



Flood Control Certificate

Project no: 200831

Issue: A

Date: 28.07.2021

Client: Nicole Keogh

Engineer: Kostas Oikonomou

Principal review: Michael Wachjo

Council: Northern Beaches Council (Pittwater Area)

Site: 1031 Barrenjoey Road, Palm Beach

Northern Beaches Consulting Engineers (NBCE) has assessed the architectural plans provided by O2 Architecture (dated 15/07/2021) and survey plan provided by C.M.S. Surveyors (dated 11/06/2021) for alterations and additions at the above site address in reference to potential flood issues. Refer Appendix C for architectural plans and survey.

NBCE has analysed the general drainage patterns of the catchment and has considered the effects of mainstream flooding as determined in the Avalon to Palm Beach Floodplain Risk Management Study and Plan (2017) with respect to the proposed development. This certificate has been prepared in accordance with:

- *Australian Rainfall and Runoff 2019*
- *Northern Beaches Council (Pittwater Area)*
- *Pittwater Local Environmental Plan 2014 (LEP)*
- *Pittwater 21 Development Control Plan (DCP) – Section 3.11 Flood Prone Land*
- *NSW Government Floodplain Management Manual (2005)*
- *Council supplied flood information and advise*

The site flooding extent has been determined using Council's available flood information (Refer Appendix B). All relevant flood information is shown below:

1% AEP Flood Level:	2.36m AHD
Highest Flood Planning Level (FPL):	2.86m AHD
Probable Maximum Flood (PMF) level:	2.49m AHD
Flood Category:	Flood Fringe
Flood Risk Precinct:	Low-Medium
Flood characteristics (subject site):	
* Maximum 1% AEP Flood Depth	0.47m above surface level
* Degree of Inundation	Partial
Existing Timber Deck (RL) Level:	2.58m AHD
Proposed Timber Deck (RL) Level:	2.58m AHD

The proposed development seeks certification of an existing timber deck structure (Refer Area [A] in Appendix A) and its extension towards the southeast boundary (Refer Area [B] in Appendix A).

The existing and proposed timber deck structure are shown above the predicted flood levels for the 1% AEP flood event & PMF.

Furthermore, the deck structure **must** be of an open design and provide minimum 50% open area up to the 1% Flood Level along the northeast and southeast boundary and allow flood water to enter and enter and exit the deck structure unimpeded.



The proposed development is not envisaged to have a detrimental effect on neighboring properties. The proposed development generally meets the requirements of *Northern Beaches Council (Pittwater) DCP* provided the recommendations within this report are implemented. A development application is recommended.

We trust that this certificate meets with your requirements. Please contact the author if further clarification is required.

NORTHERN BEACHES CONSULTING ENGINEERS P/L

Author:

Kostas Oikonomou
Design Engineer | BE(Civil) TMIEAust

Reviewed By:

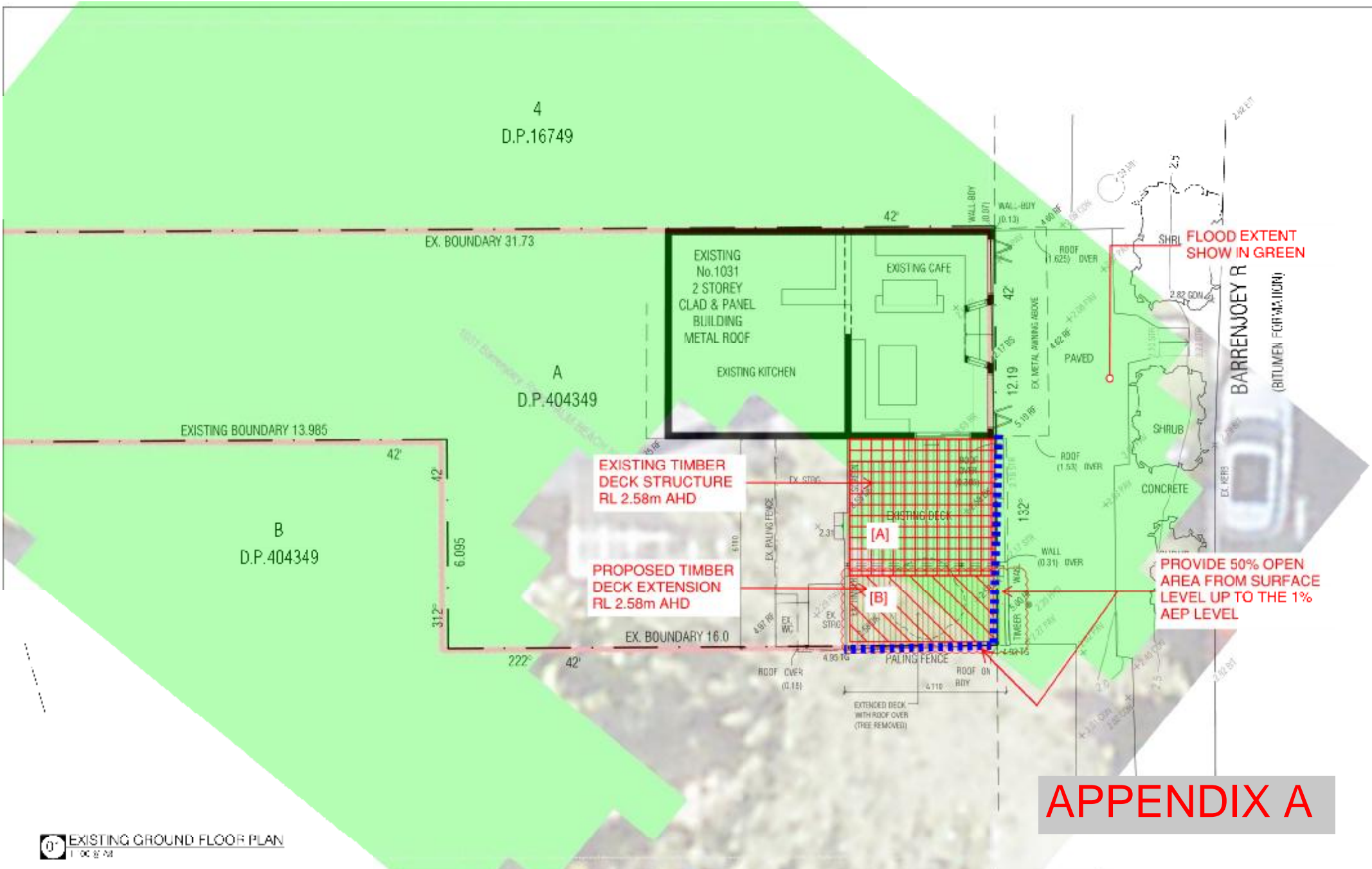
Michael Wachjo
Senior Engineer | BE(Civil) MIEAust Director

X:\Synergy\Projects\200831 1031 BARRENJOEY ROAD, PALM BEACH\ENG Design\FLOOD\200831 Flood Certificate.doc



APPENDIX A

Flood Extent and Post Development Site Overlay



APPENDIX A

01 EXISTING GROUND FLOOR PLAN
1:00 @ A4

20/01/2015 No. 1031 - PALM BEACH A 15.07.21 ISSUED FOR BUILDING CERTIFICATE		o2 architecture interior design project management masterplanning 6/13 15 small st ulima nsw 2007 t 02 9888 9839 f k@o2architecture.com.au www.o2architecture.com.au		PROJECT WORKS AS EXECUTED 1031 BARRENJOEY ROAD, PALM BEACH NICKI KEOGH		NORTH 		DRAW TITLE WAE - EXISTING GROUND FLOOR PLAN			
DATE	20/01/2015	SCALE	1:100 @ A4	TRACED	NO	DATE	20/01/2015	SCALE	1:100 @ A4	TRACED	NO
NO.	2136	PROJECT	BC01	REV.	A						



APPENDIX B

Council Flood Information



FLOOD INFORMATION REQUEST - BASIC

Property: 1031 Barrenjoey Road PALM BEACH NSW 2108

Lot DP: Lot A DP 404349

Issue Date: 16/06/2021

Flood Study Reference: Avalon to Palm Beach Floodplain Risk Management Study and Plan 2017, Manly Hydraulics Laboratory

Flood Information for lot 1:

Flood Risk Precinct – See Map A

Flood Planning Area – See Map A

Maximum Flood Planning Level (FPL) ^{2, 3, 4}: 2.86 m AHD

1% AEP Flood – See Flood Map B

1% AEP Maximum Water Level ^{2, 3}: 2.36 m AHD

1% AEP Maximum Depth from natural ground level³: 0.47 m

1% AEP Maximum Velocity: 0.48 m/s

1% AEP Hydraulic Categorisation: Flood fringe See Flood Map D

Probable Maximum Flood (PMF) – See Flood Map C

PMF Maximum Water Level ⁴: 2.49 m AHD

PMF Maximum Depth from natural ground level: 0.60 m

PMF Maximum Velocity: 0.69 m/s

Flood Life Hazard Category – See Map E

¹ The flood information does not take into account any local overland flow issues nor private stormwater drainage systems.

² Overland flow/mainstream water levels may vary across a sloping site, resulting in variable minimum floor/flood planning levels across the site. The maximum Flood Planning Level may be in a different location to the maximum 1% AEP flood level.

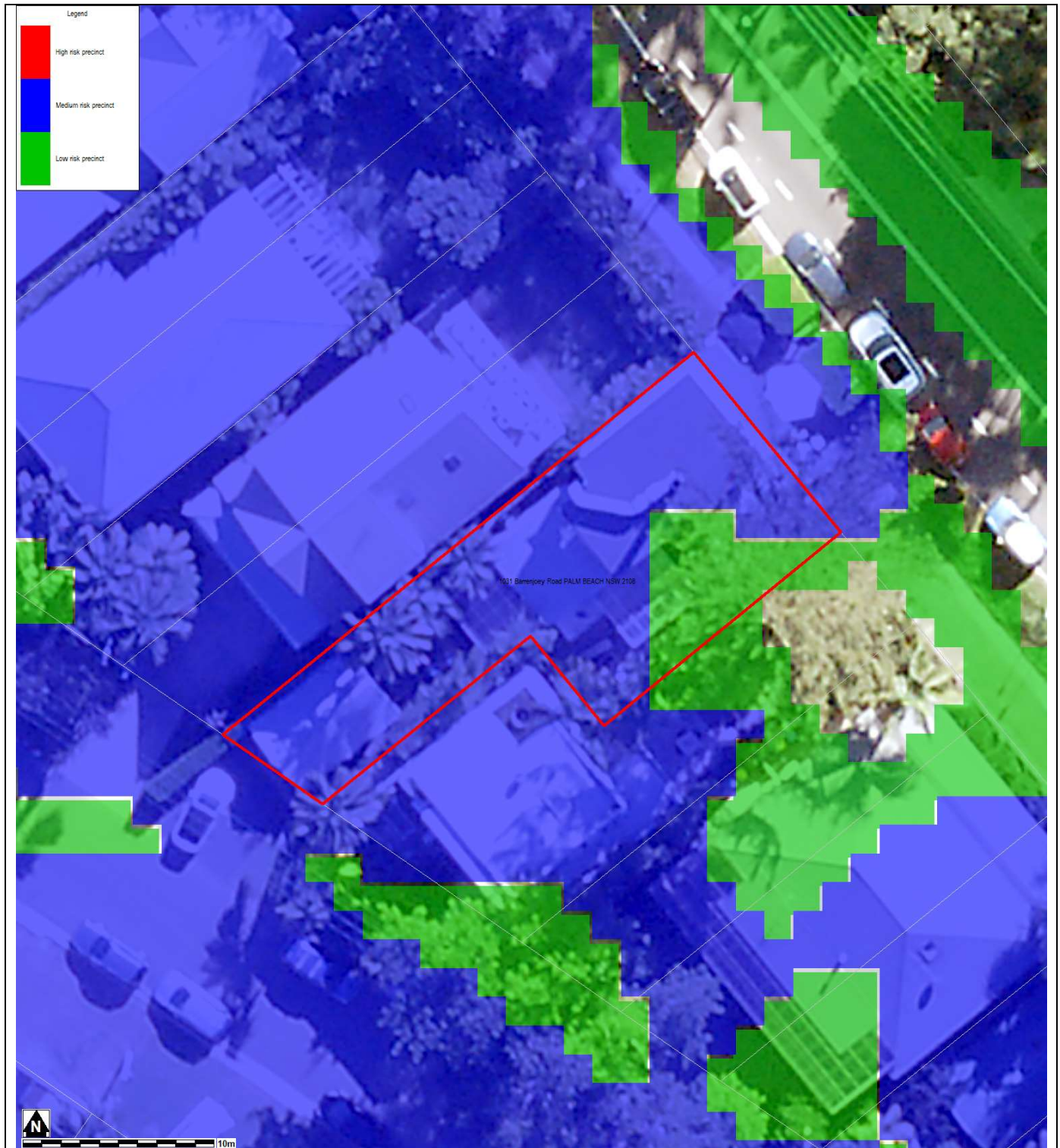
³ Intensification of development in the former Pittwater LGA requires the consideration of climate change impacts which may result in higher minimum floor levels.

⁴ Vulnerable/critical developments require higher minimum floor levels using the higher of the PMF or FPL.

General Notes:

- All levels are based on Australian Height Datum (AHD) unless otherwise noted.
- This is currently the best available information on flooding; it may be subject to change in the future.
- Council recommends that you obtain a detailed survey of the above property and surrounds to AHD by a registered surveyor to determine any features that may influence the predicted extent or frequency of flooding. It is recommended you compare the flood level to the ground and floor levels to determine the level of risk the property may experience should flooding occur.
- Development approval is dependent on a range of issues, including compliance with all relevant provisions of Northern Beaches Council's Local Environmental Plans and Development Control Plans.
- Please note that the information contained within this letter is general advice only as a detail survey of the property as well as other information is not available. Council recommends that you engage a suitably experienced consultant to provide site specific flooding advice prior to making any decisions relating to the purchase or development of this property.
- The Flood Studies on which Council's flood information is based are available on Council's website.

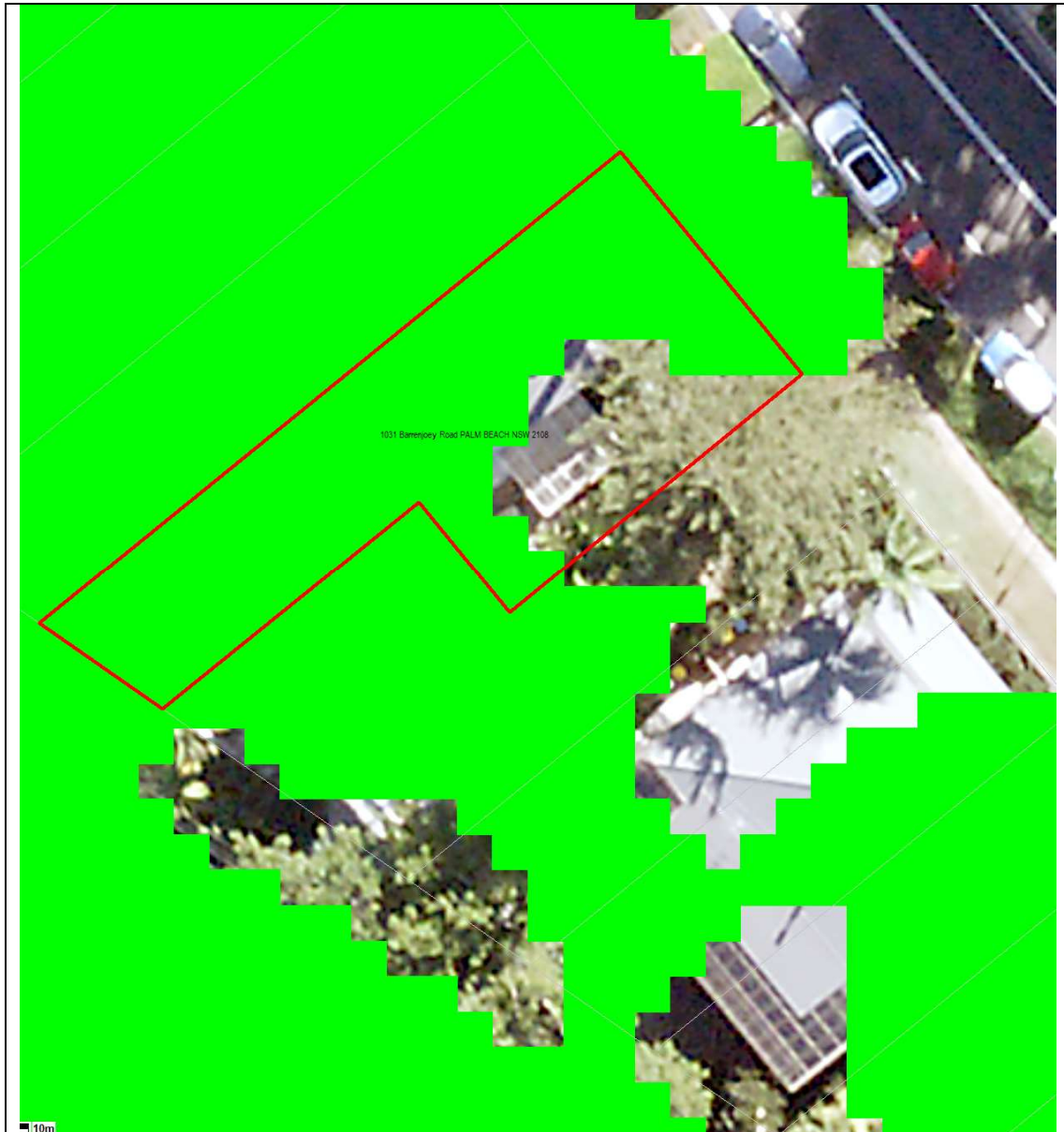
FLOOD MAP A: FLOOD RISK PRECINCT MAP



Notes:

- **Low Flood Risk precinct** means all flood prone land not identified within the High or Medium flood risk precincts.
- **Medium Flood Risk precinct** means all flood prone land that is (a) within the 1% AEP Flood Planning Area; and (b) is not within the high flood risk precinct.
- **High Flood Risk precinct** means all flood prone land (a) within the 1% AEP Flood Planning Area; and (b) is either subject to a high hydraulic hazard, within the floodway or subject to significant evacuation difficulties (H5 or H6 Life Hazard Classification)
- The **Flood Planning Area** extent is equivalent to the Medium Flood Risk Precinct extent, and includes the High Flood Risk Precinct within it. The mapped extent represents the 1% annual Exceedance Probability (AEP) flood event + freeboard.
- None of these mapped extents include climate change.

FLOOD MAP B: FLOODING - 1% AEP EXTENT



Notes:

- Extent represents the 1% annual Exceedance Probability (AEP) flood event.
- Flood events exceeding the 1% AEP can occur on this site.
- Extent does not include climate change.
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Avalon to Palm Beach Floodplain Risk Management Study and Plan 2017, Manly Hydraulics Laboratory) and aerial photography (Source: NearMap 2014) are indicative only.

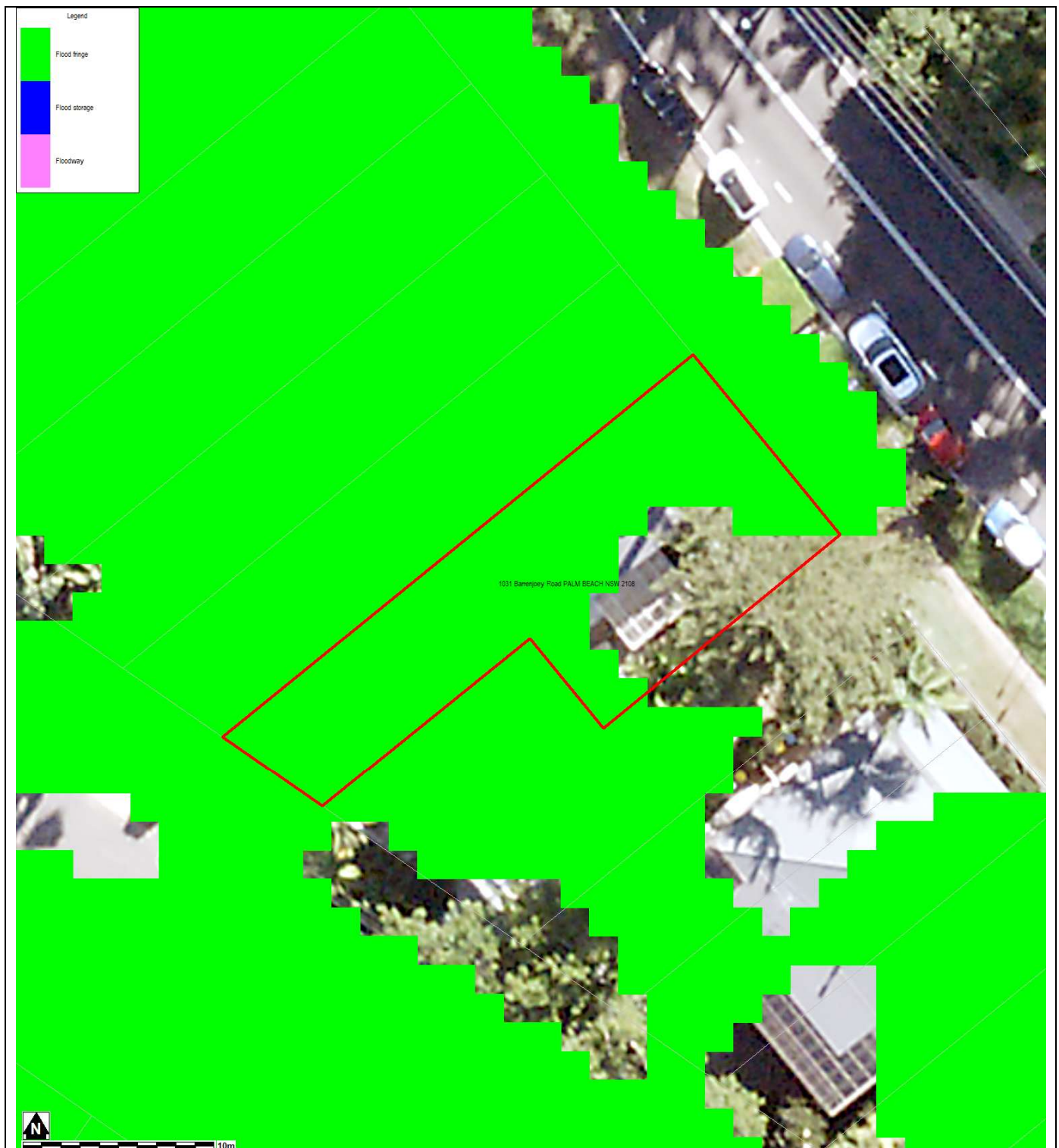
FLOOD MAP C: PROBABLE MAXIMUM FLOOD EXTENT



Notes:

- Extent represents the Probable Maximum Flood (PMF) flood event.
- Extent does not include climate change.
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Avalon to Palm Beach Floodplain Risk Management Study and Plan 2017, Manly Hydraulics Laboratory) and aerial photography (Source: NearMap 2014) are indicative only.

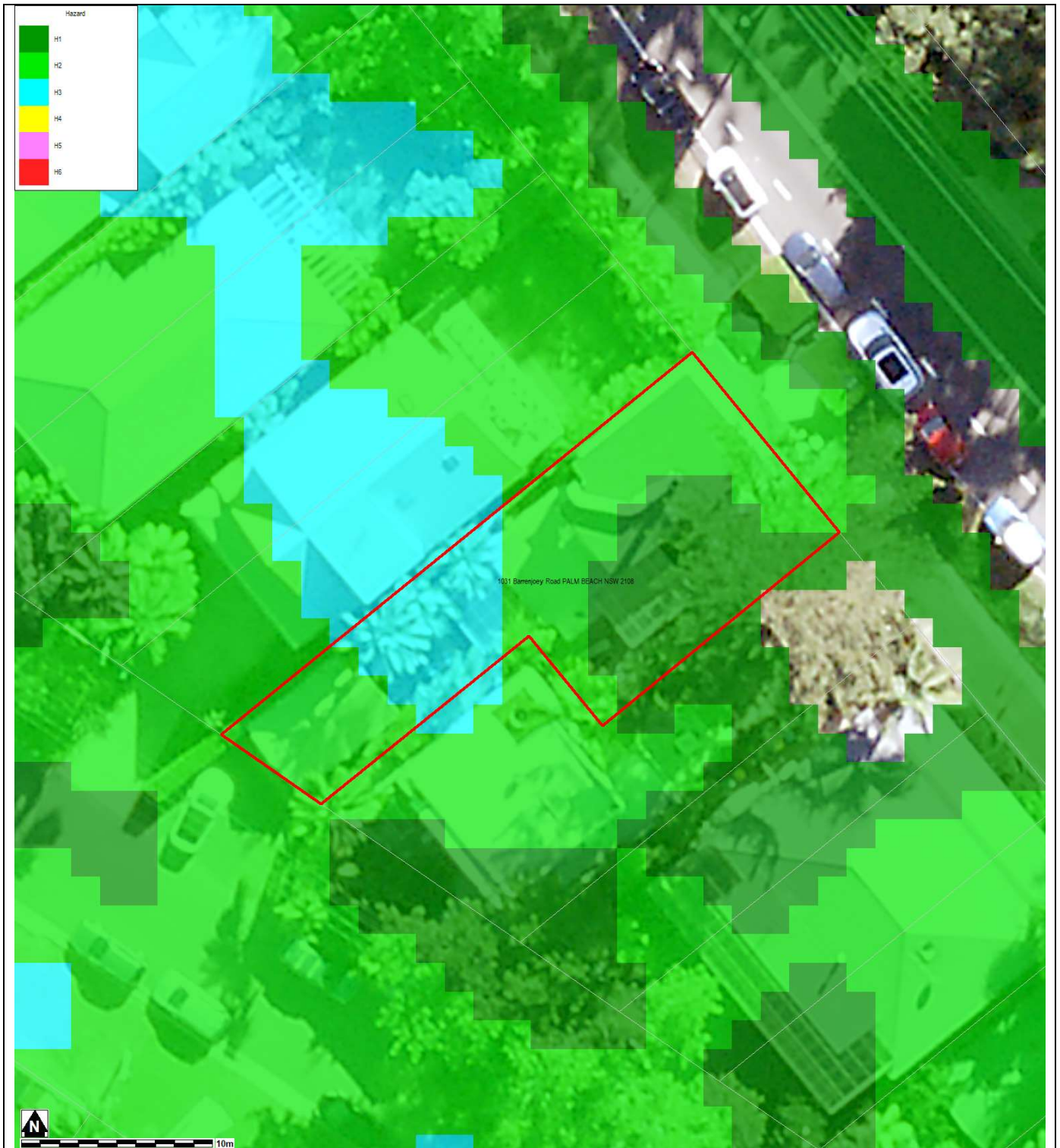
FLOOD MAP D: 1% AEP FLOOD HYDRAULIC CATEGORY EXTENT MAP



Notes:

- Extent represents the 1% annual Exceedance Probability (AEP) flood event.
- Extent does not include climate change.
- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Avalon to Palm Beach Floodplain Risk Management Study and Plan 2017, Manly Hydraulics Laboratory) and aerial photography (Source: NearMap 2014) are indicative only.

FLOOD MAP E: FLOOD LIFE HAZARD CATEGORY



Notes:

- Cadastre Lines (Source: NSW Government Land and Property Information), flood levels/extents (Source: Avalon to Palm Beach Floodplain Risk Management Study and Plan 2017, Manly Hydraulics Laboratory) and aerial photography (Source: NearMap 2014) are indicative only.

Preparation of a Flood Management Report

Introduction

These guidelines are intended to provide advice to applicants on how to determine what rules apply on flood prone land, and how to prepare a Flood Management Report. The purpose of a Flood Management Report is to demonstrate how a proposed development will comply with flood related planning requirements.

Planning Requirements for Flood Prone Land

Development must comply with the requirements for developing flood prone land set out in the relevant Local Environment Plan (LEP) and Development Control Plan (DCP). There are separate LEPs and DCPs for each of the former Local Government Areas (LGAs), although preparation of a LGA-wide LEP and DCP is currently under way.

The clauses specific to flooding in the LEPs and DCPs are as follows:

LEP Clauses	DCP Clauses
Manly LEP (2013) – 6.3 Flood Planning	Manly DCP (2013) – 5.4.3 Flood Prone Land
Warringah LEP (2011) – 6.3 Flood Planning Warringah LEP (2000) – 47 Flood Affected Land *	Warringah DCP (2011) – E11 Flood Prone Land
Pittwater LEP (2014) – 7.3 Flood Planning Pittwater LEP (2014) – 7.4 Flood Risk Management	Pittwater 21 DCP (2014) – B3.11 Flood Prone Land Pittwater 21 DCP (2014) – B3.12 Climate Change

* The Warringah LEP (2000) is relevant only for the “deferred lands” which affects only a very small number of properties, mostly in the Oxford Falls area.

Development on flood prone land must also comply with Council’s Water Management for Development Policy, and if it is in the Warriewood Release Area, with the Warriewood Valley Water Management Specification. Guidelines for Flood Emergency Response Planning are available for addressing emergency response requirements in the DCP. These documents can be found on Council’s website on the [Flooding page](#).

Note that if the property is affected by estuarine flooding or other coastal issues, these need to be addressed separately under the relevant DCP clauses.

When is a Flood Management Report required?

A Flood Management Report must be submitted with any Development Application on flood prone land (with exceptions noted below), for Council to consider the potential flood impacts and applicable controls. For Residential or Commercial development, it is required for development on land identified within the Medium or High Flood Risk Precinct. For Vulnerable or Critical development, it is required if it is within any Flood Risk Precinct.

There are some circumstances where a formal Flood Management Report undertaken by a professional engineer may not be required. However the relevant parts of the DCP and LEP would still need to be addressed, so as to demonstrate compliance. Examples where this may apply include:

- If all proposed works are located outside the relevant Flood Risk Precinct extent
- First floor addition only, where the floor level is above the Probable Maximum Flood level
- Internal works only, where habitable floor areas below the FPL are not being increased

Note that development on flood prone land will still be assessed for compliance with the relevant DCP and LEP, and may still be subject to flood related development controls.

What is the purpose of a Flood Management Report?

The purpose of a Flood Management Report is to demonstrate how a proposed development will comply with flood planning requirements, particularly the development controls outlined in the relevant LEP and DCP clauses. The report must detail the design, measures and controls needed to achieve compliance, following the steps outlined below.

A Flood Management Report should reflect the size, type and location of the development, proportionate to the scope of the works proposed, and considering its relationship to surrounding development. The report should also assess the flood risk to life and property.

Preparation of a Flood Management Report

The technical requirements for a Flood Management Report include (where relevant):

1. Description of development

- Outline of the proposed development, with plans if necessary for clarity
- Use of the building, hours of operation, proposed traffic usage or movement
- Type of use, eg vulnerable, critical, residential, business, industrial, subdivision, etc

2. Flood analysis

- 1% AEP flood level
- Flood Planning Level (FPL)
- Probable Maximum Flood (PMF) level
- Flood Risk Precinct, ie High, Medium or Low
- Flood Life Hazard Category
- Mapping of relevant extents
- Flood characteristics for the site, eg depth, velocity, hazard and hydraulic category, and the relevance to the proposed development

If the property is affected by an Estuarine Planning Level (EPL) which is higher than the FPL, then the EPL should be used as the FPL. If the FPL is higher than the PMF level, then the FPL should still be used as the FPL, as it includes freeboard which the PMF does not.

3. Assessment of impacts

- Summary of compliance for each category of the DCP, as per the table below.

	Compliance		
	N/A	Yes	No
A) Flood effects caused by Development			
B) Building Components & Structural Soundness			
C) Floor Levels			
D) Car parking			
E) Emergency Response			
F) Fencing			
G) Storage of Goods			
H) Pools			

- Demonstration of how the development complies with any relevant flood planning requirements from the DCP, LEP, Water Management for Development Policy, and if it is in the Warriewood Valley Urban Land Release Area, with the Warriewood Valley Water Management Specification (2001)

- For any non-compliance, a justification for why the development should still be considered.
- Calculations of available flood storage if compensatory flood storage is proposed
- Plan of the proposed development site showing the predicted 1% AEP and PMF flood extents, as well as any high hazard or floodway affectation
- Development recommendations and construction methodologies
- Qualifications of author - Council requires that the Flood Management Report be prepared by a suitably qualified Engineer with experience in flood design / management who has, or is eligible for, membership to the Institution of Engineers Australia
- Any flood advice provided by Council
- Any other details which may be relevant

Further information and guidelines for development are available on Council's website at:

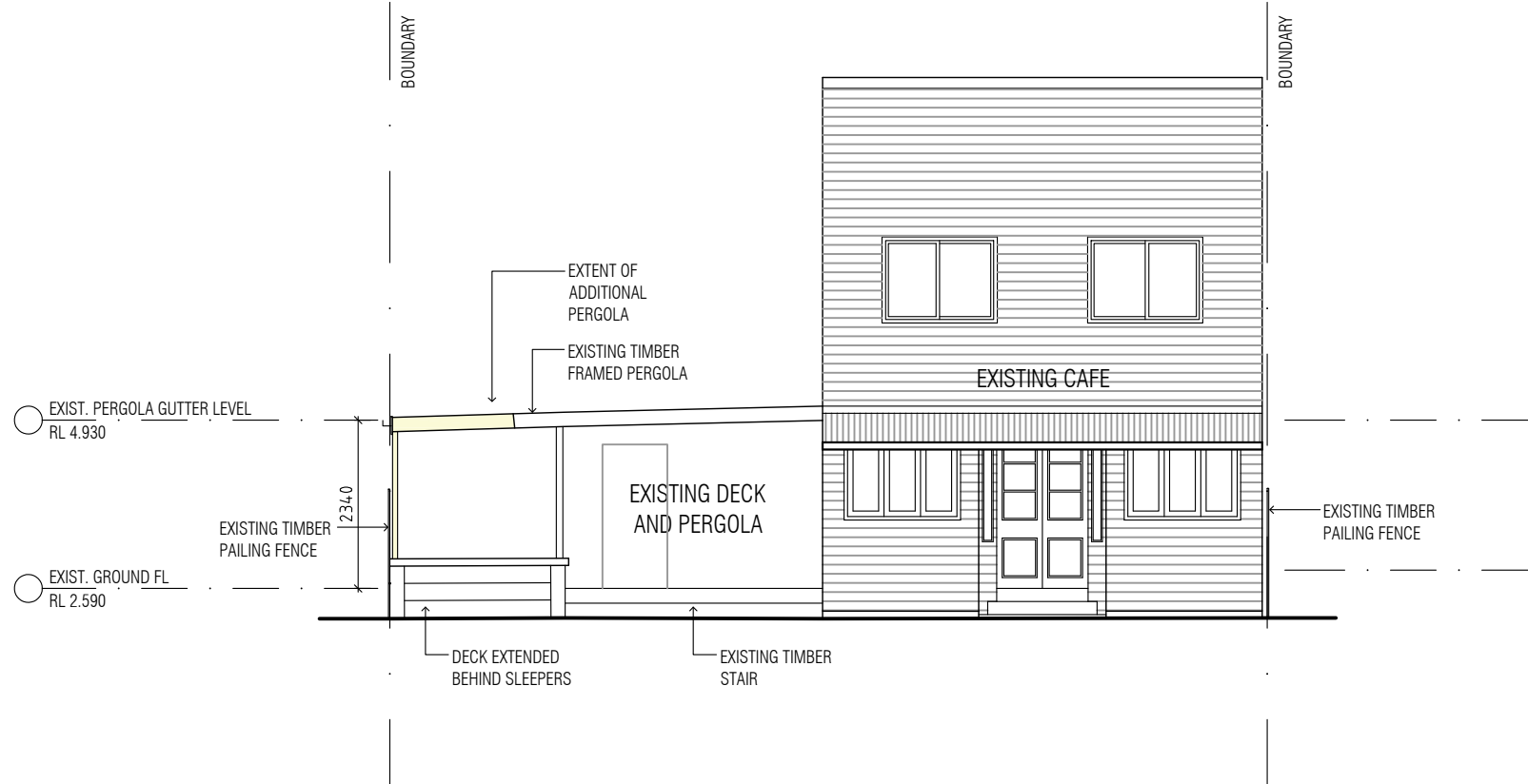
<https://www.northernbeaches.nsw.gov.au/planning-and-development/building-and-renovations/development-applications/guidelines-development-flood-prone-land>

Council's Flood Team may be contacted on 1300 434 434 or at floodplain@northernbeaches.nsw.gov.au .



APPENDIX C

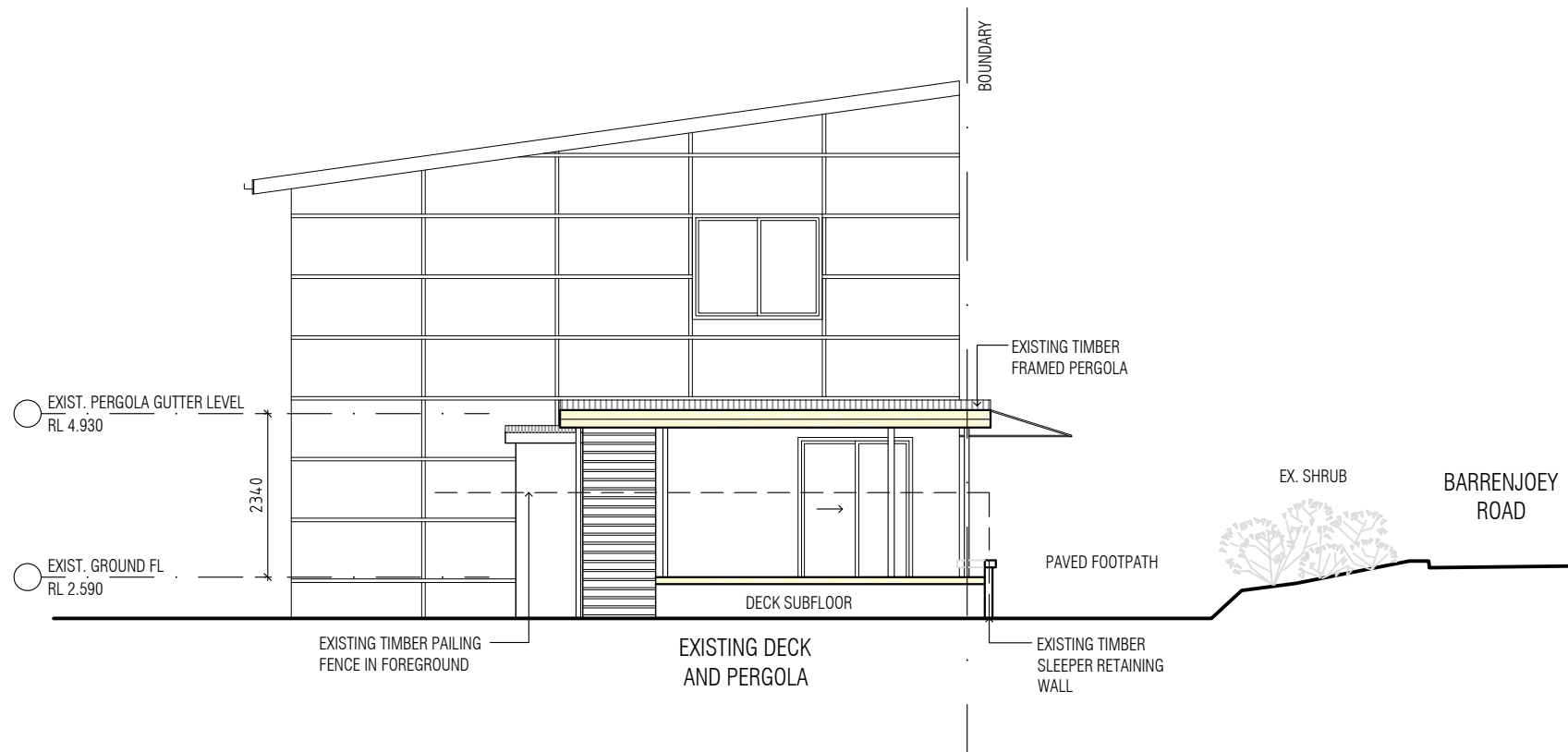
Proposed Development Plans



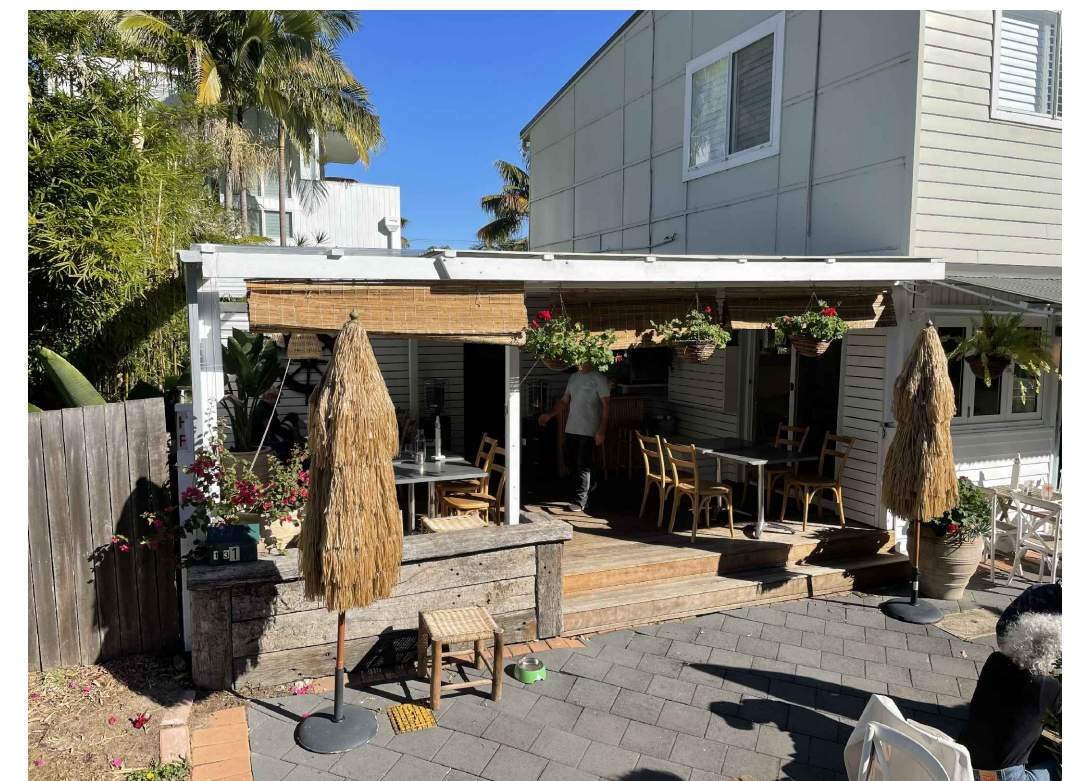
01 EXISTING FRONT ELEVATION
1:100 @ A3



STREET VIEW OF CAFE

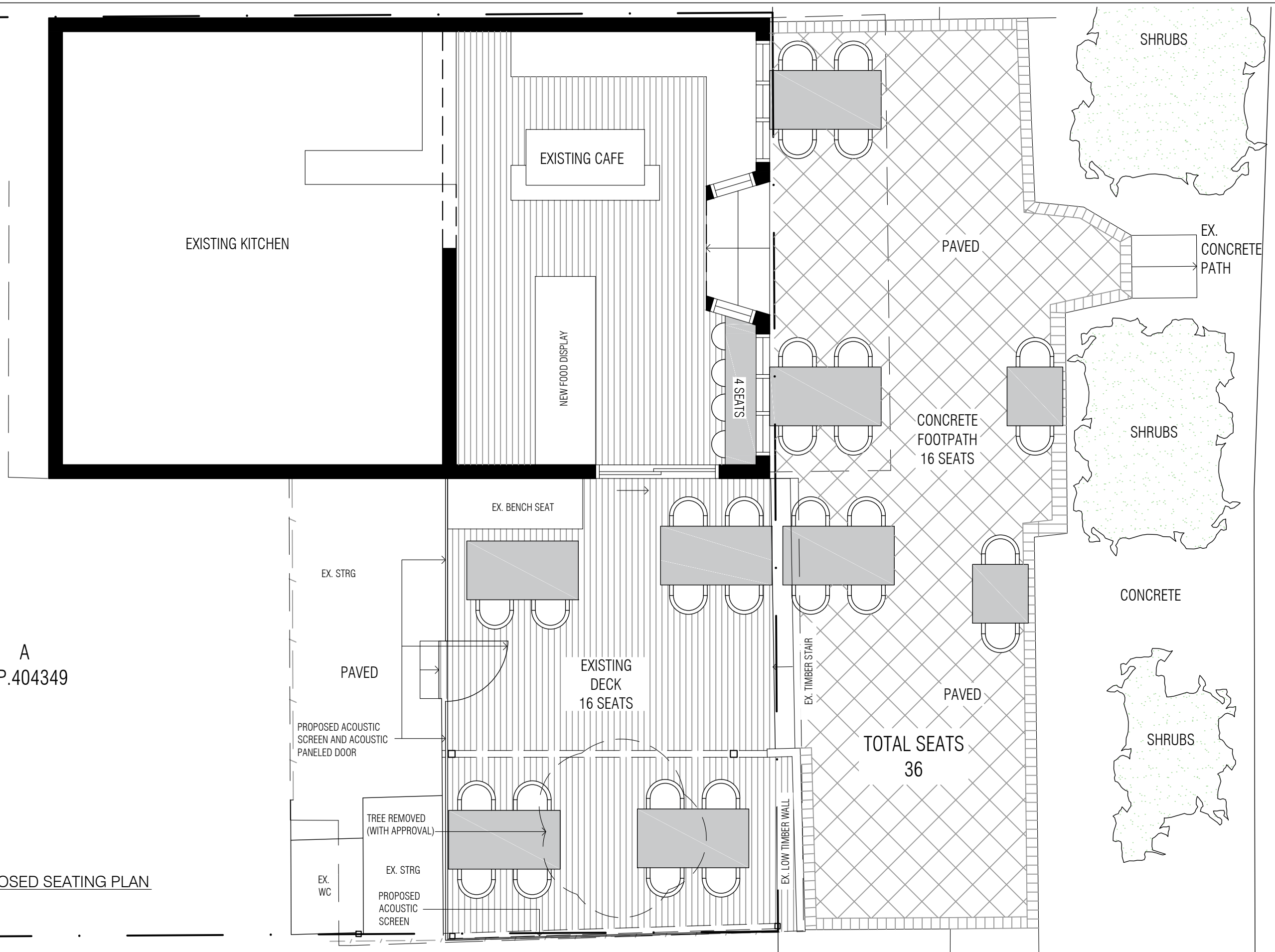


02 EXISTING SOUTHEAST ELEVATION
1:100 @ A3



STREET VIEW OF DECK & PERGOLA

REVISIONS No. DATE REVISION A 15.07.21 ISSUED FOR DEVELOPMENT APPLICATION			ARCHITECT o2 architecture 6/13-15 smail st ultimo nsw 2007 t 02 8068 9839 e info@o2architecture.com.au w www.o2architecture.com.au		PROJECT PROPOSED CAFE 1031 BARRENJOEY ROAD, PALM BEACH NICKI KEOGH		NORTH		DRAWING TITLE EXISTING ELEVATION & STREET VIEW					
			architecture interior design project management masterplanning						DATE	JUNE 2021	SCALE	AS INDICATED	DRAWN	GM
			o2 architecture pty ltd - abn 38 603 776 825 nominated architect: stefan lombardo nsw reg no.8715						JOB NO.	2136	DRW NO.	DA02	REV	A



A
D.P.404349

01 PROPOSED SEATING PLAN
1:50 @ A3

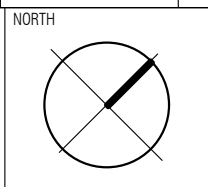
REVISIONS		
No.	DATE	REVISION
A	15.07.21	ISSUED FOR DEVELOPMENT APPLICATION

ARCHITECT
o2 architecture
interior design
project management
master planning

6/13-15 smail st ultimo nsw 2007
t 02 8068 9839
e info@o2architecture.com.au
w www.o2architecture.com.au

o2 architecture pty ltd - abn 38 603 776 825
nominated architect: stefan lombardo nsw reg no.8715

PROJECT
PROPOSED CAFE
1031 BARRENJOEY ROAD, PALM BEACH
NICKI KEOGH



DRAWING TITLE			
PROPOSED SEATING PLAN			
DATE	SCALE	DRAWN	GM
JUNE 2021	1:50 @ A3	GM	GM
JOB NO.	DRW NO.	REV	
2136	DA03	A	