Douglas PARTNERS

GROUNDED EXPERTISE

Report on Groundwater Impact Assessment

Proposed Multistorey Residential Development

5-7 Church & 42 Donald Street, Nelson Bay NSW

Prepared for Fortezza Group Pty Ltd

Project 227295.03

21 October 2025

Douglas Partners Pty Ltd
ABN 75 053 980 117
douglaspartners.com.au
15 Callistemon Close, Warabrook, NSW 2304
(02) 4960 9600

Document History

Details

Project No.	227295.03
Document Title	Report on Groundwater Impact Assessment
Site Address	5-7 Church & 42 Donald Street, Nelson Bay NSW
Report Prepared For	Fortezza Group Pty Ltd
Filename	227295.03.R.001.Rev0

Status and Review

Status	Prepared by	Reviewed by	Date issued
Revision 0	Jason Lambert	Will Wright	21 October 2025

Distribution of Copies

Status	Issued to
Revision 0	Fortezza Group Pty Ltd – Roberto Giammaria

The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

Signature		Date
Author		21 October 2025
Reviewer	P W Wright	21 October 2025

Douglas Partners acknowledges Australia's First Peoples as the Traditional Owners of the Land and Sea on which we operate. We pay our respects to Elders past and present and to all Aboriginal and Torres Strait Islander peoples across the many communities in which we live, visit and work. We recognise and respect their ongoing cultural and spiritual connection to Country.

Table of Contents

Report on Groundwater Impact Assessment
Proposed Multistorey Residential Development
5-7 Church & 42 Donald Street, Nelson Bay NSW

1. Introduction

This report prepared by Douglas Partners Pty Ltd (Douglas) presents the results of a groundwater impact assessment (GIA) undertaken for a proposed multistorey residential development at 5-7 Church & 42 Donald Street, Nelson Bay NSW (the site). The investigation was commissioned by email instructing to proceed dated 31 July 2025 from Roberto Giammaria of Fortezza Group Pty Ltd and was undertaken in line with Douglas' proposal 227295.01.P.001.Rev0 dated 30 July 2025.

The aim of this GIA is to assess the potential impacts of the proposed development on groundwater, together with monitoring and mitigation measures that should be adopted during construction to manage groundwater.

Douglas has previously undertaken investigations at the site which included assessment of the subsurface soil and groundwater conditions across the site, the results of which are reported separately. A summary of the relevant field work results is presented/utilised in this report.

This GIA has been prepared in response to the requirements contained within Planning Secretary's Environmental Requirements (SEARs) for SSD-83366960 dated 7 May 2025 as shown in Figure 1.

12. Ground and Groundwater Conditions • Assess potential impacts on soil resources and related infrastructure and riparian lands on and near the site and including soil erosion. • Where required provide a Groundwater Impact Assessment in accordance with relevant Groundwater Guidelines. If the proposed development is on land identified as having high salinity or acid sulfate soil potential in an EPI provide a Salinity Management Plan or Acid Sulfate Soil Management Plan that includes appropriate management measures and strategies.	Geotechnical Assessment If required: Groundwater Impact Assessment Salinity Management Plan Acid Sulfate Soils Management Plan

Figure 1: SEARs for SSD-83366960 Item 12

This GIA has been prepared with reference to the following policy and guidelines:

- Minimum requirements for building site groundwater investigations and reporting (DPE, 2022); and
- NSW Aquifer Interference Policy (DPI, 2012).

This report must be read in conjunction with all appendices including the notes provided in Appendix B.

2. Site description

Table 1 presents site identification details.

Table 1: Site identification

Item	Details
Site address	5-7 Church & 42 Donald Street, Nelson Bay NSW
Legal description	Lot A, B DP 417172 and 15 DP 5616
Approximate area	2200 m^2
Zoning	Medium density residential (R3) and Local centre (B2)
Local council area	Port Stephens Council (PSC)
Current use	Residential and commercial (hairdresser)
Surrounding uses	North – Residential (apartments) East – Commercial (clothing shop) South – Residential (house/apartments) West – School (Tomaree community college)

A The site currently comprises a single commercial building in the south eastern area of the site (Lot B). Previous investigations by Douglas indicate that the ground surface at the site slopes to the south east with elevations from approximately RL 25 (AHD) in the north western area of the site to RL 20 in the south eastern area of the site.

Figure 1: Site location, approximate site boundary shown in red.

3. Proposed development

With reference to the supplied architectural drawings, it is understood that the proposed residential development, will comprise of the construction of a nine-storey residential apartment building with a two-level basement car park, as shown in Figure 2.

Based on supplied information, it is anticipated that cuts ranging to 8 m would be required to facilitate the construction of the below ground car parking area, nominally excavations to about RL 17, depending on the basement two slab thickness. Excavations for pile caps (where proposed) and lift pits are expected to be locally deeper.

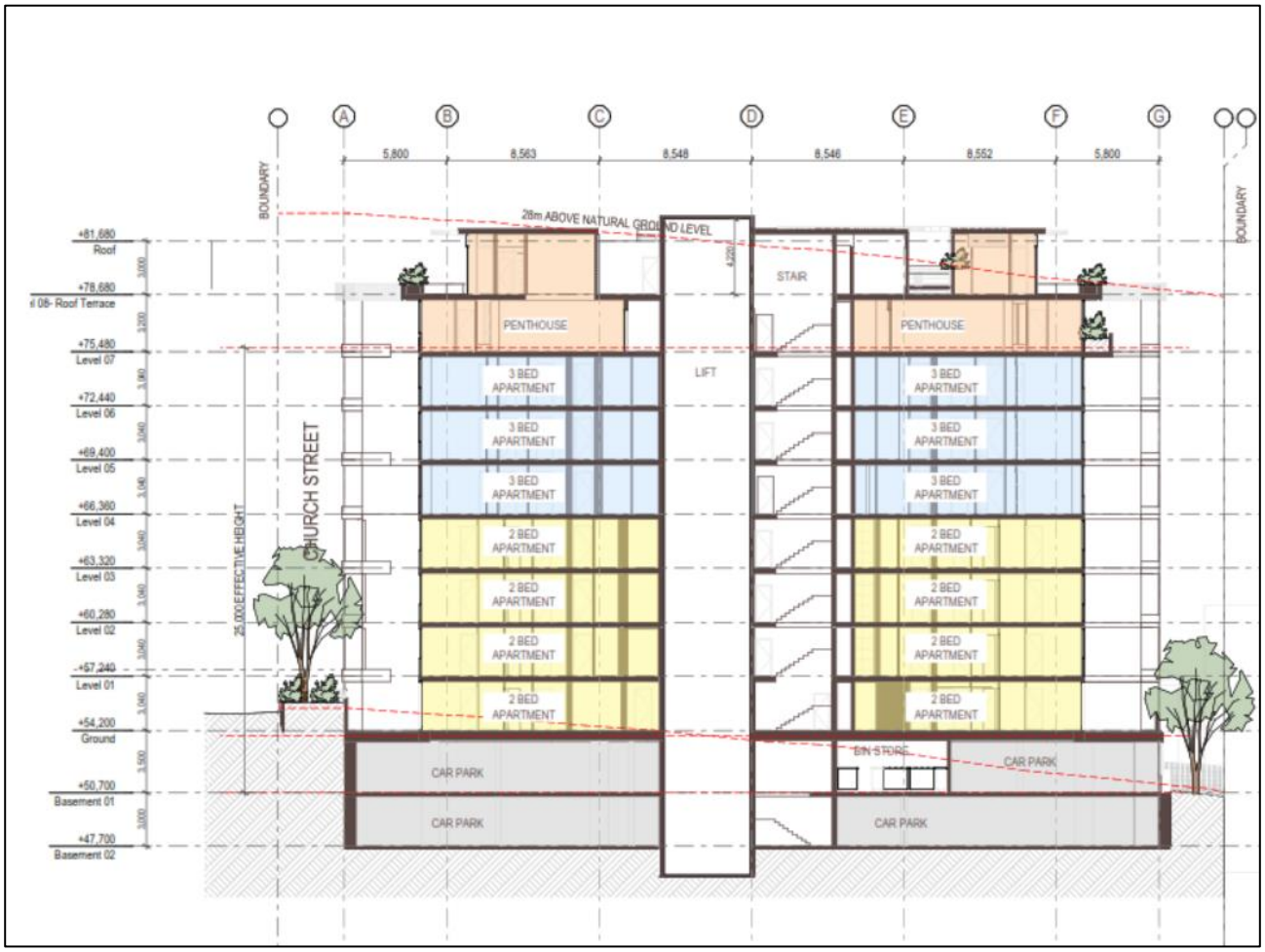


Figure 2: Section A Drawing TP501 from Hayes Anderson Lynch Architects Pty Ltd

A detention tank is also proposed in the south eastern area of the site. From discussions with the client it is understood that the detention tank will partially infiltrate stormwater and therefore requires subsurface conditions which are favourable to soil infiltration. Based on client supplied drawings it is understood that the tank footprint is approximately 50 m^2 and will be installed to a depth less than the basement floor level (i.e. RL 17) (see Figure 3 and Figure 4).

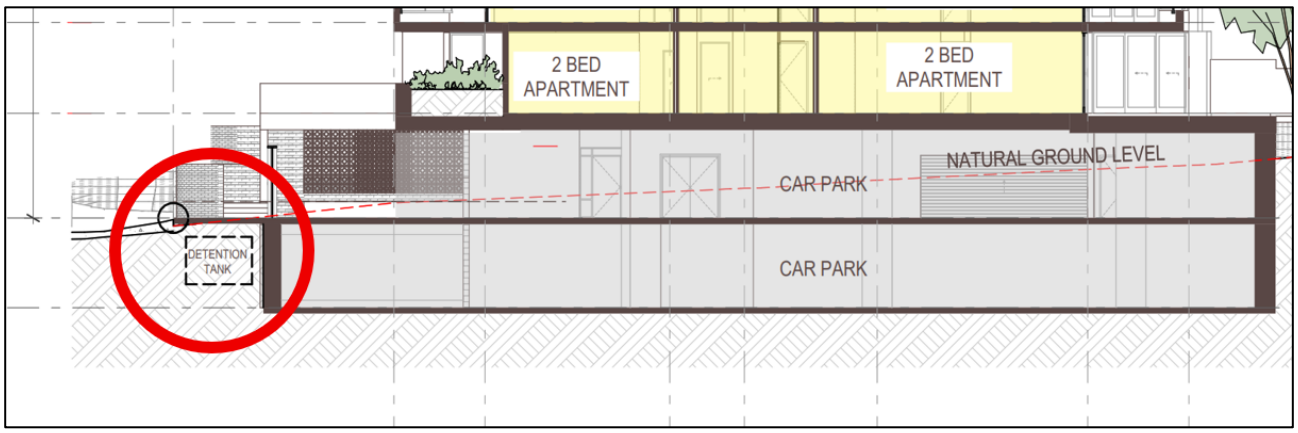


Figure 3: Detention tank shown with red, figure adapted from client supplied drawings (Hayes Anderson Lynch Architects Pty Ltd Section B drawing TP502)

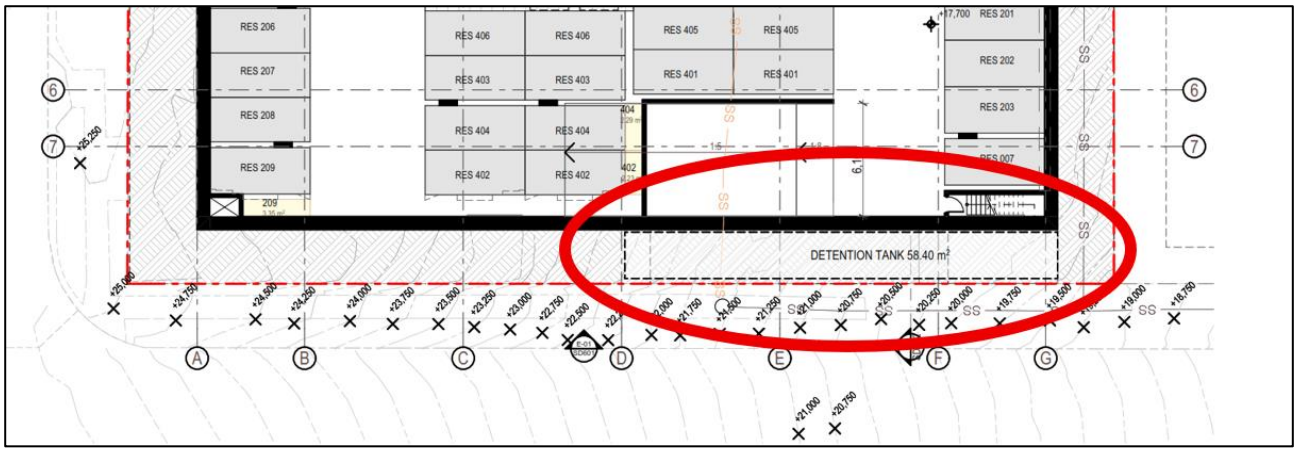


Figure 4: Detention tank shown in red, figure adapted from client supplied drawings (Hayes Anderson Lynch Architects Pty Ltd GA Plan – Basement 02 drawing TP201)

4. Published data

4.1 Topography

Reference to NSW 2 m contours indicates the regional topography in the vicinity of the site generally falls to the north-east, with the highest elevation of approximately RL 40 (m AHD) (at hilltops to the south-west) and as low as RL 0 (at Nelson Bay to the north-east).

At the site, levels range from the highest point of about RL 24 in the western area of the site, down to around RL 20 in the eastern area of the site.

4.2 Geology and soil landscape

Reference to NSW Seamless Geology mapping indicates the site is underlain by Pleistocene to quaternary aged coastal deposits which typically comprise sand.

Reference to the NSW NCCA Quaternary Geology mapping indicates the site is underlain by Pleistocene aged bedrock-mantling dune comprising marine sand and indurated sand which is indicated to have low pyrite, organic and carbonate content and low to moderate heavy mineral content, no shell.

Reference to NSW Soil Landscapes of Central NSW index indicates the site is underlain by soils typical of the Fingal Head soil landscape which typically comprises gently undulating rises to rolling low hills comprised of high-level dunes and sand sheets mantling bedrock. Typical limitations of this soil landscape include localised shallow soils, widespread poor moisture availability, widespread non-cohesive soils, localised steep slopes, localised mass movement hazard, localised foundation hazard, widespread recharge zone, widespread wind erosion hazard.

4.3 Hydrology

The regional groundwater regime is generally expected to flow to the north/north east towards Nelson Bay which is approximately 250 m from the site. Nelson Bay is considered to be the nearest sensitive receptor.

Groundwater is expected to flow similarly to surface topology i.e. flowing under the site to the east/north east.

4.4 Rainfall residual mass balance (RRMB)

A residual rainfall mass balance (RRMB) has been undertaken on the long-term rainfall records from Williamtown (061078) weather station. These records have been collected by BOM continuously since 1960 to September 2025. A RRMB provides a cumulative plot of above or below average rainfall over the length of the rainfall records. A slope upwards on the plot indicates above average rainfall whereas a slope downward indicates below average rainfall (over the length of rainfall records). The RRMB is shown in Figure 5.

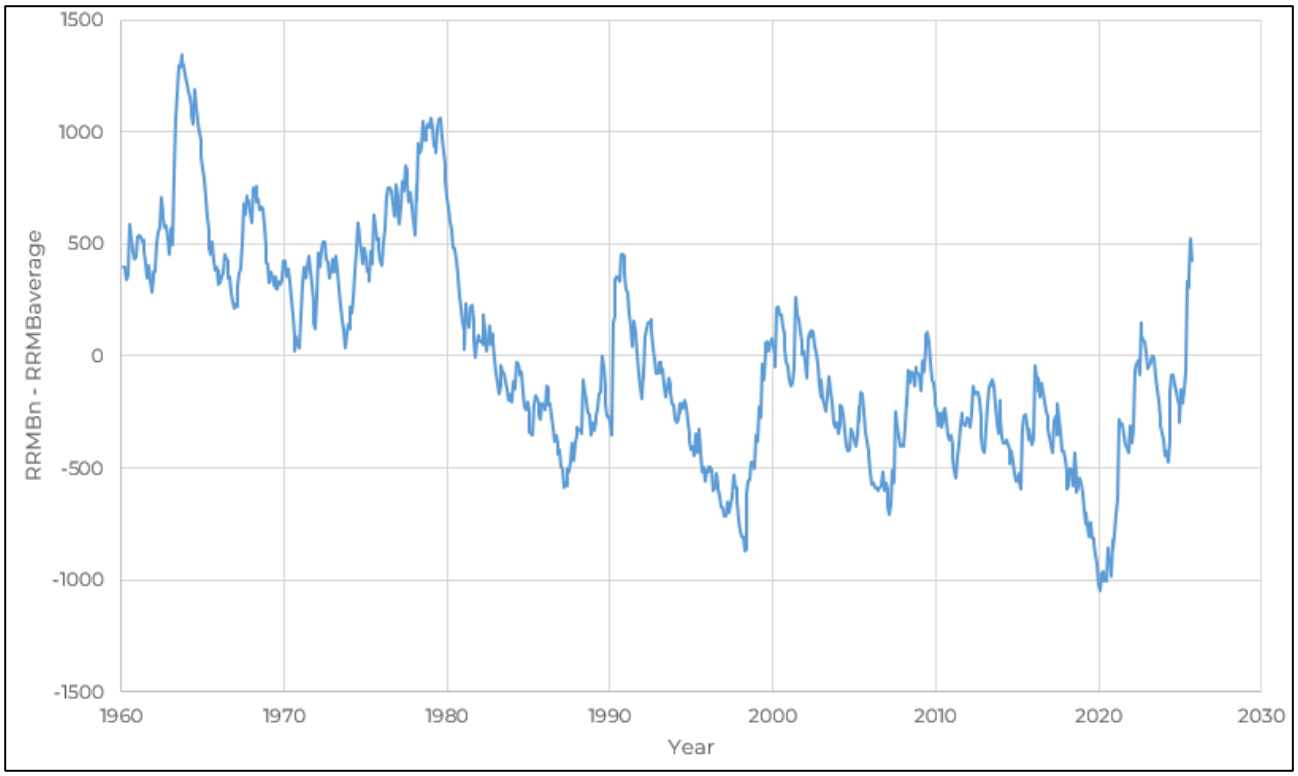


Figure 5: Residual Rainfall Mass Balance (RRMB) for Williamtown weather station (61078)

The RRMB indicates below average rainfall from around 2017 to 2020 with generally above average rainfall since 2020 (with some localised dry spells during that time). Additionally, recent months had above average rainfall.

4.5 **Groundwater receptors**

Search of NSW registered groundwater bores indicates the following nearby registered groundwater bores within 500 m of the site (information sourced from groundwater work summary for each bore):

- GW200584 – 275 m north-east – installed in 2007 – no purpose listed on the work summary;
- GW080159 – 325 m north-east – 10 m deep well installed in 2001 – monitoring purposes – observed water depth of 0.48 m in sands; and
- GW200402 – 375 m east – 24 m deep well installed in 2001 – monitoring purposes – observed water depth of 6.40 m in sands.

It should be noted that groundwater levels are affected by factors such as climatic conditions and soil permeability and therefore vary with time.

Reference to NSW registered groundwater bores listed above, wells were listed for monitoring purposes which are not considered sensitive groundwater receptors.

Reference to the Australia GDE atlas indicates the following groundwater dependent ecosystems (GDEs) within 1 km of the site:

- 250 m north mapped as low to high potential for terrestrial GDE. These locations are located immediately along the foreshore of Nelson Bay.;
- 400 m east/south east mapped as moderate potential for terrestrial GDE;
- 450 m south mapped as low to high potential for terrestrial GDE; and
- 1 km south west mapped as high potential for terrestrial GDE.

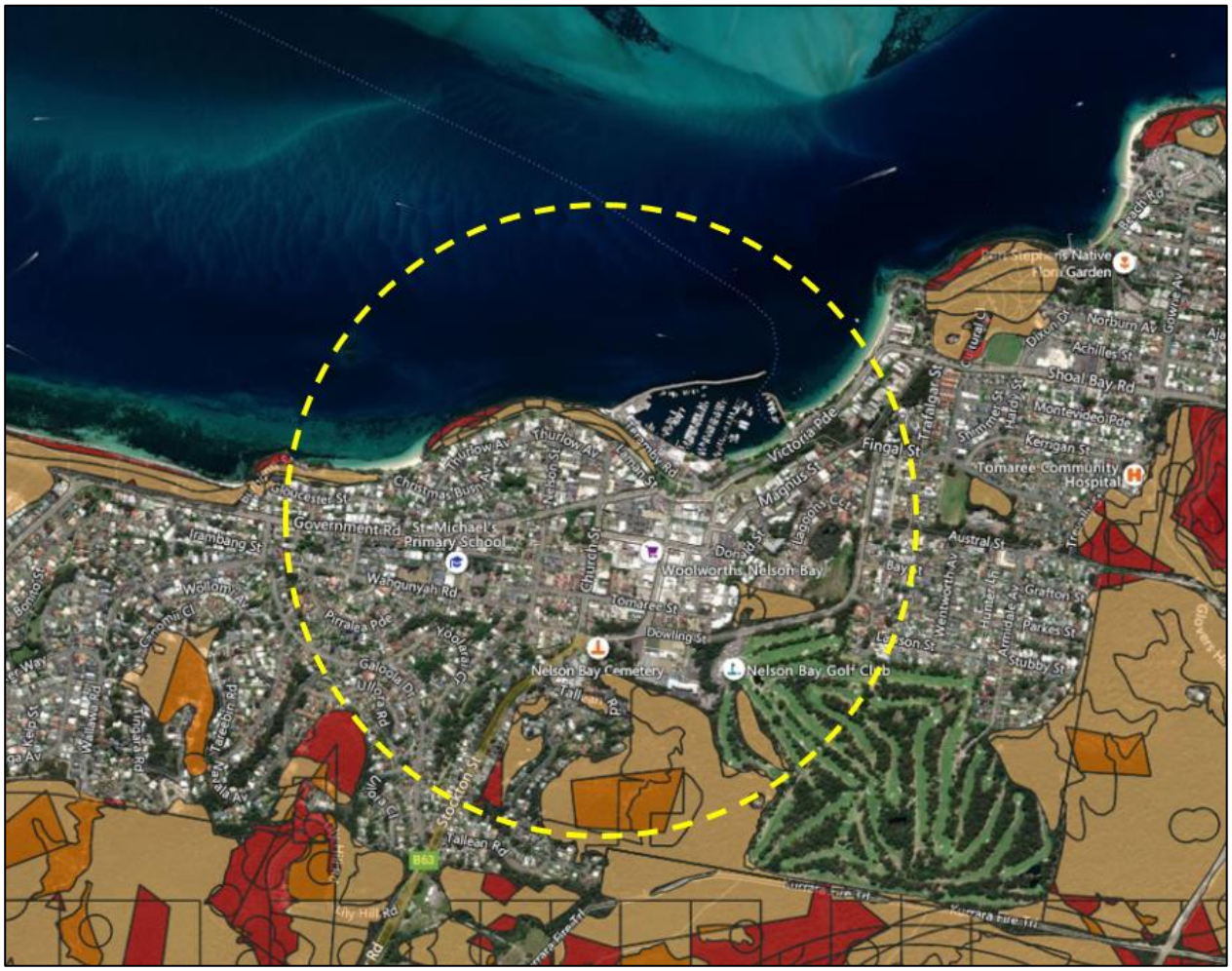


Figure 6: Approximate 1 km buffer from the site shown with yellow dash circle, high potential GDE (red), moderate potential GDE (pale orange), low potential GDE (orange).

4.6 Acid sulfate soils

Reference to NSW Acid Sulfate Soil risk mapping indicates the site is outside of the mapped area of acid sulfate risk. The nearest mapped area is approximately 110 m to the east which is mapped as low probability of occurrence (greater than 3 m below ground surface). Typically, acid sulfate soils occur in coastal areas at elevations of RL 5 and lower.

Based on a review of the above information and site information to date, an acid sulfate soil management plan (ASSMP) is not required for the proposed development.

4.7 Salinity

Reference to mapping by *Australia Dryland Salinity Assessment* by National Land and Water Resources Audit (NLWRA) indicates the site is outside of an area mapped for dryland salinity. Reference to salinity data provided by ESPADE indicated the following for nearby samples in the vicinity of the site within aeolian sand:

- Location 1000267 - 1.5 km west – no salting evident;
- Location 1000267 – 2.5 km east – no salting evident.

Based on a review of the above information and site information to date, a salinity management plan is not required for the proposed development.

5. Investigation Results

Previous investigations have been undertaken at the site for various purposes. Previous investigations pertinent to this report are as follows:

- Preliminary Geotechnical Investigation (Douglas, 2024a);
- Infiltration Testing (Douglas, 2024b);
- Additional Geotechnical Investigation (Douglas, 2025a); and
- Detailed Site Investigation (contamination) (Douglas, 2025b).

Subsurface investigation completed to date encountered the following generalised subsurface units:

Unit 1 – Fill / Possible Fill: generally comprising sand / gravelly sand and / or silty sand with varying proportion of anthropogenic material including brick, tile and glass fragments and rootlets.

Unit 2 –Aeolian and Alluvial Sand

- Unit 2.1 – Sand and Silty Sand: generally loose or loose to medium dense. Some bands of indurated sand / cemented sand;
- Unit 2.2 – Sand and Silty Sand: generally medium dense or denser, locally very dense. Some loose or loose to medium dense bands. Some bands of indurated sand / cemented sand.

Rock was not encountered during investigations to date which included cone penetration tests (CPTs) to a maximum depth of 20 m.

Groundwater was encountered at one borehole location (Bore 203) at a depth of 8.0 m and four CPT locations during testing at depths between 13.6 m to 15.7 m during testing. Groundwater observations in current CPT investigations have been inferred from pore pressure measurements during testing.

The infiltration testing completed to date comprised double ring infiltrometer testing at four locations surface and one location at a depth of 0.5 m. The results of testing estimated steady state infiltration of 86 to 128 cm/hr at the surface and 151 cm/hr at a depth of 0.5 m. The results of infiltration testing to date indicates a high infiltration rate of subsurface soils.

It should be noted that groundwater levels are affected by factors such as climatic conditions and soil permeability and therefore vary with time.

5.1 Groundwater information

Two groundwater wells have been installed within the site, at boreholes 201 and 203 (see locations on Drawing 1, Appendix B). The construction details are provided in Table 2.

Table 2: Monitoring wells overview

Borehole ID	Surface RL (AHD)	Depth of filter zone (m bgl) [AHD]	Filter zone lithology
201	25.3	2.5 – 12.0 [22.8 – 13.3]	Sand / silty sand
203	19.7	0.8 – 10.0 [18.9 - 9.7]	Sand

Notes to table:
bgl: below ground level

5.1.1 Groundwater levels

A summary of the measured groundwater levels within the monitoring well is provided in Table 3.

Table 3: Groundwater level observations (manual measurements)

Borehole	Surface level (AHD)	TOC level (AHD)	Date	Task	Water measurements	
					Depth (m bgl)	Reduced level (m AHD)
201	25.3	26.1	29/08/2025	Prior to well development	>12.0	<13.3
			04/09/2025	Prior to sampling and datalogger installation		
			03/10/2025	Datalogger removal		
203	19.7	19.6	29/08/2025	Prior to well development	8.12	11.53
			04/09/2025	Prior to sampling	8.12	11.46
			03/10/2025	Datalogger removal	8.29	11.36

Notes to table:
bgl below ground level
TOC top of casing

Data loggers were installed into 201 and 203 on 4 September 2025 after sampling. The hydrograph produced between 4 September 2025 and 3 October 2025 for Bore 203 is included in Appendix C noting that recent months have had above average rainfall as shown by the RRMB (see Section 4.4).

Table 4: Summary of groundwater monitoring results (logger data)

Well	Screened lithology	Groundwater Level During Monitoring Period (AHD)		
		Minimum	Maximum	Average
201	Sand / silty sand	Well dry for monitoring period, groundwater RL <13		
203	Sand	11.4	11.6	11.5

Monitoring data collected to date indicates that Well 203 a very subdued responsive to rainfall events (it is noted that only three daily rainfall events >10 mm were captured during monitoring period). The data suggests that the there is a slight delay of the responsiveness of the groundwater table to rainfall, however, it should be noted that during construction, while the ground is open to rainfall and run off, there would likely be a more direct groundwater response to rainfall.

Additionally, the monitoring data suggests that the groundwater levels are not affected by tidal influences.

5.1.2 Groundwater quality

Groundwater quality testing was undertaken in the monitoring well as part of the detailed site investigation (Douglas, 2025b), sample collected 4 September 2025. Key findings are summarised below with laboratory results provided in Appendix C.

All results were below the SAC, with the exception of minor PFAS concentrations exceeding the HEPA (2025) criteria for 99% level of species protection (HEPA, 2025).

Should groundwater seepage be encountered, additional water quality testing will be required prior to disposal to stormwater to ensure compliance with the selected criteria. Treatment may be required if exceedances are identified. Analytes tested as part of the groundwater quality monitoring were below these guideline values, with the exception of:

- Perfluorooctane sulfonate (PFOS) at 0.044 to 0.049 µg/L which exceeded the guideline value of 0.00023 µg/L (HEPA 99% level of protection marine criteria (HEPA, 2025)).

6. Conceptual Hydrogeological Model

The site is underlain by fill over sand. Some indurated sands have been encountered within natural sands beneath the site, however these are not considered to be confining. Based on experience with similar sands in the Nelson Bay area sands are expected to be moderate to high permeability.

Depths to groundwater have been recorded in one monitoring well installed within the site (Bore 203). Water levels measured in the monitoring well 203 ranged from RL 11.4 to 11.6. Groundwater is expected to flow similarly to surface topology i.e. flowing under the site to the east/north east.

It is understood that the finished floor levels of the basement are RL 17 with localised deeper excavations for pile caps (where proposed) and lift pits. The basement is therefore not expected to intersect the groundwater table.

Perched water may temporarily be present within the soils, particularly on top of indurated sand layers which could result in ephemeral seepage into the basement in response to high rainfall events.

It should be noted that groundwater levels are affected by factors such as climatic conditions and soil permeability and therefore vary with time. Therefore, the water levels may temporarily rise during periods of heavy or prolonged rainfall and fall during dry periods.

7. Impact Assessment

7.1 Assessment considerations

The bulk excavation levels for the proposed basement will be to about RL 17. Groundwater on site has been observed at a maximum elevation of RL 11.6 (Bore 203). The basement excavation is not expected to intersect the water table under normal conditions.

Therefore, the development is not expected to affect the groundwater regime (levels and flows). Groundwater impacts are considered unlikely. If the excavation coincides with periods of rainfall, then it is possible that some temporary seepage occur, which is associated with ephemeral perched water on top of indurated sand layers.

Excavation, construction and operations of the basement are not considered aquifer interference activities under the Aquifer Interference Policy's (AIP) definition (DPI, 2012). A simple risk-based assessment of groundwater impacts was therefore undertaken for the development.

7.2 Risk assessment

An assessment of the potential effects of intercepting groundwater on neighbouring properties and groundwater receptors has been summarised in Table 6.

Table 6: Assessment of potential effects of groundwater interception

Item	Comment	Risk
Impacts on nearby GDEs	No interception of groundwater. Therefore, no impacts expected to nearby GDEs.	Low
Water supply losses by neighbouring groundwater users	Several water bores are located within 500 m of the site which are installed for monitoring purposes. No drawdown impacts are expected to result from the development as interception of groundwater is not expected. Therefore, surrounding bores will not be impacted.	Low
Potential subsidence of neighbouring structures	No interception of groundwater therefore drawdown is not expected. Therefore, risk of subsidence on surrounding properties due to lowering of the water table is unlikely.	Low
Mounding of water upgradient of structure	No mounding is predicted as it is considered reasonable for a drained basement to be adopted given groundwater interception is not expected.	Low

8. Proposed Mitigation Measures

8.1 Monitoring program

The monitoring program will include groundwater level measurement in a monitoring well and water quality monitoring of any water seeping into the excavation (if any).

The objectives of the monitoring are to assess in a timely manner:

- Changes in groundwater levels that exceed the AIP minimal impact considerations; and
- Groundwater inflows exceeding those estimated as part of this assessment.

8.2 Mitigation measures

Although unlikely, should any groundwater inflow be observed during excavation, volumes will be recorded. Should inflow rates be significant, construction will be halted and further assessment by Douglas will be undertaken to advise on a management strategy.

In the unlikely event of groundwater inflows in the excavation during construction, water quality testing of the water contained in the excavation will be undertaken to ensure its suitability for disposal. Should exceedances of the selected disposal criteria be found, treatment will be required prior to disposal.

9. Conclusions

The investigations completed to date identified the site is underlain by sand which is considered to be high permeability and high infiltration. Groundwater levels within the site have been observed to be below the proposed excavation levels and detention tank.

As the water table will not be intercepted, no groundwater impacts are expected as a result of the development. Minor and ephemeral seepage could occur into the excavation during construction in response to high rainfall events. Should seepage in the excavation occur, treatment may be required prior to disposal.

Due to the possibility of localised seepage flows under typical rainfall events and the possibility of elevated groundwater levels under rare extreme conditions, it is recommended that some form of under drainage be provided in the long term structure to manage possible temporary hydraulic pressures on the structure and uncontrolled seepage through structural joints. The testing completed to date indicated the subsurface conditions are high permeability and the depth to groundwater table is typically approximately 5 m below the base of the proposed infiltration system. Based on the information collected to date the subsurface conditions encountered are suitable for soil infiltration. Some soil pore clogging and reduction of permeability can be expected to occur over time and may require ongoing maintenance, alternatively contingency can be allowed for this in the sizing of the infiltration area.

It should be noted that the infiltration area will potentially lead to a localised saturated mound of groundwater during rainfall events. This may lead to local hydraulic pressures on the wall and/or floor of the basement or water entering the basement drainage system. Consideration should be given to the location of this relative to the basement to reduce the likelihood of this water interacting with the basement walls and floor. The risk of interaction would be reduced with an infiltration system located at or below the basement floor and a setback distance from the basement walls would be beneficial.

10. References

ANZG. (2018). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Canberra, ACT: Australian and New Zealand Governments and Australian state and territory governments.

Douglas. (2024a). *Report on Preliminary Geotechnical Investigation, Proposed residential development, 5-7 Church & 42 Donald Street, Nelson Bay NSW*. Douglas Partners Pty Ltd: Document No. 227295.00.R.002.Rev0.

Douglas. (2024b). *Report on Infiltration Testing, Proposed Residential Development, 5-7 Church & 42 Donald Street, Nelson Bay NSW*. Document No. 227295.00.R.003.Rev0: Douglas Partners Pty Ltd.

Douglas. (2025a). *Report on Additional Geotechnical Investigation, Proposed Residential Development, 5-7 Church Street & 42 Donald Street, Nelson Bay*. Document No. 227295.02.R.001.Rev0: Douglas Partners Pty Ltd.

Douglas. (2025b). *Report on Detailed Site Investigation (contamination), Proposed Residential Development, 5-7 Church Street & 42 Donald Street, Nelson Bay*. 227295.01.R.002.Rev0: Douglas Partners Pty Ltd.

DPE. (2022). *Minimum requirements for building site groundwater investigations and reporting*. NSW Department of Planning and Environment.

DPI. (2012). *NSW Aquifer Interference Policy.* Document No. 11445: Department of Primary Industries - Office of Water.

HEPA. (2025). *PFAS National Environmental Management Plan (NEMP).* Version 3.0: Heads of EPAs Australia and New Zealand.

11. Limitations

Douglas Partners Pty Ltd (Douglas) has prepared this report for this project at 5-7 Church & 42 Donald Street, Nelson Bay NSW in line with Douglas' proposal 227295.01.P.001.Rev0 dated 30 July 2025 and acceptance received from Roberto Giammaria of Fortezza Group Pty Ltd dated 31 July 2025. The work was carried out under Douglas' Engagement Terms. This report is provided for the exclusive use of Fortezza Group Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of Douglas, does so entirely at its own risk and without recourse to Douglas for any loss or damage. In preparing this report Douglas has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after Douglas' field testing has been completed.

Douglas' advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by Douglas in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

The assessment of atypical safety hazards arising from this advice is restricted to the geotechnical / groundwater components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

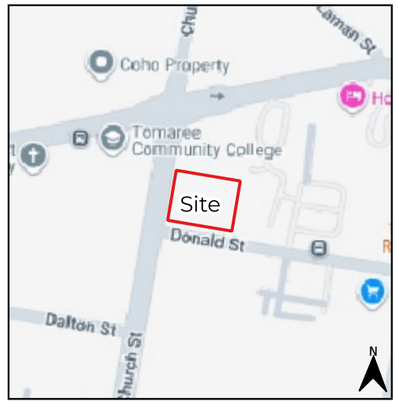
This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. Douglas cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by Douglas. This is because this report has been written as advice and opinion rather than instructions for construction.

Appendix A

Drawing 1 – Test Location Plan (Douglas, 2025b)

Proposed Development Drawings (Hayes Anderson Lynch Drawings TP201, TP202, TP501 and TP502)



Site Location

Legend

- Test Pit Location (current)
- Borehole Location (current)
- Confirmed Asbestos (current & previous testing)
- Borehole Location (previous)
- CPT Location (previous)
- Material Fragment Locations (previous)
- Approximate Site Boundary
- Lot Boundary
- Former Building Footprints
- W Groundwater Monitoring Well

0 10 20 30 m

NOTE:
1. Drawing adapted from aerial imagery from Metromap dated 30 May 2024.
2. Test locations are approximate only and were located using differential GPS typically accurate to ± 0.1 m depending on satellite coverage.

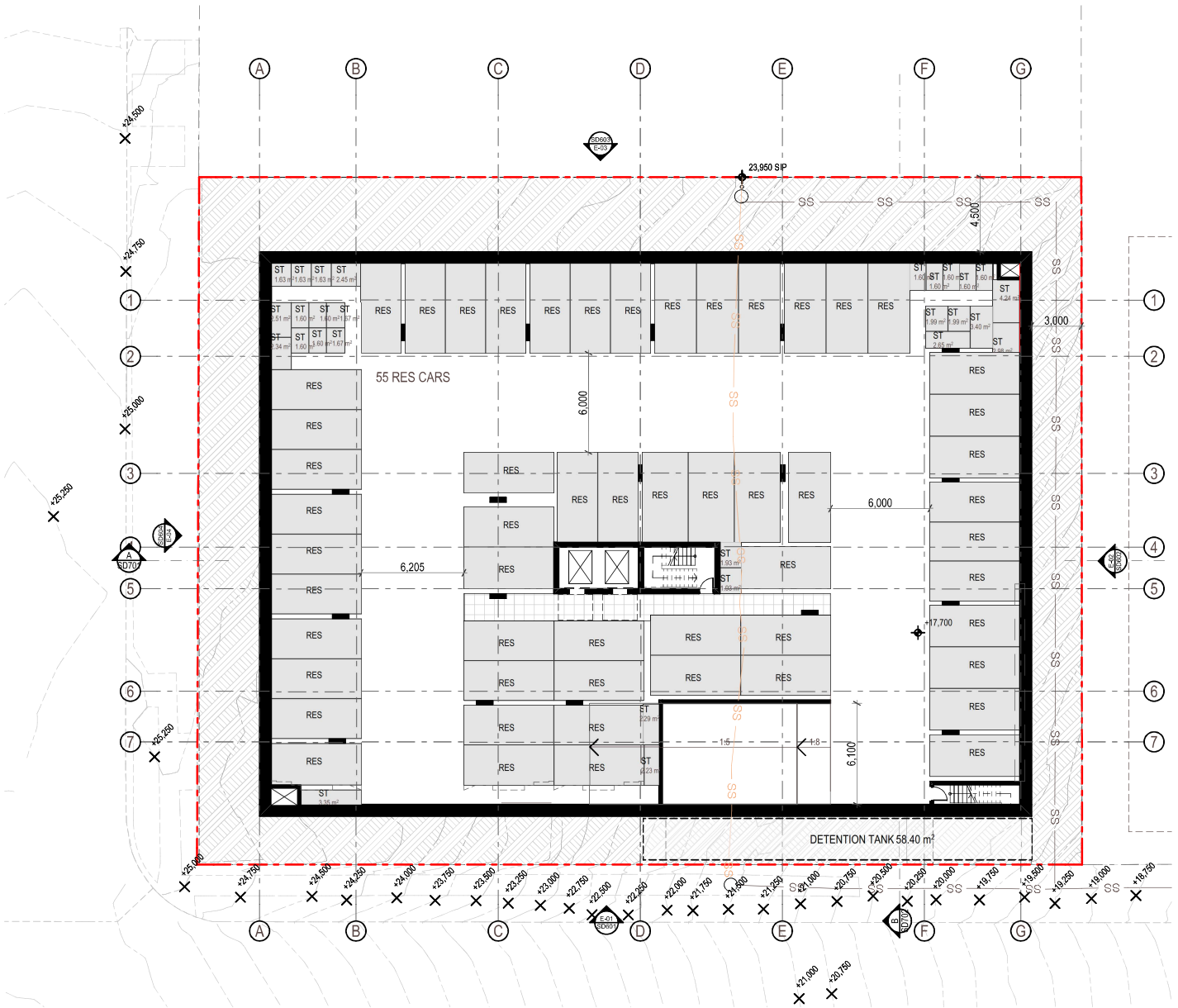
Douglas PARTNERS

CLIENT: Fortezza Group Pty Ltd		
OFFICE: Newcastle	DRAWN BY: PLH	
SCALE: 1:400 @A3	DATE: 10.October.2025	

TITLE: **Test Location Plan**
Proposed Residential Development
5-7 Church & 42 Donald Street, Nelson Bay NSW

N

Project:	227295.01
DRAWING No:	1
REVISION:	0



Basement 02
1:250

TOWN PLANNING

fortezza GROUP

THE BELVEDERE
Developed by Fortezza Group

fortezzagroup.com.au
07 3236 4188
admin@fortezzagroup.com.au

General Notes

This drawing is Copyright © Any design or drawing is not to be reproduced, either in whole or part, without written permission by Hayes Anderson Lynch Architects Pty. Ltd.
Confirm all dimensions on site.
Do not scale off drawings.
All levels are approximate only and are subject to confirmation by licenced surveyor.
All workmanship, materials and construction to comply with the Queensland Building Act 1975, the Queensland Development Code, the Building Code of Australia ####, Premises Standard and AS1428.1.
Work to be carried out in a neat and appropriate manner.
Where ambiguities or discrepancies exist, Hayes Anderson Lynch Architects Pty. Ltd. shall be contacted for clarification.

Date	Issue	Details	Checked
17/06/25	A	Issue for Lodgement	RH
06/06/25	P2	Preliminary	RH
16/05/25	P1	Preliminary	RH

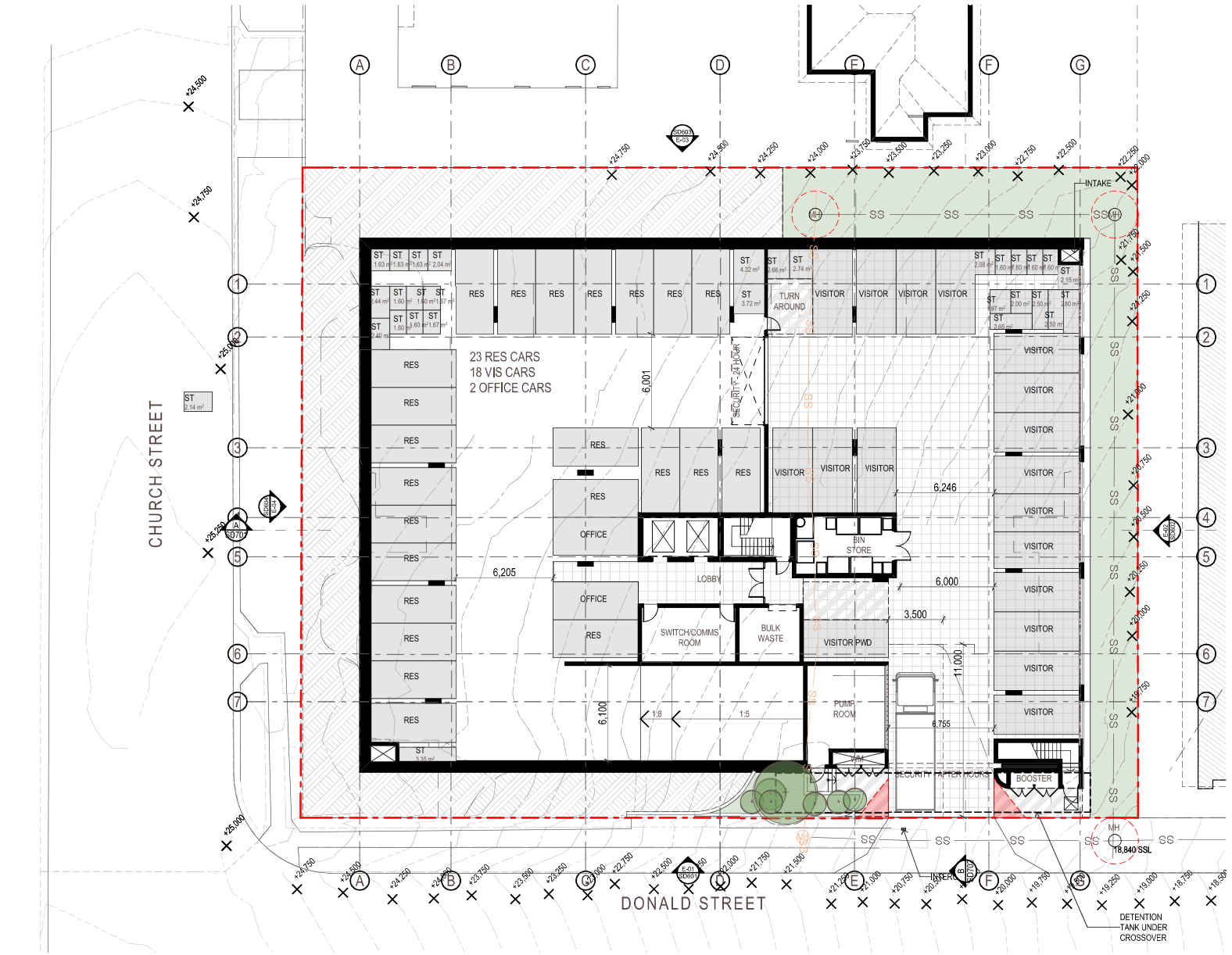
HAYES ANDERSON LYNCH ARCHITECTS PTY LTD
ARCHITECTS
TOWN PLANNERS
INTERIOR DESIGNERS
3 / 709 MAIN STREET
KANGAROO POINT QLD 4169
P +61 7 3852 3190
E reception@halarchitects.com.au
W www.halarchitects.com.au
Member Australian Institute of Architects

Project
The Belvedere
5-7 Church st, 42 Donald st ,
NSW 2315

Drawing Title
GA Plan - Basement 02

Scale @ A3	Drawn:	Checked:
1:250	RH	EA

Project Number	Drawing Number	Issue
H4700DON	TP201	A



Basement 01
1:250

TOWN PLANNING

fortezza GROUP

THE BELVEDERE
Developed by Fortezza Group

fortezzagroup.com.au
07 3236 4188
admin@fortezzagroup.com.au

General Notes

This drawing is Copyright © Any design or drawing is not to be reproduced, either in whole or part, without written permission by Hayes Anderson Lynch Architects Pty. Ltd.
Confirm all dimensions on site.
Do not scale off drawings.
All levels are approximate only and are subject to confirmation by licenced surveyor.
All workmanship, materials and construction to comply with the Queensland Building Act 1975, the Queensland Development Code, the Building Code of Australia ####, Premises Standard and AS1428.1.
Work to be carried out in a neat and appropriate manner.
Where ambiguities or discrepancies exist, Hayes Anderson Lynch Architects Pty. Ltd. shall be contacted for clarification.

Date	Issue	Details	Checked
17/06/25	A	Issue for Lodgement	RH
06/06/25	P2	Preliminary	RH
16/05/25	P1	Preliminary	RH

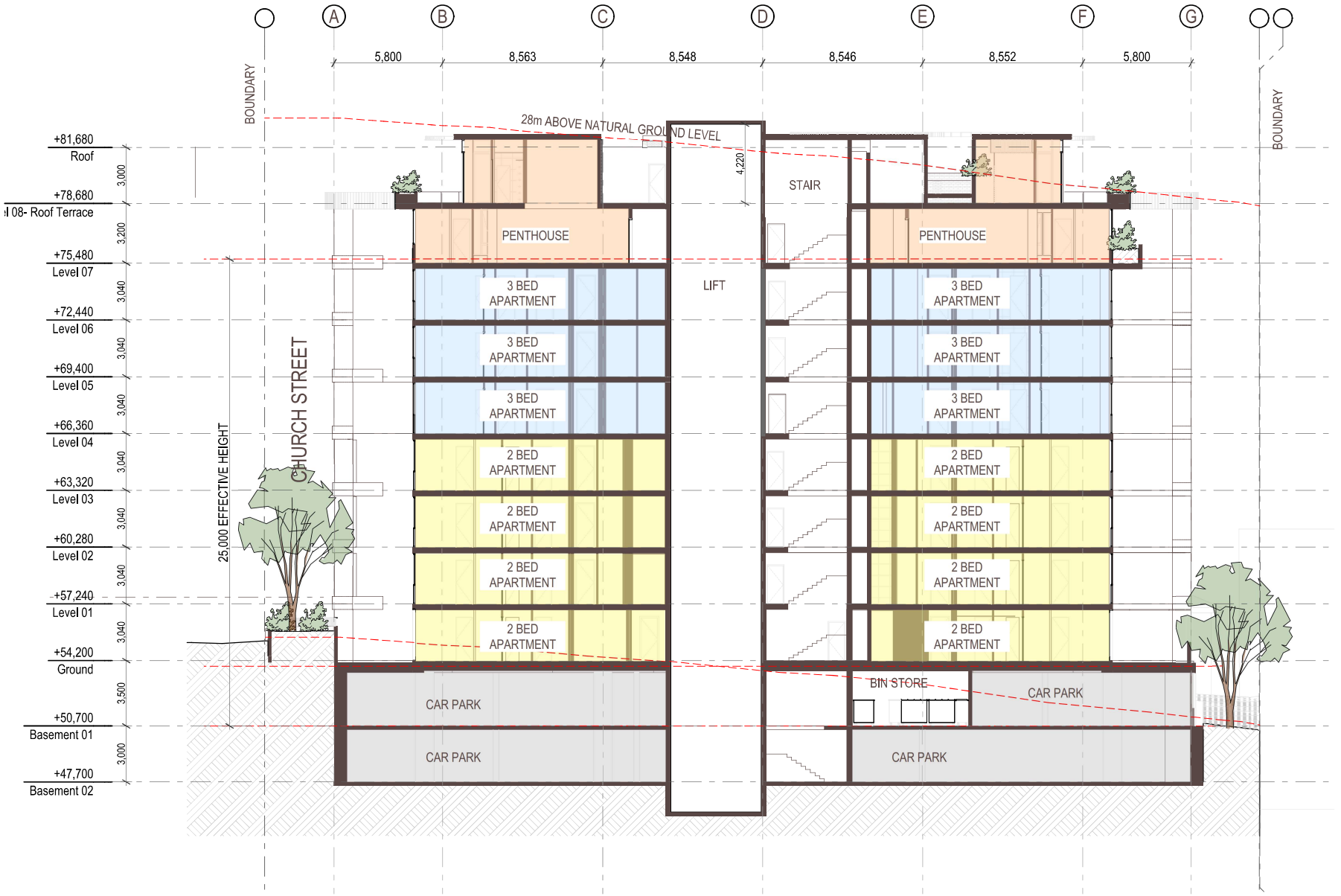
HAYES ANDERSON LYNCH ARCHITECTS PTY LTD
ARCHITECTS
TOWN PLANNERS
INTERIOR DESIGNERS
3 / 709 MAIN STREET
KANGAROO POINT QLD 4169
P +61 7 3852 3190
E reception@halarchitects.com.au
W www.halarchitects.com.au
Member Australian Institute of Architects

Project
The Belvedere
5-7 Church st, 42 Donald st ,
NSW 2315

Drawing Title
GA Plan - Basement 01

Scale @ A3	Drawn:	Checked:
1:250	RH	EA

Project Number	Drawing Number	Issue
H4700DON	TP202	A



A **Section A**
1:200

TOWN PLANNING

fortezza GROUP

THE BELVEDERE
Developed by Fortezza Group

fortezzagroup.com.au
07 3236 4188
admin@fortezzagroup.com.au

General Notes

Confirm all dimensions on site.
Do not scale off drawings.
All levels are approximate only and are subject to confirmation by licenced surveyor.
All workmanship, materials and construction to comply with the Queensland Building Act 1975, the Queensland Development Code, the Building Code of Australia ####, Premises Standard and AS1428.1.
Work to be carried out in a neat and appropriate manner.
Where ambiguities or discrepancies exist, Hayes Anderson Lynch Architects Pty. Ltd. shall be contacted for clarification.

Date	Issue	Details	Checked
17/06/25	A	Issue for Lodgement	RH
06/06/25	P2	Preliminary	RH
16/05/25	P1	Preliminary	RH

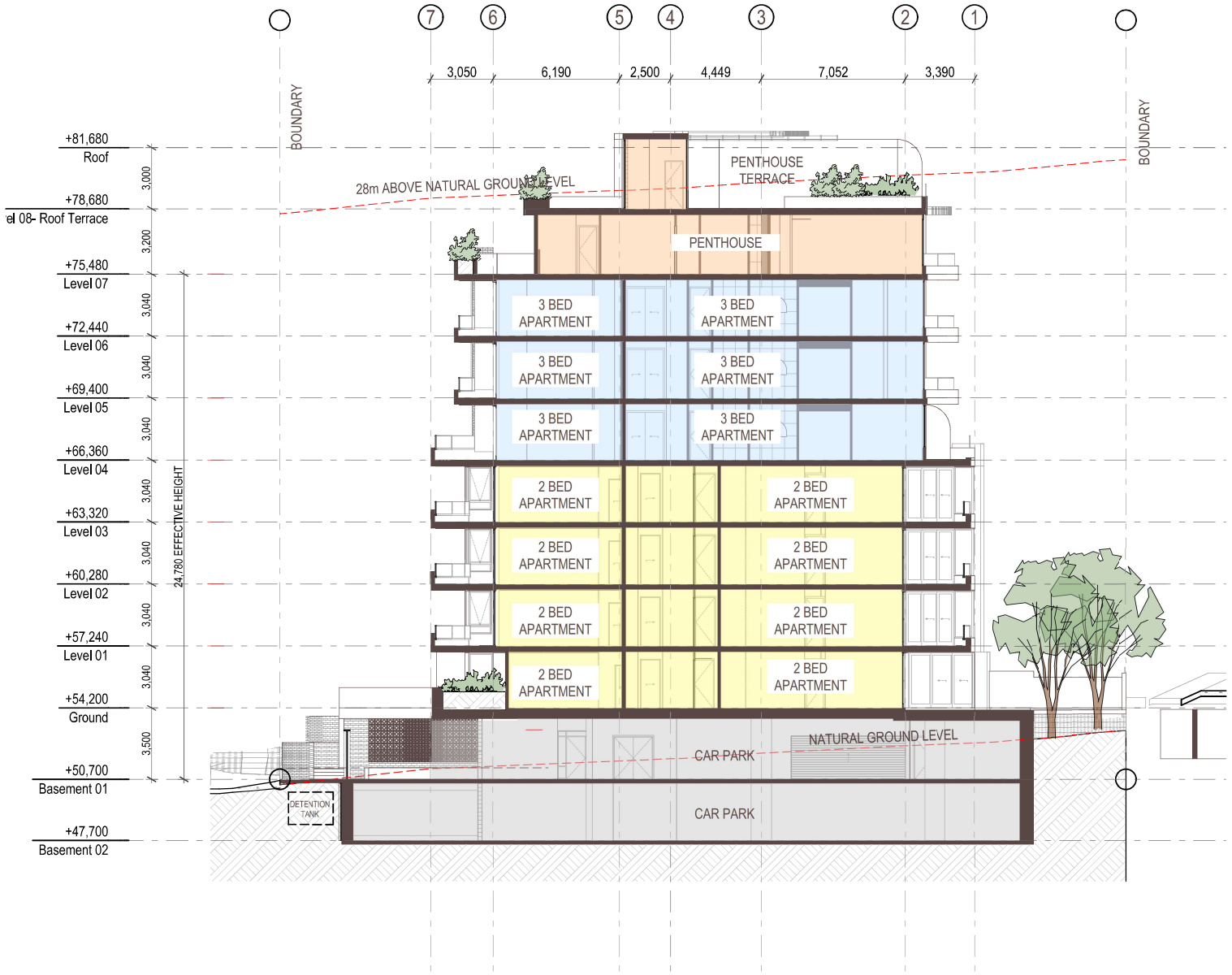
HAYES ANDERSON LYNCH
ARCHITECTS PTY LTD
ARCHITECTS
TOWN PLANNERS
INTERIOR DESIGNERS
3 / 709 MAIN STREET
KANGAROO POINT QLD 4169
P +61 7 3852 3190
E reception@halarchitects.com.au
W www.halarchitects.com.au
Member Australian Institute of Architects

Project
The Belvedere
5-7 Church st, 42 Donald st ,
NSW 2315

Drawing Title
Section A

Scale @ A3	Drawn:	Checked:
1:200	RH	EA

Project Number	Drawing Number	Issue
H4700DON	TP501	A



B

Section B
1:200

TOWN PLANNING

fortezza GROUP

THE BELVEDERE
Developed by Fortezza Group

fortezzagroup.com.au
07 3236 4188
admin@fortezzagroup.com.au

General Notes

Confirm all dimensions on site.
Do not scale off drawings.
All levels are approximate only and are subject to confirmation by licenced surveyor.
All workmanship, materials and construction to comply with the Queensland Building Act 1975, the Queensland Development Code, the Building Code of Australia ####, Premises Standard and AS1428.1.
Work to be carried out in a neat and appropriate manner.
Where ambiguities or discrepancies exist, Hayes Anderson Lynch Architects Pty. Ltd. shall be contacted for clarification.

Date	Issue	Details	Checked
17/06/25	A	Issue for Lodgement	RH
06/06/25	P2	Preliminary	RH
16/05/25	P1	Preliminary	RH

HAYES ANDERSON LYNCH
ARCHITECTS PTY LTD
ARCHITECTS
TOWN PLANNERS
INTERIOR DESIGNERS
3 / 709 MAIN STREET
KANGAROO POINT QLD 4169
P +61 7 3852 3190
E reception@halarchitects.com.au
W www.halarchitects.com.au
Member Australian Institute of Architects

Project
The Belvedere
5-7 Church st, 42 Donald st ,
NSW 2315

Drawing Title
Section B

Scale @ A3	Drawn:	Checked:
1:200	RH	EA

Project Number	Drawing Number	Issue
H4700DON	TP502	A

Appendix B

About this Report

About this Report

October 2024

Introduction

These notes have been provided to amplify Douglas' report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

Douglas' reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, Douglas will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, Douglas cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, Douglas will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, Douglas requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. Douglas would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

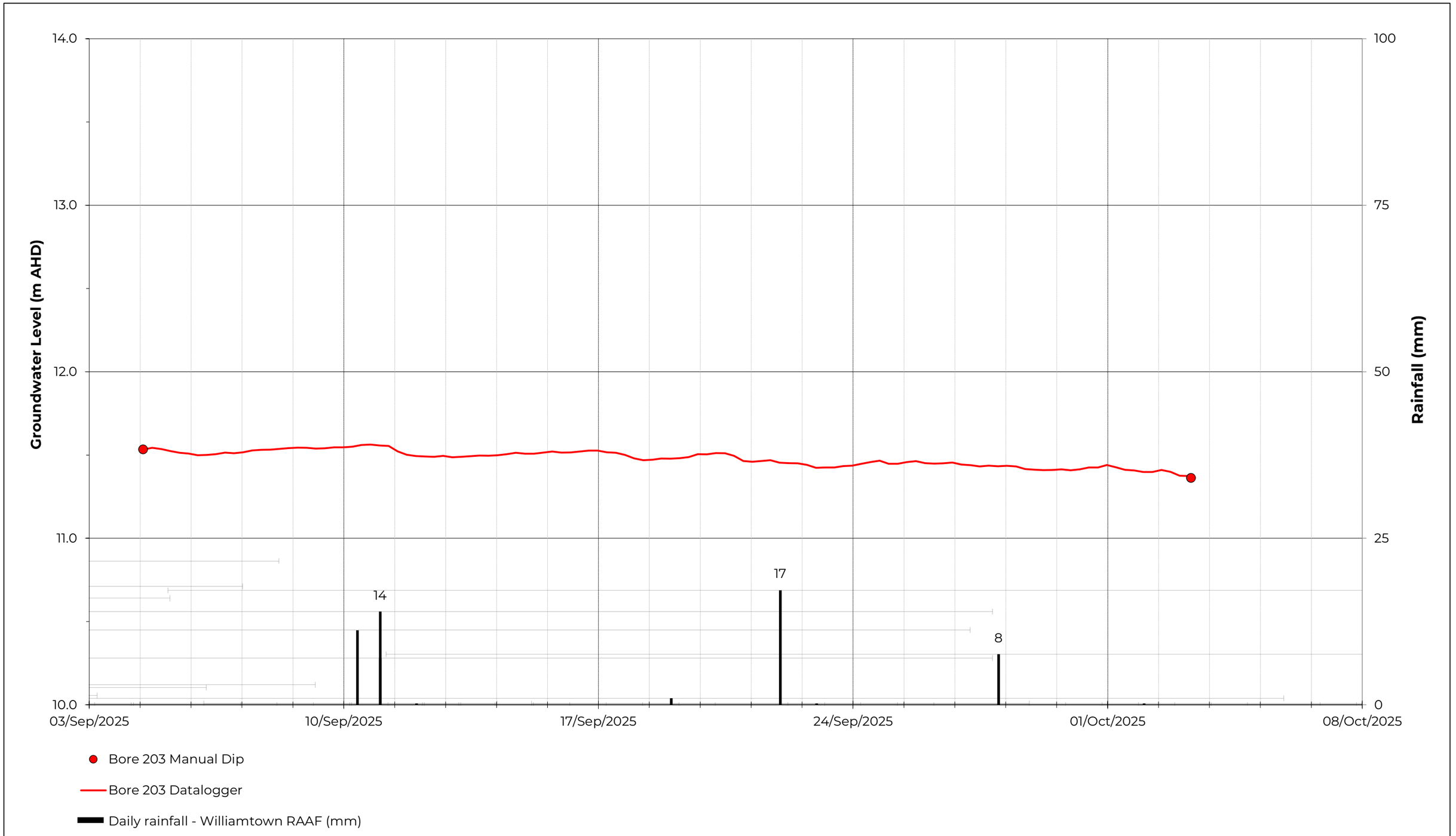
The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

intentionally blank

Appendix C

Groundwater Level vs Rainfall

Table G4 – Summary of Results of Groundwater Sampling (Douglas, 2025b)



Douglas PARTNERS GROUNDED EXPERTISE	CLIENT: Fortezza Group Pty Ltd	**Groundwater Level vs Rainfall** **Proposed Mutlistorey Residential Development** **5-7 Church & 42 Donald St, Nelson Bay, NSW**	PROJECT NO: 227295.01
	OFFICE: Newcastle / DRAWN BY: JCL		FIGURE NO: 1
	SCALE: N/A / DATE: 3 October 2025		REVISION: 0

Table G4: Summary of Laboratory Results – Groundwater

				NEPC (2013) HSL 2-<4m	ANZG (2018) 95% LOP	HEPA (2018) 99% LOP	HEPA (2018) 95% LOP	NHMRC (2012) Recreation		
Sample ID									203	D1/SBK
Sample Date		PQL	Units						04/09/25	04/09/25
Metals - Dissolved	Total Arsenic	1	µg/L					100	<1	<1
	Beryllium	0.5	µg/L					600	<0.5	<0.5
	Boron	20	µg/L		940*			40,000	<20	<20
	Cadmium	0.1	µg/L		5.5			20	<0.1	<0.1
	Total Chromium	1	µg/L		4.4				<1	<1
	Cobalt	1	µg/L		1				<1	<1
	Copper	1	µg/L		1.3			20,000	<1	<1
	Lead	1	µg/L		4.4			50	<1	<1
	Manganese	5	µg/L		80			5,000	**7**	**6**
	Mercury (inorganic)	0.05	µg/L		0.1			10	<0.05	<0.05
	Nickel	1	µg/L		70			200	<1	<1
	Selenium (Total)	1	µg/L			5*		100	<1	<1
	Zinc	1	µg/L		8				**2**	**2**
TRH	F1 ((C6-C10)-BTEX)	10	µg/L	1000					<10	<10
	F2 (>C10-C16 less Naphthalene)	50	µg/L	1000					<50	<50
	F3 (>C16-C34)	100	µg/L						**100**	**120**
	F4 (>C34-C40)	100	µg/L						<100	<100
BTEX	Benzene	1	µg/L	800	700			10	<10	<10
	Toluene	1	µg/L	NL	180			8,000	<10	<10
	Ethylbenzene	1	µg/L	NL	80			3,000	<10	<10
	o-Xylene	1	µg/L		350*				<10	<10
	m+p-Xylene	2	µg/L		75				<20	<20
	Total Xylenes	1	µg/L	NL				6,000	<10	<10
PAH	Acenaphthene	0.1	µg/L						<0.1	<0.1
	Acenaphthylene	0.1	µg/L						<0.1	<0.1
	Anthracene	0.1	µg/L		0.01				<0.1	<0.1
	Benzo(a)anthracene	0.1	µg/L						<0.1	<0.1
	Naphthalene	1	µg/L	NL	70				<10	<10
	Benzo(a)pyrene (B(a)P)	0.1	µg/L		0.1			0.1	<0.1	<0.1
	Benzo(b,j+k)fluoranthene	0.2	µg/L						<0.2	<0.2
	Benzo(g,h,i)perylene	0.1	µg/L						<0.1	<0.1
	Chrysene	0.1	µg/L						<0.1	<0.1
	Dibenzo(a,h)anthracene	0.1	µg/L						<0.1	<0.1
	Fluoranthene	0.1	µg/L		1				<0.1	<0.1
	Fluorene	0.1	µg/L						<0.1	<0.1
	Indeno(1,2,3-c,d)pyrene	0.1	µg/L						<0.1	<0.1
	Phenanthrene	0.1	µg/L		0.6				<0.1	<0.1
	Pyrene	0.1	µg/L						<0.1	<0.1
	Sum of detected PAH	0.1	µg/L						<0.1	<0.1
VOC (excluding BTEX)	1,1,1,2-tetrachloroethane	1	µg/L						<10	<10
	1,1,1-trichloroethane	1	µg/L		270				<10	<10
	1,1,2,2-tetrachloroethane	1	µg/L		400				<10	<10
	tetrachloroethene	1	µg/L		70			500	<10	<10
	1,1,2-trichloroethane	1	µg/L		1,900				<10	<10
	1,1,2-trichloroethylene	1	µg/L		330				<10	<10
	1,1-dichloroethane	1	µg/L						<10	<10
	1,1-Dichloroethene	1	µg/L		700			300	<10	<10
	1,1-dichloropropene	1	µg/L						<10	<10
	1,2,3-trichlorobenzene	1	µg/L						<10	<10
	1,2,3-trichloropropane	1	µg/L						<10	<10
	1,2,4-trichlorobenzene	1	µg/L		20				<10	<10
	1,2,4-trimethyl benzene	1	µg/L						<10	<10
	1,2-dibromo-3-chloropropane	1	µg/L						<10	<10
	1,2-dichlorobenzene	1	µg/L					15,000	<10	<10
	1,2-dichloroethane	1	µg/L		1,900			30	<10	<10
	1,2-dichloropropane	1	µg/L		900				<10	<10
	1,3,5-trimethyl benzene	1	µg/L						<10	<10
	1,3-dichlorobenzene	1	µg/L						<10	<10
	1,3-dichloropropane	1	µg/L		1,100				<10	<10
	1,4-dichlorobenzene	1	µg/L					400	<10	<10
	2,2-dichloropropane	1	µg/L						<10	<10
	2-chlorotoluene	1	µg/L						<10	<10
	4-chlorotoluene	1	µg/L						<10	<10
	4-isopropyl toluene	1	µg/L						<10	<10
	Bromobenzene	1	µg/L						<10	<10

Table G4: Summary of Laboratory Results – Groundwater

				NEPC (2013) HSL 2-<4m	ANZG (2018) 95% LOP	HEPA (2018) 99% LOP	HEPA (2018) 95% LOP	NHMRC (2012) Recreation		
Sample ID									203	D1/SBK
Sample Date		PQL	Units						04/09/25	04/09/25
VOC (excluding BTEX)	Bromochloromethane	1	µg/L						<10	<10
	Bromodichloromethane	1	µg/L						<10	<10
	Bromoform	1	µg/L						<10	<10
	carbon tetrachloride	1	µg/L		240			30	<10	<10
	Chloroethane	10	µg/L						<100	<100
	Vinyl Chloride	10	µg/L		100			3	<100	<100
	Chloroform	1	µg/L		770				<10	<10
	Chloromethane	10	µg/L						<100	<100
	cis-1,2-dichloroethene	1	µg/L						<10	<10
	cis-1,3-dichloropropene	1	µg/L						<10	<10
	Isopropylbenzene (cumene)	1	µg/L		30				<10	<10
	Cyclohexane	1	µg/L						<10	<10
	dibromochloromethane	1	µg/L						<10	<10
	Dibromomethane	1	µg/L						<10	<10
	Dichlorodifluoromethane	10	µg/L						<100	<100
	1,2-dibromoethane	1	µg/L					10	<10	<10
	hexachlorobutadiene	1	µg/L					7	<10	<10
	Bromomethane	10	µg/L					10	<100	<100
	Monochlorobenzene	1	µg/L		55			3,000	<10	<10
	n-butyl benzene	1	µg/L						<10	<10
	n-propyl benzene	1	µg/L						<10	<10
	sec-butyl benzene	1	µg/L						<10	<10
	Styrene (vinylbenzene)	1	µg/L					300	<10	<10
	Tert-butyl benzene	1	µg/L						<10	<10
	trans-1,2-dichloroethene	1	µg/L						<10	<10
	trans-1,3-dichloropropene	1	µg/L						<10	<10
	Trichlorofluoromethane	10	µg/L						<100	<100
	Sum of detected VOC	1	µg/L						<10	<10
PFAS	PFOS	0.001	µg/L			0.00023	0.13		**0.049**	**0.044**
	PFOA	0.001	µg/L			19	220	10	**0.009**	**0.009**
	PFHxS	0.001	µg/L						<0.001	<0.001
	Perfluorobutanesulfonic acid (PFBS)	0.001	µg/L						**0.001**	**0.001**
	6:2 FTS	0.001	µg/L						<0.001	<0.001
	8:2 FTS	0.002	µg/L						<0.002	<0.002
	Sum of detected PFAS	0.001	µg/L						**0.059**	**0.054**

Notes:

-	No criterion / not defined / not tested / not applicable
*	QA/QC replicate of sample listed directly below the primary sample
NL	Not limiting
PQL	Practical quantitation limit

Shaded cell is exceedance of guideline value

Where one or more guideline value is exceeded, the cell is shaded to the colour of the highest guideline value exceeded

NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013), health screening level Sand 4-8m

ANZG (2018) Australian and New Zealand Guidelines for Fresh and Marine Water Quality, 95% level of protection of species for Marine aquatic ecosystems [NB: 99% level of protection adopted for bioaccumulative chemicals]

HEPA (2025) PFAS National Environmental Management Plan, Version 3.0 99% level of protection for Marine water aquatic ecosystems

NHMRC (2008) Guidelines for Managing Risk in Recreational Water

ANZG (2018) Australian and New Zealand Guidelines for Fresh and Marine Water Quality, orange text is 'unknown' level of protection

Underlining of ANZG (2018) criteria indicates a criteria with an 'unknown' level of protection.

ANZG (2018) DGV adopted for most conservative species of following analytes: DGV for xylene (m) adopted for xylene (m+p); DGV for CrVI adopted for total chromium; DGV for AsV adopted for total arsenic

ANZG (2018) DGV adopted for aluminium in freshwater is for receiving waters with pH >6.5. For receiving waters with pH <6.5 suitability of the more conservative, low reliability DGV of unknown LOP should be considered

ANZG (2018) Ammonia DGV is pH and temperature dependant. DGV for a pH of 8 provided in table.

*Adopted from freshwater criteria for in absence of marine criteria

The assumed depth of groundwater from the finished floor level of the proposed basement is anticipated to be greater than 2 m and as such the groundwater HSL for vapour intrusion adopts the 2 m to <4 m criteria as an initial screen.