

No.98 MACKENZIE STREET, REVESBY

Our Ref: E240269

FLOOD RISK MANAGEMENT REPORT

PREPARED BY: YOUSSEF RIAD

*CHECKED BY: NADER ZAKI
MIEAust CPEng NER*

10 September 2024



INTRODUCTION

NY Civil Engineering has prepared a Flood Risk Management Report to accompany the Development Application submitted to Canterbury Bankstown City Council for the Proposed Dual Occupancy and Secondary Dwellings at property No. 98 Mackenzie Street, Revesby.

Canterbury Bankstown City Council have identified the proposed development site as affected by low and medium risk flooding. Flood mapping has been undertaken through the 100 Year ARI Flood Maps from Padstow Catchment Study. This Flood Risk Management Plan has been undertaken identifying the proposed developments adherence with the requirements of Council's Development Control Plan (DCP).

The following documentation has been used in the preparation of this Flood Risk Management Report;

- Survey by TJ Surveyors dated 29 January 2024
- Architectural Plans by Masterton Homes dated 11 April 2024 (Appendix A)
- 100 Year ARI Flood Maps from Padstow Catchment Study (Appendix B)
- Canterbury Bankstown Development Control Plan 2023 (DCP) Chapter 2 – Flood Risk Management

SITE INFORMATION

The site is approximately 300m west of Playford Park. The existing development consists of a single storey dwelling. The general nature of the surrounding development is primarily residential. The site is located adjacent a natural depression in the topography directing runoff from the local catchment through the front half of the property. The site slopes predominantly from east to west.



Figure 1. Subject Site and Surrounding Area Developments

Figure 1 shows the location of the subject site and an indication of the nature of the developments surrounding the site.

FLOODING

Council has shown in their 'Stormwater System Report' dated 17.10.2023 (Appendix B) that the site is subject to flooding in the 1% AEP and PMF flood events, with relevant flood levels as below;

1% AEP flood level (Dwelling A)	RL 17.80m AHD
1% AEP flood level (Dwelling B)	RL 18.10m AHD
Flood Planning Level (Dwelling A)	RL 18.30m AHD
Flood Planning Level (Dwelling B)	RL 18.60m AHD
PMF (Dwelling A)	RL 17.90m AHD
PMF (Dwelling B)	RL 18.30m AHD

Table 1: Flood Levels

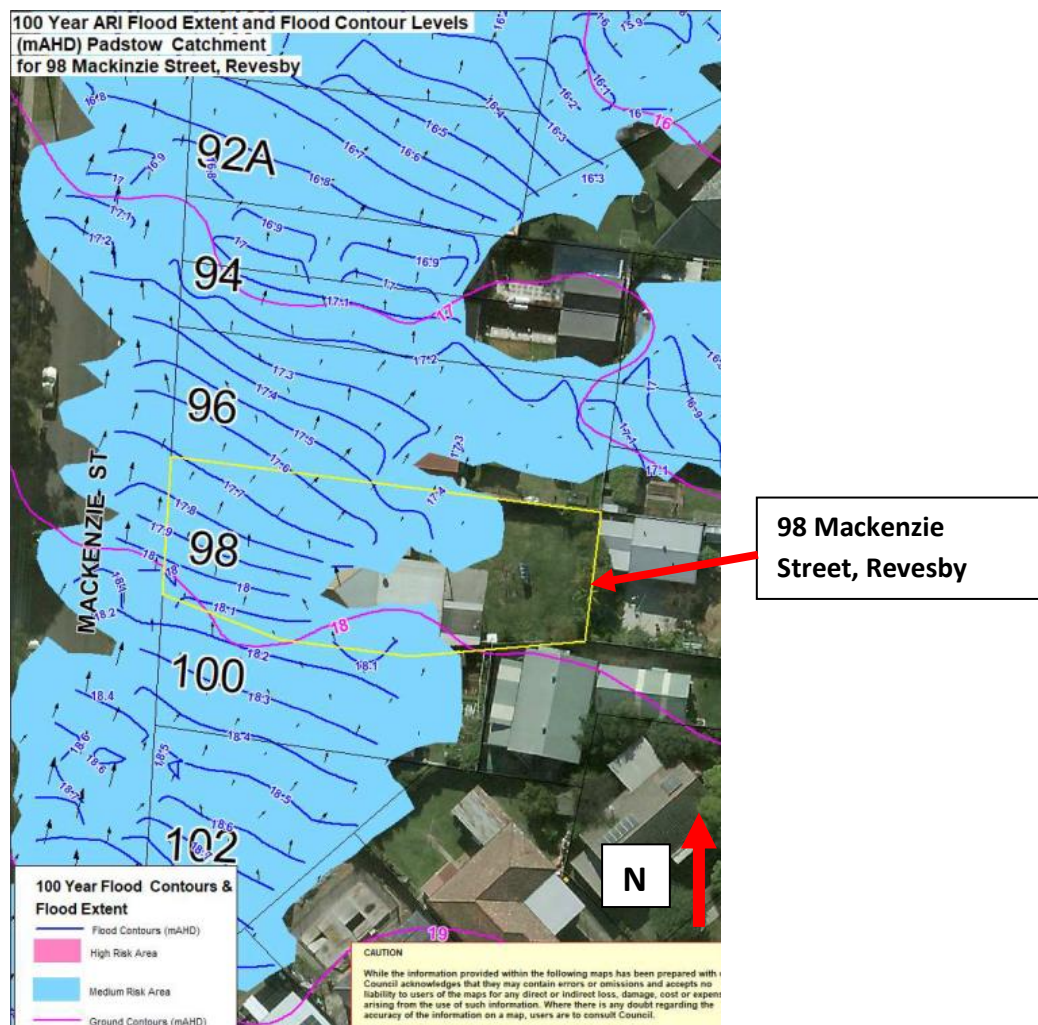


Figure 3: 100 Yr ARI Flood Depth

Figure 3 is an extract from the 100 Year ARI Flood Maps from Padstow Catchment Study indicating the site is affected by a minor overland flowpath. The front 30% of the site is inundated in the 100 ARI storm event.

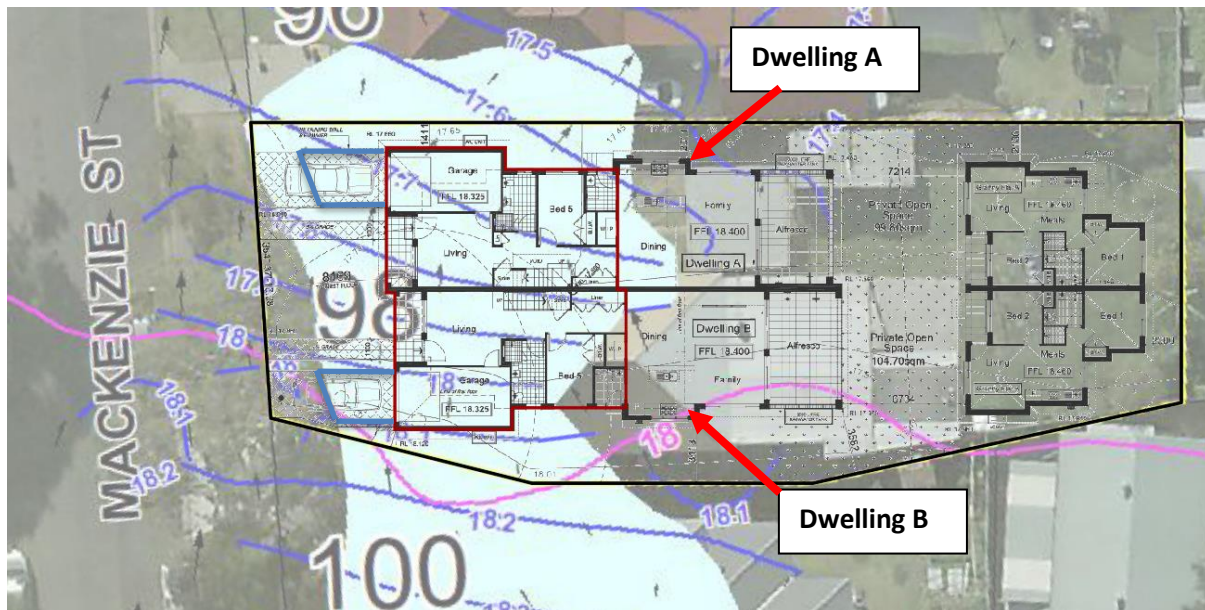


Figure 4: Proposed Building Outline

Figure 4 is an outline of the proposed development overlaying the 100-year ARI flood map indicating the flood level at Dwelling A and Dwelling B. From figure 4, the Flood Planning Levels aforementioned (in table 1) can be interpolated.

Commentary received in phone conversation between our office and from Pushpa Goonetilleke (Council Stormwater Engineer) on 10 September 2024 has confirmed that this flooding is minor in nature and Council considers the obstruction of this minor flow inconsequential to the flood regime.

FLOOD MANAGEMENT REQUIREMENTS

Canterbury Bankstown City Council have outlined in their DCP 'Chapter 2 - Flood Risk Management' a number of planning controls for developments subject to low, medium and high-risk flooding. The proposed development's flood risk category has been considered as medium risk for the purpose of addressing the below requirements.

As outlined in the DCP, Section 6 – Schedule 5 – Catchments Affected by Stormwater Flooding, considerations and assessment for Residential type development(s) include;

Floor Level:

Consideration No.1: non-habitable floor levels should be no lower than the 20-year flood unless justified by a specific assessment.

Assessment: Non applicable.

Consideration No.2: All habitable floor levels to be equal to or greater than the 100-year flood level plus freeboard.

Assessment: The minimum freeboard in relation to peak water surface level of the 1% AEP overland flow path to habitable floor space is 500mm.

The highest flood level immediately adjacent to the building footprint is interpolated for Dwelling A to be 17.80m AHD and 18.10m AHD for Dwelling B.

The proposed dwellings are to have a finished floor level (FFL) no lower than RL 18.30m AHD and RL 18.60m AHD respectively.

Consideration No.6: A restriction on the use of the land is to be registered on the Certificate of Title where the lowest floor level is elevated more than 1.5m above finished ground level, requiring that the undercroft area is not to be enclosed. The use of roller shutters, hit and miss brickwork and similar methods is however permissible where there is no significant flood impact. Non-habitable uses (laundry, toilet, bathroom and similar uses) can be enclosed where there is no significant flood impact.

Assessment: Non applicable.

Building Components and Method:

Consideration No.1: All structures to have flood compatible building components below the 100-year flood level plus freeboard.

Assessment: A suitably qualified structural engineer is to certify that the building components of the proposed structures below RL 18.30 AHD for Dwelling A and RL 18.60 AHD for Dwelling B are flood compatible nature at CC stage.

Structural Soundness:

Consideration No.1: Applicant to demonstrate that the structure can withstand the forces of floodwaters, debris and buoyancy up to and including a 100-year flood plus freeboard, or up to the PMF (probable Maximum Flood) if required to satisfy evacuation requirement (See below). An engineer's report may be required.

Assessment: An appropriately qualified structural engineer is to certify that the proposed dwelling can withstand the forces of floodwaters, debris and buoyancy to the habitable level of 18.30m AHD and 18.60m AHD for dwellings A and B respectively. The structures adjacent PMF level of RL 17.90m AHD for Dwelling A and RL 18.30m AHD for Dwelling B are lower than the required habitable floor level, and does not require an evacuation route.

Flood Effects:

Consideration No.2: Applicant to demonstrate to Council's satisfaction (by way of an engineer's report if requested) that the development will not increase flooding effects elsewhere, having regard to loss of flood storage; changes in flood levels, flows and velocities; the cumulative impacts of multiple developments in the vicinity. The report should also identify the presence of any "major overland flow paths". Note: Where major overland flow paths are present, this may result in restrictions of the proposed development to maintain the functioning of the flowpath, and/or to manage the impacts of development on properties.

Assessment: The flow regime is minor in nature, and Council have confirmed that construction on slab footing is appropriate.

Consideration No.3: Council may require that the creation of an easement, or that a restriction be placed on the Title Certificate identifying the location of "major overland flow paths" or locations of significant backwater flooding.

Assessment: Council to advise if an easement or restriction is to be created.

Parking and Driveway Access:

Consideration No.2: The minimum surface level of open spaces or carports shall be as high as practical, and not below (i) the 20-year flood level, or (ii) the level of the crest of the road at the location where the site has access, (whichever is lower). In the case of garages, the minimum surface level shall be as high as practical, but no lower than the 20-year flood level. Surface levels should also be determined having regard to the control Number 4 below relating to depths of inundation over driveways.

Assessment: The proposed garage and car space for both dwelling are higher than the 100-year flood level and road crest.

Consideration No.3: Garages capable of accommodating more than 3 vehicles on land zones for urban purposes, or enclosed car parking, must be protected from inundation from the 100-year flood.

Assessment: N/A No parking area accommodating more than 3 vehicles is proposed.

Consideration No.4: The level of the driveway providing access between the road and the parking spaces should be as high as practical, and not lower than 0.3m below the 100-year flood level. However, Council may consider a lower level for the driveway in the following circumstances, where risk to human life is not compromised: (a) Where the road is lower than the parking space, no part of the driveway should be inundated to a greater depth than the roadway. (b) Where the car parking space is lower than the road, the depth of inundation over the driveway must not be greater than the car park inundation depth, and the driveway must rise continuously in an egress direction. (c) Where the car parking space and road are both below the 100-year flood level, the depth of inundation over the driveway must not be greater than the depth at either the car parking space or the road. Where feasible, the driveway should rise continuously in the egress direction.

Assessment: N/A the driveway level is not lower than 0.3m below the 100-year flood level at any time.

Consideration 5: Enclosed car parking and car parking areas capable of accommodating more than three vehicles (other than on rural zoned land) with a floor level below the 20-year flood level or more than 0.8m below the 100-year flood level shall have adequate warning signs, signage and exits.

Assessment: N/A No parking area accommodating more than 3 vehicles is proposed.

Consideration 6: Restraints or vehicle barriers to be provided to prevent floating vehicles leaving a site during a 1% AEP flood.

Assessment: N/A parking and garage spaces are higher than 100-year flood level.



Evacuation:

Consideration No.2: Reliable access for pedestrians or vehicles is required from the building, commencing at a minimum level equal to the lowest habitable floor level to an area of refuge above the PMF. Such a refuge may comprise a minimum of 20% of the gross floor area of the dwelling being above the PMF level. An engineer's report may be required.

Assessment: All habitable floor levels are above PMF level as such reliable access is always achievable.

Consideration No.3: The development is to be consistent with any flood evacuation strategy, flood plan or similar strategy that has been adopted by Council.

Assessment: Council to advise if a current Flood Evacuation Strategy or Plan exists for any previous DA Applications.

CONCLUSIONS AND RECOMMENDATIONS

Based on our analysis of the proposal, it can be concluded that the proposed development has a negligible impact on surrounding developments.

The following conclusions and recommendations are based on council's controls for flood affected developments;

- **The proposed Dwelling A and the adjacent Secondary Dwelling is to have a finished floor level (FFL) no lower than RL 18.30m AHD.**
- **The proposed Dwelling B and the adjacent Secondary Dwelling is to have a finished floor level (FFL) no lower than RL 18.60m AHD.**
- The building components of the proposed dwelling structure below RL 18.30m AHD and RL 18.60m AHD for Dwelling A and B, respectively, are to be constructed from flood compatible materials.
- An appropriately qualified structural engineer is to certify that the proposed dwelling can withstand the forces of floodwaters, debris and buoyancy to RL 18.30m AHD and RL 18.60m AHD for Dwelling A and B, respectively.

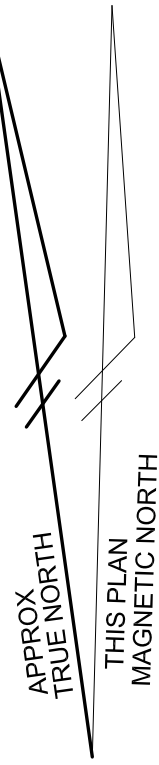
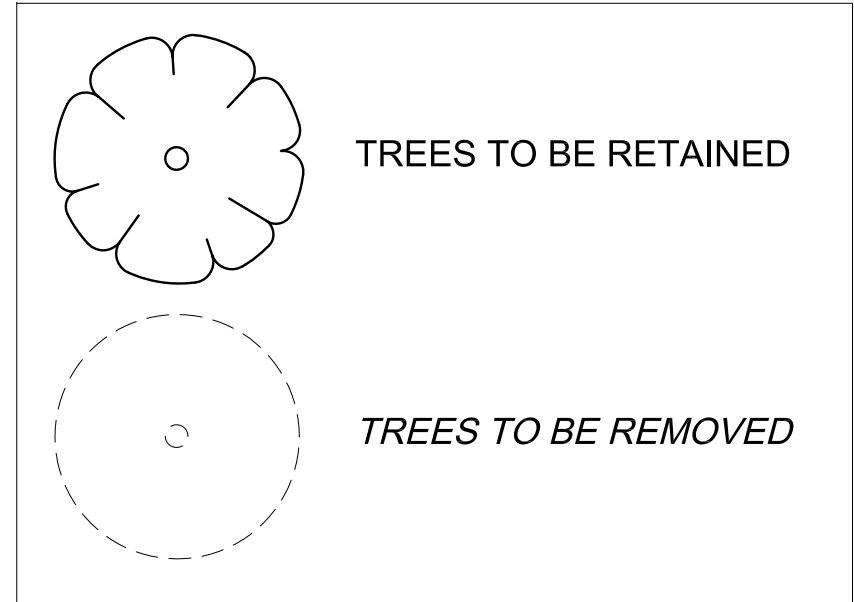
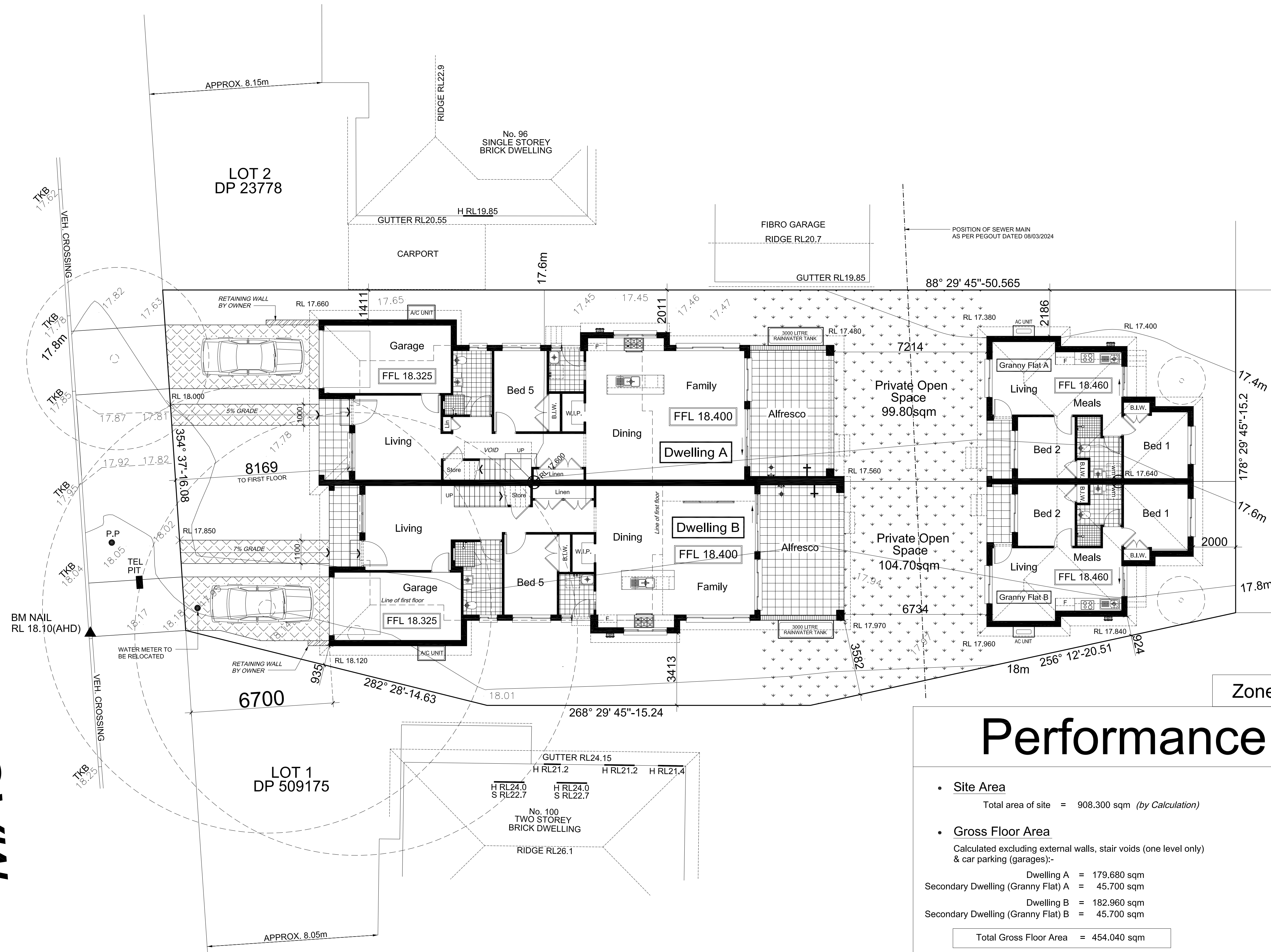


APPENDIX A

ARCHITECTURAL PLANS



MACKENZIE STREET



Zoned R2 - Low Density Residential

Performance Criteria

• **Site Area**

Total area of site = 908.300 sqm (by Calculation)

• **Gross Floor Area**

Calculated excluding external walls, stair voids (one level only) & car parking (garages):-

Dwelling A = 179.680 sqm
Secondary Dwelling (Granny Flat) A = 45.700 sqm
Dwelling B = 182.960 sqm
Secondary Dwelling (Granny Flat) B = 45.700 sqm

Total Gross Floor Area = 454.040 sqm

• **Floor Space Ratio**

Maximum allowable = 0.50 : 1 or 454.150 sqm
FSR proposed = 0.499 : 1 or 454.040 sqm

• **Individual Floor Space Ratio - Lot 100**

FSR proposed = 0.497 : 1 or 228.78 sqm / 453.30 sqm

• **Individual Floor Space Ratio - Lot 101**

FSR proposed = 0.502 : 1 or 228.66 sqm / 455.00 sqm

• **Carparking Requirement**

Required 2 spaces per 3 + bedrooms

	Required	Provided
Dwelling A	2 spaces	2 spaces
Dwelling B	2 spaces	2 spaces

• **Private Open Space**

Minimum 80sqm required with 5.0m minimum dimension throughout

	Required	Provided
Dwelling A	80.000 sq.m	99.800 sqm
Dwelling B	80.000 sq.m	104.700 sqm

• **Front Setback Landscaped Area**

Minimum required for Bankstown Council Area is 45% of front setback area of 118.500 sq.m

Required 45% of front setback or 53.325 sq.m
Provided 52.46% of front setback or 62.170 sq.m

TORRENS TITLE

100 Year ARI Flood Level
RL 17.900 AHD

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DATED: / /

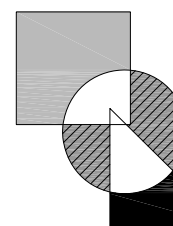
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A	27.02.24	SL	Presentation Plans
B	11.04.24	CR	Liveable Housing Design Amendments

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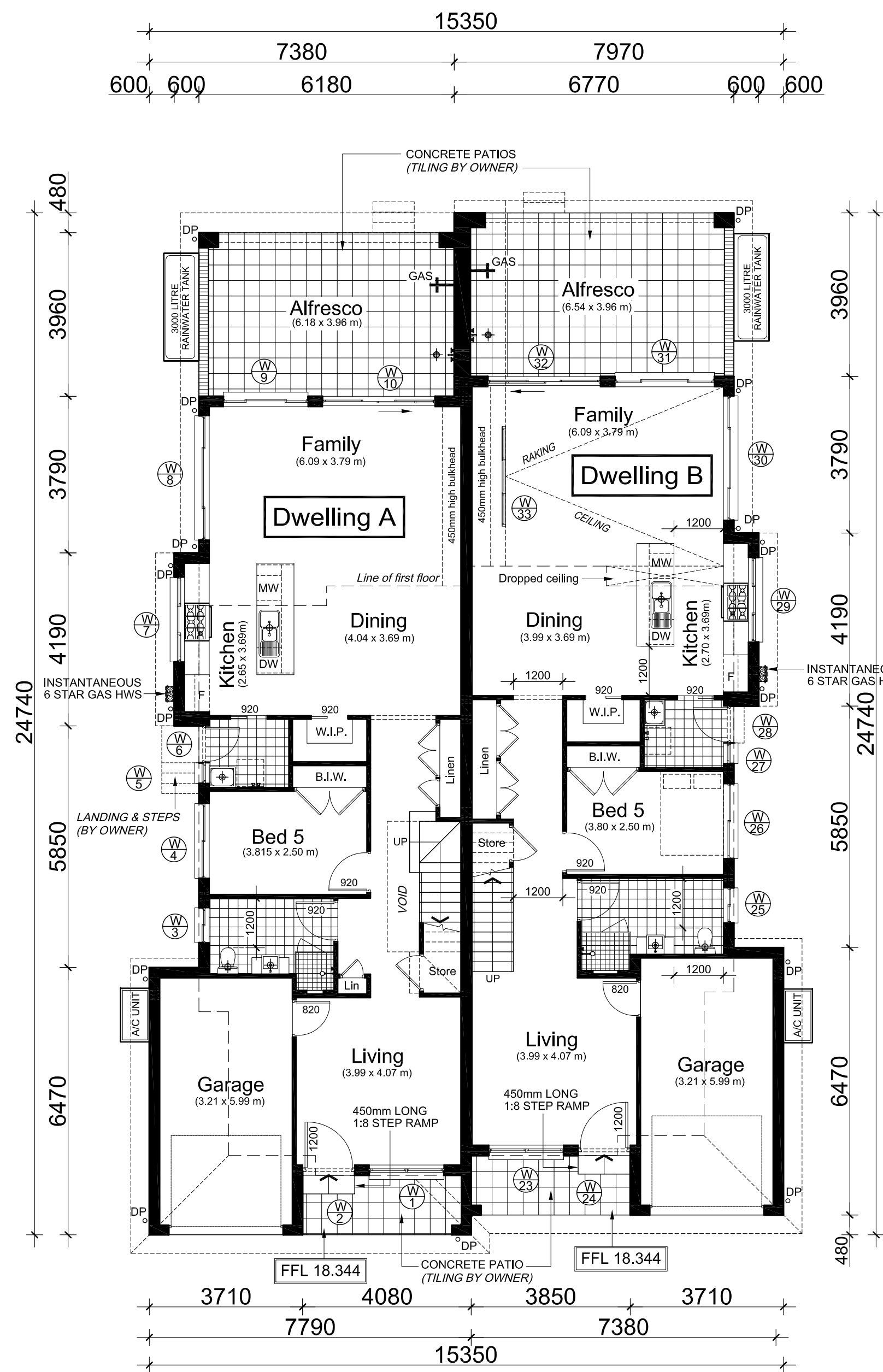
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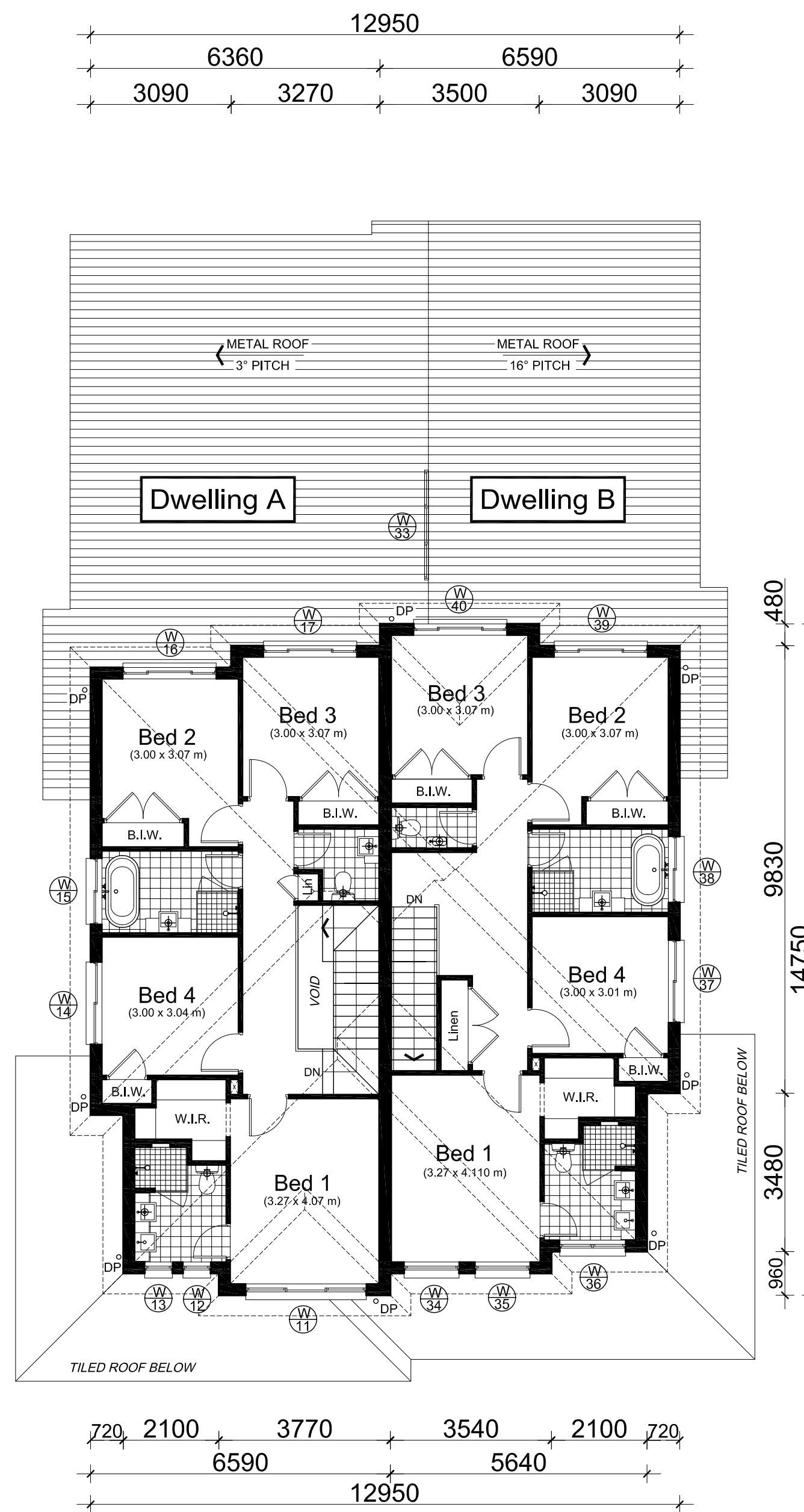
RESIDENTIAL LOGISTICS P/L
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Liverpool NSW 2170
Email: mail@r.net.au Phone: 9602 7700 Fax: 9734 6633

Site Plan & Performance Criteria Calculations
PROPOSED ATTACHED DUAL OCCUPANCY

CLIENT: Mr Manduca & Mrs Fruci
SITE ADDRESS: No.98 (Lot A in DP 416914) Mackenzie Street,
SUBURB: Revesby SCALE: 1 : 100
COUNCIL: Canterbury Bankstown JOB No.: RL 5989
REVISION: B DATE: 11.04.2024 SHEET: 1 of 3

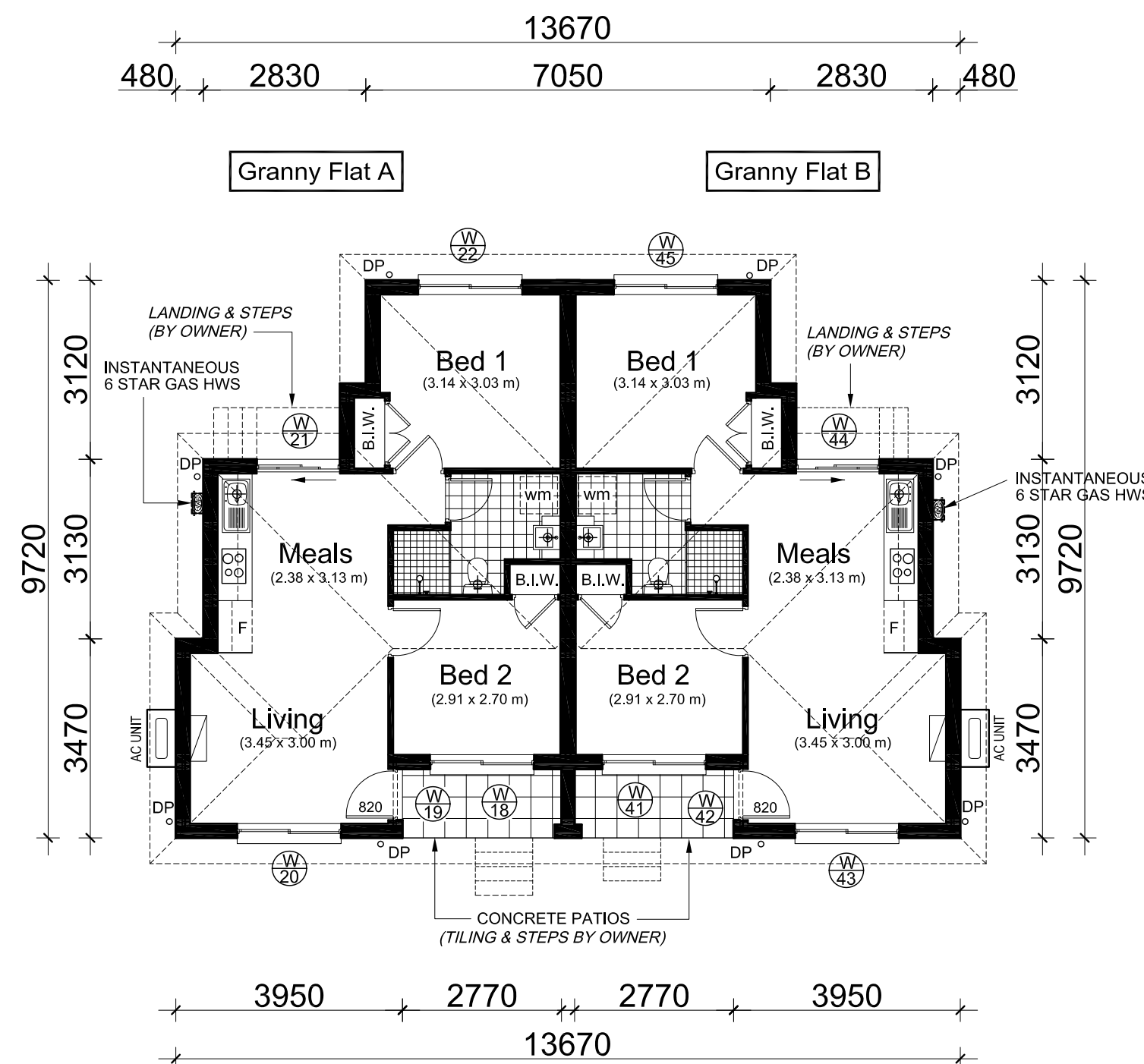


Ground Floor Plan



First Floor Plan

100 Year ARI Flood Level
RL 17.900 AHD



Granny Flat Floor Plans

WINDOW SCHEDULE				
No	TYPE	HEIGHT	WIDTH	GLAZING/REMARK
1	AW1818	1800	1810	AWNING
2	SW0909	2388	1260	TIMBER ENTRY FRAME
3	SW0909	857	950	SLIDING / OBSCURE GLASS
4	SW1218	1200	1810	SLIDING
5	AW0905	857	500	AWNING
6		2088	881	TIMBER ENTRY FRAME
7	FW0521	500	2050	FIXED
8	SW1230	1200	3010	SLIDING
9	SW1221	1200	2050	SLIDING
10	SD2127-3	2100	2725	ALU SLIDING DOOR
11	AW1507	1457	610	AWNING / OBSCURE GLASS
12	AW1006	1029	610	AWNING / OBSCURE GLASS
13	AW1006	1029	610	AWNING / OBSCURE GLASS
14	SW0918	857	1810	SLIDING
15	SW0915	857	1450	SLIDING / OBSCURE GLASS
16	SW0921	857	2050	SLIDING
17	SW0621	600	2050	SLIDING
18	SW1218	1200	1810	SLIDING
19		2388	881	TIMBER ENTRY FRAME
20	SW1518	1457	1810	SLIDING
21	SD2115	2100	1450	ALUM SLIDING DOOR
22	SW1218	1200	1810	SLIDING
23	AW1818	1800	1810	ALUMINIUM AWNING
24		2388	1260	TIMBER ENTRY FRAME
25	SW0909	857	850	SLIDING / OBSCURE GLASS
26	SW0918	857	1810	SLIDING
27	AW0905	857	500	AWNING
28		2088	881	TIMBER ENTRY FRAME
29	FW0521	500	2050	FIXED
30	SW1230	1200	3010	SLIDING
31	SW1224	1200	2410	SLIDING
32	SD2127-3	2100	2725	ALUM SLIDING DOOR
33	FW0624	600	2410	FIXED
34	AW1512	1457	1210	AWNING
35	AW1512	1457	1210	AWNING
36	AW0615	600	1450	AWNING / OBSCURE GLASS
37	SW0918	857	1810	SLIDING
38	SW0915	857	1457	SLIDING / OBSCURE GLASS
39	SW0921	857	2050	SLIDING
40	SW0621	600	2050	SLIDING
41	SW1218	1200	1810	SLIDING
42		2388	881	TIMBER ENTRY FRAME
43	SW1518	1457	1810	SLIDING
44	SD2115	2100	1450	ALUM SLIDING DOOR
45	SW1218	1200	1810	SLIDING

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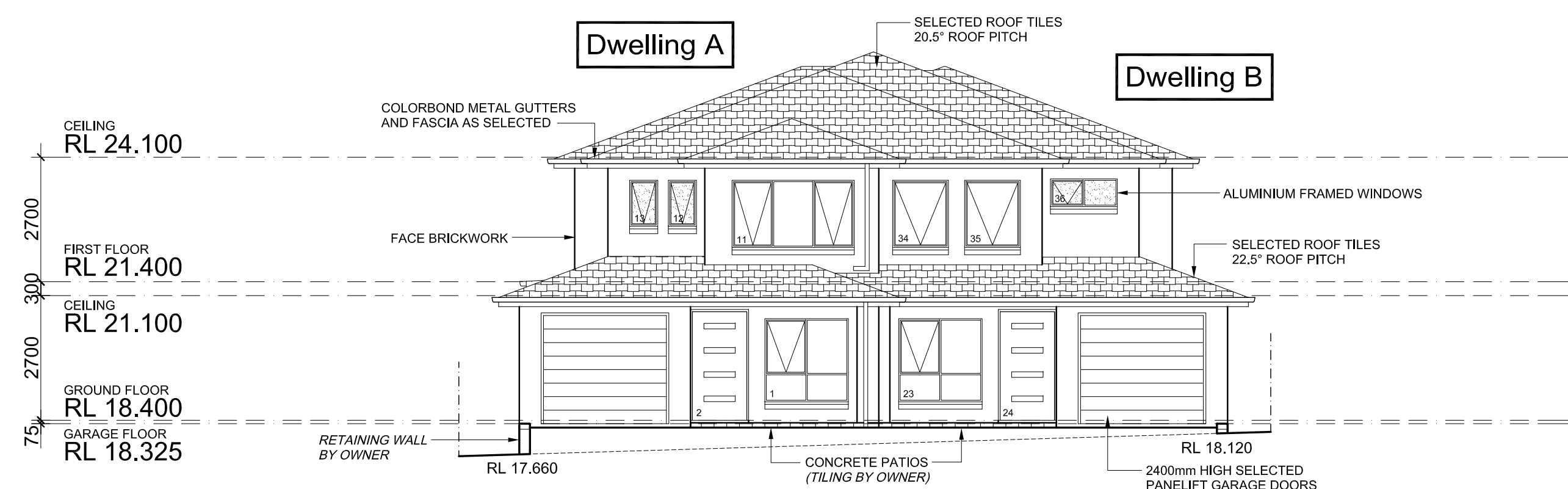
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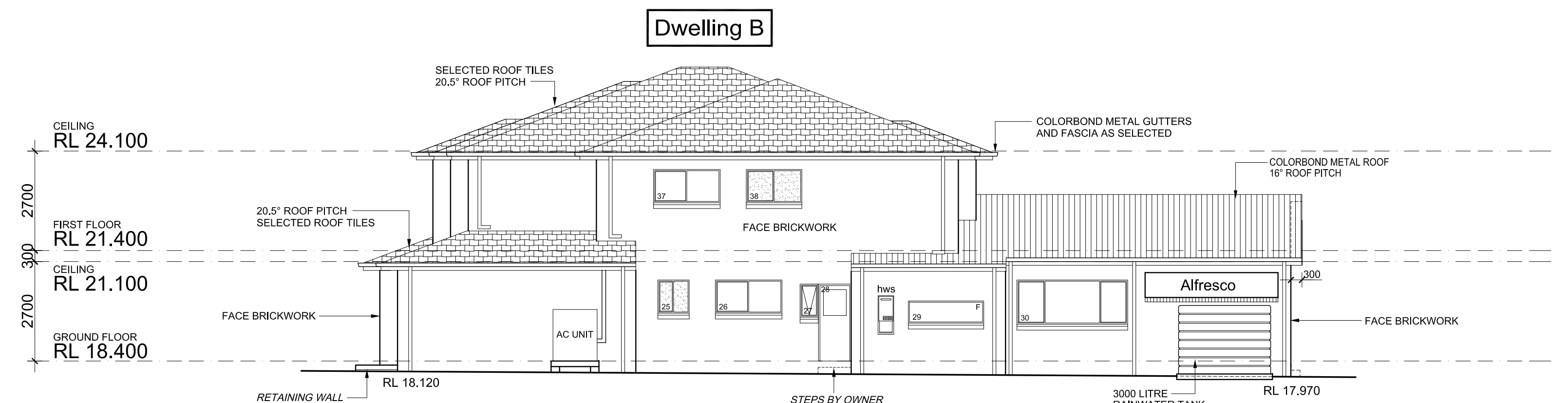
DATED: / /

Livable Housing Design Guidelines

Dwelling A: Silver Standard - Dwelling B: Gold Standard



Mackenzie Street (Western) Elevation



Right (Southern) Elevation

REVISION	DATE	DRAWN BY	COMMENTS
A	27.02.24	SL	Presentation Plans
B	11.04.24	CR	Livable Housing Design Amendments

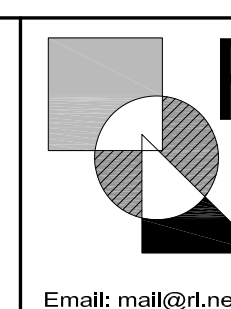
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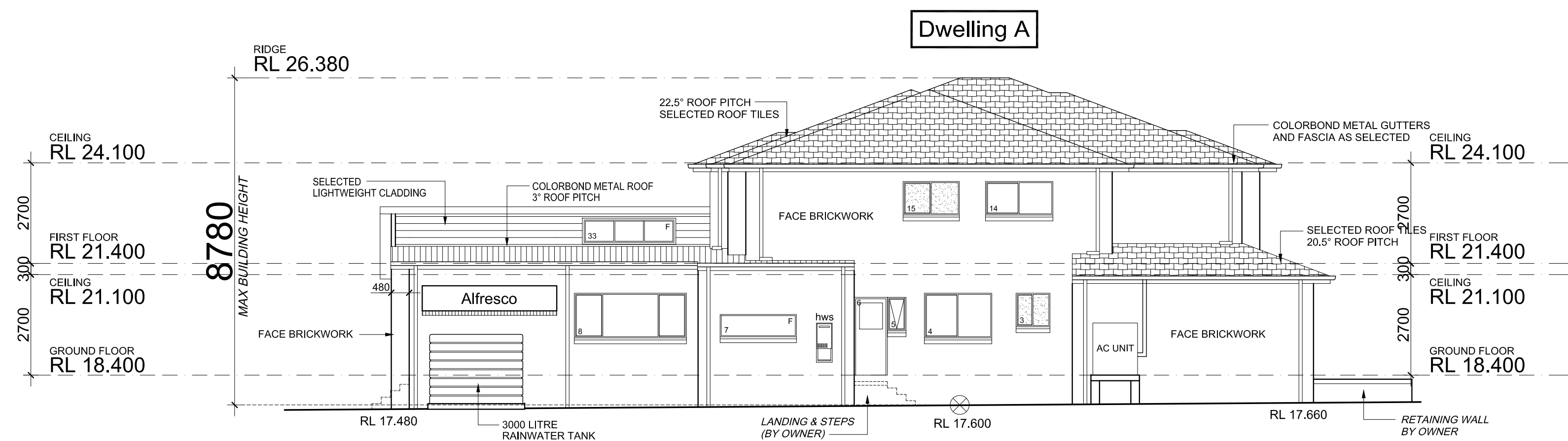
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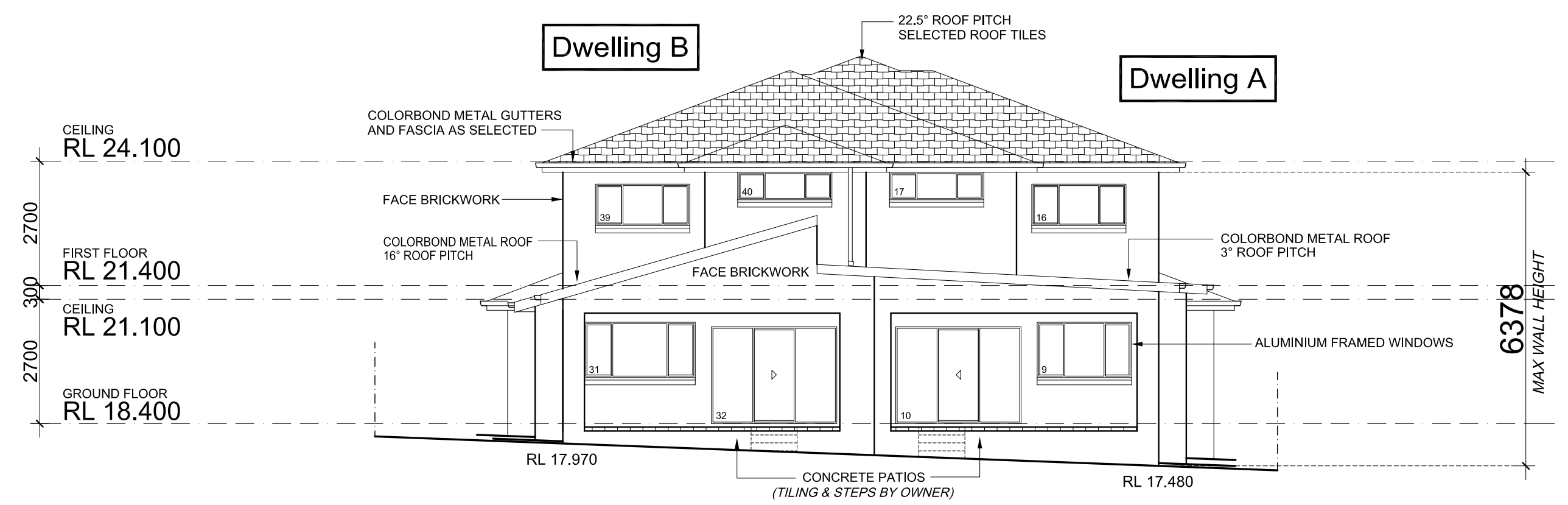
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Floor Plans, Elevations & Window Schedule
PROPOSED ATTACHED DUAL OCCUPANCY

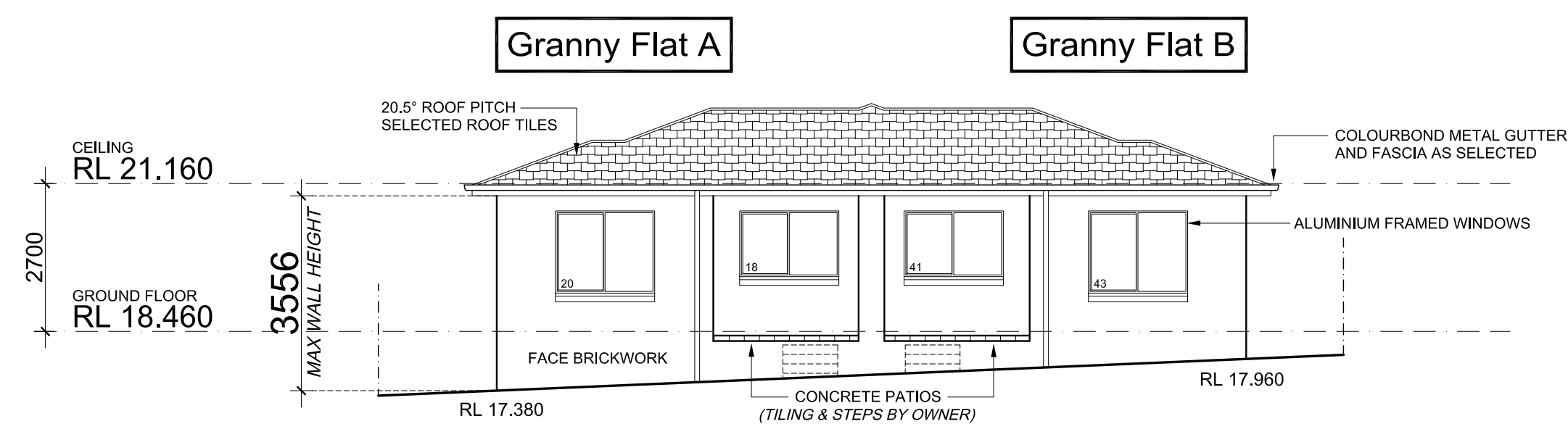
CLIENT: Mr Manduca & Mrs Fruci
SITE ADDRESS: No.98 (Lot A in DP 416914) Mackenzie Street,
SUBURB: Revesby SCALE: 1 : 100
COUNCIL: Canterbury Bankstown JOB No.: RL 5989
REVISION: B DATE: 11.04.2024 SHEET: 2 of 3



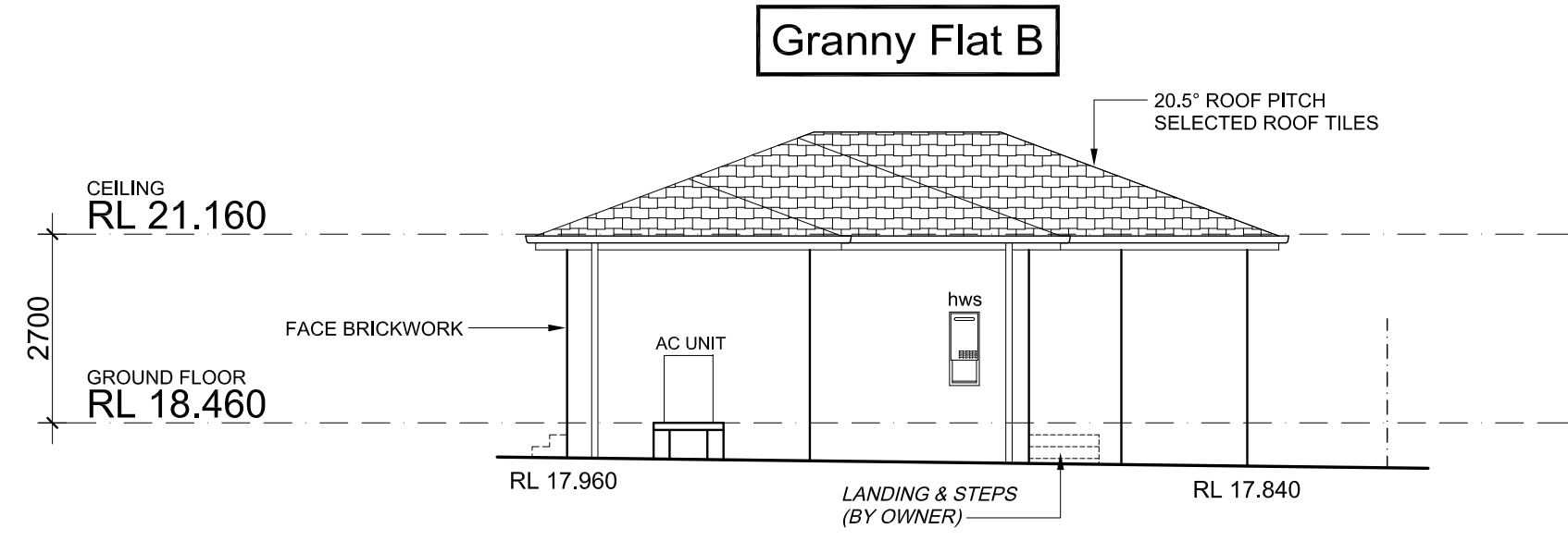
Left (Northern) Elevation



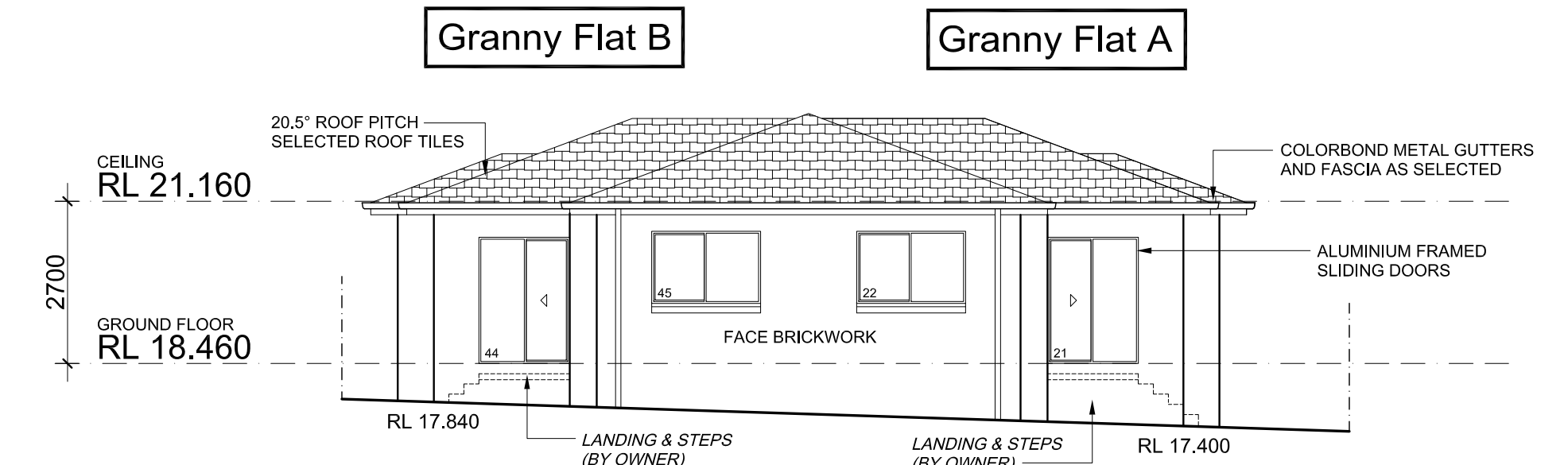
Rear (Eastern) Elevation



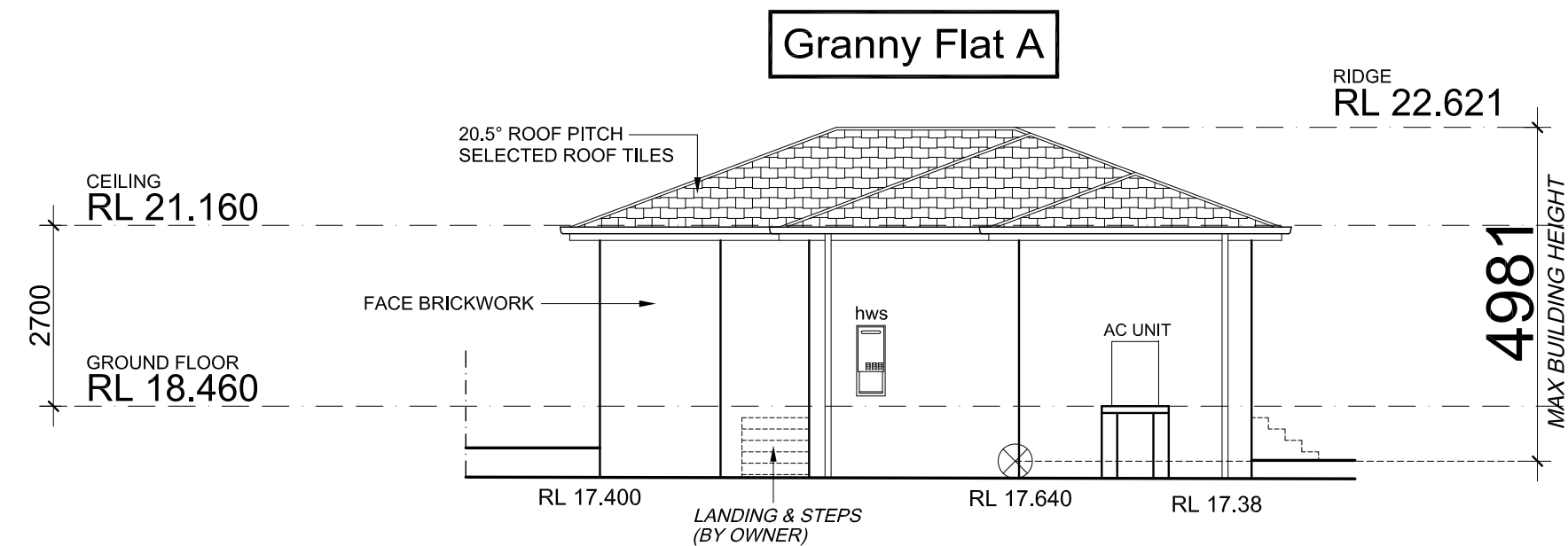
Front (Western) Elevation



Right (Southern) Elevation

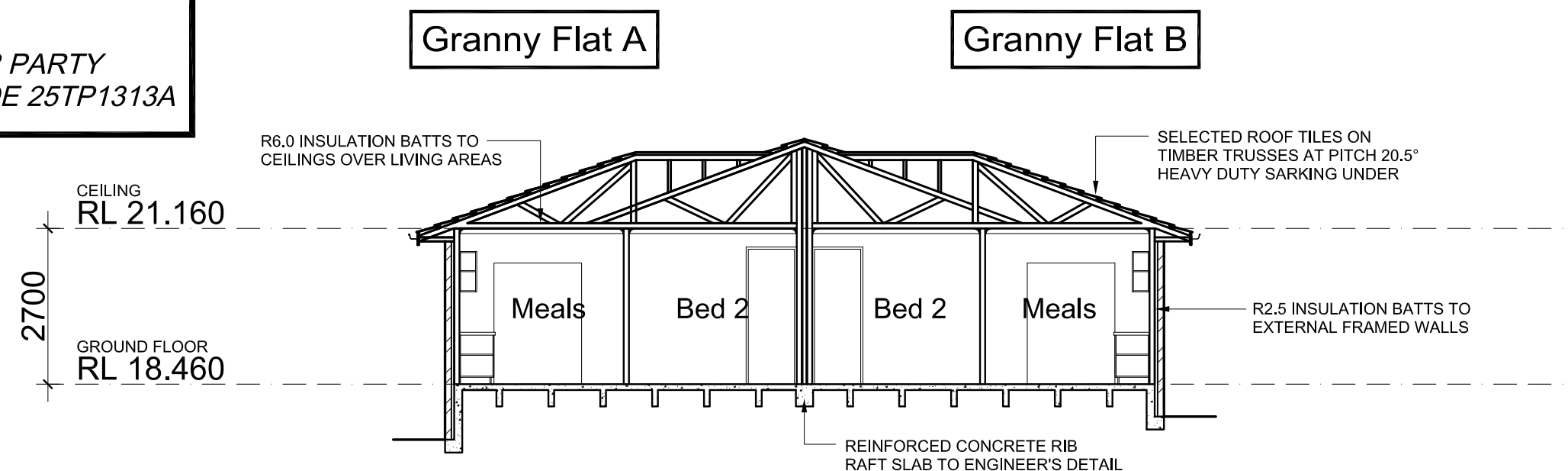


Rear (Eastern) Elevation

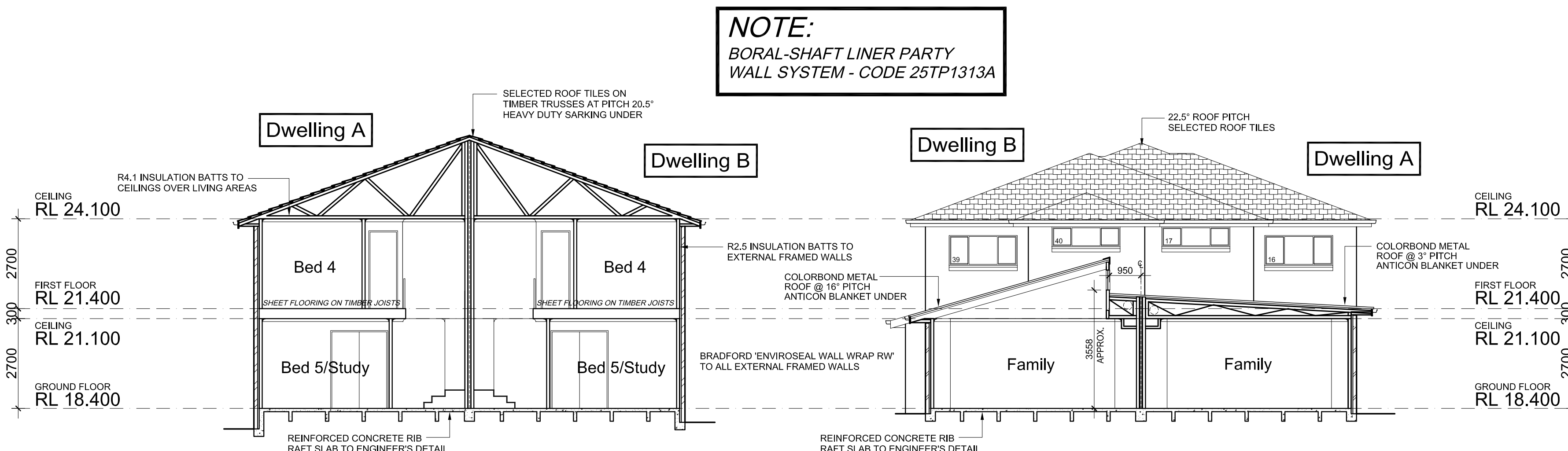


Left (Northern) Elevation

NOTE:
BORAL-SHAFT LINER PARTY
WALL SYSTEM - CODE 25TP1313A



Sectional Elevation



Cross Section 1

Cross Section 2

100 Year ARI Flood Level
RL 17.900 AHD

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PRINT NAME:

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DATED: / /

BASIX

REVISION	DATE	DRAWN BY	COMMENTS
A	27.02.24	SL	Presentation Plans
B	11.04.24	CR	Liveable Housing Design Amendments

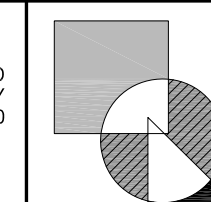
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Elevations, Sections & BASIX Commitments PROPOSED ATTACHED DUAL OCCUPANCY			
CLIENT: Mr Manduca & Mrs Fruci			
SITE ADDRESS: No.98 (Lot A in DP 416914) Mackenzie Street,			
SUBURB: Revesby		SCALE: 1 : 100	
COUNCIL: Canterbury Bankstown		JOB No.: RL 5989	
REVISION: B		DATE: 11.04.2024	
		SHEET: 3 of 3	



APPENDIX B

100 YEAR ARI FLOOD MAPS - PADSTOW CATCHMENT STUDY





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PO Box 8, Bankstown NSW 1885
Tel: (02) 9707 9010 - Fax: (02) 9707 9408
DX 11220 BANKSTOWN
council@cbc.city.nsw.gov.au

CITY OF CANTERBURY BANKSTOWN

To: Rosetta Fruci
8 Elliston Pl
BARDEN RIDGE NSW 2234

STORMWATER SYSTEM REPORT **98 Mackenzie Street, REVESBY NSW 2212**

Date: 17-Oct-2023
Ref: WP-SIAONL-2103/2023
Development type: Dual Occupancy

NO

FLOOD/OVERLAND FLOW STUDY REQUIRED

The site is affected by the following Council stormwater system components:

- Overland flowpath for excess stormwater runoff from the upstream catchment to the south of the site.

The site will be subject to stormwater inundation from this overland flowpath during large storm events. Refer to the attached "100 Year ARI Flood Maps from Padstow Catchment Study" showing the flood contours to m AHD**. Provision should be made on site, and at boundary fences, for this stormwater runoff to pass unobstructed over the site. Stormwater flowing naturally onto the site must not be impeded or diverted.

The estimated 100 year ARI* flood level at the site is RL 17.9 m AHD**.

For this development, a flood /overland flow study to determine the 100 year ARI* water surface level is not necessary provided that the proposed development including floor levels, shall comply with the development controls specified in Chapter 2.2 Schedule 5, of Canterbury Bankstown's Development Control Plan 2023 - Catchments Affected by Stormwater Flooding.

The Development Application submission shall be based on an AHD datum for levels where sites are affected by overland flow / flooding. Refer Bankstown Council's *Development Engineering Standards** 2023.**

Habitable floor levels are to be at least 500mm above the 100 year ARI* flood level at the site adjacent to the proposed buildings.

Runoff on the site, and naturally draining to it is to be collected and disposed of to Council's requirements detailed in Bankstown Council's *Development Engineering Standards**** 2023.

This report is given without the benefit of development plans or a site survey. Council may choose to vary some report requirements following evaluation of detailed plans when they are submitted.

This report relates to the exposure of the subject site to Council's stormwater system, both underground and overland. It does not assess the suitability or otherwise of this site for the proposed development.

* Average Recurrence Interval

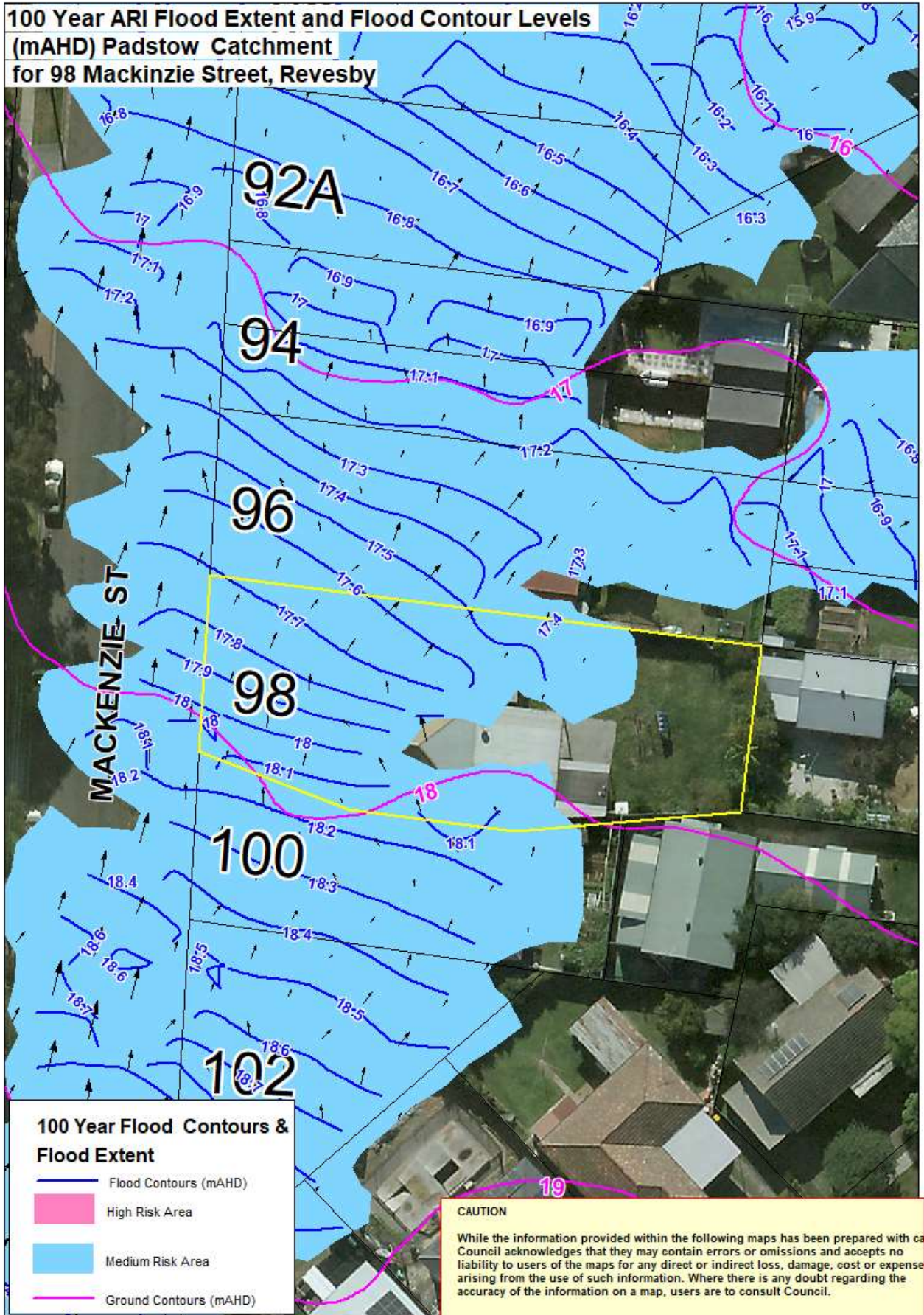
** Australian Height Datum

*** Canterbury Bankstown Council's *Development Engineering Standards* June 2023 and Canterbury Bankstown's *Development Control Plan 2023* is available from Council's Web Page.

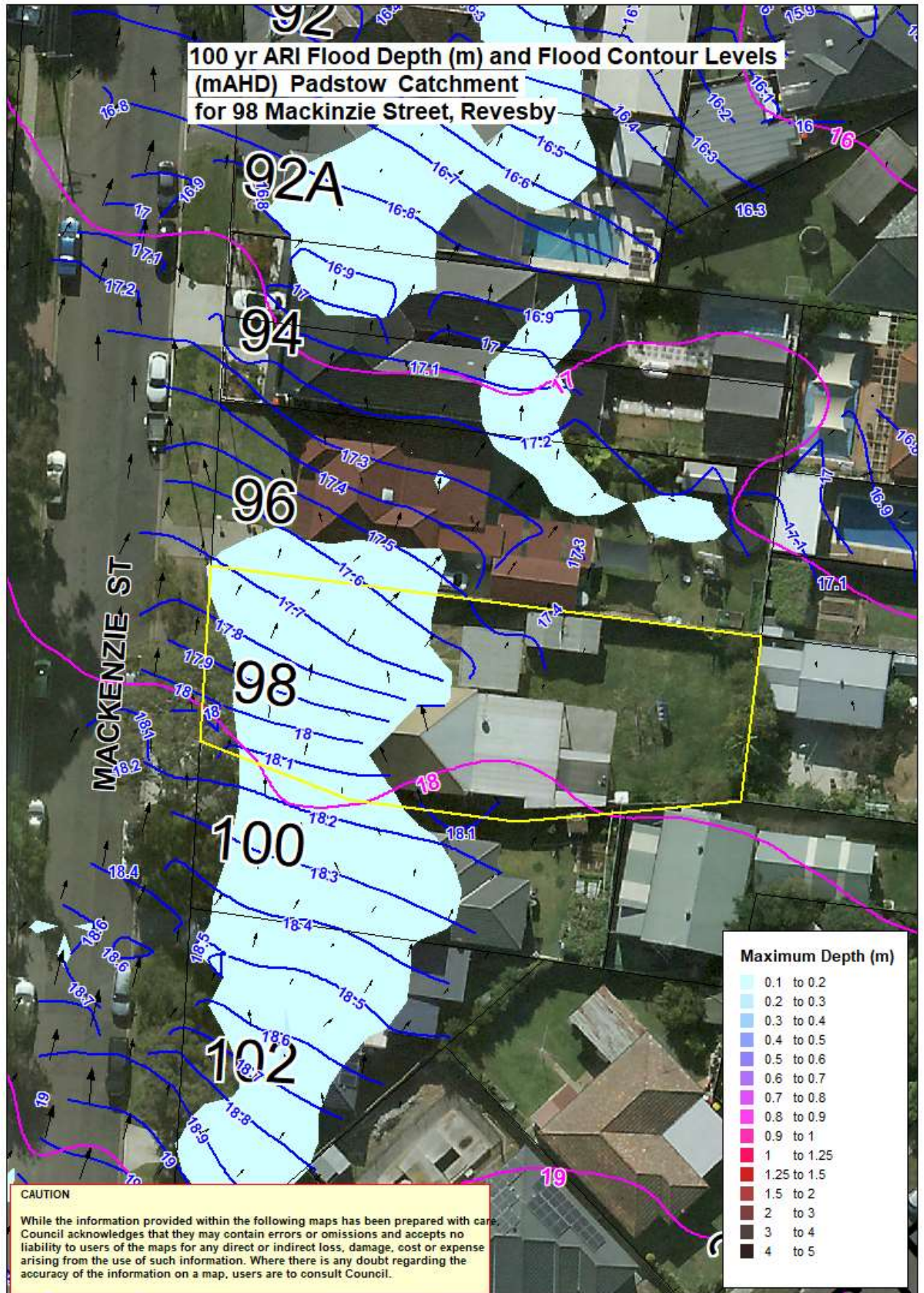
PMF Probable Maximum Flood

Pushpa Goonetilleke
ENGINEER

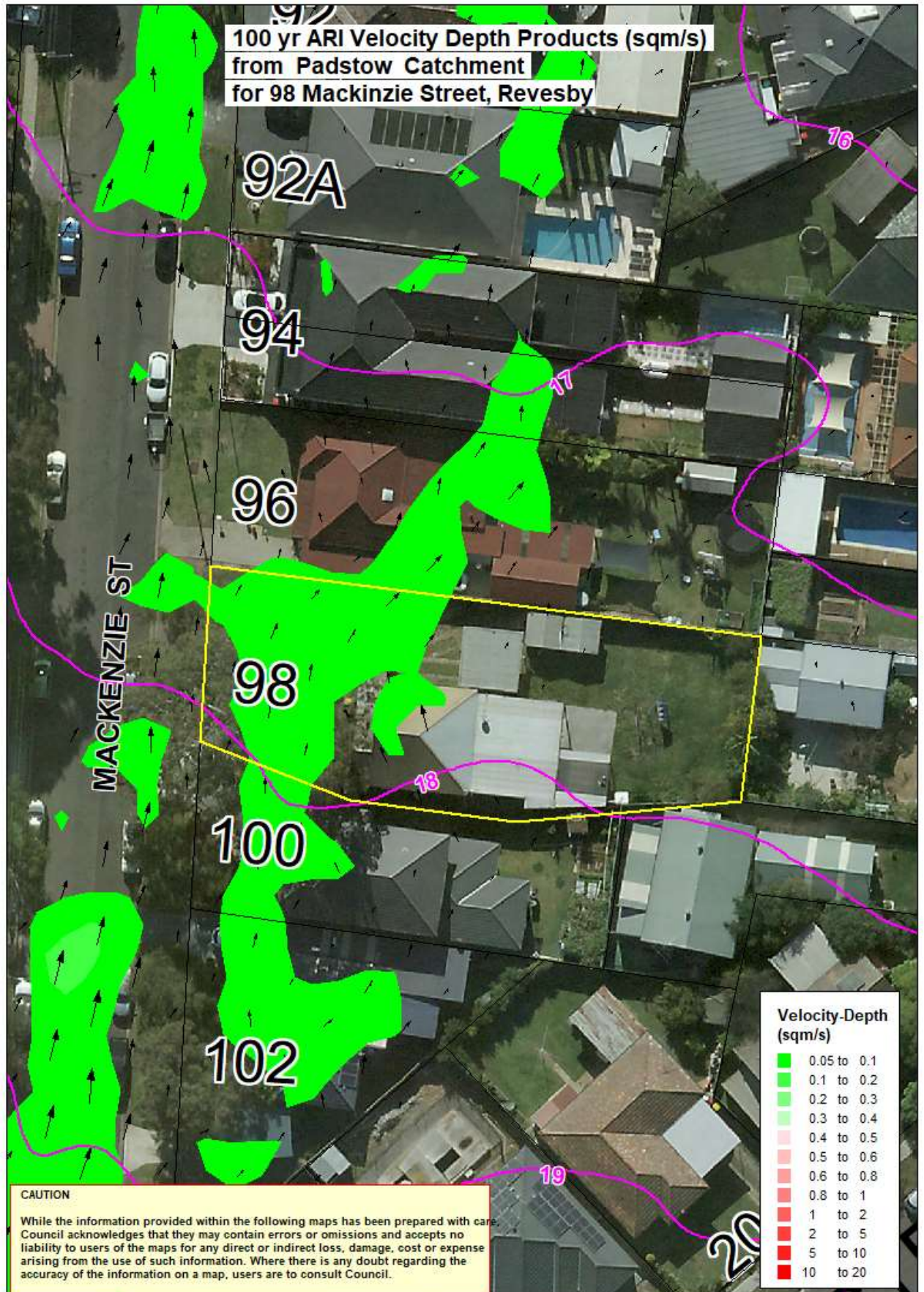
**100 Year ARI Flood Extent and Flood Contour Levels
(mAHD) Padstow Catchment
for 98 Mackenzie Street, Revesby**



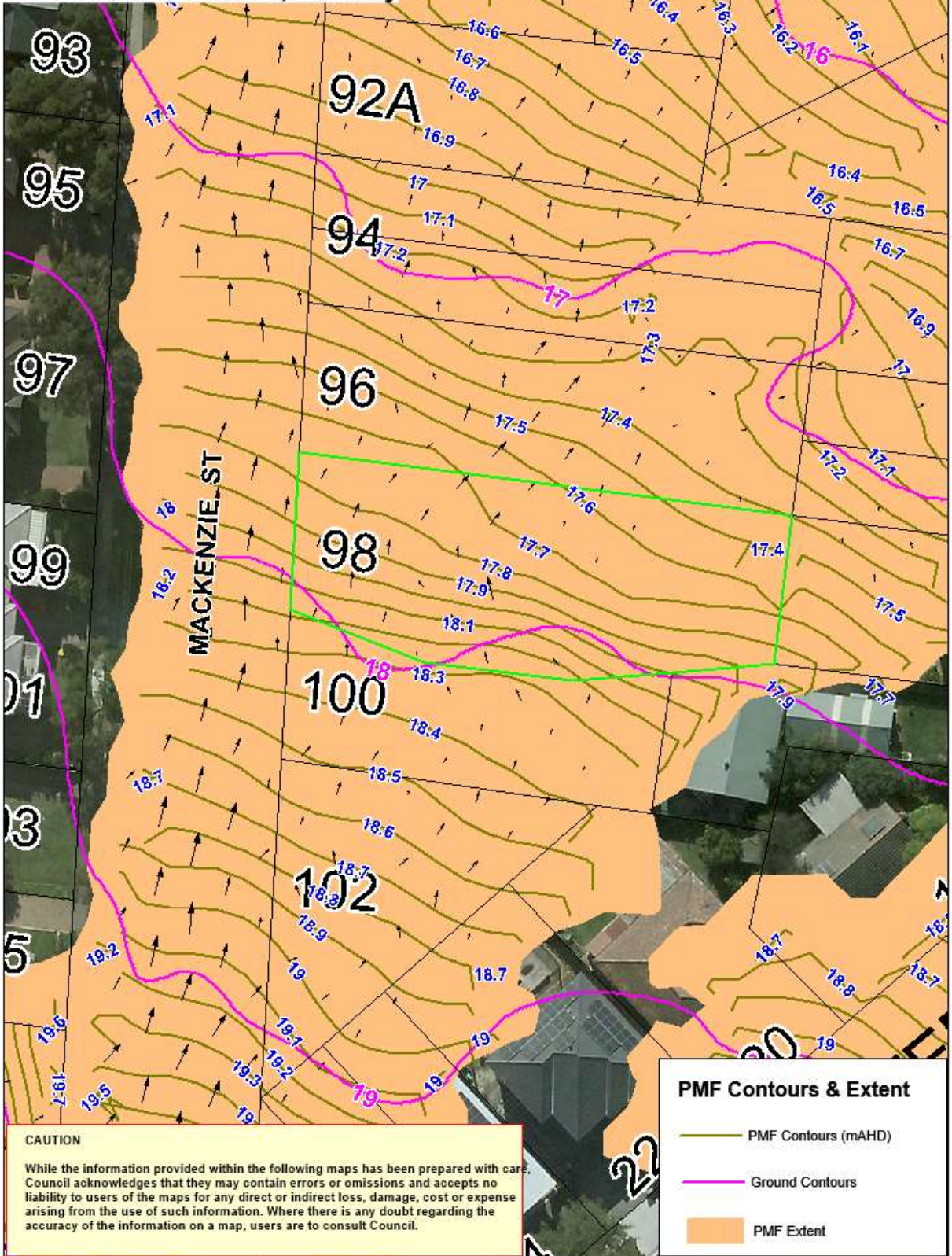
100 yr ARI Flood Depth (m) and Flood Contour Levels (mAHD) Padstow Catchment for 98 Mackenzie Street, Revesby



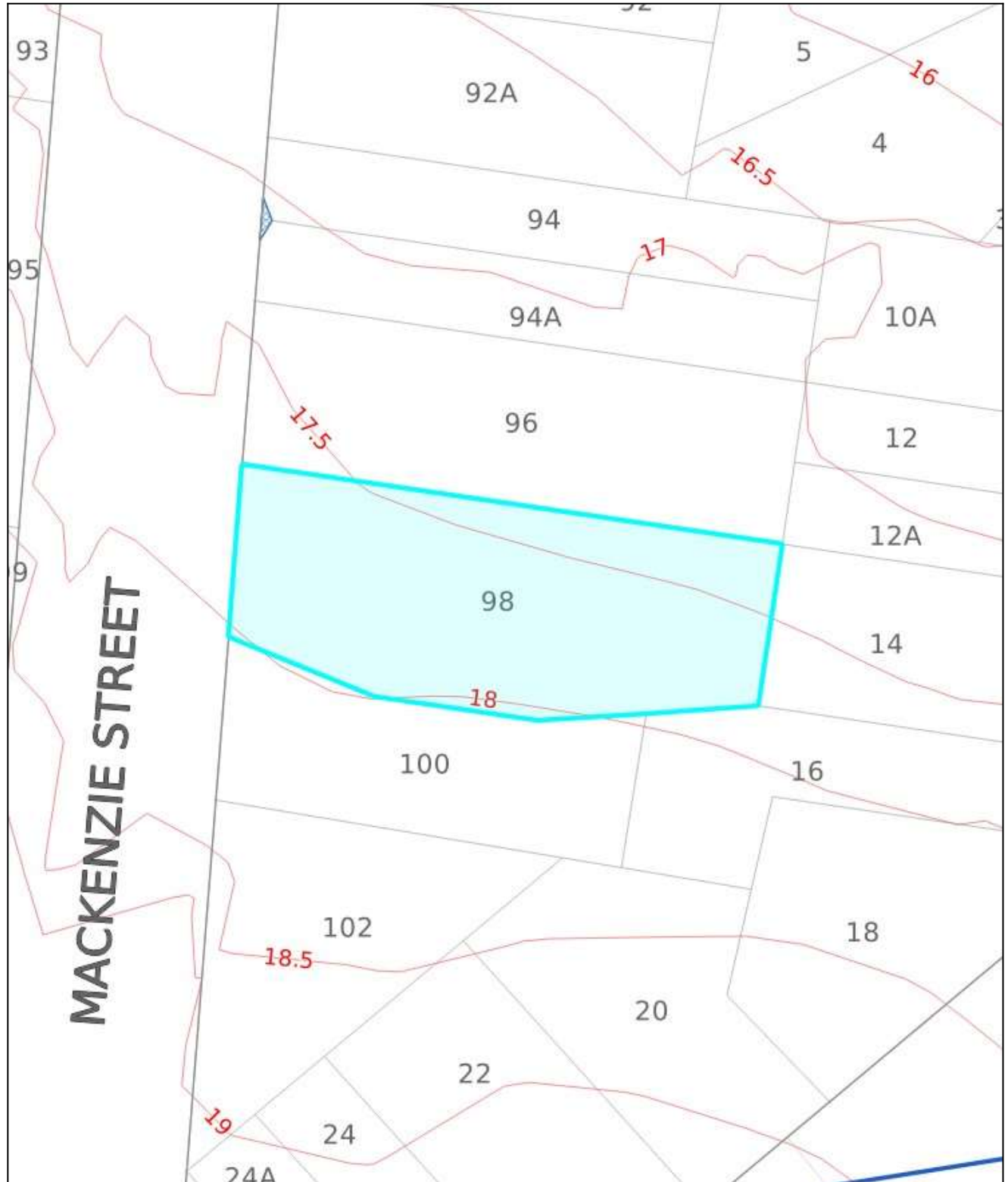
100 yr ARI Velocity Depth Products (sqm/s)
from Padstow Catchment
for 98 Mackenzie Street, Revesby



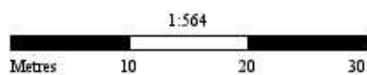
**PMF Extent and Contour Levels (mAHD)
from Padstow Catchment
for 98 Mackenzie Street, Revesby**



GIS Map 98 Mackenzie Street, Revesby



DATE: Oct 17, 2023, 10:38 AM

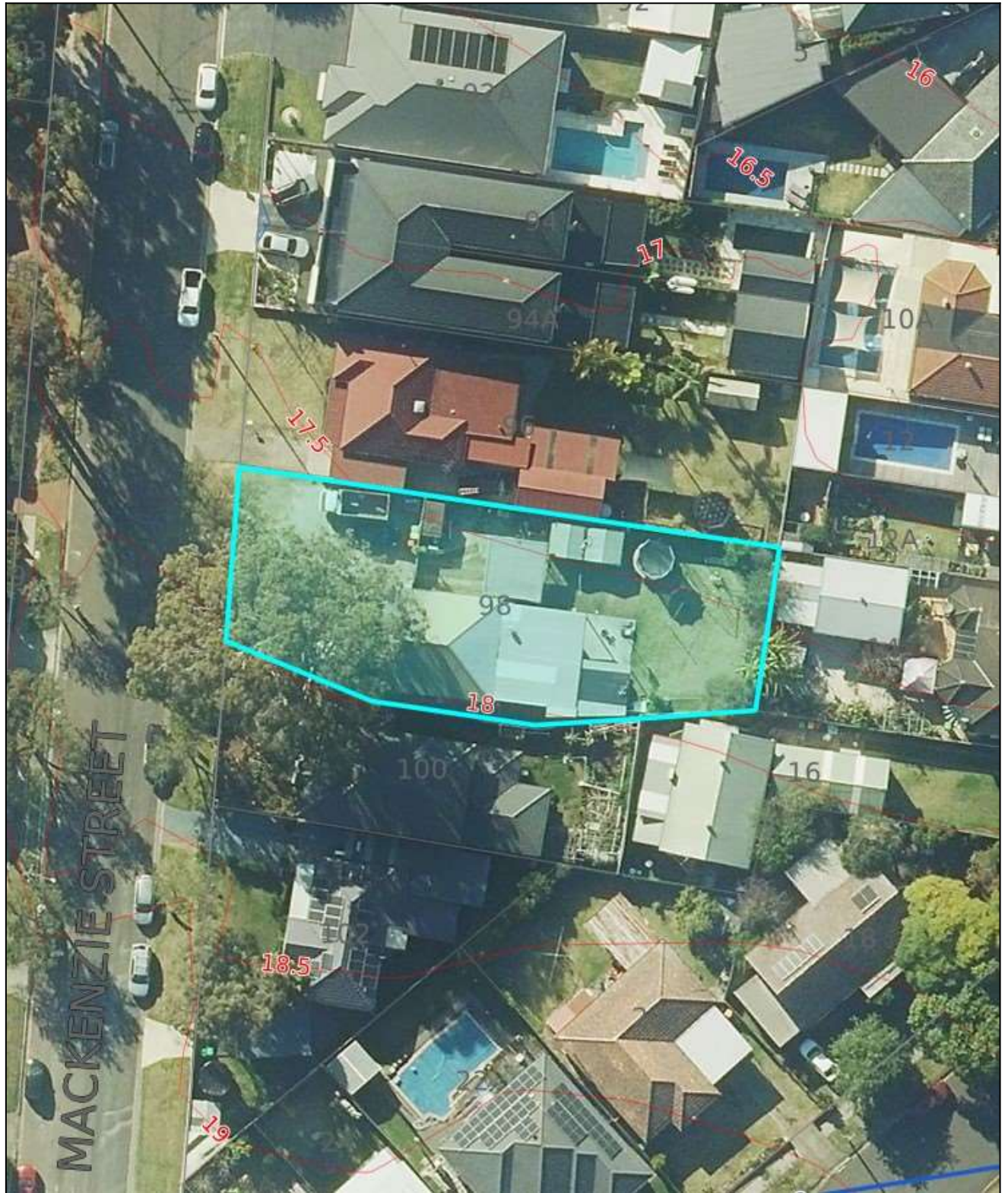


PREPARED BY: ushpa G

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GIS Map 98 Mackenzie Street, Revesby



DATE: Oct 17, 2023, 10:41 AM

PREPARED BY: ushpa G

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Metres 10 20 30

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LEGEND



Canterbury Bankstown LGA



Surrounding LGA's

Jetty



Jetty

Parcel Frontage



Parcel Frontage

Parcel Boundary



Parcel Boundary

Parcel Easements (Line)



Parcel Easements (Line)

Parcel Easements (Polygon)



Parcel Easements (Polygon)

Contours (Major 10m)



Contours (Major 10m)

Contours (Intermediate 5m)



Contours (Intermediate 5m)

Contours (Minor <5m)



Contours (Minor <5m)

Drains



Drains

Pits



Pits

Sydney Water Stormwater Channels