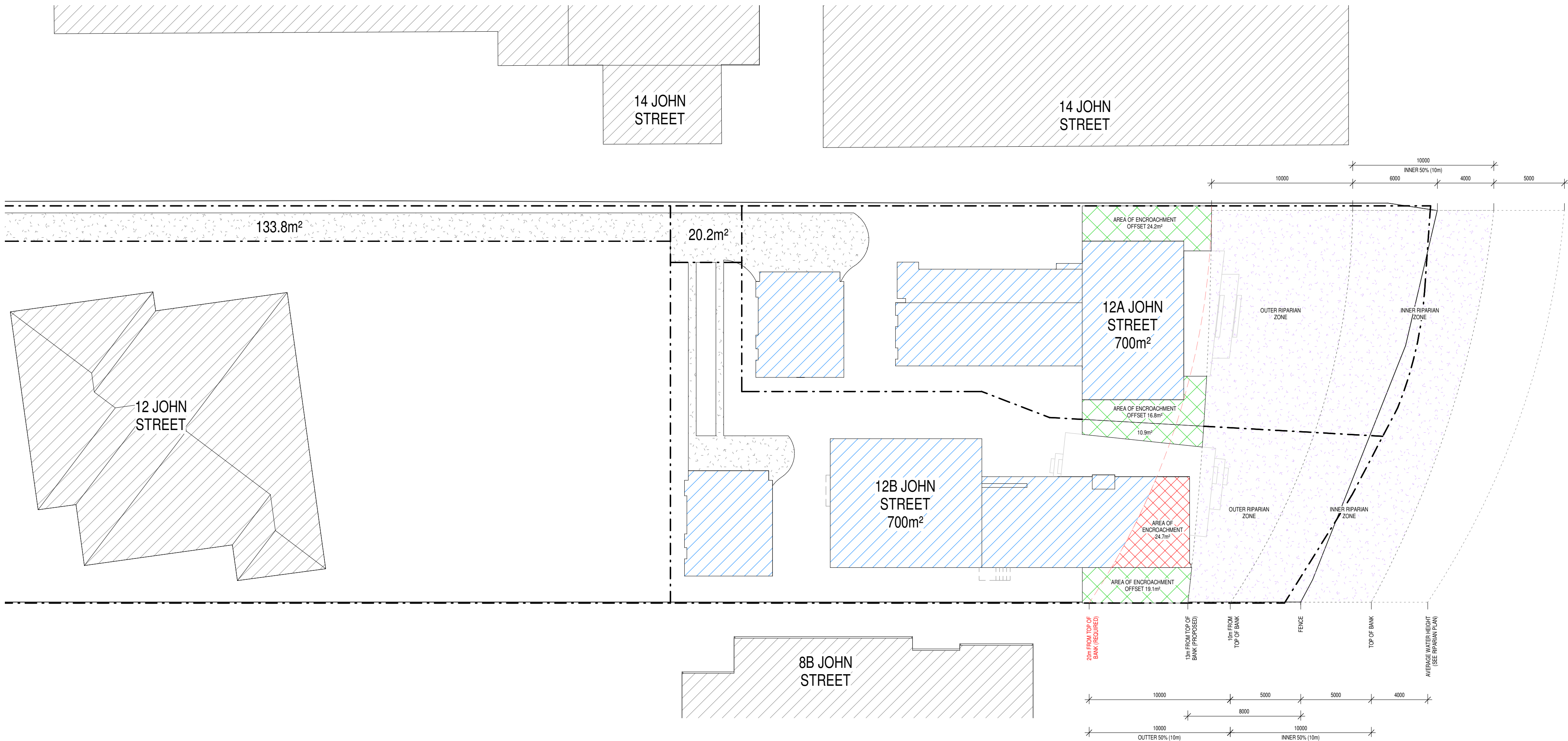
LEGEND



- (A) RIGHT OF ACCESS 2.5 WIDE (D.P. 1237357)
(B) RIGHT OF ACCESS VARIABLE WIDTH (D.P. 1237357)
(C) EASEMENT FOR DRAINAGE OF WATER 2.5 WIDE (D.P. 1237357)
(D) EASEMENT FOR DRAINAGE OF WATER 2 WIDE (D.P. 1237357)
(E) EASEMENT FOR DRAINAGE OF WATER VARIABLE WIDTH (D.P. 1237357)

PLAN SHOWING BOUNDARIES, RELATIVE HEIGHTS & PHYSICAL FEATURES OVER LOT 1 IN D.P. 1237357 KNOWN AS No. 12A JOHN STREET, AVALON.

L.G.A.: NORTHERN BEACHES



1 12A-B JOHN ST SUBDIVISION
306 1 : 200

KEY:
PROPOSED SITE
RIPARIAN ZONE
ENCROACHMENT
OFFSET (71m²)



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									<div>DRAWING NAME 12A-B JOHN ST SUBDIVISION</div>		<div>DRAWING NUMBER A 306</div>			
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