

GEOTECHNICAL INVESTIGATION REPORT

Proposed Dual Occupancy Development

Project Address:
16 Carinya Road
Picnic Point NSW 2213

Prepared By:
Stratatek Geotechnical Solutions Pty Ltd

Report Prepared By:

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Project: Proposed Demolition of Existing Dwelling and Construction of an Attached Dual Occupancy with Associated Retaining Walls, Earthworks and Site Works

Purpose of Report:

This Geotechnical Investigation Report has been prepared to assess the subsurface conditions of the site and provide recommendations relating to site classification, footing design, excavation, retaining structures, earthworks and foundation construction for the proposed development.

Investigation Date:

24 June 2026

Report Date:

24 June 2026

Prepared By

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This report has been prepared for the exclusive use of the client for the above project and shall not be relied upon by any other party without the written consent of Stratatek Geotechnical Solutions Pty Ltd.

1. Introduction

This report presents the findings of a geotechnical investigation undertaken for the proposed dual occupancy development at **16 Carinya Road, Picnic Point NSW**.

The investigation was commissioned to assess the subsurface conditions of the site and provide geotechnical recommendations for foundation design, earthworks, retaining structures and excavation works associated with the proposed development.

The investigation has been undertaken generally in accordance with the requirements of **AS 1726–2017 Geotechnical Site Investigations, AS 2870–2011 Residential Slabs and Footings**, together with other relevant Australian Standards.

The objectives of the investigation were to:

- *Undertake a detailed site inspection by a senior geotechnical engineer.*
- *Drill three (3) boreholes to a maximum depth of approximately **5.4 metres** below existing ground level.*
- *Assess the subsurface profile including fill, natural soils, weathered rock and groundwater conditions.*
- *Determine an appropriate site classification in accordance with **AS 2870–2011**.*
- *Provide recommendations for footing systems and allowable bearing capacities.*
- *Provide preliminary recommendations for excavation, retaining structures and earthworks.*
- *Provide construction recommendations for the proposed development.*

2. Referenced Standards

This report has been prepared with reference to the following standards and guidelines:

- *AS 1726–2017 – Geotechnical Site Investigations*
- *AS 2159–2009 – Piling – Design and Installation*
- *AS 2870–2011 – Residential Slabs and Footings*
- *AS 3798–2007 – Guidelines on Earthworks for Commercial and Residential Developments*
- *AS 4678–2002 – Earth Retaining Structures*

3. Site Description

The subject site is located at **16 Carinya Road, Picnic Point NSW** and comprises an existing residential allotment situated on the southern side of Carinya Road.

The site is generally rectangular in configuration and exhibits a moderate to steep natural fall from the north-east towards the south-west. The central portion of the allotment contains the steepest gradient before transitioning to a more moderate slope towards the lower section of the property.

At the time of the investigation, the site contained an existing residential dwelling together with associated hardstand areas, landscaping and domestic vegetation.

The proposed development comprises the demolition of the existing improvements and construction of a dual occupancy development incorporating associated retaining walls, excavation works, drainage infrastructure and landscaping.



4. Regional Geology

Reference to the NSW Geological Survey Seamless Geology Mapping indicates that the site is underlain by the **Hawkesbury Sandstone Formation**, comprising medium to coarse grained quartz sandstone with minor shale and laminite lenses of Middle Triassic age.

The subsurface profile encountered during the investigation is considered to be generally consistent with the published geological mapping for the locality.

5. Field Investigation

5.1 Field Investigation

The field investigation was undertaken on **24 June 2026**.

The investigation comprised the drilling of **three (3) boreholes** across the proposed building footprint to a maximum depth of approximately **5.4 metres** below existing surface level. Boreholes were logged in accordance with **AS 1726–2017 Geotechnical Site Investigations**, with representative soil samples collected for classification and engineering assessment.

Groundwater observations were recorded during drilling.

6. Results of the Investigation

6.1 Subsurface Conditions

Relatively consistent subsurface conditions were encountered across the investigation area.

The generalized soil profile is summarised below.

Origin	Material	Approximate Depth
Topsoil / Fill	Sandy gravelly clay, medium plasticity, stiff to very stiff	0.3–0.6 m
Natural Residual Soil	Silty clay, medium plasticity, grey to reddish brown, trace fine gravel, very stiff	Approximately 3.5–4.5 m
Extremely Weathered Rock	Gravelly clay with sandstone fragments	Variable
Hawkesbury Sandstone	Low strength sandstone becoming stronger with depth	Borehole termination

The transition between residual clay and weathered sandstone varied across the site and is consistent with expected weathering of the Hawkesbury Sandstone Formation.

6.2 Groundwater

Groundwater was not encountered during drilling to the maximum investigation depth.

It should be recognised that groundwater levels may fluctuate seasonally and in response to prolonged rainfall events. Localised seepage may therefore occur during excavation works and should be appropriately managed during construction.

7. Site Classification

In accordance with **AS 2870–2011 Residential Slabs and Footings**, the site has been classified as:

Class P – Problem Site

The Class P classification is considered appropriate due to the presence of fill, sloping site conditions, proposed excavation works, retaining structures and potential abnormal moisture conditions associated with existing site features and surface drainage.

The classification has been established based upon:

- the subsurface profile encountered during drilling;
- conditions existing at the time of the investigation;
- engineering judgement;
- local geological conditions; and
- the requirements of AS 2870–2011.

Should site conditions encountered during construction differ significantly from those described within this report, the classification should be reviewed by the project geotechnical engineer.

8. Foundation Recommendations

The proposed development may be supported using conventional stiffened raft slabs, strip footings or bored pier foundations designed by the project structural engineer.

All structural footings shall:

- bypass any uncontrolled fill;
- be founded within competent natural residual clay or weathered sandstone;
- achieve a minimum embedment of **300 mm** into competent founding material; and
- remain clean, dry and undisturbed immediately prior to placement of concrete.

Recommended allowable bearing capacities are summarised below.

Founding Material	Minimum Embedment	Allowable Bearing Pressure
Very Stiff Residual Clay	300 mm	150 kPa
Extremely Weathered Sandstone	300 mm	450 kPa
Bored Piers Socketed into Sandstone	600 mm	800 kPa

No bearing capacity or shaft adhesion shall be adopted within uncontrolled fill.

The founding material and allowable bearing capacity shall be verified during construction by the project geotechnical engineer or a suitably qualified representative prior to the placement of concrete.

9. Earthworks

Earthworks shall be undertaken generally in accordance with **AS 3798–2007**.

Temporary unsupported excavations should generally not exceed the following slopes:

- Fill: **2 Horizontal : 1 Vertical**
- Clay: **1 Horizontal : 1 Vertical**

Structural fill shall be placed in maximum **250 mm** compacted layers and compacted to a minimum of **98% Standard Maximum Dry Density**.

Where retaining walls exceed **600 mm** in retained height they shall be designed by a suitably qualified structural engineer in accordance with **AS 4678–2002**.

10. Retaining Wall Design Parameters

The following preliminary soil parameters may be adopted for preliminary retaining wall design.

Material	Unit Weight (kN/m ³)	Cohesion (kPa)	Friction Angle	Ka	Kp	Ko
Residual Clay	18	5	25°	0.42	2.37	0.59
Extremely Weathered Sandstone	19	8	26°	0.39	2.56	0.56
Weathered Sandstone	21	60	38°	0.23	4.20	0.38

Appropriate subsoil drainage shall be provided behind all retaining walls to prevent hydrostatic pressure build-up.

Additional surcharge loading from adjacent buildings, driveways and vehicles should be incorporated into the detailed structural design.

11. Drainage

Surface and subsurface drainage is essential to maintain long-term foundation performance.

Accordingly:

- roof water shall discharge directly into the approved stormwater system;
- surface runoff shall be directed away from foundations;
- ponding adjacent to footings shall be avoided;
- subsoil drainage shall be provided behind retaining structures where required.

12. Construction Verification

All footing excavations shall be inspected by the project geotechnical engineer, or another suitably qualified geotechnical representative, **prior to the placement of concrete**.

The inspection shall confirm:

- footing founding depth;
- footing founding material;
- minimum allowable bearing capacity;
- absence of uncontrolled fill;
- absence of softened or disturbed foundation soils; and
- compliance with the recommendations contained within this report.

Should subsurface conditions encountered during construction differ from those described herein, the footing design and geotechnical recommendations shall be reviewed and amended where necessary.

13. Report Limitations

This report has been prepared from information obtained during a limited geotechnical investigation undertaken at discrete borehole locations. Variations in subsurface conditions may exist between investigation points.

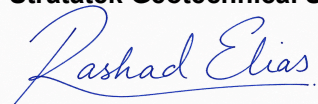
The report has been prepared solely for the proposed development at **16 Carinya Road, Picnic Point NSW** and shall not be relied upon for any other purpose.

This report does not assess the potential presence of contaminated land, acid sulfate soils or chemically aggressive ground conditions unless specifically stated.

Should conditions encountered during construction differ from those described within this report, the project geotechnical engineer shall be notified immediately so that further assessment may be undertaken prior to continuation of construction works.

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Field Investigation: 24 June 2026

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APPENDIX



Figure 1 – View Looking Downslope Across the Site

Overall view of the subject site looking downslope towards the south-west, illustrating the existing topography, moderate to steep site gradient, surrounding residential development and established vegetation. The image demonstrates the natural fall of the land and the relationship between the site and adjacent properties.



Figure 2 – Existing Ground Conditions

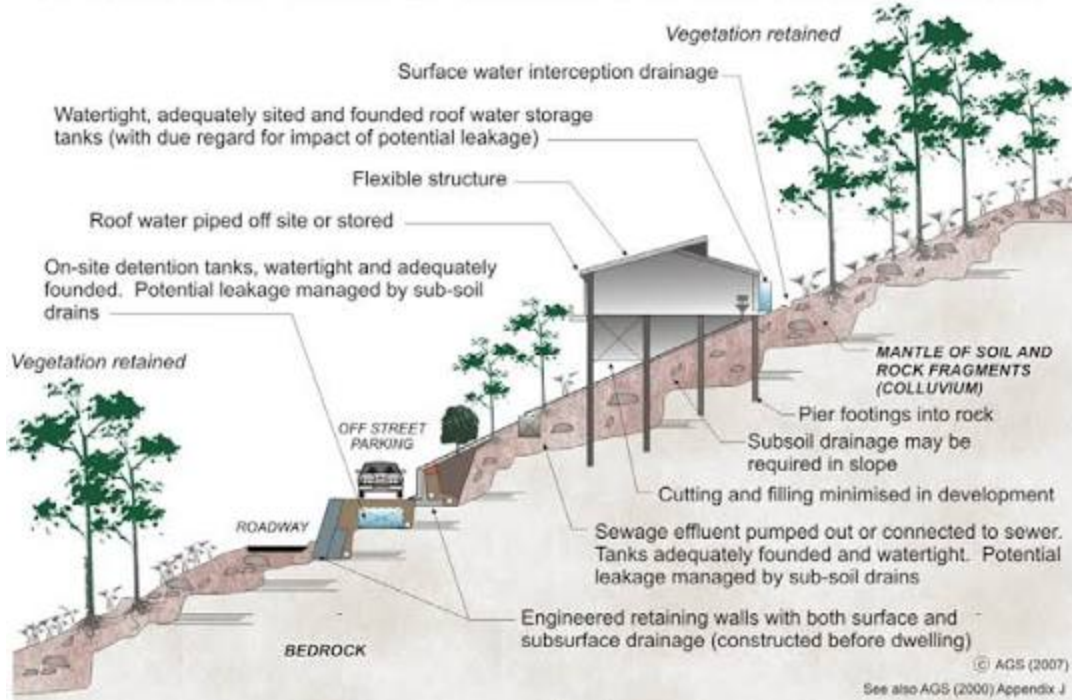
View of the central portion of the site showing exposed residual soils, sandstone outcrops and scattered surface rock. The photograph illustrates the natural ground conditions and variable weathered rock profile encountered across the allotment.



Figure 3 – Existing Rock Outcrops

General view of existing sandstone outcrops distributed across the site. The image highlights the shallow rock profile and natural surface geology, which will influence excavation methods, footing design and retaining wall construction associated with the proposed development.

EXAMPLES OF **GOOD** HILLSIDE CONSTRUCTION PRACTICE



EXAMPLES OF **POOR** HILLSIDE CONSTRUCTION PRACTICE

