Stephens Consulting Engineers

TECHNICAL MEMORANDUM

To:	Stuart Cook
Company:	BG&E
From:	Blake Stephens – Stephens Consulting Engineers
Subject:	**Proposed Mixed-Use Development**
Address:	**3-5 Fingal Street, Brunswick Heads**
Our Ref:	24-0140-TM003 – FLOOD CODE RESPONSE REPORT
Date:	5.06.2025

1.0 INTRODUCTION

1.1.1 Background

Stephens Consulting Engineers (SCE) Pty Ltd has been engaged by BG&E to provide Flood Code Response Report to Flood planning considerations and code requirements in relation to the proposed Mixed-use development (commercial/Residential) on 3-5 Fingal Street, Brunswick Heads (site).

An aerial image has been provided of the site in the below figure. The site consists of several buildings (1 & 2 storey), garages, and concrete.

Figure 1 – Aerial Image (Site) (Nearmap)

According to Byron Shire Council's (BSC) Flood Information Certificate (FIC) (# 109.2024.80.1) the flood levels on site are N/A, however Council have provided Flood Planning Levels (FPL) for the site being 3.46 m AHD (2050 Flood Planning Level) and 3.71 m AHD (2100 Flood Planning Level), see Figure 2.

Although no flood levels for the site are provided within Councils FIC the below extract of BSC Web map service, shows the Flood Planning Area (refer to BSC Development Control Plan 2010 Chapter 1: Part K) the area affected by flood. It is shown that the flood inundates the entire site and its surrounds up to 60m west of the site (flood fringe). Note, this extent of flood is also known as the old '1 in 100 year flood).

Vehicle access to the site currently is via the rear street access Balun Lane, and current ground levels range from 2.7 m AHD to 3.5m AHD. It is not clear what the current flood levels for the existing buildings are.

From BSC's FIC the 1% Flood Hazard for the property is H1 - Generally safe for people, vehicles, and buildings (figure 2). Note, this H1 Hazard is considered a Low Hazard in terms of the flood planning matrix in Council's Development Control Plan.

No flood modelling has been undertaken within this report and is solely relying on the information gathered from Councils flood repository.

Flood Planning Levels

Item	Level
2050 Flood Planning Level	3.46 m AHD
2100 Flood Planning Level	3.71 m AHD

Flood and Ground Level Information

Item	Maximum	Minimum
Ground Levels	3.60 m AHD	2.84 m AHD
10% (1 in 10) AEP Flood Level	N/A m AHD	N/A m AHD
5% (1 in 20) AEP Flood Level	N/A m AHD	N/A m AHD
1% (1 in 100) AEP Flood Level	N/A m AHD	N/A m AHD
1% (1 in 100) AEP Flood Hazard	N/A	N/A
2100 1% (1 in 100) Flood Hazard	H1	H1
Probable Maximum Flood (PMF)	5.20 m AHD	5.20 m AHD

Figure 2 – Flood Check Development Report Summary (BSC)

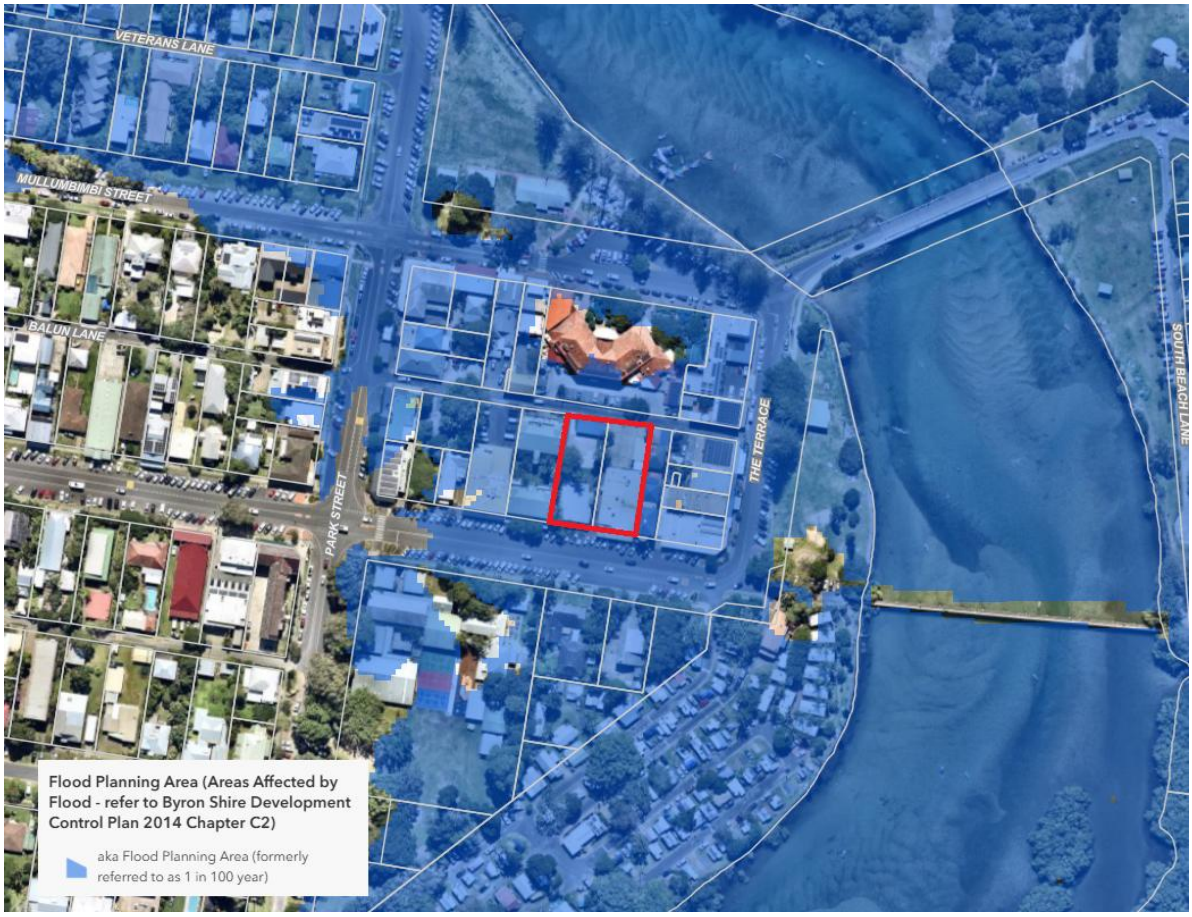


Figure 3 – Flood Planning Area (areas affected by Flood) (Byron Council Web map service - BSC)

1.1.2 Proposed Development

The proposed development consisted of a proposed mixed-use development consisting:

- Ground Floor: Commercial and carparking;
- Second Floor: Residential;
- Third Floor: Residential;

The proposed site plan and section is shown within Figure 4.

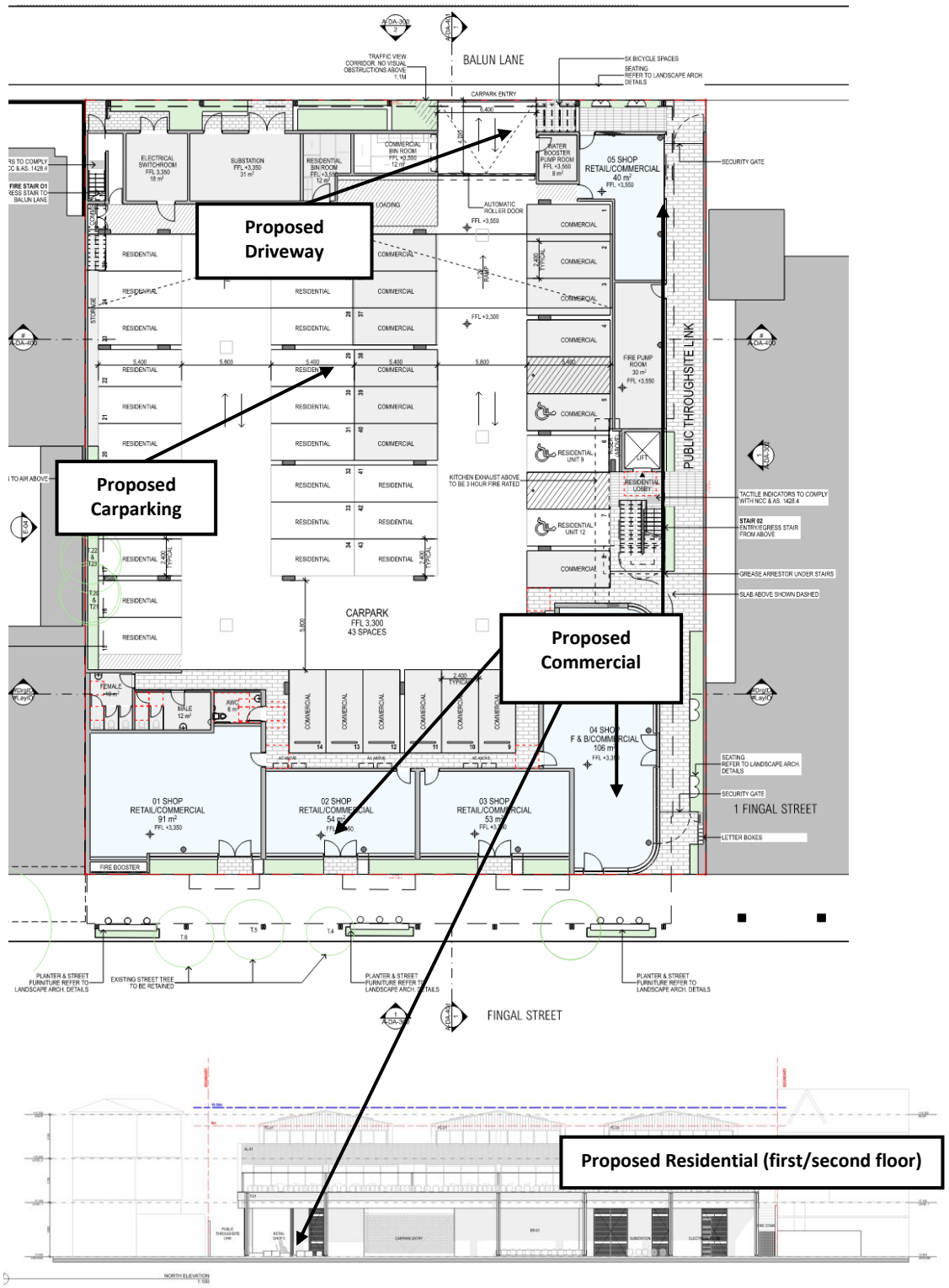


Figure 4 – Proposed Development

2.0 FLOOD CODE

The below table provides a response to Councils Flood Code with respect to both:

- Ground Floor: Carpark and commercial level, which falls under the 'Non-Habitable Building or Room';
- Second Level: Proposed Residential level, which falls under the 'Development in all other areas'.

For each Flood Code 'Control', I have addressed each of the two above development types in the below table.

Table 1 – Response to Flood Code

Controls	Development / Building Type	Primary Constraints	Additional Constraints	Comments
		Low/Intermediate Hazard	**2100 Climate Change Planning Horizon - 100 Year Low/Intermediate Hazard**	
Land Use Suitability & Fill Level	Development in all other areas: **Proposed Residential**	SF1	SF1	No minimum fill level required.
	Non-Habitable Building Room: **Ground Floor Carpark and Commercial**	SF1	SF1	No minimum fill level required.
Floor Level	Development in all other areas: **Proposed Residential**	FL2	FL2	2100 FPL = 3.71m AHD or higher
	Non-Habitable Building Room: **Ground Floor Carpark and Commercial**	FL1	FL1	5% AEP FL = N/A* Therefore no minimum requirement
Building Components	Development in all other areas: **Proposed Residential**	BC1	BC1	Buildings to have flood compatible material below the 2050 FPL = 3.46 m AHD.
	Non-Habitable Building Room: **Ground Floor Carpark and Commercial**	BC1	BC1	Buildings to have flood compatible material below the 2050 FPL = 3.46 m AHD.
Structural Soundness	Development in all other areas: **Proposed Residential**	SS1	SS1	No structural soundness requirements for the force of floodwater, debris & buoyancy
	Non-Habitable Building Room: **Ground Floor Carpark and Commercial**	SS1	SS1	No structural soundness requirements for the force of floodwater, debris & buoyancy
Flood Effect	Development in all other areas: **Proposed Residential**	FE2	FE1	The flood impact of the development to be considered by Council, with Council having the right to request an engineer's report.
	Non-Habitable Building Room: **Ground Floor Carpark and Commercial**	FE1	FE1	No action required
Evacuation & Access	Development in all other areas: **Proposed Residential**	EA1	EA1	Council to provide information on flood evacuation strategy**
	Non-Habitable Building Room: **Ground Floor Carpark and Commercial**	N/A	N/A	N/A

*5% AEP flood level (FL) was not provided in FIC.

**This suggests that specific evacuation strategies are to be provided by the Council on a case-by-case basis.

3.0 CONCLUSION

This Technical Memorandum has addressed Byron Shire Councils minimum Flood Code requirements and addressed the flood planning level requirements as per the following:

- There is no minimum fill level required.
- The proposed residential floor level has been set well above the minimum requirement of the 2100 FPL = 3.71m AHD or higher.
- The proposed Ground Floor carpark and Commercial uses have a minimum floor level requirement of the 5% AEP flood level, however this has not been provided and therefore no minimum floor level is required for this use.
- Buildings to have flood compatible material below the 2050 FPL = 3.46 m AHD.
- No structural soundness requirements for the force of floodwater, debris & buoyancy.
- While the preferred approach is to site the substation at or above the flood planning level of 3.46 m AHD, if this is not feasible, the substation will be designed using flood-resilient materials and/or enclosed in a waterproof enclosure in accordance with the Byron Bay DCP flood code.
- Council to provide information on flood evacuation strategy.

This technical memorandum and the associated response described herein demonstrates compliance with the BSC Flood Code. The proposed mixed use development is therefore in accordance with Councils flood planning considerations, and flood management strategies.

3.1 Certification

This report and associated modelling have been prepared by Blake Stephens of SCE (RPEQ 24262).

Signature:  Date: 5-06-2025

ATTACHMENTS

Attachment A – Flood Information Certificate

Attachment B – Site Survey

Attachment C – Proposed Site Plans

Certificate No.109.2024.80.1
Date: 16/10/2024
Your Reference: 193 - Brunswick Heads
Prepared by: rtrinder

BYRON SHIRE COUNCIL

Momentum Project Group
Attn: Martin Bilbe
Email: martin@momentumprojects.com.au

Property Details

Property description:	1/112944,2/112944
Property address:	3-5 Fingal Street, Brunswick Heads
Parcel:	23400,23410

Flood Planning Levels

Item	Level
2050 Flood Planning Level	3.46 m AHD
2100 Flood Planning Level	3.71 m AHD

Flood and Ground Level Information

Item	Maximum	Minimum
Ground Levels	3.60 m AHD	2.84 m AHD
10% (1 in 10) AEP Flood Level	N/A m AHD	N/A m AHD
5% (1 in 20) AEP Flood Level	N/A m AHD	N/A m AHD
1% (1 in 100) AEP Flood Level	N/A m AHD	N/A m AHD
1% (1 in 100) AEP Flood Hazard	N/A	N/A
2100 1% (1 in 100) Flood Hazard	H1	H1
Probable Maximum Flood (PMF)	5.20 m AHD	5.20 m AHD

The above flood information has been sourced from North Byron Floodplain Risk Management Study and Plan (WMAwater, Oct 2020).

NOTE: This certificate does not contain any information regarding the 2022 flood events or localised flooding.

Flood hazard at property for 1% AEP flood

Hazard

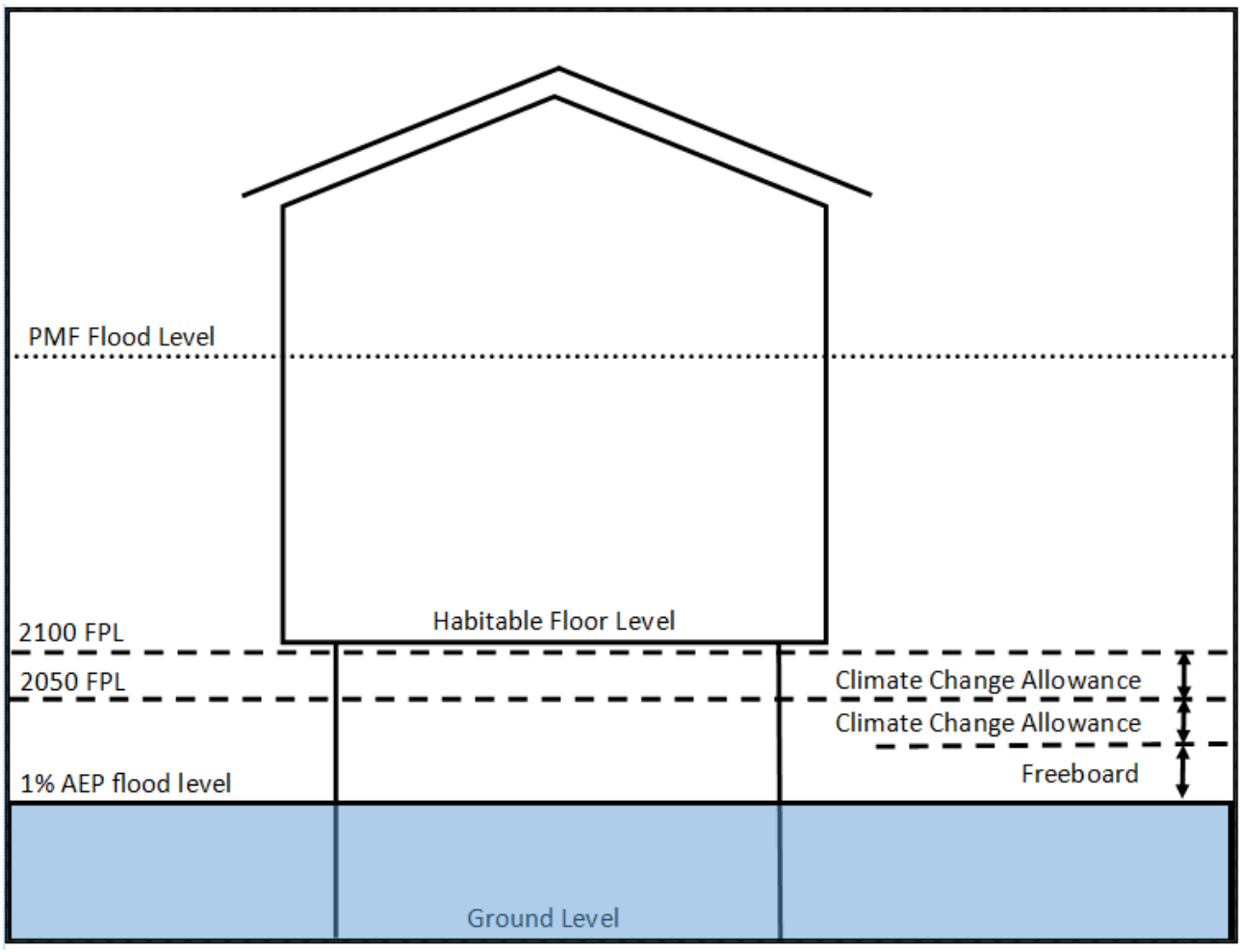
	H1	Generally safe for people, vehicles, and buildings
	H2	Unsafe for small vehicles
	H3	Unsafe for vehicles, children, and the elderly.
	H4	Unsafe for people and vehicles.
	H5	Unsafe for vehicles and people. All buildings are vulnerable to structural damage. Some less robust building types vulnerable to failure.
	H6	Unsafe for vehicles and people. All building types considered vulnerable to failure.

Development Control

For the flood planning matrix in Council's Development Control Plan the following hazards are to be applied:

- Low Hazard is equivalent to H1 and H2
- Intermediate Hazard is equivalent to H3
- High Hazard is equivalent to H4 to H6

Definitions and Notes



Annual Exceedance Probability (AEP) is the probability of an event being equalled or exceeded within a year. AEP may be expressed as either a percentage (%) or 1 in X. For example, a 1% AEP event or 1 in 100 AEP event has a 1% chance of being equalled or exceeded in any year.

2050 Flood Planning Level (2050 FPL) means the level of the 1% AEP flood event plus 0.5m freeboard plus the projected climate change allowances for the year 2050. This is the minimum habitable floor level required for development in most areas.

2100 Flood Planning Level (2100 FPL) means the level of the 1% AEP flood event plus 0.5m freeboard plus the projected climate change allowance for the year 2100. This the minimum habitable floor level required for development in new release areas (eg. the Tallowood residential estate in Mullumbimby).

Habitable floor level, in a residential situation, means a living or working area, such as a lounge room, dining room, rumpus room, kitchen, bedroom, study, workroom or the like. Laundries, bathrooms and garages are non-habitable rooms. In an industrial or commercial situation, it means an area used for offices or to store valuable possessions susceptible to flood damage in the event of a flood.

Ground Levels in this flood information certificate are from airborne laser scanning and are only an indication of what they might be. A survey will be required to determine the exact ground levels to AHD.

Australian Height Datum (AHD) is a common surface level datum used in Australia. 0.0m AHD is approximately mean sea level.

Probable Maximum Flood (PMF) is the largest flood that could conceivably occur on a catchment. It is a theoretical flood and is extremely rare and unlikely. PMF is used for emergency planning, evacuation planning and locating critical infrastructure, such as hospitals. It is also used to determine which areas are potentially flood prone (in the floodplain) and which areas are flood free (only land outside of the PMF is truly 'flood free').

Localised Flooding is inundation by local stormwater runoff rather than overbank discharge from the river or creek system. The North Byron Floodplain Risk Management Study and Plan focuses on flooding resulting from the river and creek systems.

Disclaimer:

This flood information is provided for general purposes only. Council has not prepared this information itself. The information has been supplied to Council by various third parties at a point in time. Because this information is based on modelling, any particular flood (and the circumstances causing it) may be different to the scenarios modelled by the various studies which provided the basis for this information.

Because of the nature of this information and how it has been supplied to Council, Council does not promise that the information is free from error or omission. As a result, Council will not be responsible for any damage, however caused, by the provision of this information.

This information is subject to change as a result of updated flood modelling. Council is not responsible for updating this information. This means Council does not warrant that the information is accurate after the day of issue.

Council does not know each customer's reasons for seeking this information. Customers are encouraged to obtain professional advice specific to their requirements regarding this information.

Tree Table

Tree	Type	Diameter	Spread	Height
T1	PALM	0.4	6	8
T2	UNKNOWN	0.1	5	5
T3	TUCKEROO	0.3	8	10
T4	GREVILLEA	0.2	3	4
T5	GREVILLEA	0.1	4	4
T6	PALM	0.15	5	7
T7	PALM	0.1	4	7
T8	PALM	0.15	5	5
T9	PALM	0.15	5	5
T10	PALM	0.15	5	5
T11	PALM	0.15	6	7
T12	PALM	0.15	6	7
T13	PALM	0.3	6	7
T14	PALM	0.2	6	7
T15	PALM	0.2	6	7
T16	PALM	0.2	5	7
T17	PALM	0.2	6	7
T18	PALM	0.25	5	9
T19	PALM	0.25	5	9
T20	PALM	0.2	5	7
T21	PALM	0.2	5	7
T22	PALM	0.2	5	7
T23	PALM	0.2	5	7
T24	PALM	0.2	5	7
T25	EUCALYPTUS	0.6	13	15
T26	PALM	0.2	5	7
T27	MELALEUCA	0.4	7	10
T28	PALM	0.2	4	8
T29	PANDANUS	0.8	7	5
T30	PALM	0.2	5	7
T31	POINCIANA	0.8	10	8

1 - TREE TABLE - SURVEYOR - BENNET & BENNET 1:2

BENNETT + BENNETT
PO Box 5021, GCMC QLD 9726
Ph: (07) 5631 8000
mail@bennettandbennett.com.au

Surveying, Town Planning, Spatial Services & Titling
GOLD COAST | BRISBANE | SUNSHINE COAST | NORTHERN RIVERS

www.bennettandbennett.com.au

LEGEND:

Road
- Kerb Back
- Kerb Invert
- Edge of Bitumen
- Edge of Gravel
- Road Crown
- ◇ Traffic Park Meter
- Traffic Light
- Traffic Pit
- Traffic Sign
- Traffic Post Box

Structures
- Building Line
- Roof Ridgeline
- Fence Line
- Gate
- Hand Rail
- Cattle Grid
- ● Bollard

Sewer
- S(*) Sewer Line
- ⋈ Valve
- ○ Inspection Opening
- MH Manhole

Electrical
- E(*) Electricity Line
- EOH Overhead Line
- Pits/Manholes
- Pole
- Street Light
- Light In-Ground

Water
- W(*) Water Line
- Meter
- ⋈ Valve
- H Fire Hydrant
- Tap
- Sprinkler

Fuel
- P(*) Fuel Line
- + Fitting

Terrain
- Driveway
- Footpath
- Slab Edge
- Retaining Wall Base
- Retaining Wall Top
- Change of Grade
- Top of Bank
- Toe of Bank
- Waterline
- Garden Edge
- Creek Toe of Bank
- Creek Top of Bank
- Creek Invert
- Creek Waterline
- Tree
- Tree Canopy
- △ ◎ Control Point/PSM

Drainage
- D(*) Drainage line
- Open Drain
- MH Manhole
- Field Inlet
- ● Downpipe

Communications
- C(*) Communication Line
- TOH Overhead Line
- Pits/Manholes
- ⊙ Pillar

Gas
- G(*) Gas Line
- ⋈ Valve
- Marker

General
- Pothole

Subsurface Utility - QL
- *(A) * QL-A (H±50mm,V±50mm)
- *(B) * QL-B (H±300mm,V±500mm)
- *(C) * QL-C (H±300mm,2D)
- *(D) * QL-D (Exist Record)

NOTES:

1. Drawn to scale on an A1 sheet.
2. Contour Interval... 0.25m
3. All levels are in metres on the Australian Height Datum referred to PM42174 - RL 2.022 AHD situated in Brunswick Terrace.
4. All Boundaries are subject to confirmation by a boundary redefinition survey.
5. The Location of Underground services are in accordance with AS5488:2019, the Australian Standard for classification of Subsurface Utility Information (SUI). The exact nature and location of these services should be confirmed prior to construction.
6. Total Combined Site Area Survey : 2034m²
7. Field Survey Completed on 9/10/2024.
8. Tree species should be verified by a suitably qualified professional. Tree spreads are diagrammatic only and may not be symmetrical. Heights and spreads are approximate only.

Level datum: AHD Derived (PM42174)
Horiz datum: MGA Derived PLAN (D.P.1137515)
Coord Origin: PM (SCIMS) (PM42205)
GDA System: GDA2020 Coordinate System: Plane 1:1
Meridian: D.P.1137515

Title:

Detail Survey
Lots 1 & 2 D.P.112944
3 & 5 Fingal Street
Brunswick Heads

Client: **Momentum Project Group Pty Ltd**

ARCHITECT

CHROFI
3/1 THE CORSO MANLY NSW 2095 AUSTRALIA
T +61 2 8096 8500 E info@chrofi.com
CHOI ROPIHA FIGHERA P/L ACN 144 714 885 ATF CHOI ROPIHA FIGHERA UNIT TRUST T/A CHROFI ABN 22 365 257 187 NOMINATED ARCHITECT JOHN CHOI 8706 TAI ROPIHA 6568 STEVEN FIGHERA 6609

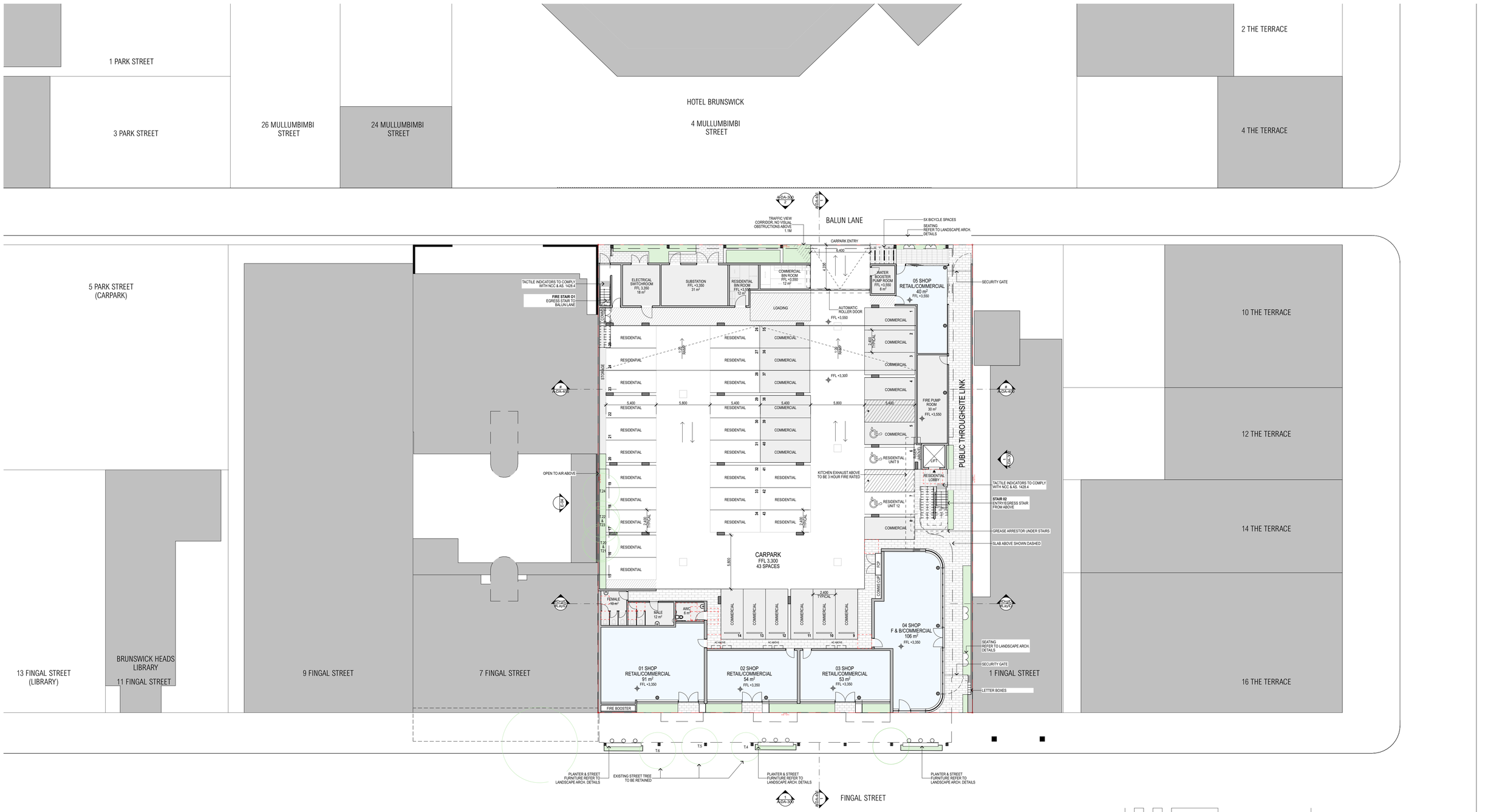
REV	DATE	ISSUE
01	30/1/2025	For Information
02	1/4/2025	Issue for DA
03	16/4/2025	Issue for DA
04	30/4/2025	Issue for DA

PROJECT
Brunswick Heads
3-5 Fingal Street, Brunswick Heads

PROJECT NUMBER	PLOT DATE	DRAWN	CHECKED	SHEET SCALE	SHEET SIZE	NORTH
210110	30/04/25			1:2	A1	

DRAWING TITLE
SURVEY

DRAWING NUMBER	REVISION
A-DA-002	04



1 GROUND
1:200

AREAS SHOWN ON FLOOR PLAN ARE CALCULATED FROM INTERNAL WALL TO INTERNAL WALL (NLA). FOR GFA CALCULATION REFER TO **DA-601 GFA SCHEDULE**

ARCHITECT

CHROFI

3/1 THE CORSO MANLY NSW 2095 AUSTRALIA
T +61 2 8096 8500 E info@chrofi.com

CHOI ROPIHA FIGHERA P/L ACN 144 714 885 ATF CHOI ROPIHA FIGHERA UNIT TRUST T/A CHROFI ABN 22 365 257 187 NOMINATED ARCHITECT JOHN CHOI 8706 TAI ROPIHA 6568 STEVEN FIGHERA 6609

REV	DATE	ISSUE
01	30/1/2025	For Information
02	1/4/2025	Issue for DA
03	16/4/2025	Issue for DA
04	30/4/2025	Issue for DA

PROJECT

Brunswick Heads

3-5 Fingal Street, Brunswick Heads

PROJECT NUMBER	PLOT DATE	DRAWN	CHECKED	SHEET SCALE	SHEET SIZE	NORTH
210110	30/4/25			1:200	A1	N

DRAWING TITLE

GROUND FLOOR PLAN

DRAWING NUMBER	REVISION
A-DA-200	04

AREAS SHOWN ON FLOOR PLAN ARE CALCULATED FROM INTERNAL WALL TO INTERNAL WALL (NSA). FOR GFA CALCULATION REFER TO **DA-603 GFA SCHEDULE**

ARCHITECT

CHROFI

3/1 THE CORSO MANLY NSW 2095 AUSTRALIA
T +61 2 8096 8500 E info@chrofi.com

CHOI ROPIHA FIGHERA P/L ACN 144 714 885 ATF CHOI ROPIHA FIGHERA UNIT TRUST T/A CHROFI ABN 22 365 257 187 NOMINATED ARCHITECT JOHN CHOI 8706 TAI ROPIHA 6568 STEVEN FIGHERA 6609

REV	DATE	ISSUE
01	30/1/2025	For Information
02	1/4/2025	Issue for DA
03	16/4/2025	Issue for DA
04	30/4/2025	Issue for DA

PROJECT

Brunswick Heads

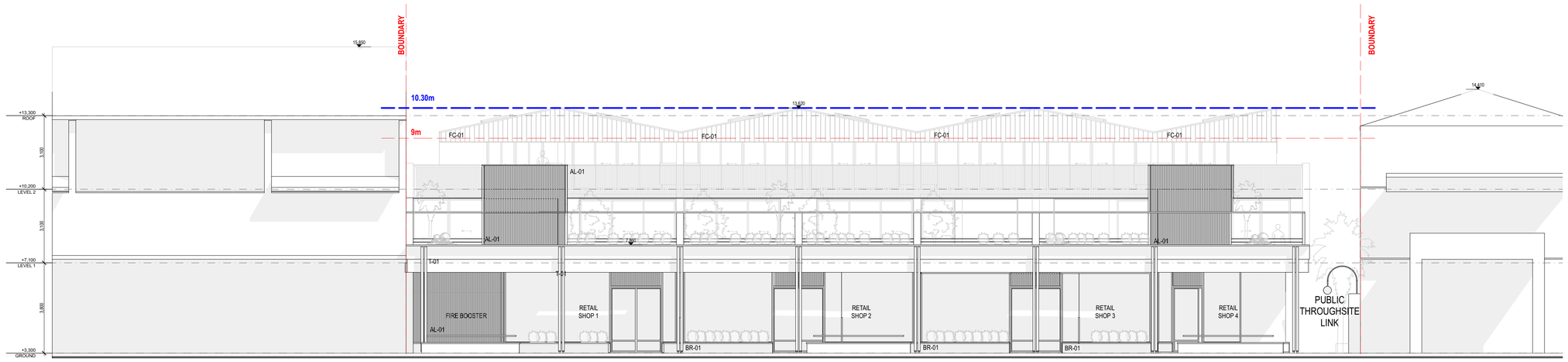
3-5 Fingal Street, Brunswick Heads

PROJECT NUMBER	PLOT DATE	DRAWN	CHECKED	SHEET SCALE	SHEET SIZE	NORTH
210110	30/4/25			1:200	A1	N

DRAWING TITLE

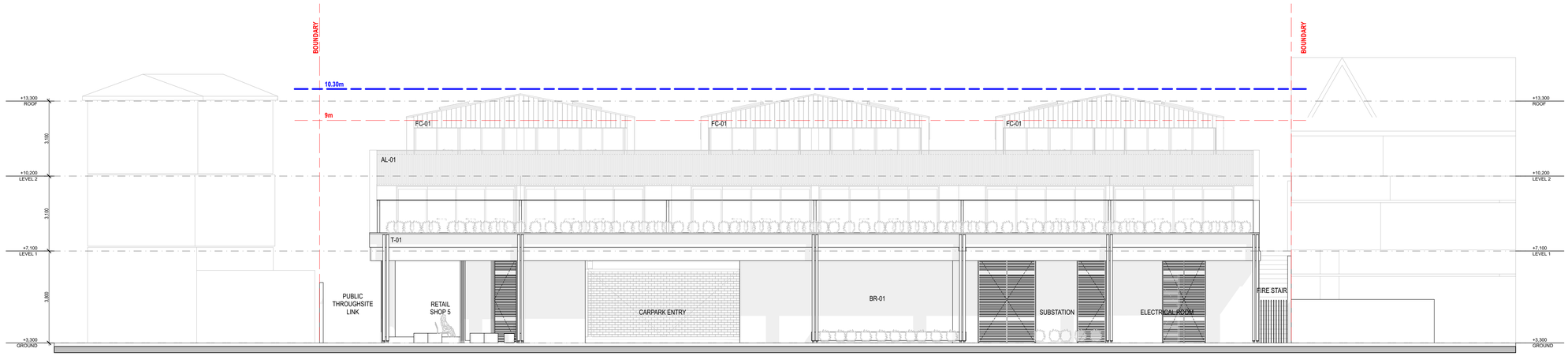
FIRST FLOOR PLAN

DRAWING NUMBER	REVISION
A-DA-201	04



1
-

SOUTH ELEVATION
1:100



2
-

NORTH ELEVATION
1:100

ARCHITECT

CHROFI

3/1 THE CORSO MANLY NSW 2095 AUSTRALIA
T +61 2 8096 8500 E info@chrofi.com

CHOI ROPIHA FIGHERA P/L ACN 144 714 885 ATF CHOI ROPIHA FIGHERA UNIT TRUST T/A CHROFI ABN 22 365 257 187 NOMINATED ARCHITECT JOHN CHOI 8706 TAI ROPIHA 6568 STEVEN FIGHERA 6609

REV	DATE	ISSUE
01	30/1/2025	For Information
02	1/4/2025	Issue for DA
03	16/4/2025	Issue for DA
04	30/4/2025	Issue for DA

PROJECT

Brunswick Heads

3-5 Fingal Street, Brunswick Heads

PROJECT NUMBER	PLOT DATE	DRAWN	CHECKED	SHEET SCALE	SHEET SIZE	NORTH
210110	30/4/25			1:100	A1	

DRAWING TITLE

ELEVATIONS

DRAWING NUMBER	REVISION
A-DA-300	04