

GLENORCHY PLANNING AUTHORITY
ATTACHMENTS
MONDAY, 6 NOVEMBER 2023



TABLE OF CONTENTS:

PLANNING

**5. PROPOSED USE AND DEVELOPMENT - MULTIPLE DWELLINGS
(ONE EXISTING TWO PROPOSED) - 36 GROVE ROAD
GLENORCHY**

1: GPA Attachment - 36 Grove Road, Glenorchy	2
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© Glenorchy City Council

36 Grove Road, Glenorchy

30-Oct-2023



The graphic information on this map is produced by Glenorchy City Council. As errors or omissions may occur please verify data before any projects are commenced. The representation of roads or tracks is no evidence of right of way. This map is not to be used as a site plan for making an application to council.



20 m

PROPOSED 3 UNITS DEVELOPMENT (2 NEW & 1 EXISTING)

36 GROVE ROAD, GLENORCHY

ARCHITECTURAL & ENGINEERING DRAWING

DRAWINGS NO. DRAWING NAME

DA00	COVER
DA01	EXISTING & DEMOLITION PLAN
DA02	SITE PLAN LEVEL GROUND
DA03	SITE PLAN LEVEL 1
DA04	SITE ELEVATIONS
DA05	SITE ELEVATIONS
DA06	SITE ELEVATIONS
DA07	PLANS (UNIT 1-2)
DA08	LANDSCAPE DETAILS
DA09	LANDSCAPE DETAILS
DA10	SHADOW DIAGRAMS
DA11	SHADOW DIAGRAMS

SITE INFORMATION		216332/17
TITLE REF		5372372
PROPERTY ID		697 sq.m
SITE AREA		3 / 697 sq.m = 232.33 < 200 sq.m
DENSITY		265.45 sq.m / 697 sq.m = 38.08%
SITE COVERAGE		
UNIT 1 (EXISTING HOUSE)		
LEVEL GROUND		REMAING EXISTING
PRIVATE OPEN SPACE		71.9 SQ.M. > 40 SQ.M.
UNIT 2 & 3 (NEW UNIT)		
LEVEL GROUND		58.45 SQ.M. (INC. EXTERNAL WALL)
LEVEL 1		59.89 SQ.M. (INC. EXTERNAL WALL)
TOTAL		118.34 SQ.M. (INC. EXTERNAL WALL)
BALCONY		22.03 SQ.M.
PRIVATE OPEN SPACE		
UNIT 1		36.74 + 6.24 + 22.03 (BALCONY) = 65.01 SQ.M. > 40 SQ.M.
UNIT 2		36.26 + 6.15 + 22.03 (BALCONY) = 64.44 SQ.M. > 40 SQ.M.

ISSUE	REVISION	OWN	CHK	DATE
1	DESIGNER PARTITION	DA	DA	02/02/23
2	RESPONSE TO COUNCIL REF	DA	DA	13/07/23
3	RESPONSE TO COUNCIL REF	DA	DA	26/09/23

Mind.

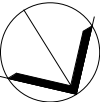
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PROJECT:
PROPOSED 3 UNITS DEVELOPMENT
PROJECT ADDRESS:
36 GROVE ROAD, GLENORCHY
CLIENT:
TANT HOLDINGS PTY LTD.

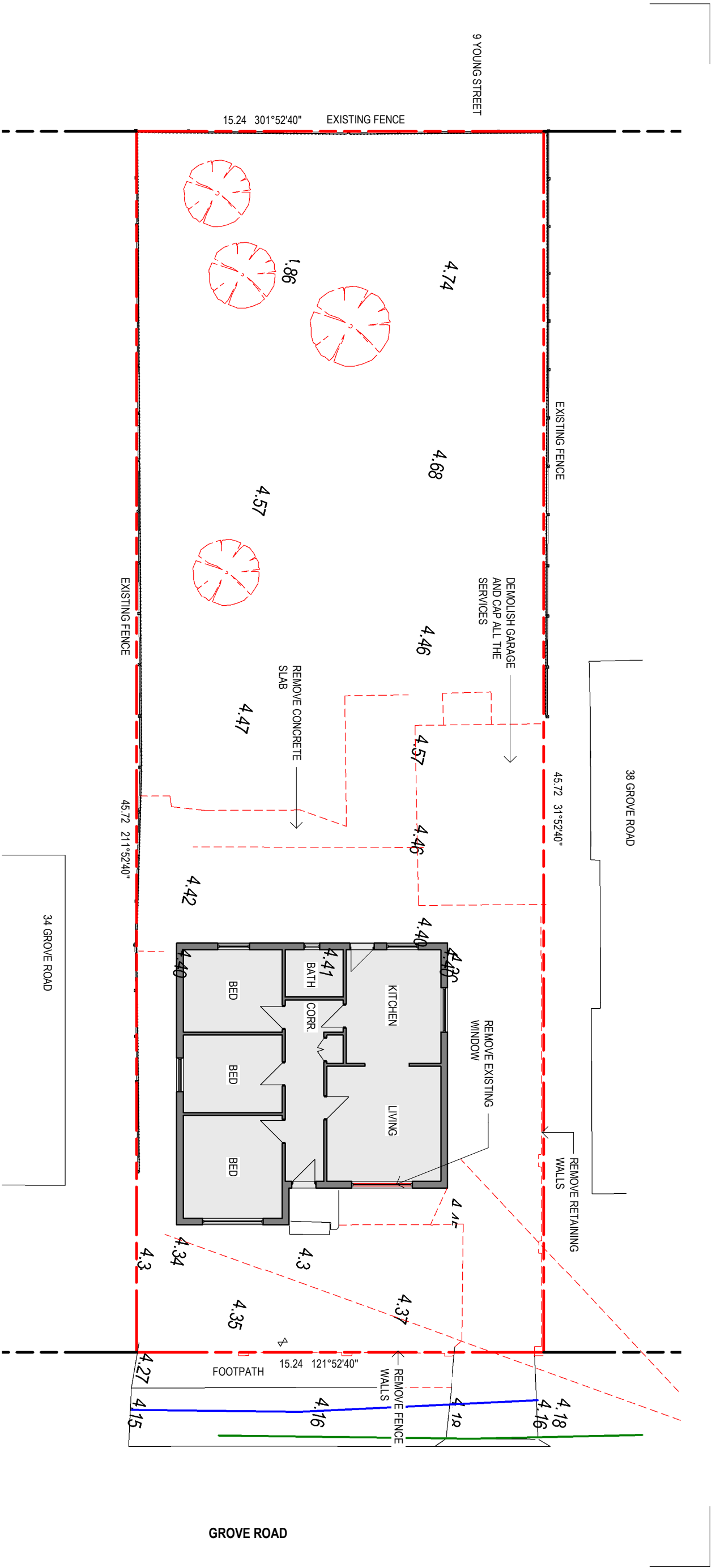
DRAWING TITLE:
COVER
PROJECT NO.:
2241

SCALE:
1 : 35 @ A3
DRAWING No.:
DA00

REVISION:
3



SITE CONTEXT PLAN

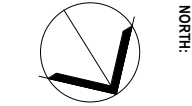


1
EXISTING & DEMOLITION PLAN
Scale 1 : 150

NO	REVISION	DATE
1	DESIGNER APPLICATION	02/06/23
2	RESPONSE TO COUNCIL REF	13/07/23
3	RESPONSE TO COUNCIL REF	26/09/23

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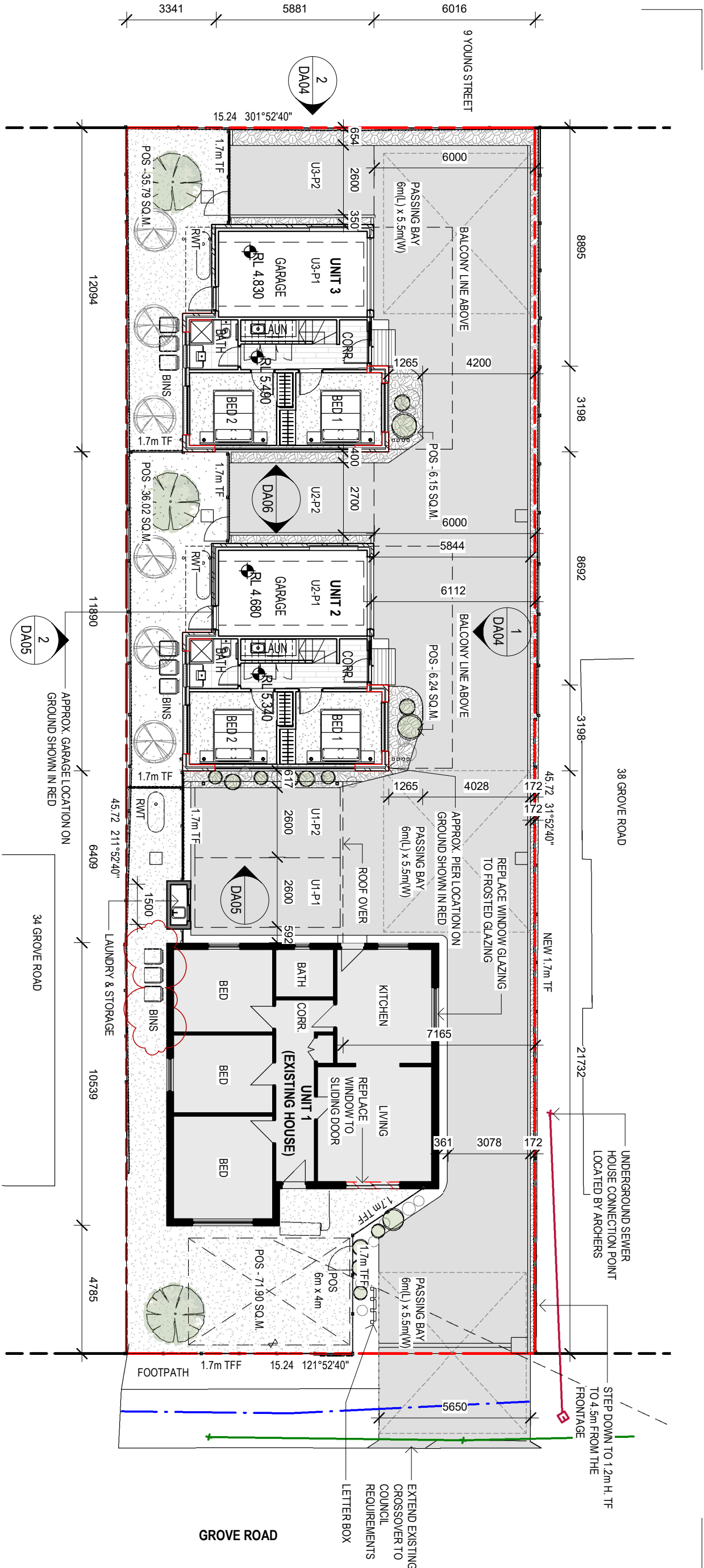


PROJECT:
PROPOSED 3 UNITS DEVELOPMENT
PROJECT ADDRESS:
36 GROVE ROAD, GLENORCHY
CLIENT:
TANT HOLDINGS PTY LTD.

DRAWING TITLE:
EXISTING & DEMOLITION
PLAN
PROJECT NO.:
2241

SCALE:
As indicated
@ A3
DRAWING No.:
DA001

REVISION:
3



1 LEVEL GROUND 1

Scale 1 : 150

UNIT 1 (EXISTING HOUSE)	REMAINING EXISTING
LEVEL GROUND	71.9 SQ.M. > 40 SQ.M.
PRIVATE OPEN SPACE	
UNIT 2 & 3 (NEW UNIT)	58.45 SQ.M. (INC. EXTERNAL WALL)
LEVEL GROUND	59.89 SQ.M. (INC. EXTERNAL WALL)
LEVEL 1	118.34 SQ.M. (INC. EXTERNAL WALL)
TOTAL	
BALCONY	22.03 SQ.M.
PRIVATE OPEN SPACE	
UNIT 1	36.74 + 6.24 + 22.03 (BALCONY) = 65.01 SQ.M. > 40 SQ.M.
UNIT 2	36.26 + 6.15 + 22.03 (BALCONY) = 64.44 SQ.M. > 40 SQ.M.

BS#	REVISION	BY	CHK	DATE
1	DESIGNATED APPLICATION	DA	DA	02/02/23
2	RESPONSE TO COUNCIL RFI	DA	DA	13/07/23
3	RESPONSE TO COUNCIL RFI	DA	DA	09/08/23
4	RESPONSE TO COUNCIL RFI	DA	DA	30/09/23

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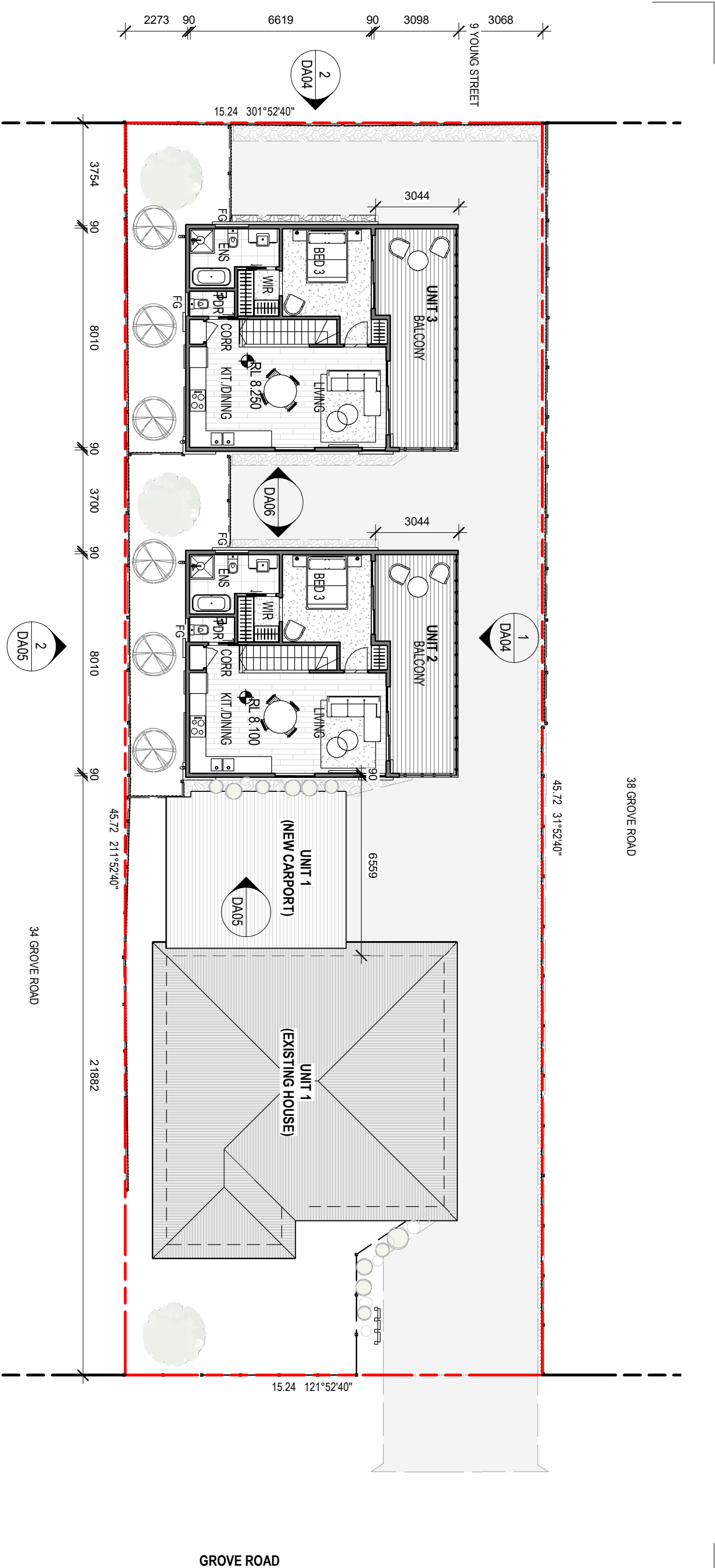


PROJECT: PROPOSED 3 UNITS DEVELOPMENT
PROJECT ADDRESS: 36 GROVE ROAD, GLENORCHY
CLIENT: TANT HOLDINGS PTY LTD.

DRAWING TITLE: SITE PLAN LEVEL GROUND
PROJECT NO.: 2241

SCALE: As indicated @ A3
DRAWING NO.: DA02

REVISION: 4



1 U3_Level 1
DA04 Scale 1 : 150

UNIT 1 (EXISTING HOUSE) LEVEL GROUND	REMANING EXISTING
PRIVATE OPEN SPACE	71.9 SQ.M. > 40 SQ.M.
UNIT 2 & 3 (NEW UNIT) LEVEL GROUND	58.45 SQ.M. (INC. EXTERNAL WALL) 59.89 SQ.M. (INC. EXTERNAL WALL)
TOTAL	118.34 SQ.M. (INC. EXTERNAL WALL)
BALCONY	22.03 SQ.M.
PRIVATE OPEN SPACE	36.74 + 6.24 + 22.03 (BALCONY) = 65.01 SQ.M. > 40 SQ.M.
UNIT 1	36.26 + 6.15 + 22.03 (BALCONY) = 64.44 SQ.M. > 40 SQ.M.
UNIT 2	

BSR#	REVISION	CHK /	DATE
1	DESIGN/PLAN APPLICATION	DA	02/02/23
2	RESPONSE TO COUNCIL RFI	DA	13/07/23
3	RESPONSE TO COUNCIL RFI	DA	09/09/23
4	RESPONSE TO COUNCIL RFI	DA	30/09/23

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REASON FOR ISSUE
DEVELOPMENT
APPROVAL

NORTH:

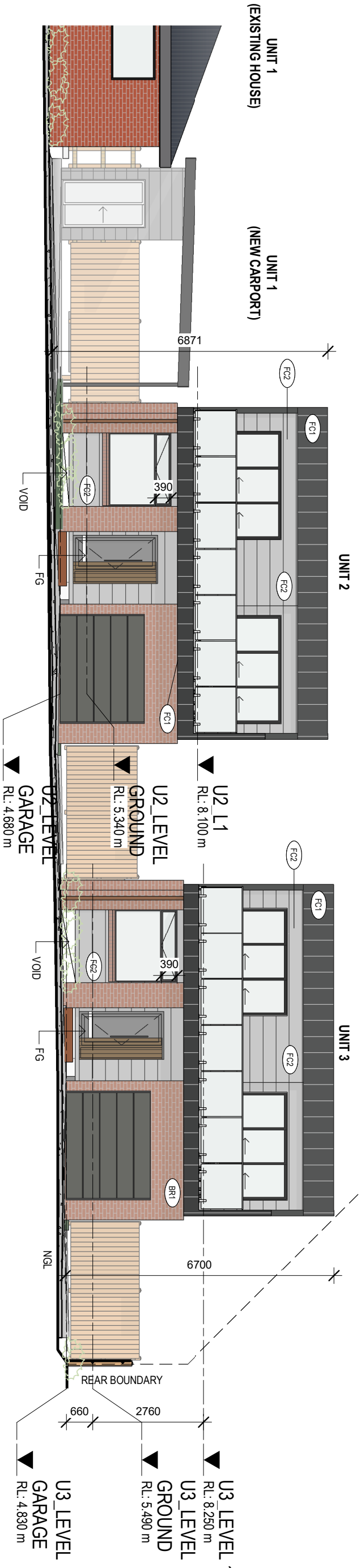
PROJECT:
PROPOSED 3 UNITS DEVELOPMENT
PROJECT ADDRESS:
36 GROVE ROAD, GLENORCHY
CLIENT:
TANT HOLDINGS PTY LTD.



DRAWING TITLE:
SITE PLAN_Level 1
PROJECT NO.:
2241

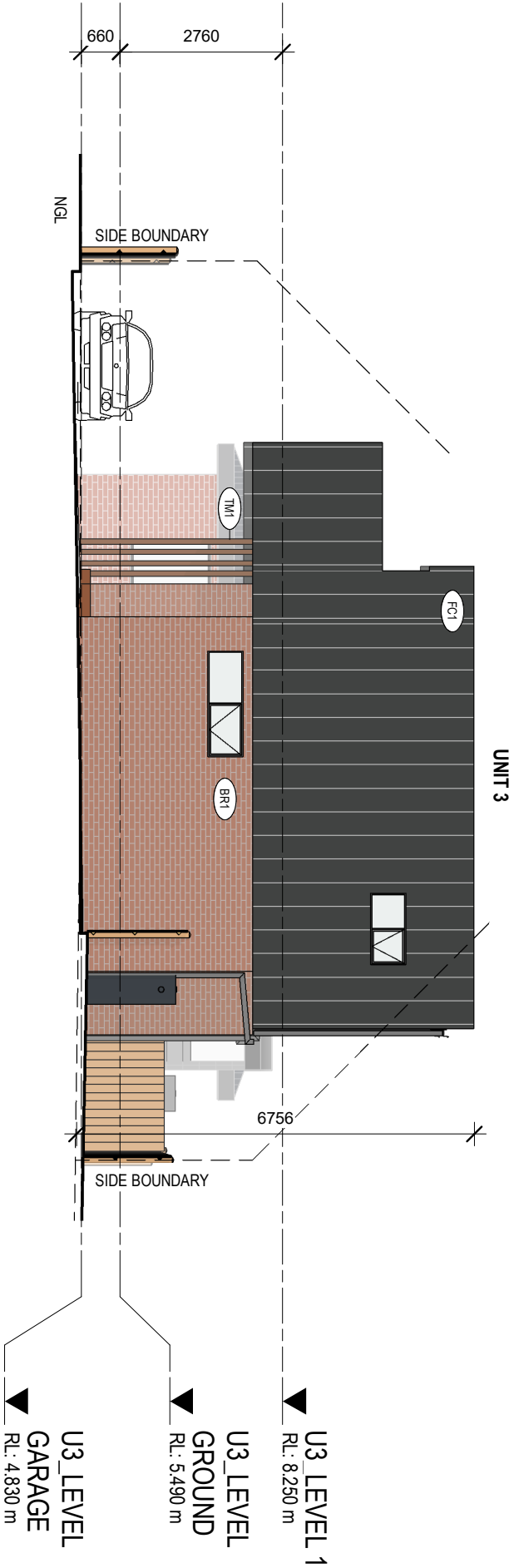
SCALE:
1 : 150 @ A3
DRAWING No.:
DA03

REVISION:
4



1 U2 & U3 NORTH-WEST ELEVATIONS
DA02 Scale 1 : 100

2 U3 SOUTH-WEST ELEVATION
DA02 Scale 1 : 100



MATERIAL LEGEND	
BR1	FACE BRICK - RECLAIMED BRICK LOOKED
FC1	FIBRE CEMENT CLADDING - AXON 400
FC2	FIBRE CEMENT CLADDING - STRIA 325
TM1	HARDWOOD TIMBER BATTEN
FG	FROSTED GLASS

ISSUE	REVISION	DATE
1	DESIGNER PARTICIPATION	02/04/23
2	RESPONSE TO COUNCIL REF	13/07/23
3	RESPONSE TO COUNCIL REF	09/08/23
4	RESPONSE TO COUNCIL REF	28/09/23

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PROJECT:
PROPOSED 3 UNITS DEVELOPMENT

PROJECT ADDRESS:
36 GROVE ROAD, GLENORCHY

CLIENT:
TANT HOLDINGS PTY LTD.

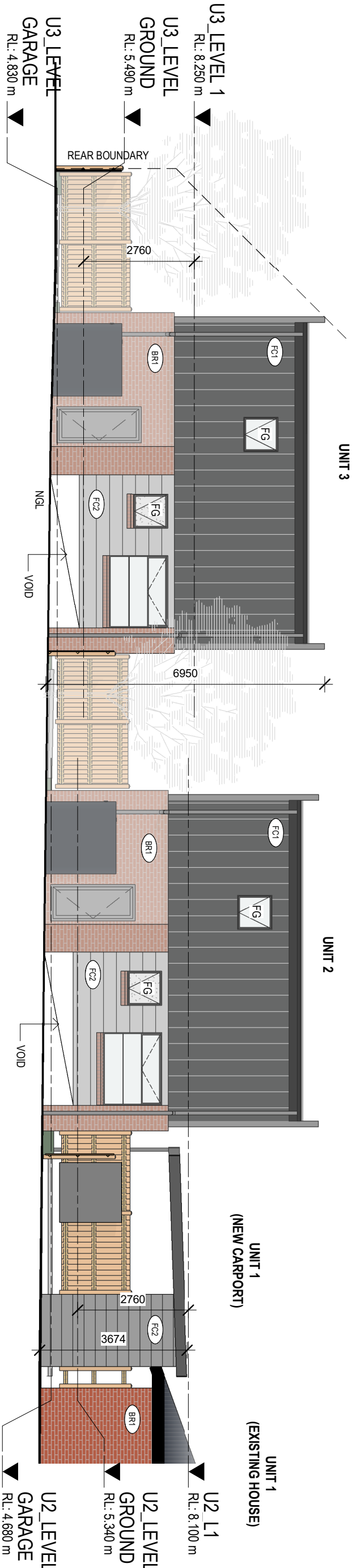
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SITE ELEVATIONS

PROJECT NO.:
2241

SCALE:
1 : 100 @
A3

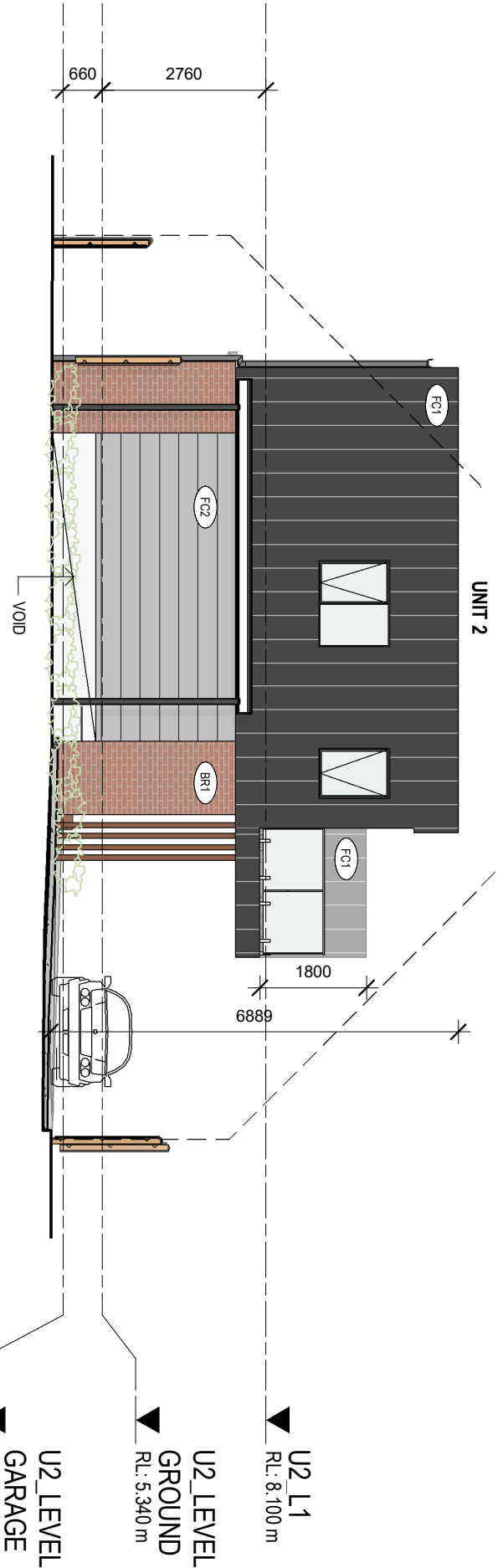
DRAWING No.:
DA04

REVISION:
4



2 U2 & U3 SOUTH-EAST ELEVATIONS

DA02 Scale 1 : 100



1 U2 NORTH-EAST ELEVATION

DA02 Scale 1 : 100

MATERIAL LEGEND	
BR1	FACE BRICK - RECLAIMED BRICK LOOKED
FC1	FIBRE CEMENT CLADDING - AXON 400
FC2	FIBRE CEMENT CLADDING - STRIA 325
TM1	HARDWOOD TIMBER BATTEN
FG	FROSTED GLASS

NO	REVISION	CHK	DATE
1	DESIGNER APPLICATION	DA	02/02/23
2	RESPONSE TO COUNCIL REF	DA	13/07/23
3	RESPONSE TO COUNCIL REF	DA	09/08/23
4	RESPONSE TO COUNCIL REF	DA	28/09/23

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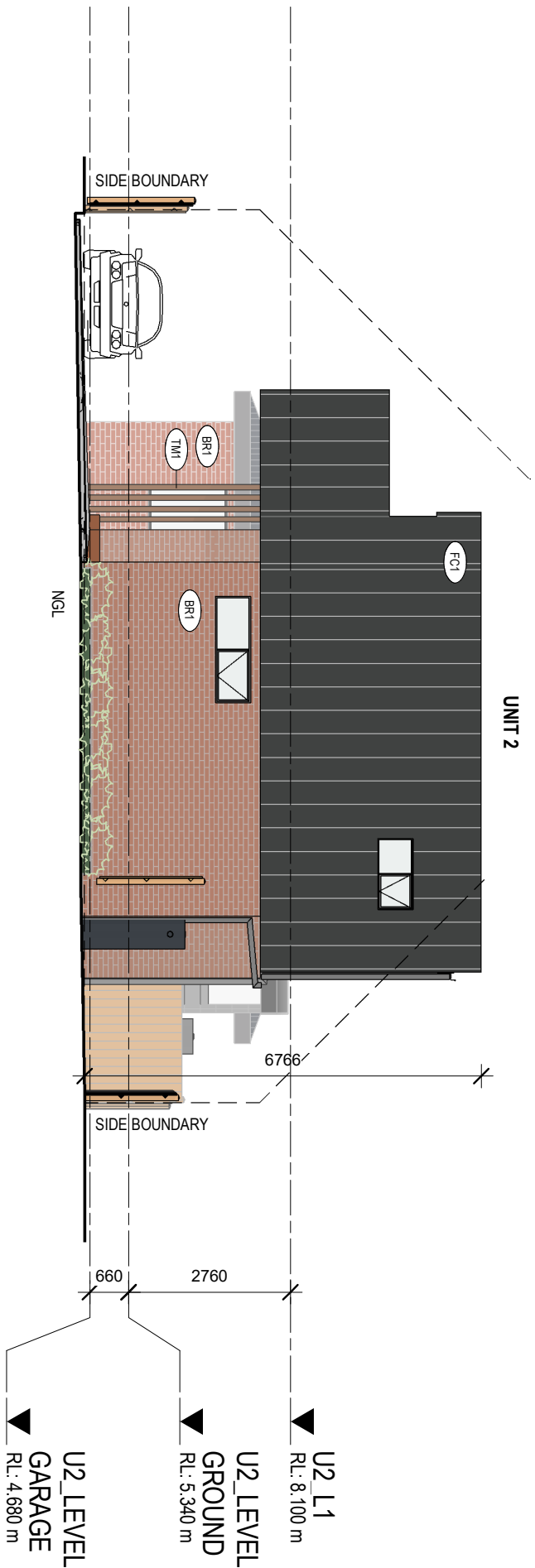
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PROJECT:
PROPOSED 3 UNITS DEVELOPMENT
PROJECT ADDRESS:
36 GROVE ROAD, GLENORCHY
CLIENT:
TANT HOLDINGS PTY LTD.

DRAWING TITLE:
SITE ELEVATIONS
PROJECT NO.:
2241

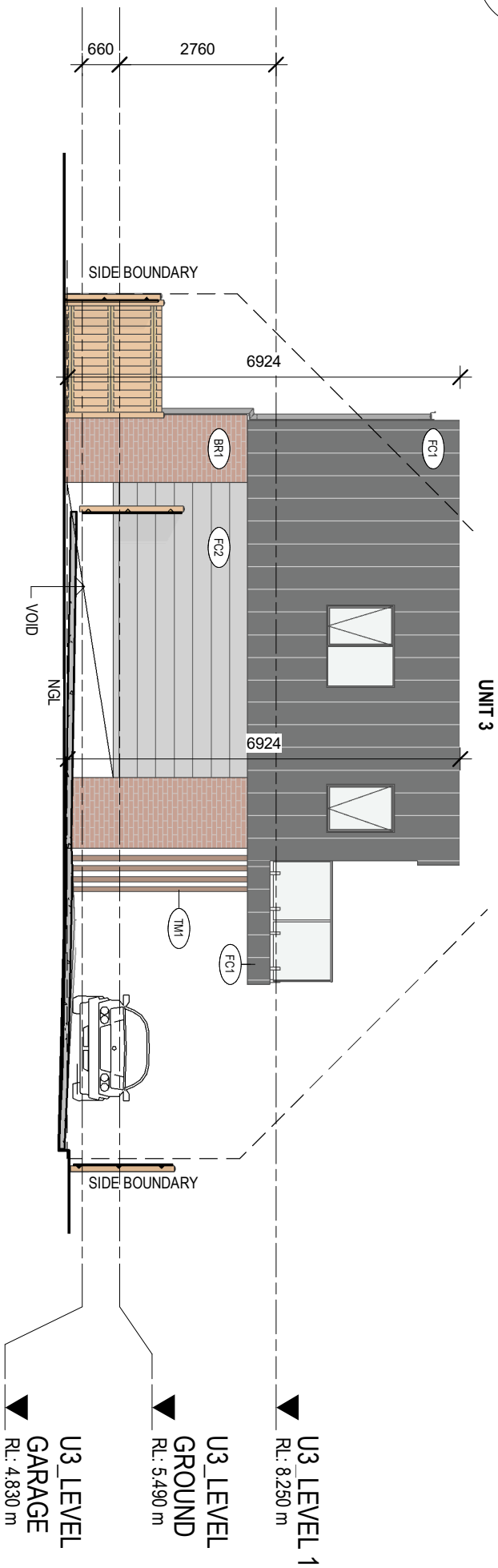
SCALE:
1 : 100 @
A3
DRAWING No.:
DA05

REVISION:
4



1 U2_SOUTH-WEST ELEVATION

DA02 Scale 1 : 100



2 U3_NORTH-EAST ELEVATION

DA02 Scale 1 : 100

MATERIAL LEGEND	
BR1	FACE BRICK - RECLAIMED BRICK LOOKED
FC1	FIBRE CEMENT CLADING - AXON 400
FC2	FIBRE CEMENT CLADING - STRIA 325
TM1	HARDWOOD TIMBER BATTEN
FG	FROSTED GLASS

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PROJECT:
PROPOSED 3 UNITS DEVELOPMENT

PROJECT ADDRESS:
36 GROVE ROAD, GLENORCHY
CLIENT:
TANT HOLDINGS PTY LTD.

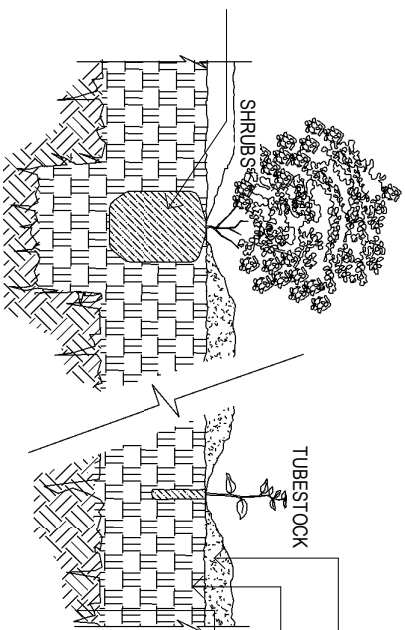
DRAWING TITLE:
SITE ELEVATIONS

PROJECT NO.:
2241

SCALE:
1 : 100 @
A3

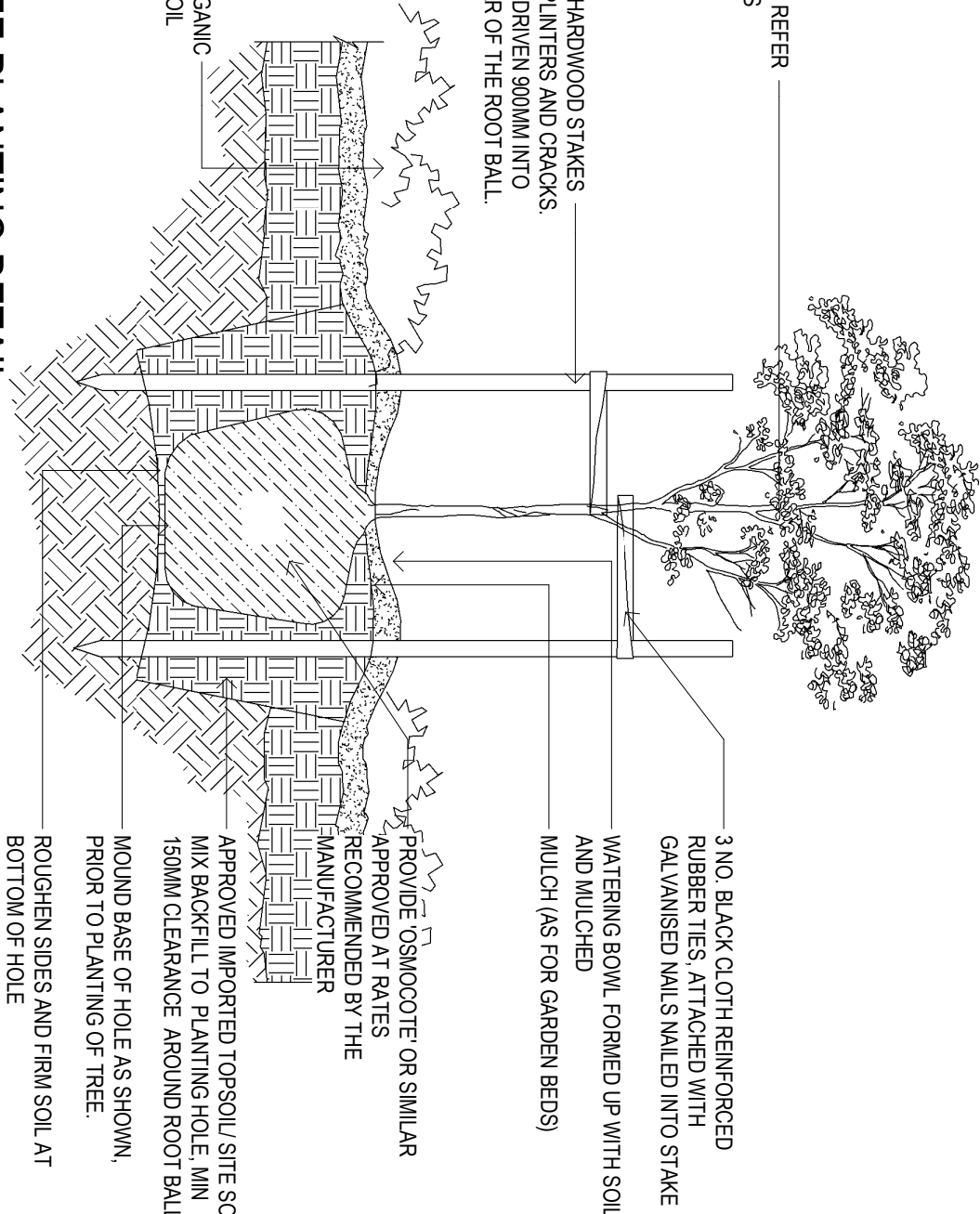
DRAWING No.:
DA06

REVISION:
3



2 SHRUB PLANTATION DETAIL

Scale 1:20



1 TREE PLANTING DETAIL

Scale 1 : 20

[illegible]

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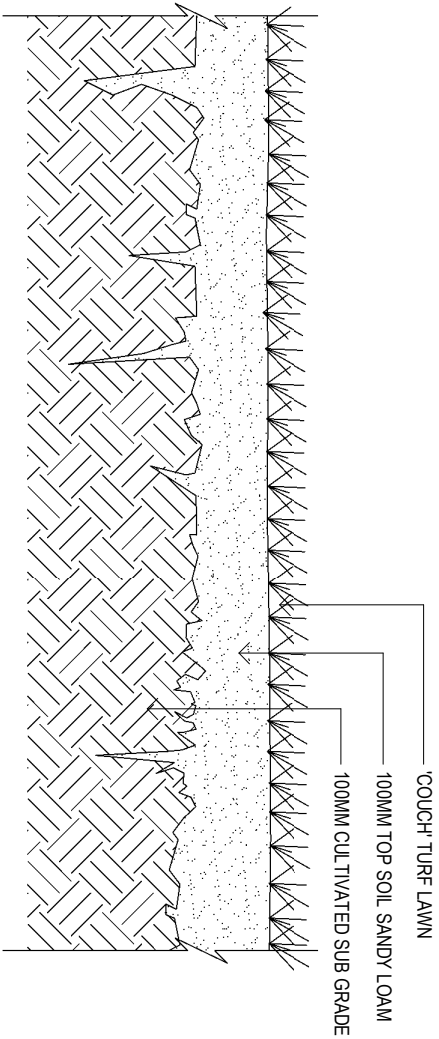
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3 GRASS DETAIL

Scale 1:10



PROJECT:
PROPOSED 3 UNITS DEVELOPMENT

PROJECT ADDRESS:
36 GROVE ROAD, GLENORCHY

CLIENT:
TANT HOLDINGS PTY LTD.

DRAWING TITLE:
LANDSCAPE DETAILS

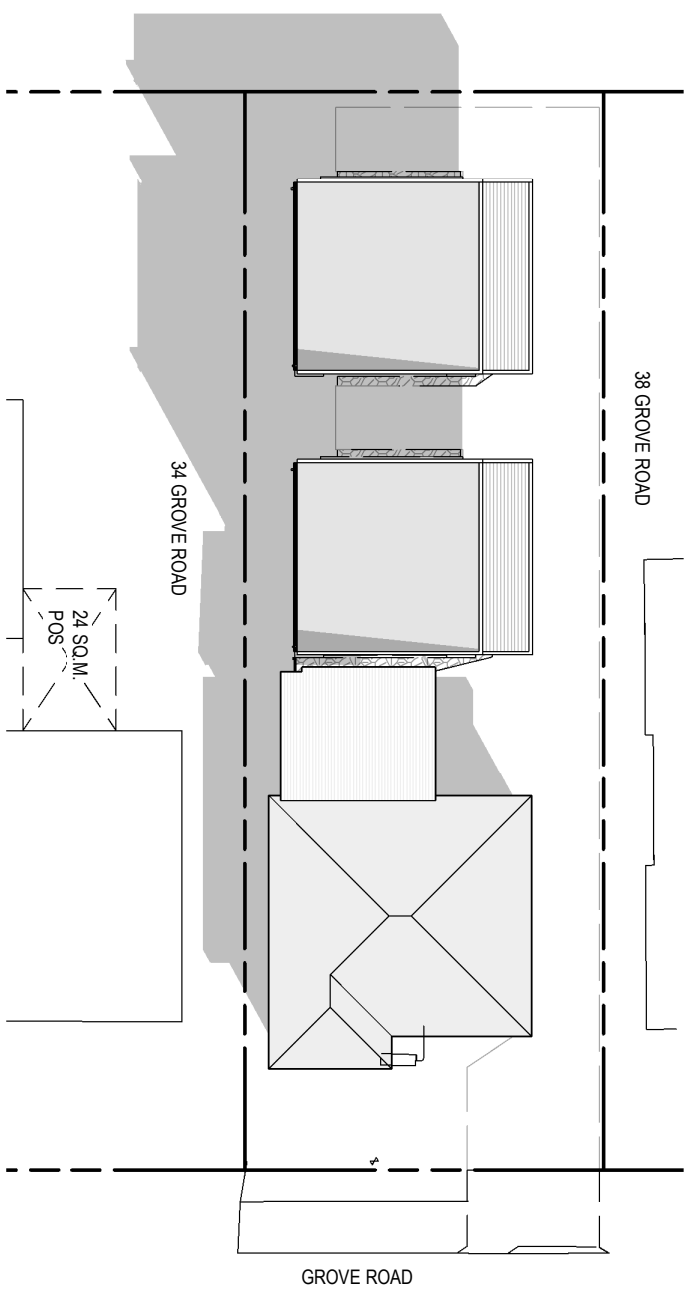
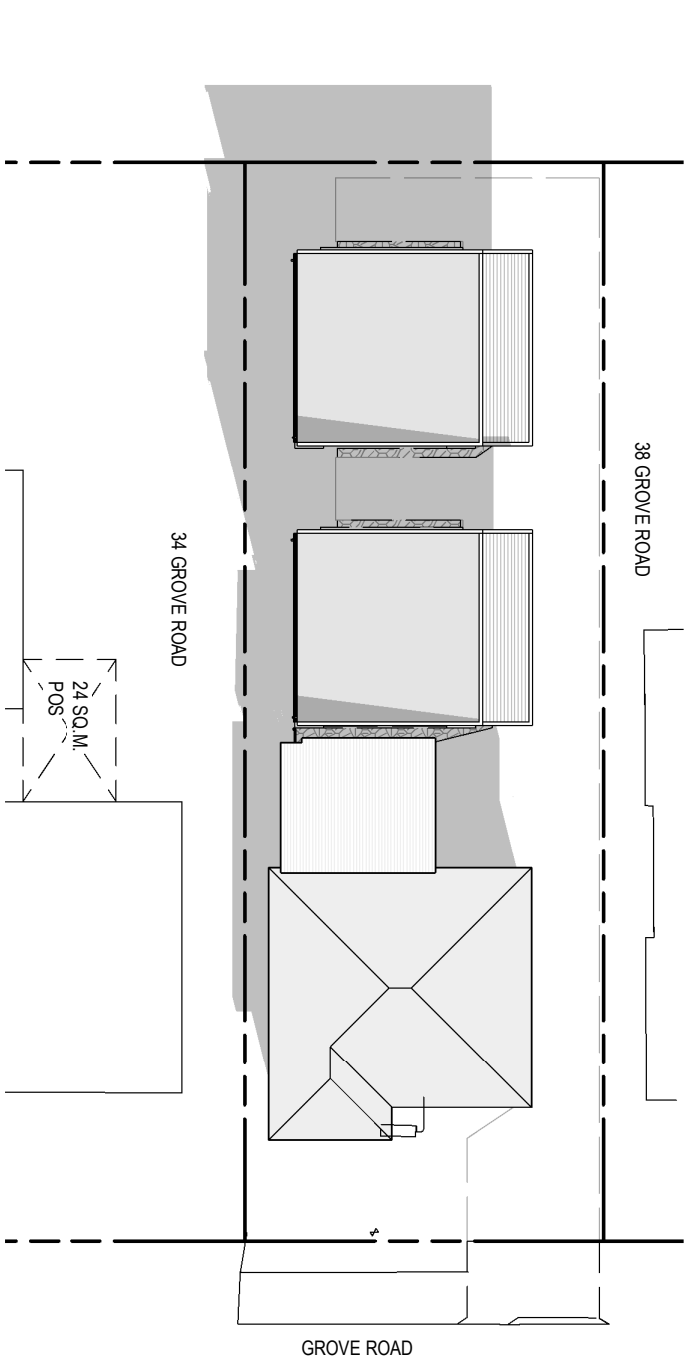
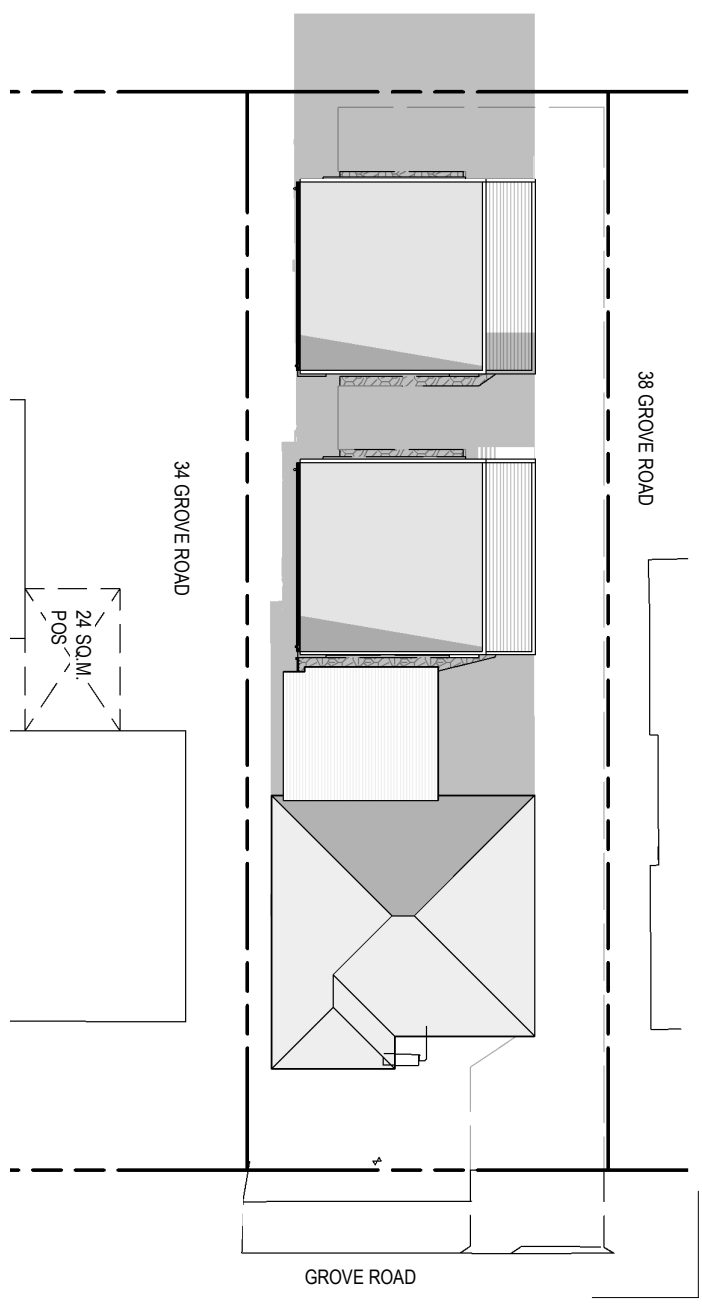
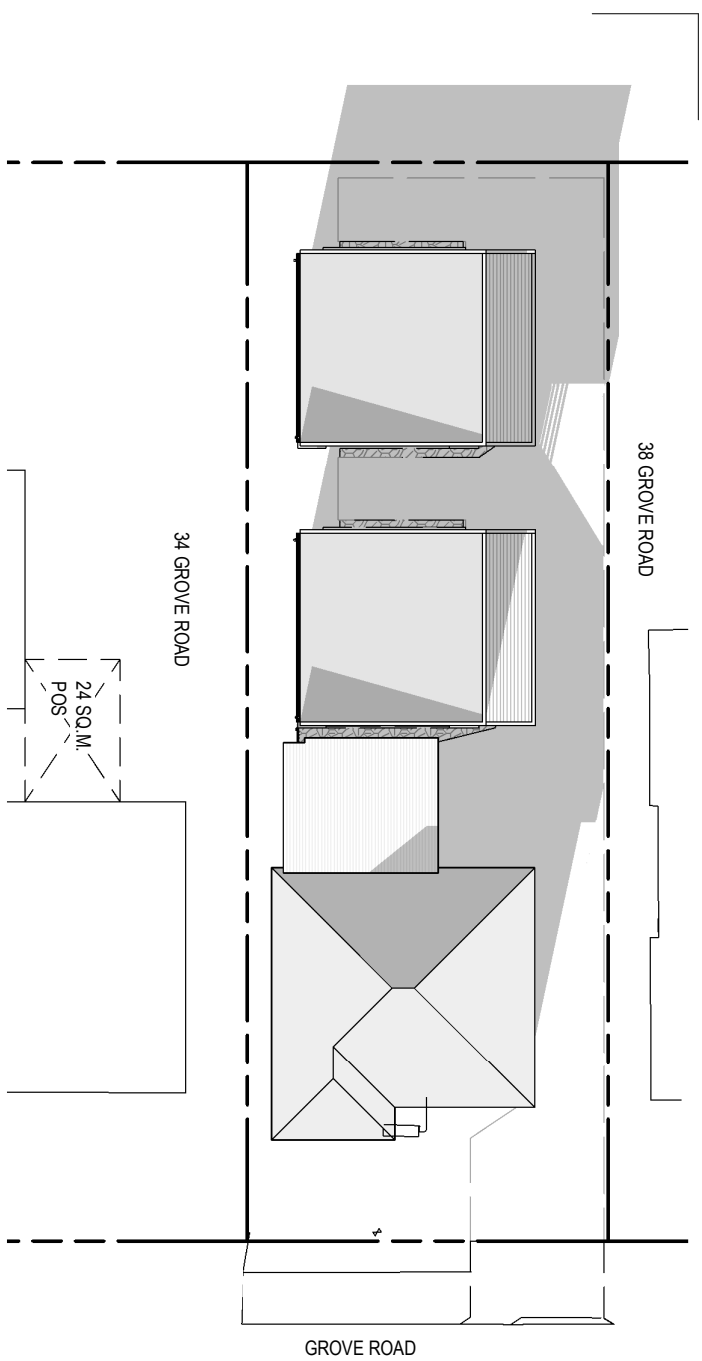
PROJECT NO.:
2241

SCALE:
As indicated
@ A3

DRAWING No.:

DA09

REVISION:



BASE	REVISION	CHG / DATE
1	DEVELOPMENT LOCATION	RON / 02/02/23
2	RESPONSE TO COUNCIL REF	PA / 15/07/23

Mind.
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NORTH:



PROJECT:
PROPOSED 3 UNITS DEVELOPMENT

DRAWING TITLE:
SHADOW DIAGRAMS

SCALE:
1 : 300 @ A3

PROJECT ADDRESS:
36 GROVE ROAD GLENBOROUGH

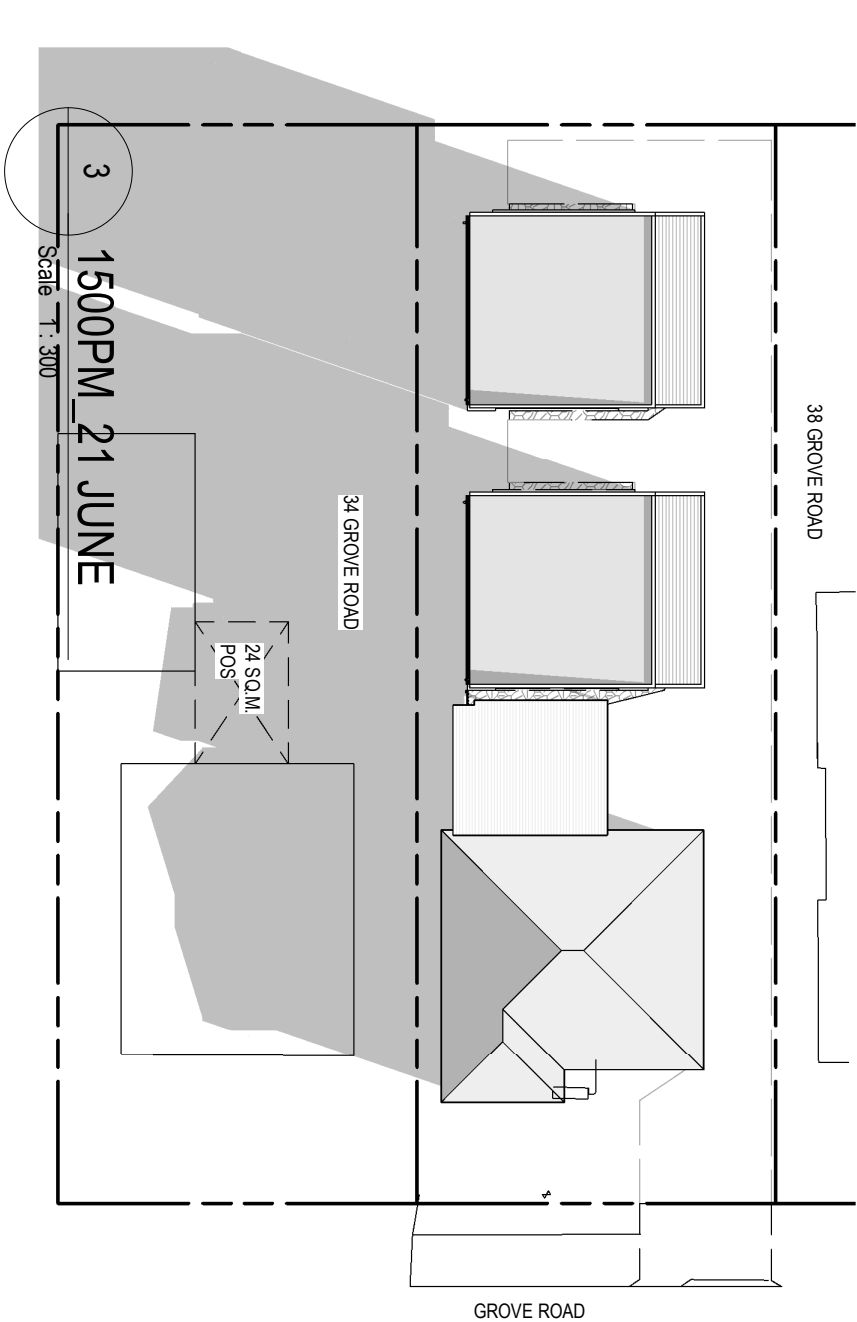
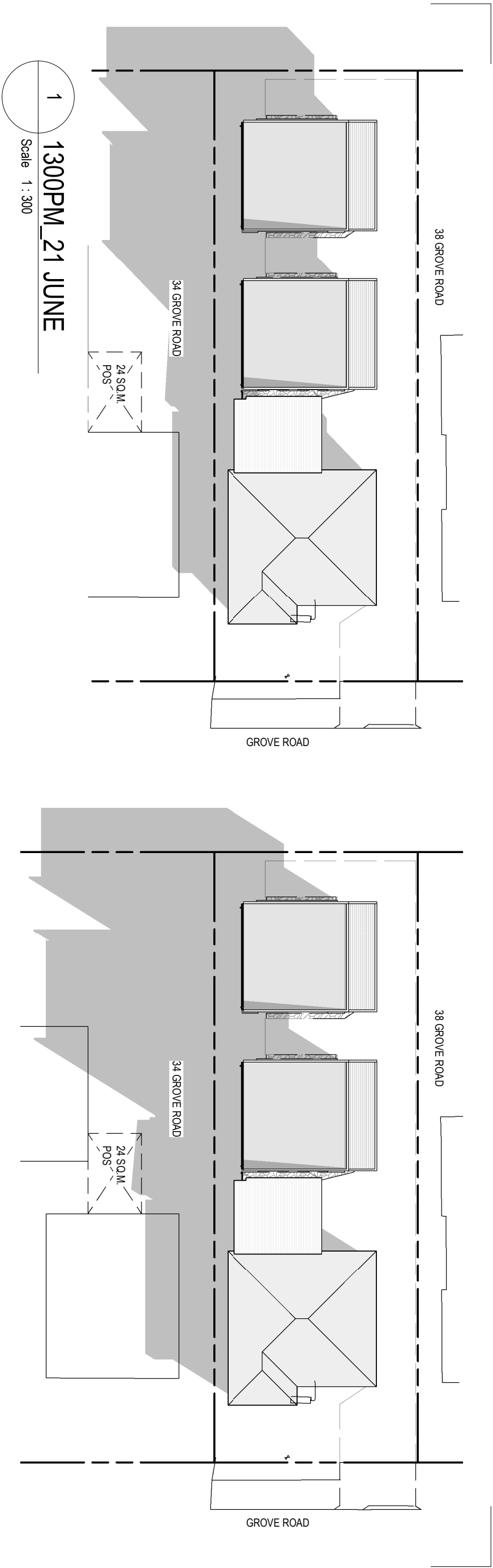
36 Gt

TANT HOLDINGS PTY LTD

PROJECT NO.:
2241

DRAWING No.:

REVISION:



DATE	CHK /	REV	REVISION	DATE
13/07/2023	DA	1	DESIGNER APPLICATION	
13/07/2023	DA	2	RESPONSE TO COUNCIL REF	

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NORTH:

PROJECT:
PROPOSED 3 UNITS DEVELOPMENT

PROJECT ADDRESS:
36 GROVE ROAD, GLENORCHY

CLIENT:
TANT HOLDINGS PTY LTD.

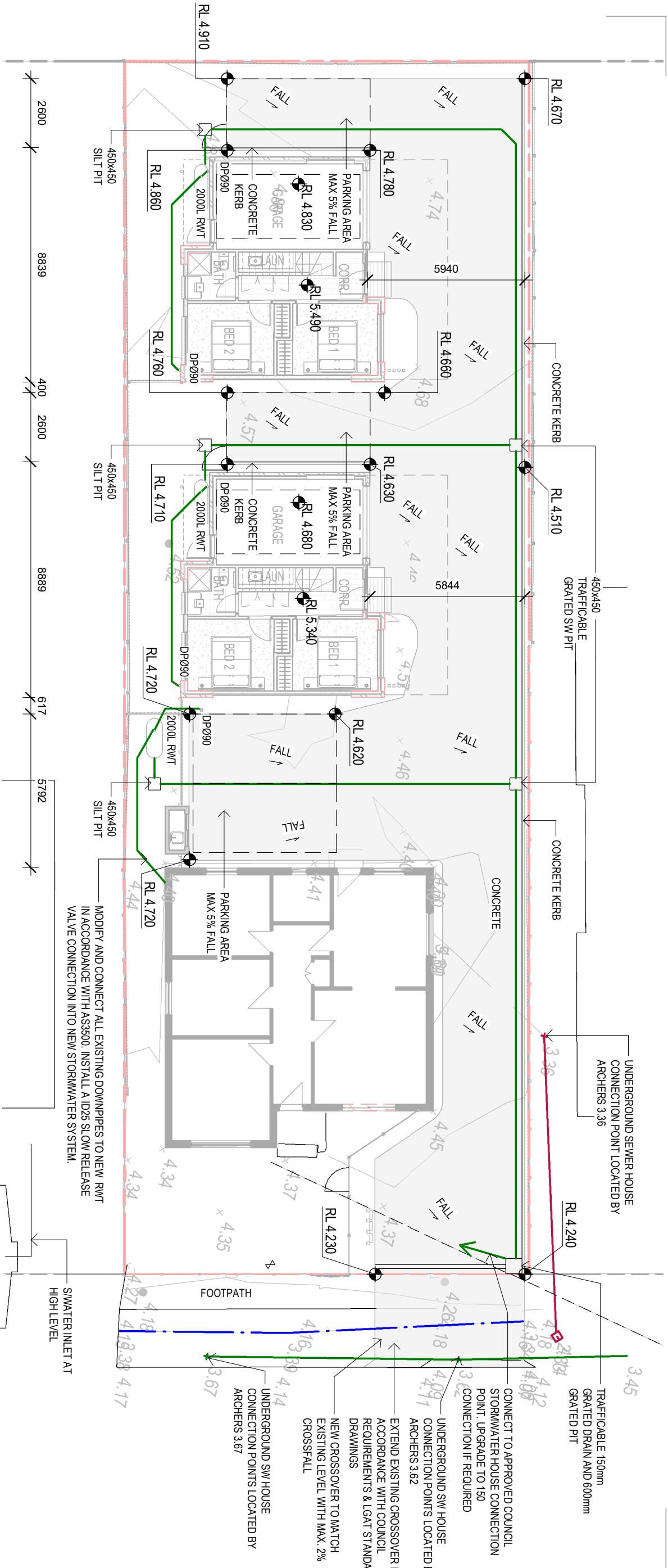
DRAWING TITLE:
SHADOW DIAGRAMS

PROJECT NO.:
224 1

SCALE:
1 : 300 @ A3

DRAWING No.:
DA11

REVISION:
2

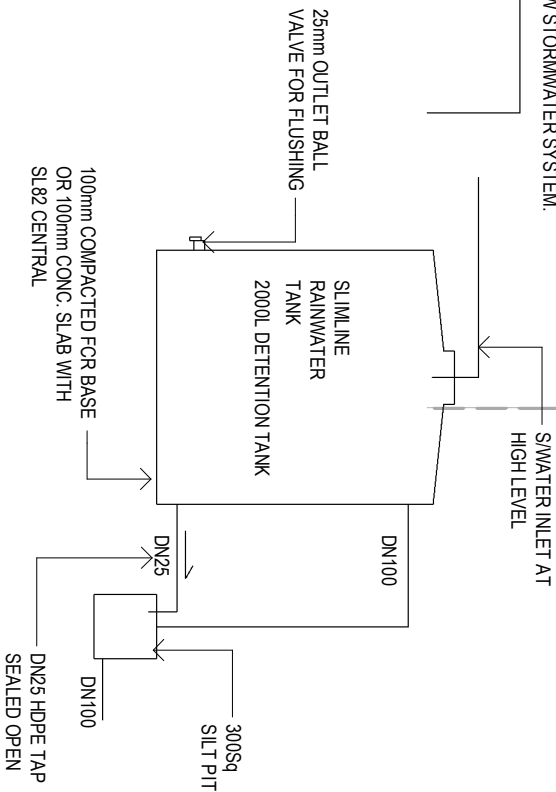


1 STORMWATER CONCEPT PLAN
Scale 1 : 150

NOTE:

- ALL STORMWATER PIPES FROM THE HOUSE TO THE RAINWATER TANK TO BE PVC-U DN100 SN8 WITH A MIN. GRADE OF 1.0% UNLESS NOTED OTHERWISE.
- ALL STORMWATER PIPES FROM THE RAINWATER TANK TO THE STORMWATER CONNECTION POINT TO BE PVC-U DN150 SN8 WITH A MIN. GRADE OF 1.0% UNLESS NOTED OTHERWISE.
- ALL STORMWATER PLUMBING TO BE CONSTRUCTED IN ACCORDANCE WITH AS3500.
- THE OUTLET/ORIFICE SHALL BE A MINIMUM INTERNAL DIAMETER OR WIDTH OF AT LEAST 25 MM AND PROTECTED BY AN APPROVED MESH SCREEN. AN OVERFLOW STRUCTURE MUST BE DESIGNED TO CATER FOR FLOWS EXCEEDING THE CAPACITY OF THE OSD. THE OVERFLOW STRUCTURE MUST DIRECT EXCESS FLOWS IN A MANNER TO MINIMISE ANY DETRIMENTAL EFFECTS ON PROPERTY DOWNSTREAM.
- ALL WORKS ARE TO BE IN ACCORDANCE WITH THE WATER SUPPLY CODE OF AUSTRALIA WSA 03 - 2011-3.1 VERSION 3.1 MRWA EDITION V2.0 AND SEWERAGE CODE OF AUSTRALIA MELBOURNE RETAIL WATER AGENCIES CODE WSA 02 - 2014-3.1 MRWA VERSION 2 AND TASWATERS SUPPLEMENTS TO THESE CODES.

2 TYP. S/WATER RAINWATER TANK
Scale 1 : 150



REVISION		REV	DATE
1	RESPONSE TO COUNCIL REF	1A	13/07/23
2	RESPONSE TO COUNCIL REF	1A	26/09/23

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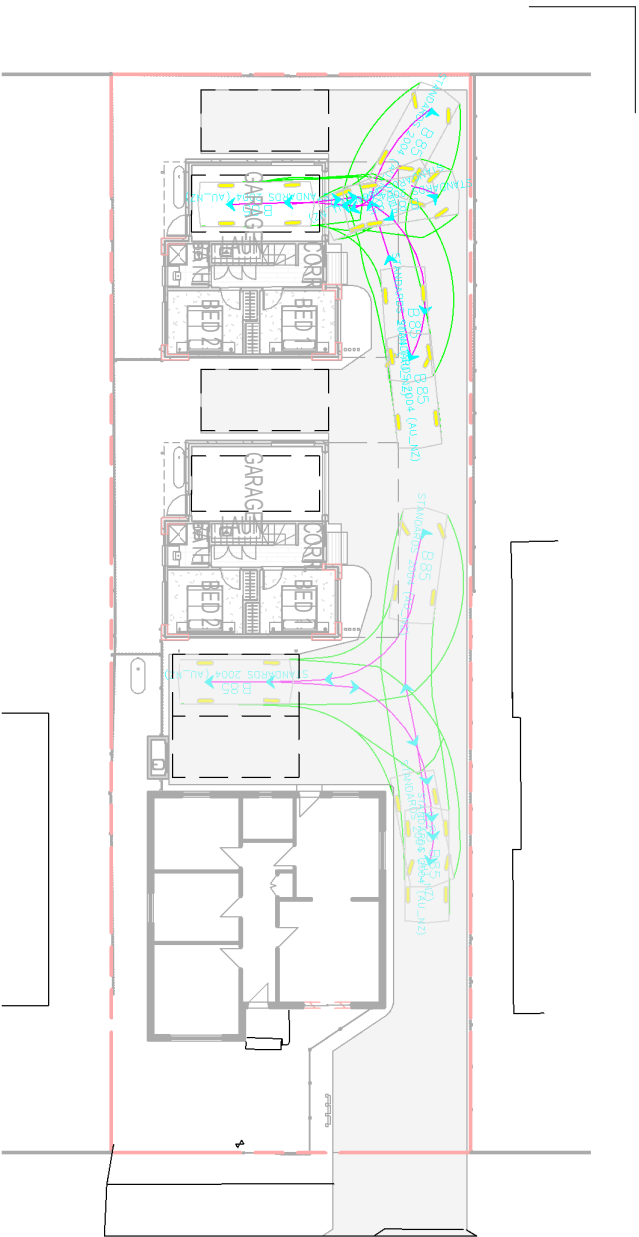
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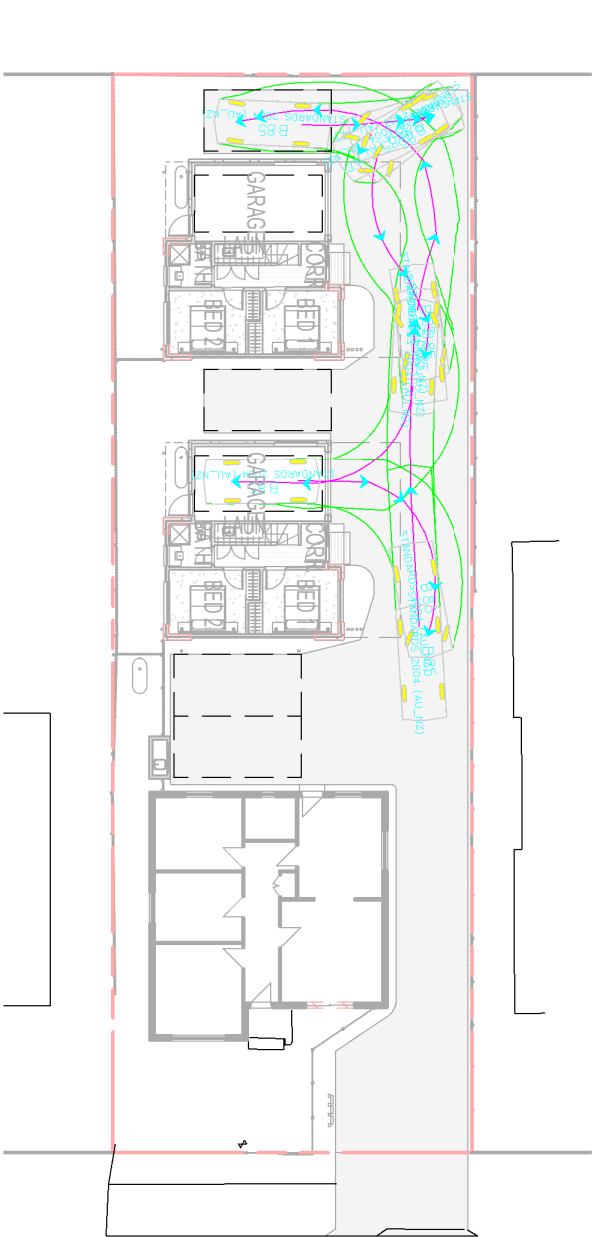
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13th July 2023
FE_23056

36 Grove Road, Glenorchy FLOOD HAZARD REPORT



Prepared for: Tant Holdings Pty Ltd

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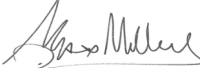
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Document Initial Revision

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Authorised by	Max W. Moller <i>Principal Hydraulic Engineer</i>		13/07/2023

Document Revision

Rev No.	Description	Prepared by	Authorised by	Date
02	Change in design-Brick Piers	Max W. Moller	Max W. Moller	08/08/2023
01	Catchment area amendment	Max W. Moller	Max W. Moller	26/07/2023

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Acronyms

AEP: Annual Exceedance Probability
ARR: Australian Rainfall and Runoff
CC: Climate Change
TPS: Tasmanian Planning Scheme
DEM: Digital Elevation Model
RCP: Representation Concentration Pathway

1. Introduction

Flüssig Engineers has been engaged by **Tant Holdings Pty Ltd** to undertake a site-specific Flood Hazard Report for the development at number 36 Grove Road, Glenorchy in the **Glenorchy City Council** municipality. The purpose of this report is to determine the flood characteristics on the existing and post-development hazard scenarios for the 1% AEP plus climate change flooding event for the purpose of development.

1.1 Development

The proposed 2-unit development consists of 1 existing unit dwelling approximately 100m² and 2 additional unit dwellings of approximately 65m² floor area each. There is a total of approximately 270 m² of concrete driveway area within the development with a site area of 697 m². This development triggers the inundation code as the development falls within Glenorchy City Council, flood prone hazard area.

1.2 Objectives and Scope

This report is in response to a request for further information under C12.0 Flood Prone Areas Hazard Code (C12.5.1 & C12.6.1) under the Tasmanian Planning Scheme 2021 (TPS 2021). The objectives of this study are:

- Provide an assessment of the site's flood characteristics under the combined 1% AEP plus climate change (CC) scenario.
- Provide comparison of flooding for post-development against acceptable solution and performance criteria.
- Provide flood mitigation recommendations for a potential future development, where appropriate.

1.3 Limitations

This study is limited to the objectives of the engagement by the clients, the availability and reliability of data, and including the following:

- The flood model is limited to a 1% AEP + CC worst case temporal design storm.
- All parameters have been derived from best practice manuals and available relevant studies (if applicable) in the area.
- All provided data by the client for the purpose of this study is deemed fit for purpose.
- The study is to determine the effects of the new development on flooding behaviour and should not be used as a full flood study outside the specified area without further assessment.

1.4 Relevant Planning Scheme Requirements

Table 1. Glenorchy City Planning Scheme Requirements

Planning Scheme Code	Objective	Document Reference
C12.5.1 Uses within a flood prone hazard area	That a habitable building can achieve and maintain a tolerable risk from flood	Refer Section 3
C12.6.1 Building and works within a flood prone hazard area	(a) building and works within a flood-prone hazard area can achieve and maintain a tolerable risk from flood; and (b) buildings and works do not increase the risk from flood to adjacent land and public infrastructure.	Refer Section 4.1 Refer Section 3.2 & 3.3

2. Model Build

2.1 Overview of Catchment

The contributing catchment for 36 Grove Road, Glenorchy is approximately 2,071 ha. The land use of the catchment is zoned predominantly General Residential, and Environmental Management at the upper catchment with the specific site being zoned Inner Residential.

Figure 1 below outlines the approximate contributing catchment for the site at 36 Grove Road, Glenorchy.

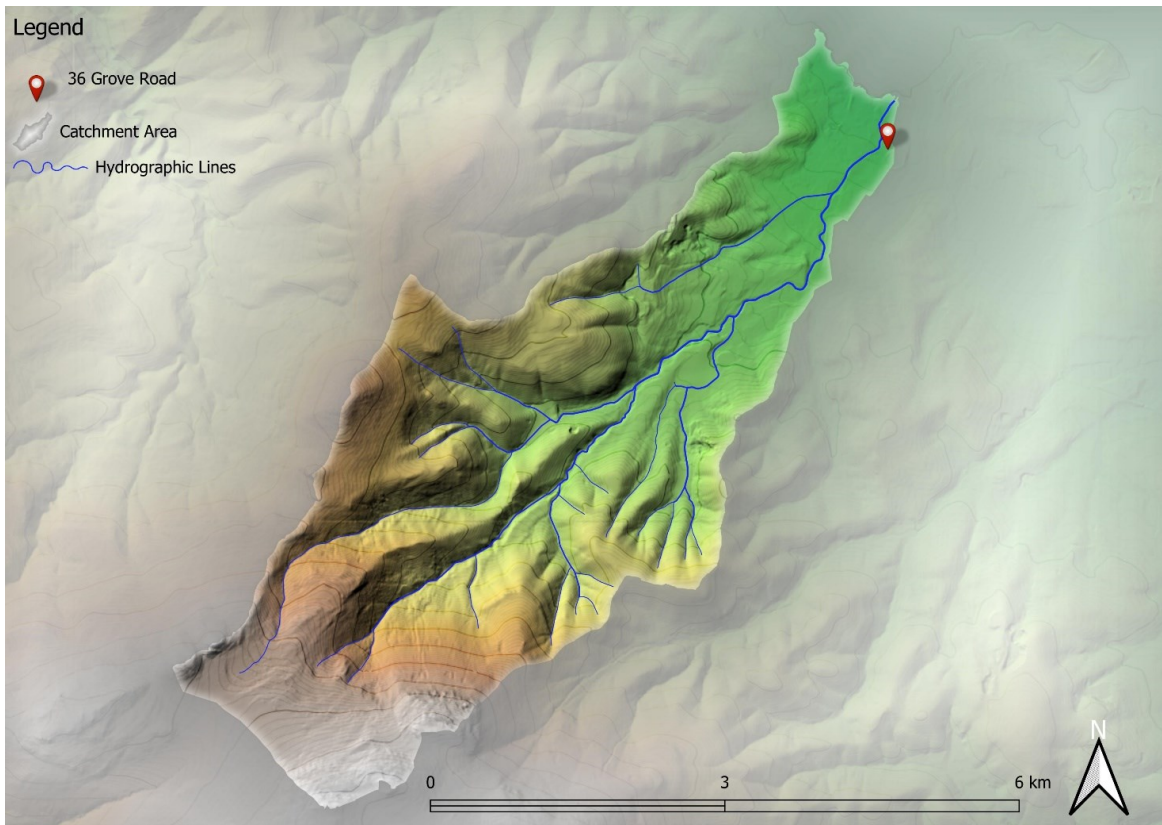


Figure 1. Contributing Catchment, 36 Grove Road, Glenorchy

2.2 Hydrology

The following Table 2 states the adopted hydrological parameters for the RAFTS catchment, as per best practice guidelines.

Table 2. Parameters for RAFTS catchment

Catchment Area (ha)	Initial Loss Perv/imp (mm)	Continuing Loss Perv/imp (mm/hr)	Manning's N pervious	Manning's N impervious	Non-linearity factor
2,071	28/1	3.7/0.0	0.045	0.02	-0.285

2.2.1 Design Rainfall Events

TPS 2021 requires modelling of flood events of 1% AEP (100yr ARI) for the life of the development. Therefore, the design events assessed in this analysis are limited to the 1% AEP + CC design events. Due to the size and grade of the catchment the peak rainfall time was restricted to between 10 mins – 30hrs.

Figure 2 shows the box and whisker output of the model run. The model shows that the 1% AEP 4.5-hour storm temporal pattern 5 was the worst-case median storm. Therefore, this storm event was used within the hydraulic model.

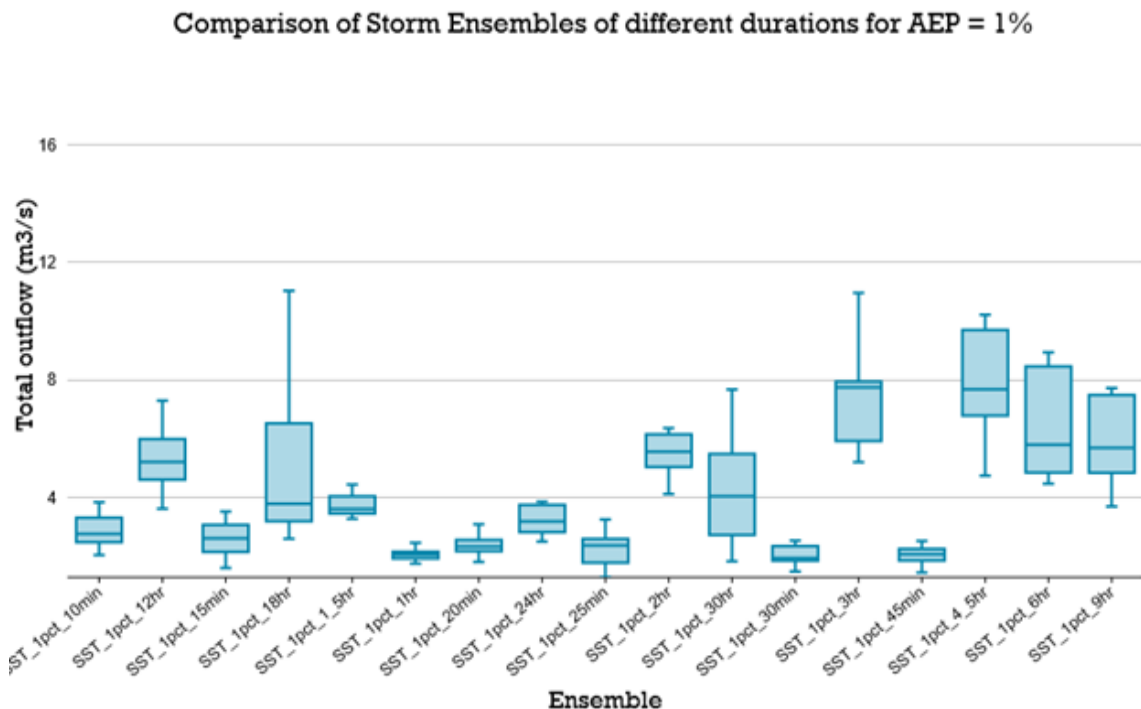


Figure 2. 1% AEP Flood Event Model, Box and Whisker Plot

2.2.2 Climate Change

As per ARR 2019 Guidelines, for an increase in rainfall due to climate change at 2100, it is recommended the use of RCP 8.5. Table 3. Climate Change Increases shows the RCP 8.5 increase compared to the revised increase of 14.6% suggested by Climate Futures Tasmania. Therefore, the RCP 8.5 increase of 16.3% was adopted in the model as a conservative estimate.

Table 3. Climate Change Increases

Catchment	CFT increase @ 2100	RCP 8.5 increase @ 2100
South-East Tasmania	14.6%	16.3%

2.2.3 Calibration/Validation

This catchment has no stream gauge to calibrate the model against a real-world storm event. Similarly, there is little historical information available, and limited available past flood analysis undertaken to validate against the flows obtained in the model.

2.3 Hydraulics

2.3.1 Survey

The 2D surface model was taken from a combination of Greater Hobart LiDAR 2013 (Geoscience Australia) to create a 1m cell size DEM. For the purposes of this report, 1m cells are enough to capture accurate flow paths. The DEM with hill shading can be seen below (Figure 3).

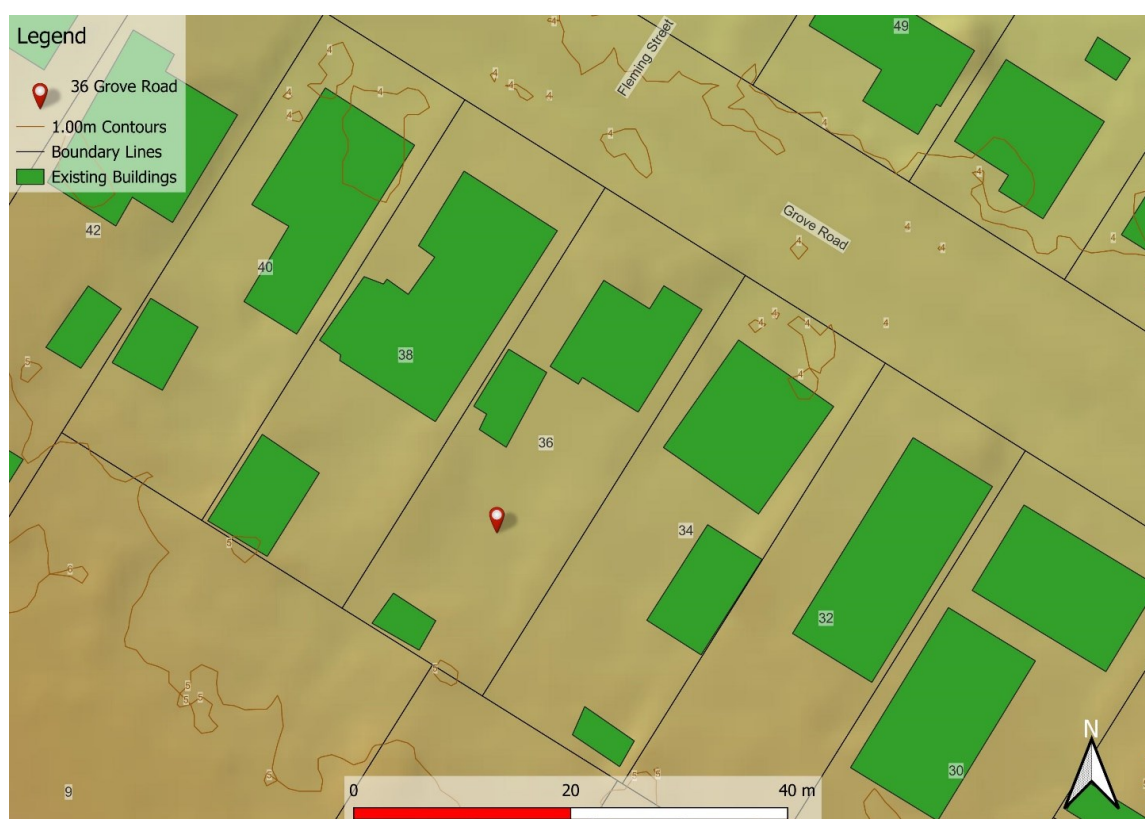


Figure 3. 1m DEM (Hill shade) of Lot Area

2.3.2 Roughness (Manning's n)

Roughness values for this model were derived from the ARR 2019 Guidelines. The Manning's values are listed in Table 4.

Table 4. Manning's Coefficients (ARR 2019)

Land Use	Roads	Open Channel	Rural	Residential	Parks	Buildings	Piped Infrastructure
Manning's n	0.018	0.035	0.04	0.045	0.05	0.3	0.013

2.3.3 Walls

Wall structures were included as base linear structures (walls) within the 2D model.

2.3.4 Buildings

Buildings were represented as mesh polygons with a high Manning's n value within the model. Buildings with unknown floor levels were set with a minimum 300 mm above ground.

The proposed unit dwellings were represented as a mesh polygon with a floor level set with a minimum 300mm above ground.

2.3.5 Stormwater Infrastructure

All upstream stormwater infrastructure was included within the model to provide insight into the capacity of the stormwater system. The pit/pipes were sourced through Glenorchy City Council data stormwater maps available via an online portal, including infrastructure location, size, type, and invert levels (where applicable). Where data was missing, this was inferred from surrounding data and where invert levels were missing, a 600 mm cover was applied.

2.3.6 Pit Inlets

As this is a 1D/2D model user defined inlet equation was adopted for varying pit sizes.

$$Q = ay^b$$

Where:

Q = flow

a = constant defined in User Equation A value field

y = depth of flow at inlet

b = constant defined in User Equation B value field

2.4 Development Runoff

Stormwater runoff from the development site has been assessed under pre- and post-development models to determine the potential impact the development at 36 Grove Road has on the immediate local flows. As per planning guidelines it is a requirement that this does not have a negative impact from pre to post development.

Site characteristics for the pre- and post-development model are summarised in Table 5.

Table 5. Site characteristics

	Pre-Development		Post-Development	
Land Use	Area (m²)	% Total land	Area (m²)	% Total land
Pervious	567	81	197	28
Impervious	130	19	500	72

3. Model Results

The result of 1% AEP + CC were run through the pre-development and post-development model scenarios to compare the changes to flooding onsite and to surrounding properties.

3.1 Flood Depth & Extent

It can be seen from the pre-development model runs (Figure 4), that the overland flow path runs from the south of the lot boundary towards Grove Road. Figure 4 shows existing dwellings and outbuildings within the lot and on surrounding areas (the existing building near Grove Road is to remain in the post development scenario). Flooding with depths under 550 mm are observed in distributed locations within the lot with a slight ponding effect occurring in the centre of the lot.

The post-development run (Figure 5) shows the influence the two proposed units and driveway have on the flood extents within the lot. The maximum flood depths within the site are observed close to unit 2 at 530 mm. The reason for the slight decrease in maximum flood depth within the lot is because the flow is more distributed due to the demolition of the existing shed which allows a path for the overland flow through the western side of the lot via the driveway.

The maximum flood level at the proposed building envelope for unit 2 is 4.98 mAHD. The maximum flood level at the proposed building envelope for unit 3 is 5.16 mAHD.

In the post development scenario, the proposed unit 2 will be inundated by less than 490 mm while proposed unit 3 will be inundated by less than 420 mm. For the purposes of modelling, the proposed brick piers were set 800 mm above raised ground level to accurately reflect the impact to stormwater flow from surrounding the piers.

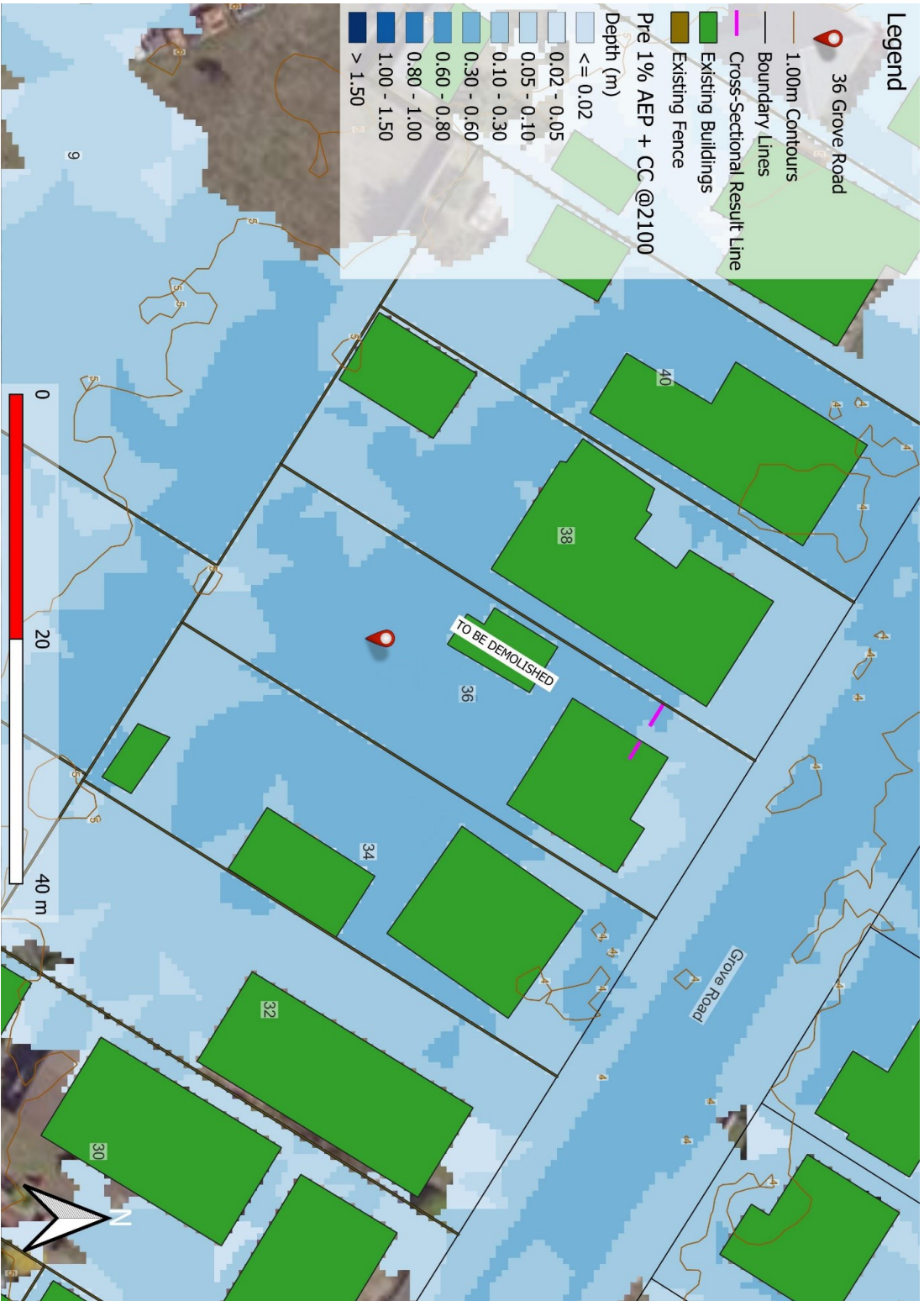


Figure 4. Pre-Development 1% AEP + CC Depth

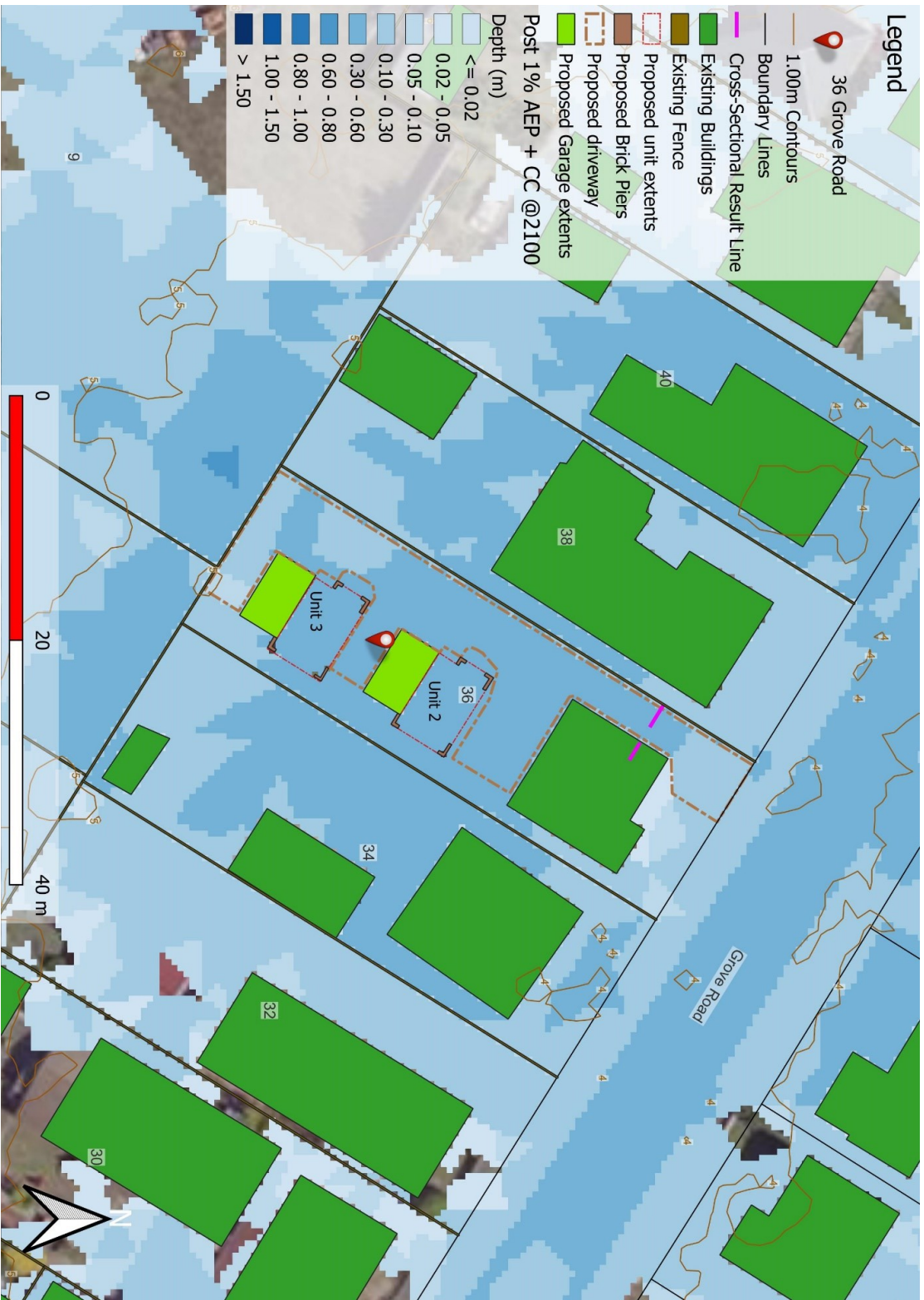


Figure 5. Post-Development 1% AEP + CC including Depth

3.2 Displacement of Overland Flow on Third Party Property

Post-development flows in Figure 5 show that when compared against pre-development in Figure 4, there is no noticeable increase in flood depths on the neighbouring properties. There is no observed increase in the hazard classification from the pre-development model to post-development models within the adjacent properties.

It is therefore deemed that the post development model does not adversely affect flood flow through surrounding properties.

3.3 Development Effects on Stormwater Discharge

Figure 6 below shows the discharge hydrograph just in front of the Northern property boundary at 36 Grove Road for the overland flow through the development area. The graph was captured in the model for both pre- and post-development runs and combined in graph format to demonstrate the change in net discharge and velocity. It demonstrates an increase in both discharge and velocity of $0.04 \text{ m}^3/\text{s}$ and 0.08 m/s respectively. The reason for the increased velocity can be explained due concentrated flow path and the addition of the proposed driveway which has a lower Manning's roughness value that allows smoother flow.

However, the values observed in the post development model do not have a negative impact on stormwater discharge as the changes are relatively small compared to the pre-development model. This is not considered to have any significant impact on receiving infrastructure and is more likely due to the sensitivity of the model.

It is therefore deemed that the post development model does not increase net discharge.

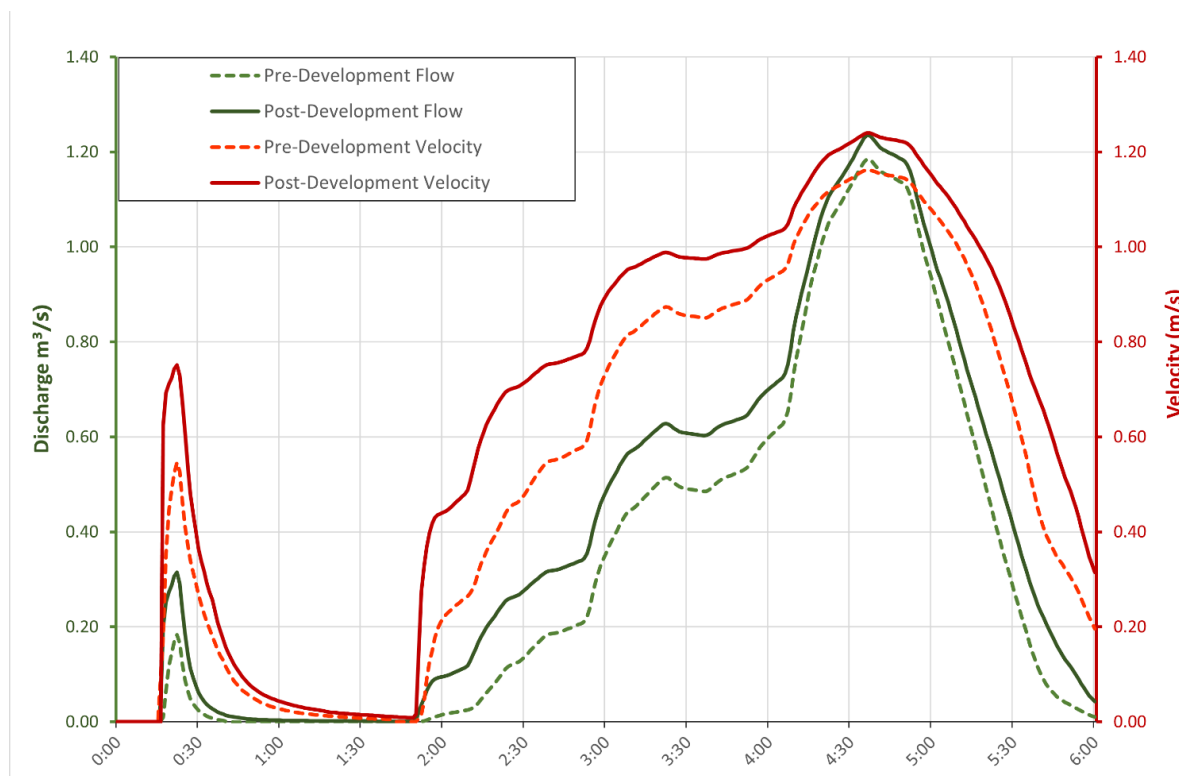


Figure 6. Pre and Post development net discharge and velocity 1% AEP + CC

3.4 New Habitable Building

To meet the performance criteria of Regulation 54 of the Building Regulations 2016, the construction of a new habitable building is required to have a habitable floor level > 300 mm above the 1% AEP + CC flood level. The new development at 36 Grove Road, Glenorchy must meet this regulation as shown in Table 6. (The floor level 1% AEP + CC flood level + 300mm does not apply for non-habitable areas).

Table 6. Habitable Floor Construction Levels

Unit number	1% AEP +CC flood level (mAHD)	Minimum Floor Level required (mAHD)	Proposed Finished Floor level (mAHD)
Unit 2	4.98	5.28	5.34
Unit 3	5.16	5.46	5.49

As shown in the above table, the proposed finished floor levels of unit 2 and 3 are constructed above the minimum required floor level, thereby complying with the performance criteria of S.54 of the buildings regulations 2016.

3.5 Model Summary

Table 7. Pre-development and post-development at the cross-sectional line

	Pre-development	Post-development	Net Change
Depth (m)	0.41	0.37	-0.04
Velocity (m/s)	1.16	1.24	0.08
Discharge (m³/s)	1.18	1.22	0.04

4. Flood Hazard

Under existing conditions prior to development, the proposed location of the development is subject to be inundated to < 0.41 m flood depth and < 1.16 m/s velocity along the marked cross-sectional result line. Within the site velocities up to 1.8 m/s and depths up to 0.53 m are observed. This places the hazard rating as adopted by Australian Flood Resilience and Design Handbook as a maximum at **H3 – Unsafe for people and vehicles** as shown in Appendix A – Hazard maps.

The post-development scenario only sees the velocity at the cross-sectional result line increase by 0.08 m/s while the depths show a slight decrease of 0.04 m at the cross-sectional line. This does not cause the pre-development hazard rating to increase. Although the hazard ratings for the lot at 36 Grove Road is relatively high at H3, the proposed development does not cause an increase in risk as the hazard ratings remains unchanged in the post-development scenario. The only obstruction for the flow in the post development scenario are the 2 proposed garages which are in line with the existing dwelling. Furthermore, since the shed is demolished, an unobstructed flow path is allowed on the western side of the lot via the driveway which is major reason for the H3 hazard extents to reduce within the lot.

As this study does not extend to the public access roads we cannot comment on the accessibility to the site, only within the site. Therefore, this report would advise that residents and visitors remain inside in the event of a flood unless instructed by emergency services.

A summary of the hazard ratings is shown in Figure 7.

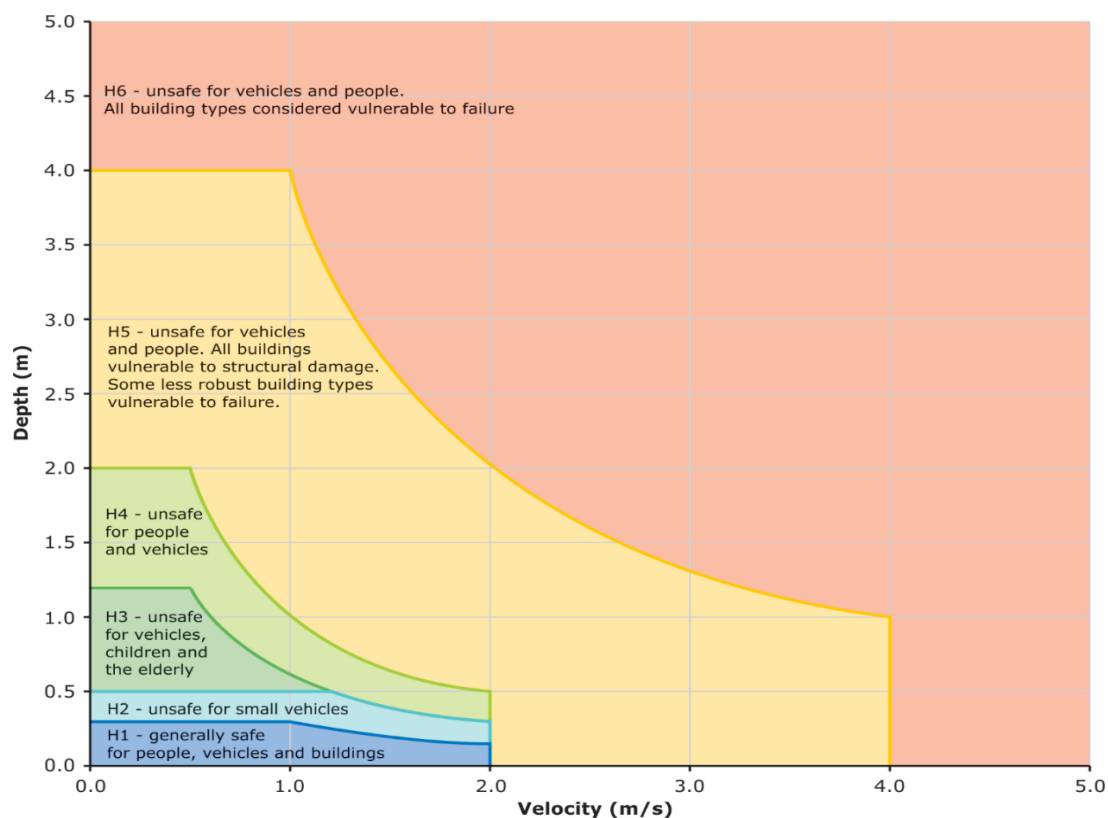


Figure 7. Hazard Categories Australian Disaster and Resilience Handbook

4.1 Tolerable Risk

The existing property at 36 Grove Road in Glenorchy is vulnerable to flooding since the area around is rated as having an H3 level of risk for a 1% AEP + climate change event. This indicates that the location is deemed hazardous and **unsafe for vehicles, children and elderly**. Due to the high hazard ratings around the properties, access to the planned units is hindered, and any escape path would be obstructed by the flood forces.

It is recommended that all structures undertake a hydrostatic/hydrodynamic analysis to ensure suitability. Assuming appropriate structural considerations are applied, it is deemed that the structures proposed, intended to be habitable class 1a dwellings with an asset life of 50 years (BCA2019), can achieve a tolerable risk to flooding over its asset life, assuming the recommendations of this report are adhered to.

Table 8. TPS C12.5.1 Uses within a flood prone area

C12.5.1 Uses within a flood prone area			
Objectives: That a habitable building can achieve and maintain a tolerable risk from flood			
Performance Criteria			
P1.1		P1.1	
A change of use that, converts a non-habitable building to a habitable building, or a use involving a new habitable room within an existing building, within a flood-prone hazard area must have a tolerable risk, having regard to:		Response from flood report	
(a)	the location of the building;	(a)	Proposed 3-unit development and concrete driveway
(b)	the advice in a flood hazard report;	(b)	Assuming recommendations of this report are implemented, no additional flood protection measures required for the life expectancy of a future habitable building.
(c)	any advice from a state authority, regulated entity or a council;	(c)	N/A
P1.2		P1.2	
A flood hazard report also demonstrates that:		Response from flood report	
(a)	any increase in the level of risk from flood does not require any specific hazard reduction or protection measures;	(a)	No change in level of risk from pre-development scenario.
(b)	the use can achieve and maintain a tolerable risk from a 1% annual exceedance probability flood event for the intended life of the use without requiring any flood protection measures	(b)	The maximum hazard rating at the site is H3. This hazard level and risk do not increase following the proposed development. The H3 hazard rating is classified as unsafe for vehicles, children, and the elderly.

Table 9. TPS C12.6.1 Building and works within a flood-prone hazard area

C12.6.1 Building and works within a flood prone area			
Objective: (a) building and works within a flood-prone hazard area can achieve and maintain a tolerable risk from flood; and (b) buildings and works do not increase the risk from flood to adjacent land and public infrastructure.			
Performance Criteria			
P1.1		P1.1	
Buildings and works within a flood-prone hazard area must achieve and maintain a tolerable risk from a flood, having regard to:		Response from flood report	
(a)	the type, form, scale and intended duration of the development;	(a)	Proposed 3-unit development and concrete driveway
(b)	whether any increase in the level of risk from flood requires any specific hazard reduction or protection measures;	(b)	Unit 2 must be constructed at a minimum FFL of 5.28 mAHD and unit 3 must be constructed at a minimum FFL of 5.46 mAHD. Material to resist the given flood forces to ensure no additional flood protection measures are required.
(c)	any advice from a state authority, regulated entity or a council; and	(c)	N/A
(d)	the advice contained in a flood hazard report.	(d)	Flood report and recommendations provided within.
Performance Criteria			
P1.2		P1.2	
A flood hazard report also demonstrates that the building and works:		Response from Flood Report	
(a)	do not cause or contribute to flood on the site, on adjacent land or public infrastructure; and;	(a)	No change in level of risk within the lot or on surrounding properties.
(b)	can achieve and maintain a tolerable risk from a 1% annual exceedance probability flood event for the intended life of the use without requiring any flood protection measures.	(b)	The proposed development would achieve and maintain a tolerable risk of 1% AEP if the construction material and methodology were not susceptible to the hydrodynamic and hydrostatic flood forces.

5. Conclusion

The Flood Hazard Report for 36 Grove Road, Glenorchy development site has reviewed the potential development flood scenario.

The following conclusions were derived in this report:

1. A comparison of the post-development peak flows for the 1% AEP at 2100 were undertaken against C12.5.1 & C12.6.1 of the Tasmanian Planning Scheme - Glenorchy Flood Prone Areas Hazard code.
2. Building Regulation 54 requires a habitable floor level of no less than level outlined in Table 6.
3. A slight decrease of 0.04 m in depth from pre- to post-development, riverine flood scenarios at the cross sectional results line.
4. Peak discharge sees a minor increase of 0.04 m³/s from pre- to post-development, riverine flood scenarios at the cross-sectional results line.
5. Velocity shows an increase of 0.08 m/s between pre- and post-development, riverine flood scenarios at the cross-sectional results line.
6. Hazard from flooding within the lot remains in the range H1-H3 for both pre and post development scenarios. No increase in hazard rating within the property and adjacent properties.
7. In the event of a major flood event, the safe area for occupants would be inside the unit dwellings.

6. Recommendations

Flüssig Engineers therefore recommends the following engineering design be adopted for the development and future use to ensure the works meets the Flood Prone Areas Hazard Code:

1. The new unit dwellings to have a minimum habitable floor level as per Table 6. (Unit 2 FFL = 5.28 mAHD, Unit 3 FFL= 5.46 mAHD).
2. The new unit dwellings to be designed to resist the hydrodynamic and hydrostatic flood forces including debris for the given flood conditions.
3. Construction of bollards and chain or a reinforced metal gate at the entrance to the development to prevent displacement of parked vehicles in the event of a major flood event.
4. Flood management plan to be submitted, advised to residents, and displayed onsite.
5. No additional solid structures be constructed around the property without further flood assessment.
6. Landscaping around the driveway should consist of stabilised, non-erosive materials.
7. Future use of lot areas to be limited to areas deemed safe under the ARR Disaster Manual categories.
8. All future proposed structures within the flood extent not shown within this report will require a separate design and report addressing their impacts.

Under the requirements of Flood Hazard Report, the construction of the proposed development will meet current acceptable solutions and performance criteria under the Tasmanian Planning Scheme 2021. The existing and future hazard of occupants will be subject to high hazard ratings and the risks associated to it.

7. Limitations

Flüssig Engineers were engaged by **Tant Holdings Pty Ltd**, for the purpose of a site-specific Flood Hazard Report for 36 Grove Road, Glenorchy as per C12.5.1 and C12.6.1 of the Tasmanian Planning Scheme - Glenorchy 2021. This study is deemed suitable for purpose at the time of undertaking the study. If the conditions of the site should change, the report will need to be reviewed against all changes.

This report is to be used in full and may not be used in part to support any other objective other than what has been outlined within, unless specific written approval to do otherwise is granted by Flüssig Engineers.

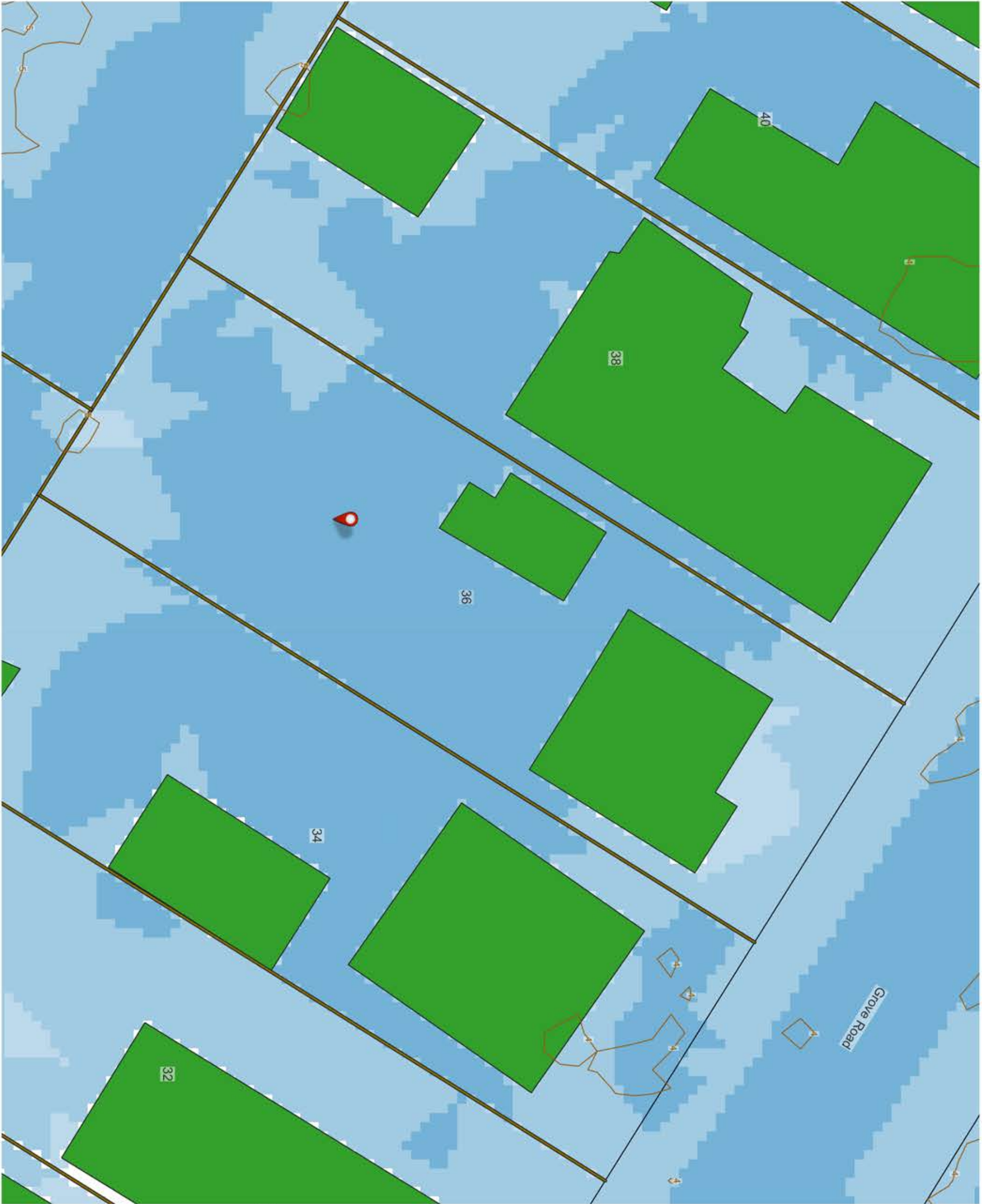
Flüssig Engineers accepts no responsibility for the accuracy of third-party documents supplied for the purpose of this Flood Hazard Report.

8. References

- Australian Disaster Resilience Guideline 7-3: Technical flood risk management guideline: Flood hazard, 2014, Australian Institute for Disaster Resilience CC BY-NC
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9. Appendices

Appendix A Flood Study Maps

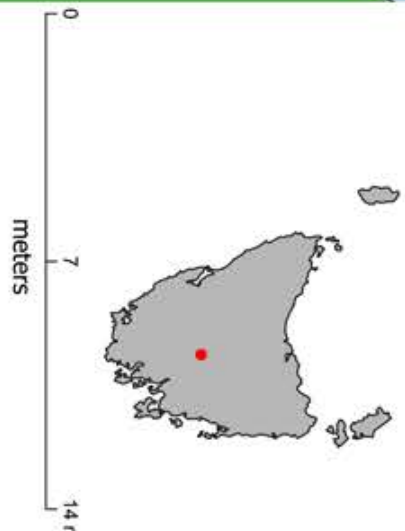


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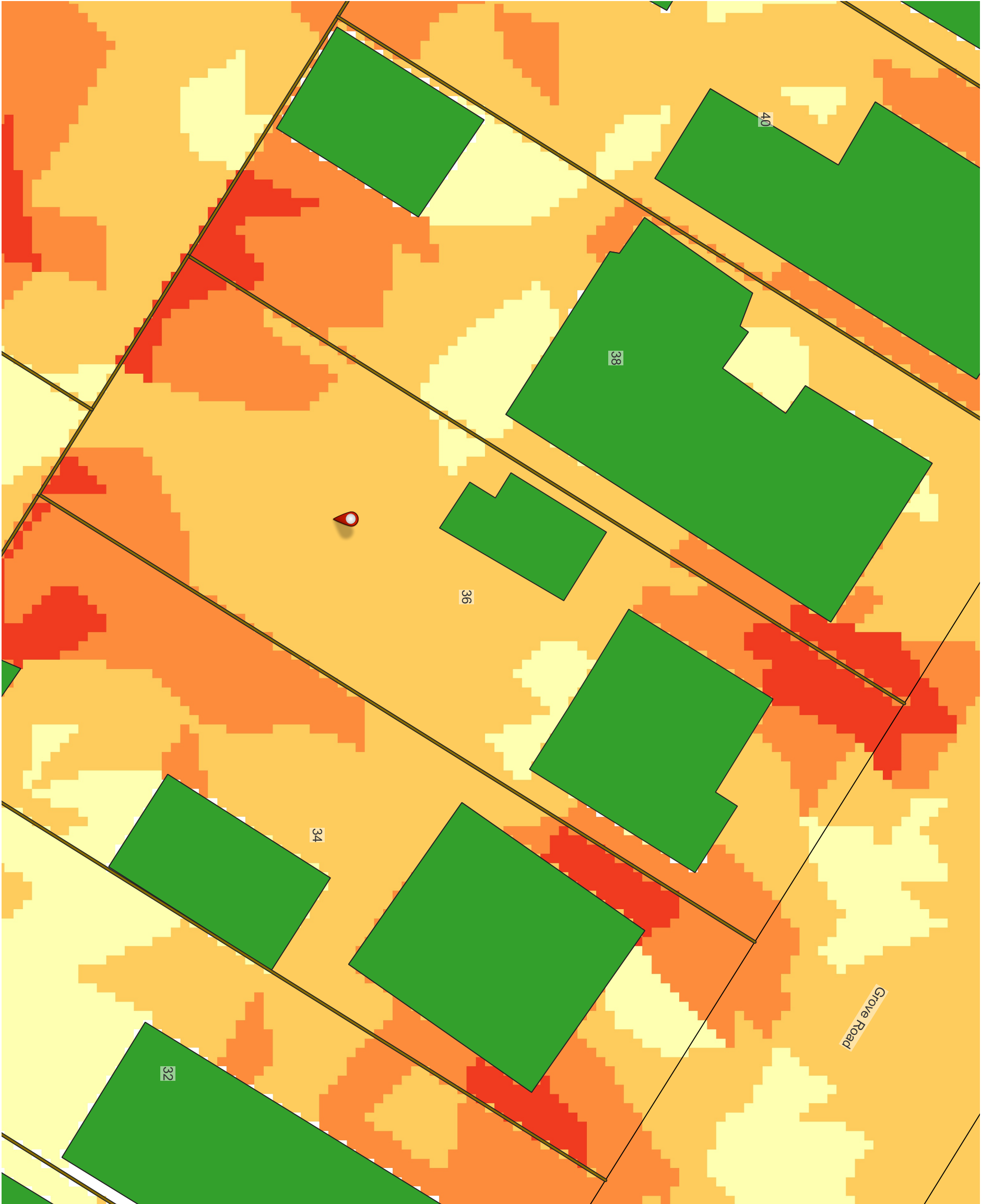
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- 1.00m Contours
- Boundary Lines
- Existing Fence
- Existing Buildings

Pre 1% AEP + CC @2100

Depth (m)	
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0.02 - 0.05	
0.05 - 0.10	
0.10 - 0.30	
0.30 - 0.60	
0.60 - 0.80	
0.80 - 1.00	
1.00 - 1.50	
> 1.50	



PRE 1% AEP + CC @2100



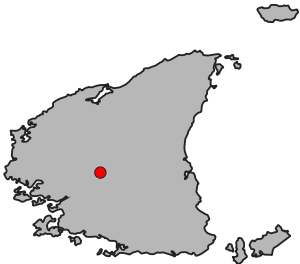
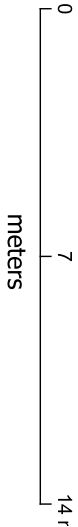
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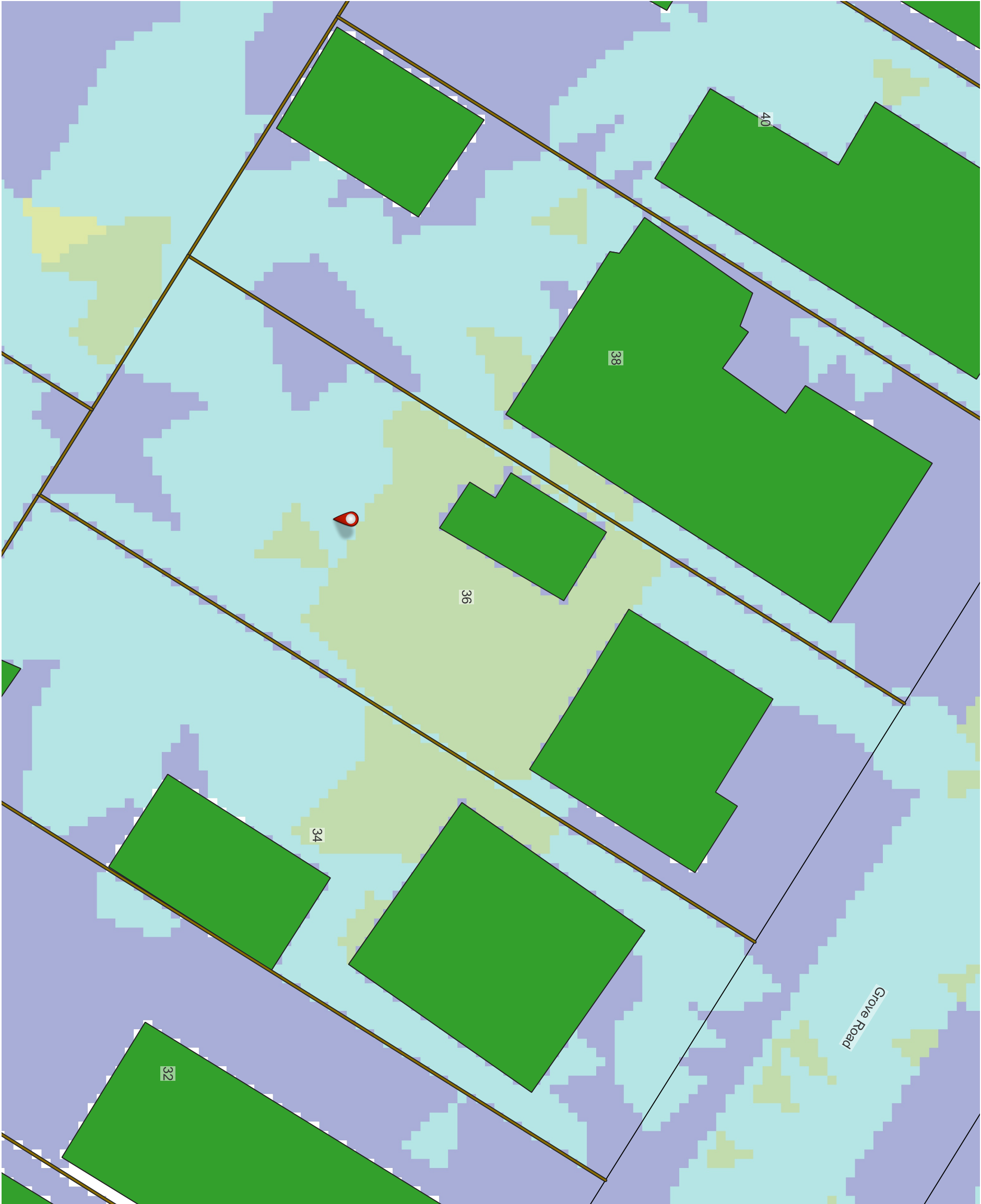
- 36 Grove Road
- Boundary Lines
- Existing Fence
- Existing Buildings

Pre 1% AEP + CC @2100

Velocity (m/s)

- <= 0.50
- 0.50 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- > 2.00





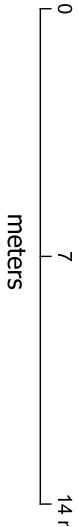
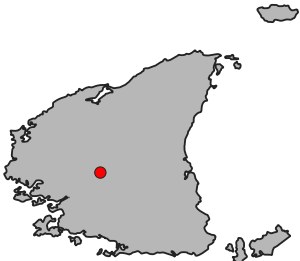
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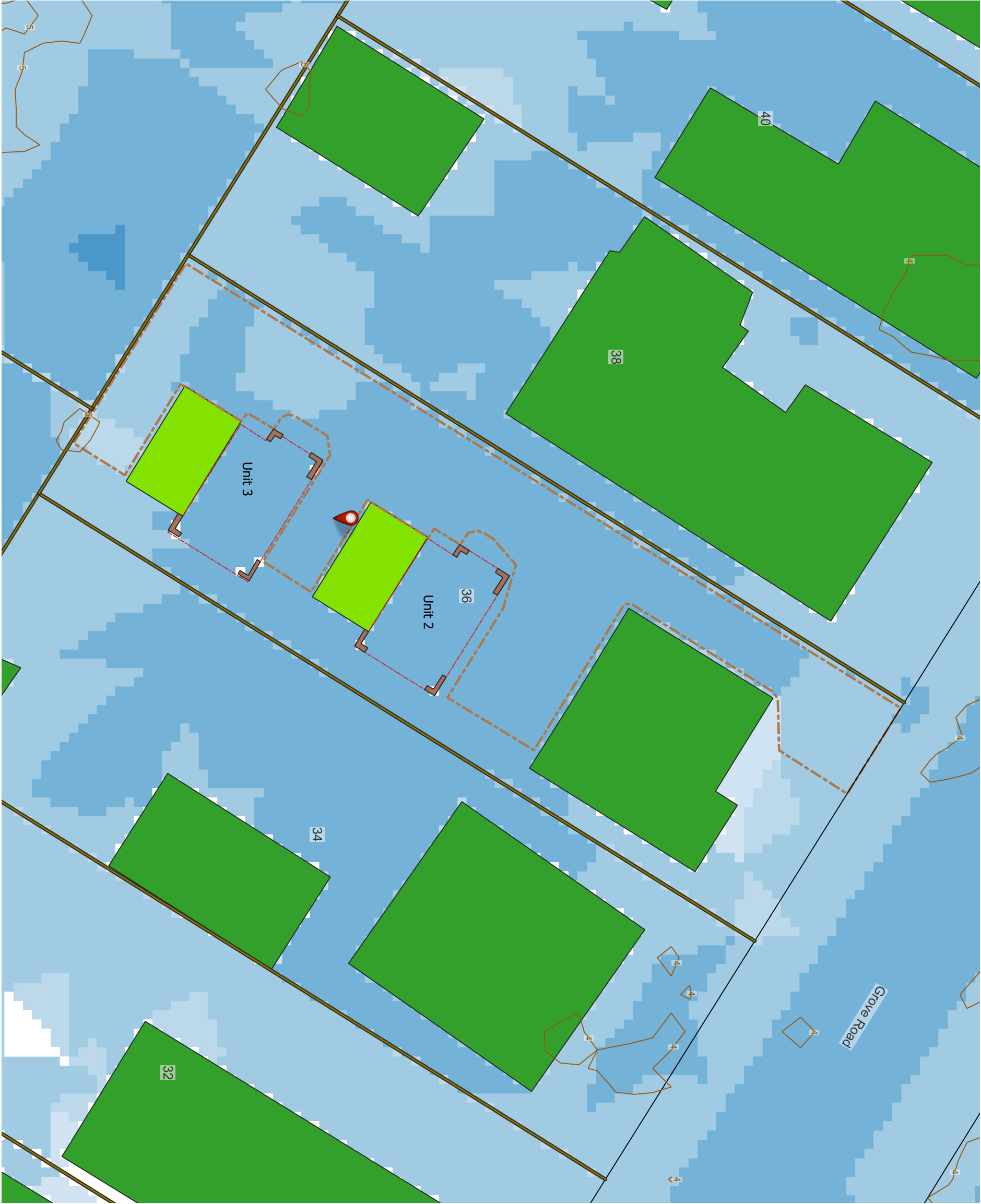
36 Grove Road

- Boundary Lines
- Existing Fence
- Existing Buildings

Pre 1% AEP + CC @2100

- Hazard
- H1
- H2
- H3
- H4
- H5
- H6

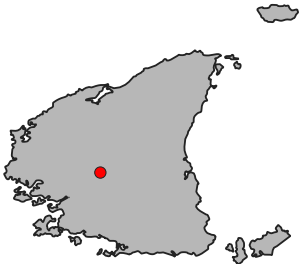
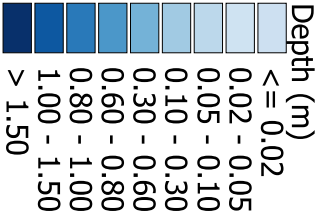


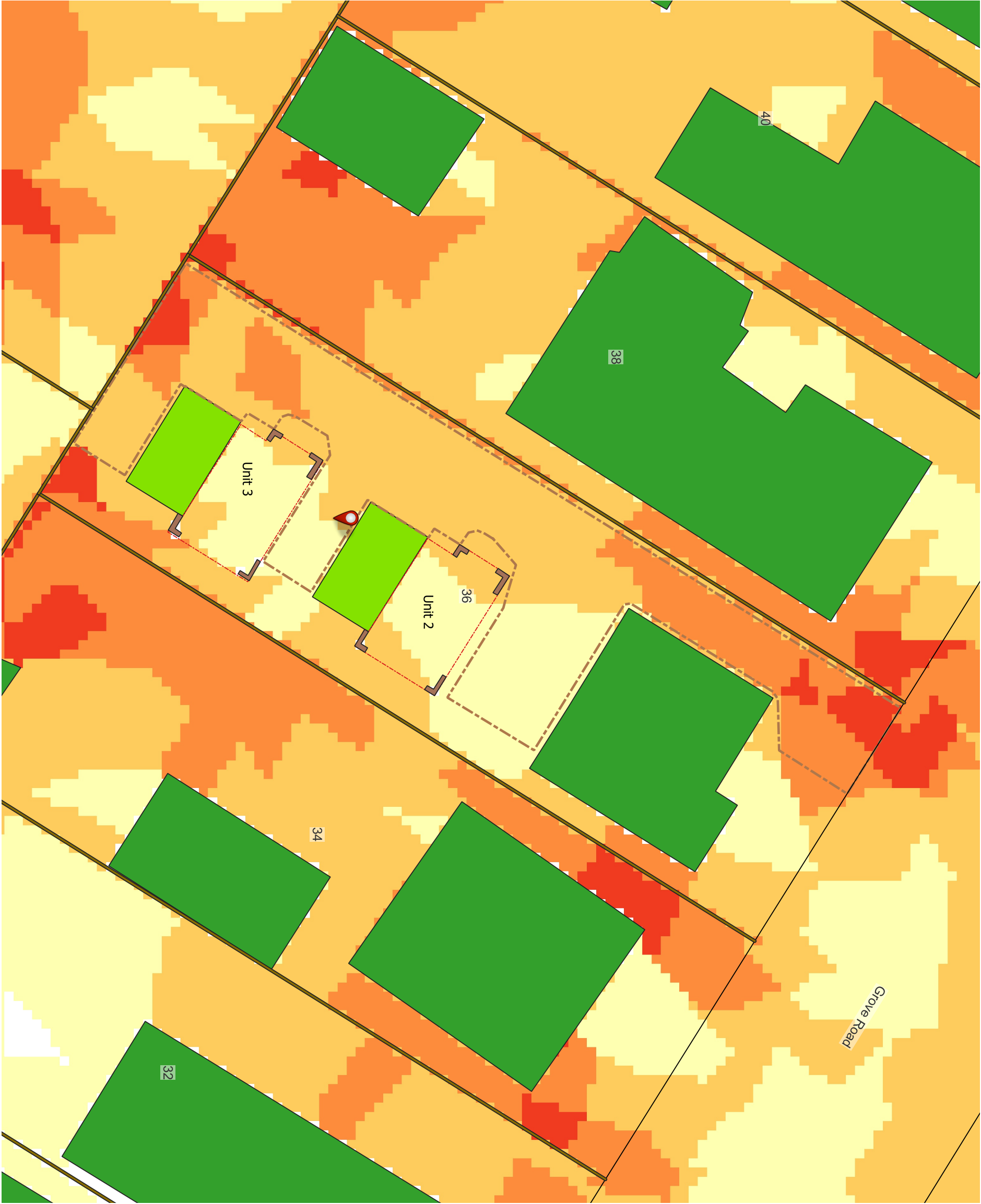


Legend

- 36 Grove Road
- 1.00m Contours
- Boundary Lines
- Existing Fence
- Existing Buildings
- Proposed unit extents
- Proposed Garage extents
- Proposed driveway
- Proposed Brick Piers

Post 1% AEP + CC @2100



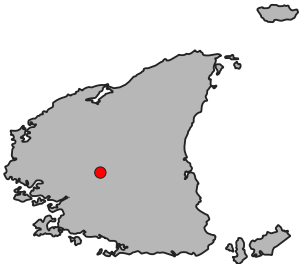
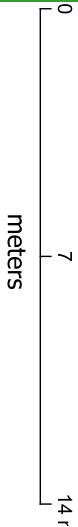


Legend

- 36 Grove Road
- Boundary Lines
- Existing Fence
- Existing Buildings
- Proposed unit extents
- Proposed Garage extents
- Proposed driveway
- Proposed Brick Piers

Post 1% AEP + CC @2100

- Velocity (m/s)
- <= 0.50
 - 0.50 - 1.00
 - 1.00 - 1.50
 - 1.50 - 2.00
 - > 2.00



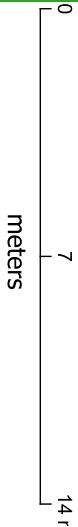
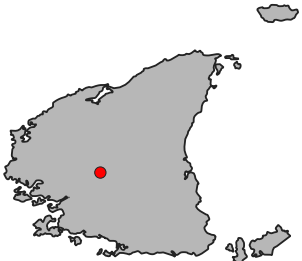


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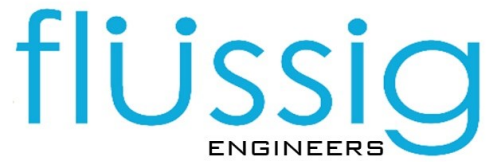
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Post 1% AEP + CC @2100

- Hazard
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- H4
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- H6



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36 GROVE ROAD, GLENORCHY: AIR MONITORING REPORT

Project ID: 15123

26/09/2023

Release: RO

Prepared For:

MinD Architects

Assured Environmental



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Project Reference ID: 15123

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Glenorchy, TAS, 7010

Harini Krishnan

M. Clifton

Author: Harini Krishnan

Reviewer: Michelle Clifton

Table 1: History of Revisions

Revision	Date	Issued to	Changes
RO	26/09/2023	D. Au	Initial Release

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GLOSSARY

Conversion of ppm to mg/m^3

Where R is the ideal gas constant; T, the temperature in kelvin ($273.16 + T^{\circ}\text{C}$); and P, the pressure in mm Hg, the conversion is as follows:

$$\mu\text{g m}^3 = (P/RT) \times \text{Molecular weight} \times (\text{concentration in ppm})$$
$$= P \times \text{Molecular weight} \times (\text{concentration in ppm})$$
$$62.4 \times (273.2 + T^{\circ}\text{C})$$

For the purposes of the air quality assessment all conversions were made at 0°C unless stated otherwise.

g/s

Grams per second

mg/m^3

Milligrams (10⁻³) per cubic metre. Conversions from mg/m^3 to parts per volume concentrations (i.e., ppm) are calculated at 0°C .

NO_x

Oxides of nitrogen – a suite of gaseous contaminants that are emitted from road vehicles and other sources. Some of the compounds can react in the atmosphere and, in the presence of other contaminants, convert to different compounds (e.g., NO to NO₂).

PM₁₀, PM_{2.5}, PM₁

Fine particulate matter with an equivalent aerodynamic diameter of less than 10, 2.5 or 1 micrometres respectively. Fine particulates are predominantly sourced from combustion processes. Vehicle emissions are a key source in urban environments.

ppb

Parts per billion.

ppm

Parts per million.

$\mu\text{g}/\text{m}^3$

Micrograms (10⁻⁶) per cubic metre. Conversions from $\mu\text{g}/\text{m}^3$ to parts per volume concentrations (i.e., ppb) are calculated at 0°C .

Percentile

The frequency of occurrence, for example the 99.5th percentile gives the value exceeded by 0.5% of the measurements or predictions.

Perception

Awareness of the effects of single or multi-sensory stimuli.

ABBREVIATIONS

BOM	Bureau of Meteorology
EPP (Air)	Environmental Protection (Air) Policy 2004
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measures
TAPM	The Air Pollution Model
TPS	Tasmanian Planning Scheme



1 INTRODUCTION

1.1 Background

MinD Architects propose to develop a 3-unit development at 36 Grove Road, Glenorchy (Subject Site). The proposed development is located within the attenuation area of a wood processing site at 22 Wrights Avenue, Glenorchy approximately 130 m south of the Subject Site.

An application (PLN-23-083) for the proposed development (Subject Site) was submitted by the MinD architects to Glenorchy City Council. In response, the council has requested the following information:

C9.0 Attenuation Code

Please provide information which addresses the relevant criteria of clause C9.5.2 Sensitive use within an attenuation area, specifically with regard for how the proposed sensitive use will not interfere with or constrain the existing wood processing works at 22 Wrights Avenue, Glenorchy (McKays Timber). The further information provided must at a minimum include an indication as to measures in the design, layout and construction of the development which are intended to eliminate, mitigate or manage effects of noise and particulate emissions generated from the activity.

In accordance with Tasmanian Planning Scheme (Glenorchy) 2015 it is necessary to conduct a site-specific air quality monitoring study to assess and ensure compliance with the specified performance criteria.

AE has previously undertaken an air impact assessment for a similar development at 72-76 Grove Road, Glenorchy which included undertaking one month of ambient air monitoring in March 2023^a. Confirmation from the Glenorchy City Council Environmental Health Officer has identified that this monitoring data is applicable to the current development.

As such, the previous monitoring data is used for the current assessment which was undertaken in accordance with AS 3580.1 *Methods for sampling and analysis of ambient air - Guide to siting air monitoring equipment*.

1.2 Scope of Assessment

Assured Environmental (AE) was appointed by MinD Architects to undertake an air impact assessment of the wood processing site to determine the suitability of the Subject Site to minimise the risk of adverse reverse amenity impacts on the on-going operation of the wood processing site.

The assessment has been undertaken in accordance with the following codes and policies:

- National Environment Protection Measures
- Tasmanian Planning Scheme;
- Tasmanian Planning Scheme (Glenorchy) 2015; and

^a Assured Environmental (2023). *72-76 Grove Road, Glenorchy: Air Monitoring Report* (Reference 14682 dated 21/04/2023).



-
- Environmental Protection (Air) Policy 2004.

In accordance with the requirements of the above codes and policies, air monitoring, computational modelling and first principal calculations have been undertaken to assess the potential for adverse reverse amenity impacts as a result of the wood processing site.

1.3 This Report

This report summarises the methodology, results, and conclusions of the air monitoring study.



2 LEGISLATIVE FRAMEWORK

2.1 Tasmanian Planning Scheme

The Tasmanian Planning Scheme (TPS) is a single state-wide planning scheme endorsed in 2017. As part of the TPS, an Attenuation Code was implemented, to achieve the following purpose:

C9.1.1 To minimise adverse impacts on the health, safety and amenity of sensitive use from activities which have the potential to cause emissions; and

C9.1.2 To minimise the likelihood for sensitive use to conflict with, interfere with, or constrain, activities which have the potential to cause emissions.

The nearby wood processing site is considered to be an “activity which have the potential to cause emissions” and therefore an Attenuation Area is applied to this activity. An Attenuation Area means land that is:

(a) within the boundary of an attenuation area shown on an overlay map in the relevant Local Provision Schedule; or

(b) within the relevant attenuation distance from an activity listed in Table C9.1 or C9.2, which is an existing activity or an activity for which a planning permit is in force.

The attenuation distances for wood processing works are listed in Table C9.1 of the TPS, as replicated in Table 2.

Table 2: Table C9.1 of TPS - Attenuation Distances (R-Z)

Activity		Attenuation Distance	
		Level 1 Activity	Level 2 Activity
Wood processing works The conduct of works (other than works at a builders supply yard, home improvement centre or firewood depot) at which timber is sawn, cut, compressed, milled, machined or kiln-dried.	Sawmill – emissions such as noise and particles.	250 m	500 m
	All other types of operation (excluding joinery, firewood merchant or woodchip mill) – emissions such as noise and particles.	250 m	1,000 m

Table E9.7.2 of the TPS provide the Performance Criteria for sensitive uses within an attenuation area, as replicated in Table 3.



Table 3: Table E9.7.2 of TPS – Development for Sensitive Use in Proximity to Use with Potential to Cause Environmental Harm

Objective:	To ensure that new sensitive use does not conflict with, interfere with or constrain uses with potential to cause environmental harm.
Acceptable Solutions	Performance Criteria
AI: No acceptable solution	PI: Sensitive use within an attenuation area, must not interfere with or constrain an existing activity listed in Tables C9.1 or C9.2, having regard to: (a) the nature of the activity with potential to cause emissions including: (i) operational characteristics of the activity; (ii) scale and intensity of the activity; and (iii) degree of hazard or pollution that may be emitted from the activity; (b) the degree of encroachment by the sensitive use into the attenuation area or the attenuation distance; (d) measures in the design, layout and construction of the development for the sensitive use to eliminate, mitigate or manage effects of emissions.

In order to assess the impact upon the Subject Site, criteria detailed in the Environmental Protection Policies will be used.

2.2 Environmental Protection Policy (Air Quality) 2004

In Tasmania, the Environment Protection Policy (Air Quality) 2004 (EPP Air), provides regulatory framework for managing air quality impacts from industrial activities.

Table 1 of Schedule 2 of the EPP (Air) specifies the design criteria, which is outlined in Table 4. The maximum predicted ground level concentration at each receptor location is defined as the 99.9 percentile peak concentration for averaging periods of one hour or less and the 100 percentile peak concentrations otherwise.

Table 4: Table 1 Design Criteria

Pollutant	Criterion	Averaging Period	Percentile
Particulate matter (as PM ₁₀)	150 µg/m ³	24-hour average	99.9 th

2.3 National Environmental Protection (Ambient Air Quality) Measures

The National Environment Protection Council (NEPC) defines national ambient air quality standards and goals in consultation, and with agreement from all Australian state and territory governments. These were first published in 1998 in the National Environment Protection (Ambient Air Quality) Measure (Air NEPM).



A number of Australian states have adopted the Air NEPM standards as air quality objectives. The NEPM criteria is more stringent than the EPP (Air) 2004 and therefore NEPM will be used for this assessment.

Table 5: Ambient Air Quality NEPM Standards

Pollutant	Averaging Period	Concentration Maximum ($\mu\text{g}/\text{m}^3$)	
		Current Objective	From 2025
PM ₁₀	1 day	50	-
	1 year	25	-
PM _{2.5}	1 day	25	20
	1 year	8	7



3 SUBJECT SITE

3.1 Location

The Subject Site is located at 36 Grove Road, Glenorchy, Tasmania on a single lot (Property ID 5372372). The Subject Site is zoned as Inner Residential under City of Glenorchy Council, with the surrounding land parcels zoned as the following:

- North: Inner Residential;
- East: Inner Residential and Community Purpose;
- South: Light Industrial; and
- West: Inner Residential and General Residential.

The location of the proposed development in relation to the wood processing site is presented in Figure 1.

3.2 Terrain

Terrain data was sourced from lidar at 1 m intervals shown in Figure 2.

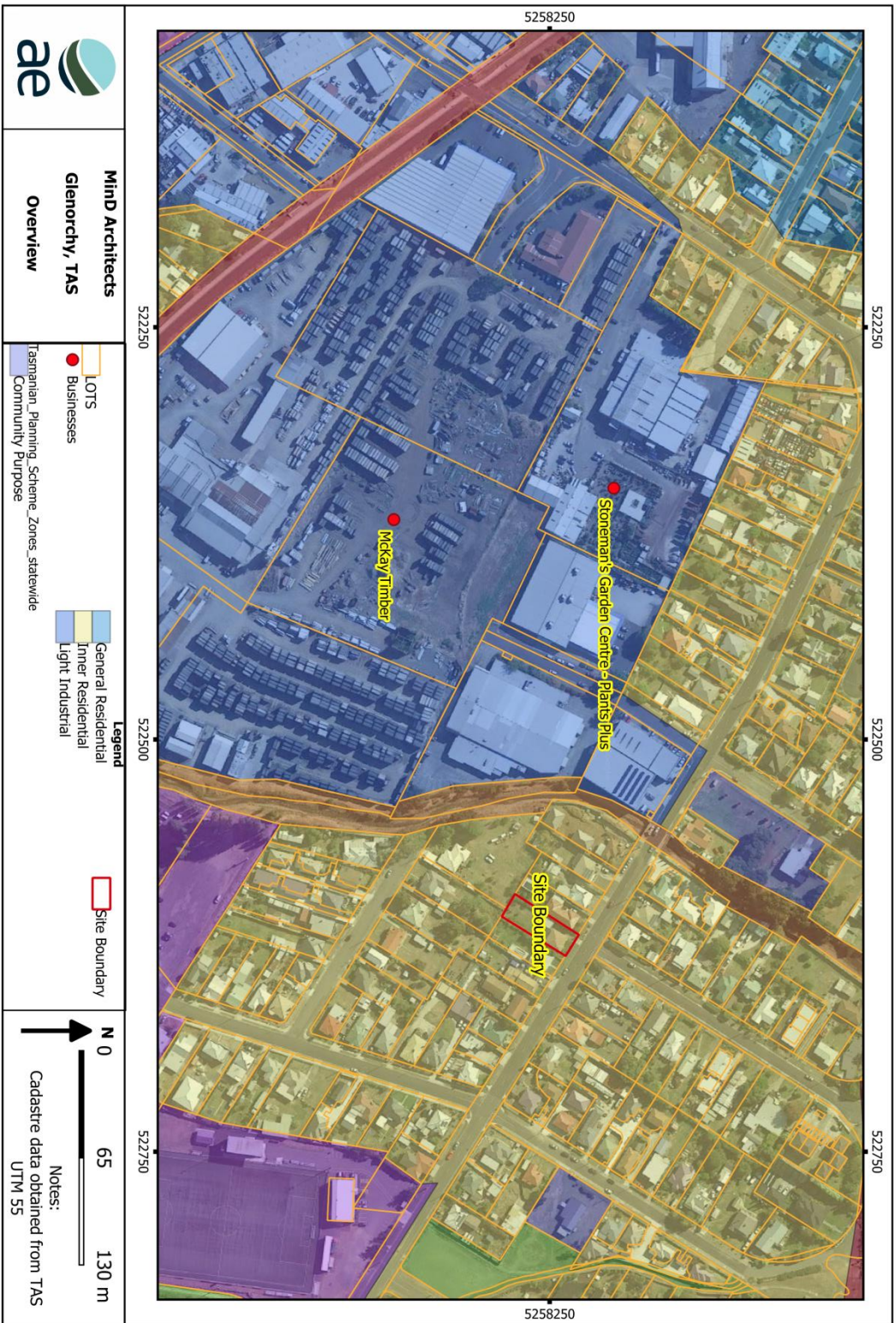


Figure 1: Site Outline

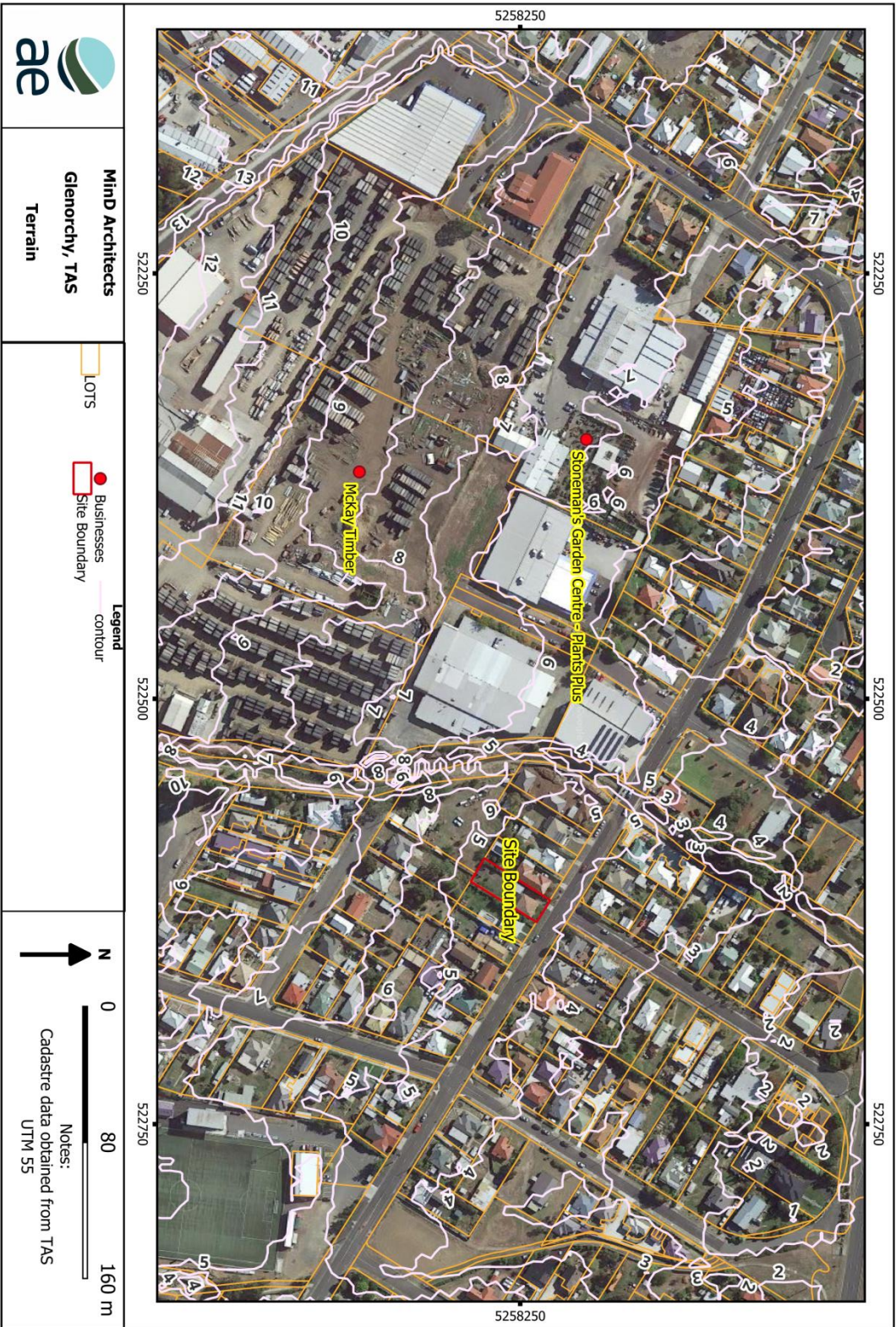


Figure 2: Subject Site Terrain



4 AMBIENT MONITORING

4.1 McKay Timber Process Description

McKay Timber Yard located at 22 Wrights Avenue, Glenorchy is a Level 2 Activity under the provisions of the *Environmental Management and Pollution Control Act 1994* includes a timber processing mill and drying facility as well as a timber truss and wall framing manufacturing operation. Sawn timber is delivered to the facility to be dried and machined to produce timber for construction and furniture with some dry shavings also transported offsite to be utilised as chicken litter.

The operating capacity of the facility is 13,000 m³ of dried sawn timber per year.

4.2 Monitoring Location

Ambient dust monitoring was undertaken at the Subject Site to measure particulate emissions over the course of one month from 27 February to 30 March 2023. The dust monitoring location is outlined in Figure 3. The monitoring location complies with AS 3580.1.1.

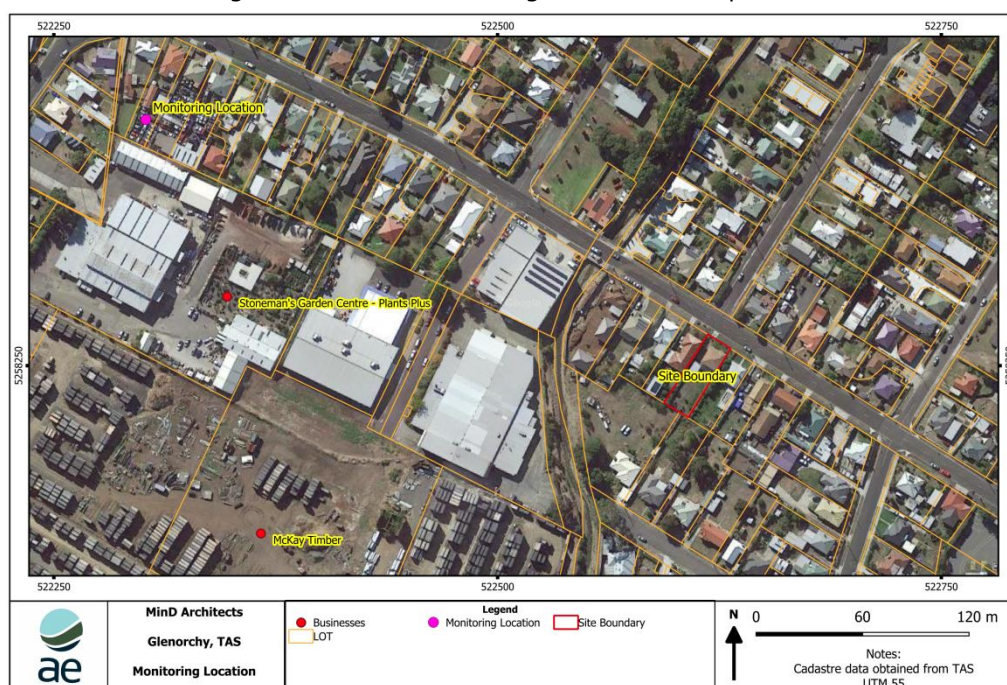


Figure 3: Monitoring Location

4.3 Equipment

Particulates (total, PM₁₀ and PM_{2.5}) are measured using a QAMS Dust Master Pro 7000 (DMP 7000). The DMP 7000 is an indicative particle counter which uses laser technology for real-time simultaneous measure of particulates.

The DMP 7000 is not a compliance monitor and is therefore not covered by an Australian Standard. However, a site K-factor is calculated by using a reference gravimetric filter for PM₁₀ and PM_{2.5} analysed by Assured Environmental as detailed in Section 4.3.



The DMP 7000 was also fitted with a wind sensor, details of the equipment used is outlined in Table 6.

Table 6: Dust Monitoring Equipment

Sampling Equipment	Serial Number
QAMS Dust Master Pro Model 7000	07.0317.105
LUFFT WS200-UMB Smart Weather Sensor – Ultrasonic Wind Sensor, Electronic Compass	052.0617.0811.224

The DMP 7000 was also interfaced with the AE web-based platform which allows the display of near real-time data. The set-up of the DMP is shown in Figure 4.



Figure 4: DMP 7000 set-up on Subject Site

4.4 Laboratory Analysis

From 27 February to 10 March, the DMP 7000 was fitted with a 37 mm PVC filter. The purpose of this filter was to be used for the development of a K-Factor to allow the validation of the real-time monitoring data. The filter pre-weight and post-weight was measured by Assured Environmental as detailed in Table 7.

Table 7: Analysis Notes

Company	NATA Accreditation
Assured Environmental	19703



The K-Factor is developed using the following steps:

1. Calculate the mass concentration of particulates by measuring the mass of particles captured in a sample filter downstream of the optical engine and dividing by the total sample volume (AS 3580.9.9:2017):

$$\text{Mass concentration} = \frac{\text{particulate mass}}{\text{sample volume}} = \frac{\text{filter postweight} - \text{filter preweight}}{\text{sample volume}}$$

2. Using the average optical result concentration, calculate the K-factor, which corrects the DMP's optical measurements for site variations:

$$K \text{ Factor} = \frac{\text{gravimetric}}{\text{optical}}$$

The results of the laboratory work and the K-factor are shown in Table 8.

Table 8: Laboratory Results and K-Factor

Properties	Units	DMP
Sample Volume ^{a)}	m ³	79
Dust Gain	mg	0.315
Gravimetric mass concentration	mg/m ³	0.0040
Optical mass concentration ^{b)}	mg/m ³	0.0125
K-Factor	-	0.32
<i>a) Filter was exposed from 27 February to 10 March 2023.</i>		
<i>b) Total dust was used in developing the K-factor.</i>		

4.5 Indicative Real-Time Monitoring

4.5.1 Data Validation

The data validation process for the DMP involved removing error values. The K-Factor correction from Section 4.3 was applied to validate the real-time monitoring data.

4.6 Meteorological Conditions

A wind rose for the monitoring period is shown in Figure 5. The dominant wind direction for the monitoring period was from the northwest with wind speeds above 4 m/s seen less than 2% of the time.

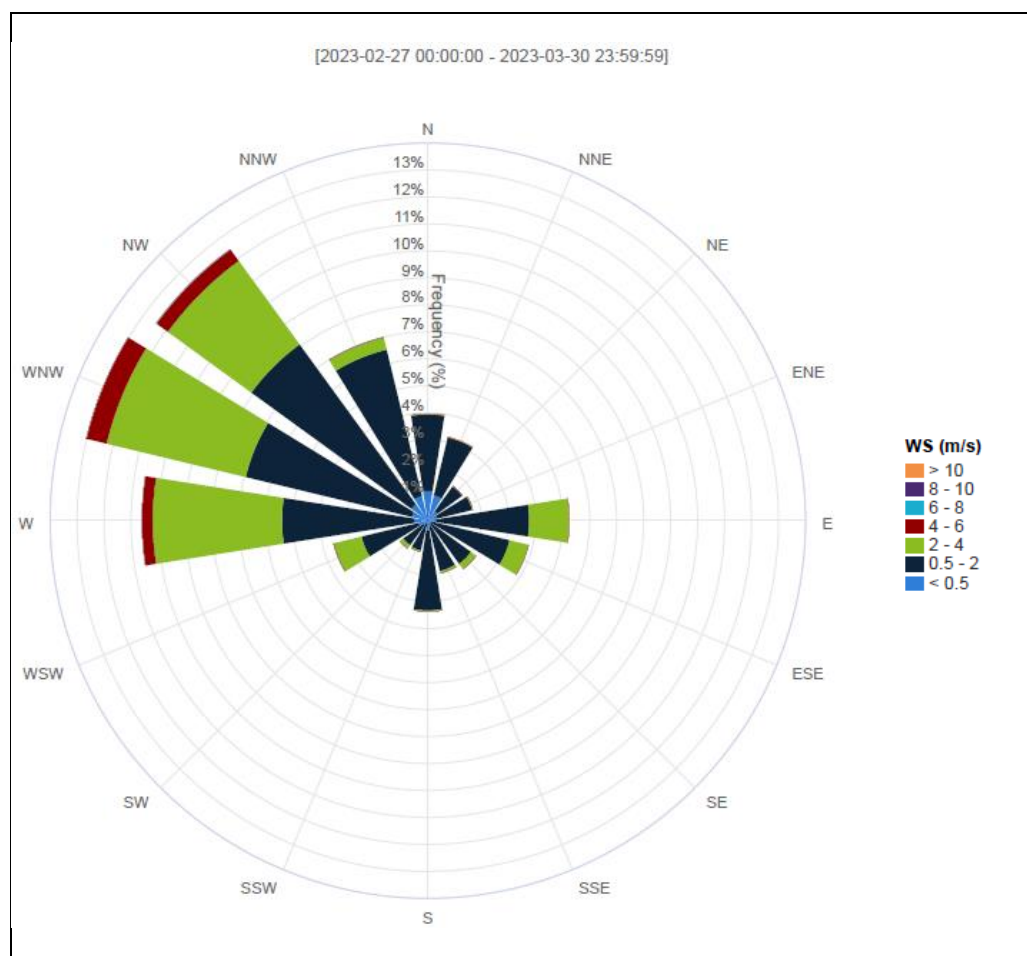


Figure 5: Wind Rose from 27 February to 30 March 2023

4.6.1 Pollution Rose

A pollution rose plot is created by plotting the observed particulate concentrations against the observed wind direction from the onsite weather station. This enabled the direction which elevated dust concentrations are coming from to be identified for the monitoring period.

Figure 6 and Figure 7 shows a pollution rose plot for PM_{10} and $PM_{2.5}$ concentrations observed for the monitoring period. PM_{10} and $PM_{2.5}$ concentrations were low with concentrations above $20 \mu\text{g}/\text{m}^3$ seen less than 1% of the time for both PM_{10} and $PM_{2.5}$. Dust concentrations were observed predominantly from the north-western quadrant for both PM_{10} and $PM_{2.5}$. Given the wood processing site is located to the south of the monitoring location and dust concentrations were low, the wood processing site is not expected to negatively impact the development site.

A summary of the continuous 1-hour and 24-hour average for PM_{10} and $PM_{2.5}$ is provided in Figure 8 and Figure 9. For each 24-hour period, measured PM_{10} or $PM_{2.5}$ concentrations represent an average of the 1-hour average concentrations across the period. Where less than 75% of the data for a given 24-hour period is identified as invalid, 24-hour average is reported. Review of the air quality monitoring data from the DMP indicates there was no exceedances of the PM_{10} and $PM_{2.5}$ 24-Hour average air quality limit.

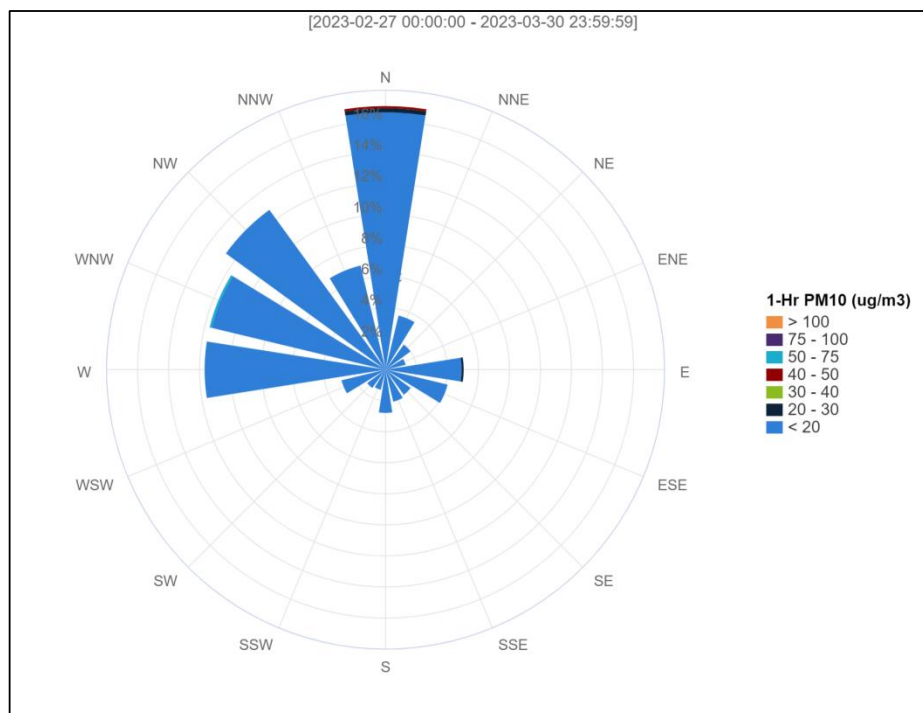


Figure 6: PM10 Pollution Rose Plot for 27 February to 10 March 2023

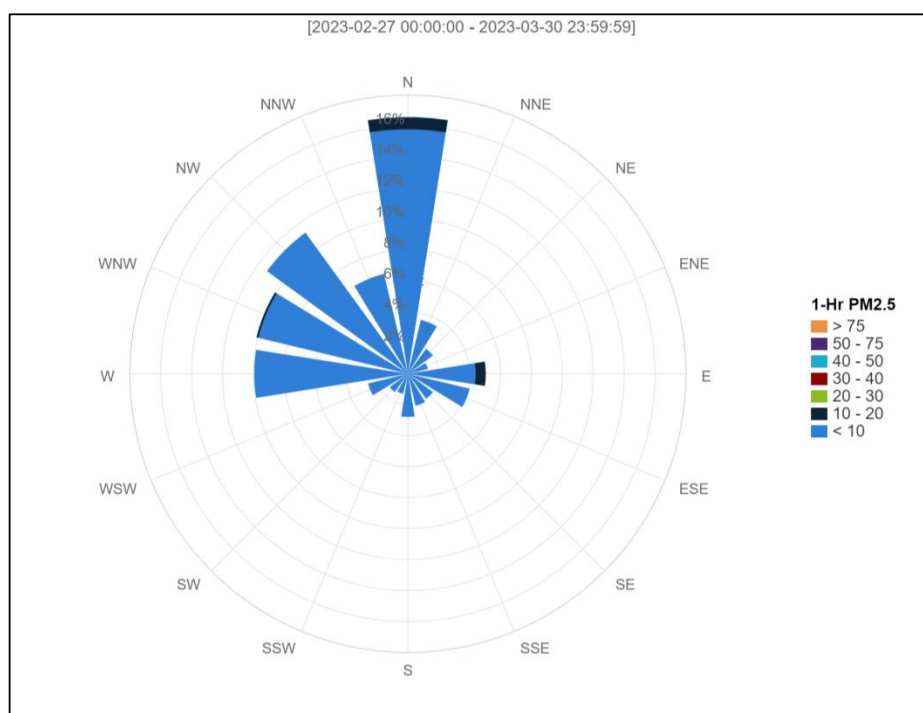


Figure 7: PM_{2.5} Pollution Rose Plot for 27 February to 10 March 2023

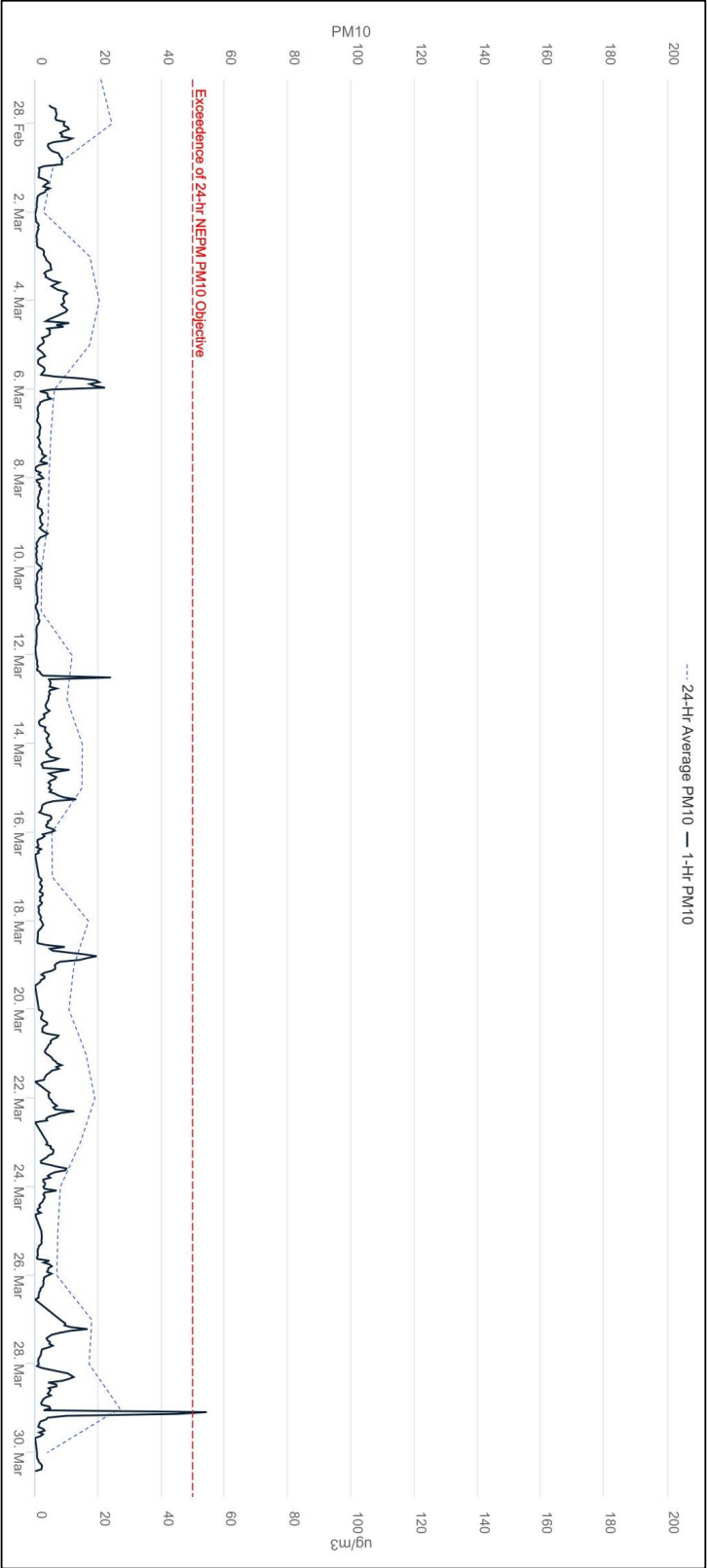


Figure 8: PM10 1-Hour and 24-Hour Average for the Monitoring Period

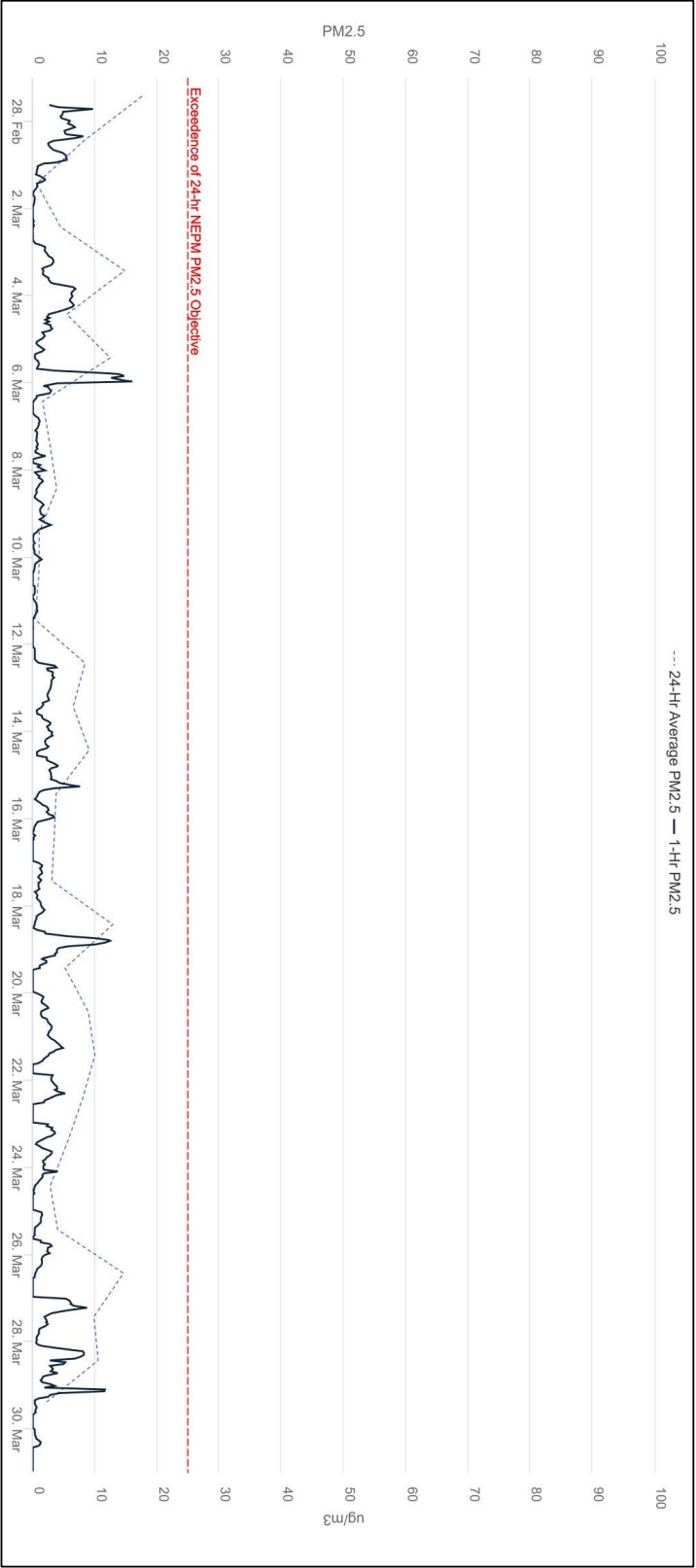


Figure 9: PM_{2.5} 1-Hour and 24-Hour Average for the Monitoring Period



5 CONCLUSIONS

MinD Architects propose to develop a 3-unit development at 36 Grove Road, Glenorchy (Subject Site). Part of the Subject Site sits within the Attenuation Area of the Glenorchy Planning Scheme 2015 triggered by the wood processing site to the south of the Subject Site.

Assured Environmental was commissioned to carry out site specific ambient monitoring to assess the impacts of the wood processing site on the proposed development. A summary of the monitoring and observations include the following:

- No PM₁₀ or PM_{2.5} 24-hour levels were recorded above the 24-hour criteria as outlined in EPP (Air) and NEPM.
- Winds were blowing from the north and northwest, with no winds from the south observed.

Therefore, it is concluded that the wood processing site will not have an adverse effect on the overall amenity of the Subject Site.