

GEOTECHNICAL DESKTOP ASSESSMENT

77 ENDERLEY ROAD, CLAYFIELD QLD 4011

LOT / PLAN 10RP34371, 1RP34371, 2RP34371, 3RP34371, 4RP34371, 9RP34371
LOCAL GOV. Brisbane City
REPORT DATE 29 June 2026



DATA AVAILABILITY



PREPARED BY
LayeredGeo Pty Ltd
layeredgeo.com.au

KEY HIGHLIGHTS

Summary of geotechnical considerations for this site



Geology

Underlying rock formation and geological units

- NERANLEIGH-FERNVALE BEDS



Topography

Site slope, elevation and terrain characteristics

- MODERATE (~5.2%)



Site Classification

Soil classification, reactivity and profile

- MODERATELY REACTIVE (M)



Historical Boreholes

Nearby borehole records and anticipated ground conditions

- 158 BORES WITHIN 2000M



Lithology

Composite ground profile synthesised from nearby borehole records

- GOOD CONFIDENCE



Historical Imagery

Aerial photography record of site and land use history

- HISTORICAL DATA AVAILABLE

ENVIRONMENTAL CONSTRAINTS



Acid Sulphate Soils

Risk classification for acid sulphate soil disturbance

- NO MAPPED RISK



Fire Ants

Biosecurity risk zones and movement restrictions

- FIRE ANT BIOSECURITY ZONE 2



Groundwater

Estimated depth, aquifer type and construction implications

- DEEP

ADDRESS

77 Enderley Road, Clayfield
QLD 4011

LOT / PLAN (6 LOTS - WHOLE PROPERTY)

10RP34371, 1RP34371,
2RP34371, 3RP34371,
4RP34371, 9RP34371

COUNCIL

Brisbane City

PLANNING ZONE

CR1 - Character

REPORT DATE

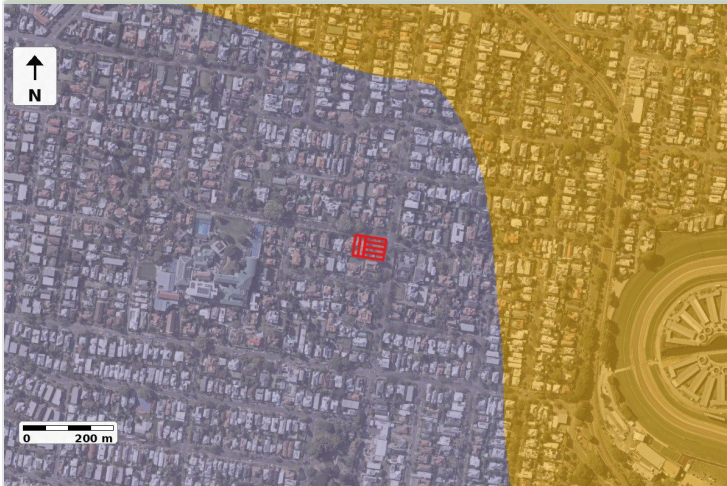
29 June 2026

SITE & GEOLOGY

Location, lot details and regional geological context

NERANLEIGH-FERNVALE BEDS

REGIONAL GEOLOGY MAP



SITE DETAILS

LOT / PLAN

10RP34371, 1RP34371,
2RP34371, 3RP34371,
4RP34371, 9RP34371

LOCAL GOV.

Brisbane City

EASTING (MGA ZONE 56)

505777

NORTHING

6966447

REGIONAL GEOLOGY

FORMATION

Neranleigh-Fernvale beds

DESCRIPTION

Mudstone, shale, arenite, chert, jasper, basic metavolcanics, pillow lava, conglomerate

SITE ATTRIBUTES

Planning-scheme and environmental overlays mapped over the property. "None" indicates no mapped overlay of that type at this location.

LOT AREA

2434 m²

PLANNING ZONE

CR1 - Character

FLOOD OVERLAY

None

BUSHFIRE OVERLAY

None

HERITAGE OVERLAY

Heritage Adjoining, Heritage Area

NOISE CORRIDOR OVERLAY

None

COUNCIL ENVIRONMENT & VEGETATION OVERLAY

None

STATE ENVIRONMENTAL SIGNIFICANCE (MSES)

None

GEOLOGICAL DESCRIPTION & LEGEND

The site is underlain by **Neranleigh-Fernvale beds**, characterised by Mudstone, shale, arenite, chert, jasper, basic metavolcanics, pillow lava, conglomerate.

Regional geology mapping indicates the site is underlain by hard crystalline rock (igneous or high-grade metamorphic). The upper profile is usually weathered to residual soil or extremely weathered rock and is generally rippable with conventional excavation plant; however, fresher, less-weathered rock may be encountered at depth, which can be slower and more costly to excavate and should be allowed for in earthworks planning. Where competent rock is present it offers high bearing capacity (commonly 1,000 kPa or more) and shallow founding, with fracture-controlled groundwater that seldom requires dewatering. Rock-socketed bored piers suit heavily loaded structures where sound rock is reached at depth.

Note: Geological mapping is based on regional surveys and may not reflect localised variations. Site-specific investigation is recommended for critical structures.

LEGEND

-  Selected Property
-  Neranleigh-Fernvale beds (DCf)
-  Td-QLD>Aspley Formation (Td>Rip)

TOPOGRAPHY

Site slope, elevation profile and terrain classification

● MODERATE (~5.2%)

TOPOGRAPHIC MAP



TERRAIN SUMMARY

MIN ELEVATION

33.6 m AHD

TOTAL FALL

3.4 m

AVG SLOPE

5.2%

MAX ELEVATION

37.0 m AHD

SLOPE CLASS

Moderate (~5.2%)

SLOPE CLASSIFICATION

Moderate

Moderate slope. Retaining walls or cut/fill likely; drainage design required.

LEGEND

- Selected Property
- Contour Lines

ENGINEERING IMPLICATIONS

CONSIDERATIONS

Understanding the topography of a site is essential for construction planning, drainage design, retaining wall requirements and foundation selection. Steep sites may require cut and fill operations, while flat sites may have drainage challenges.

Note: Elevation data is sourced from government LiDAR surveys and is indicative only. A formal survey is recommended prior to design.

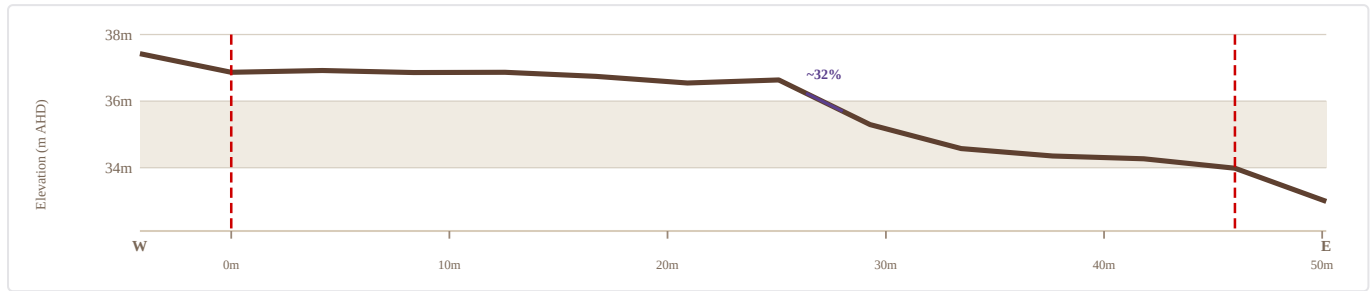
QUESTIONS TO CONSIDER

- Will retaining walls or cut/fill be required?
- How does the slope affect drainage and stormwater management?
- Are there landslide or erosion risks on steep portions?
- What foundation type suits the slope conditions?

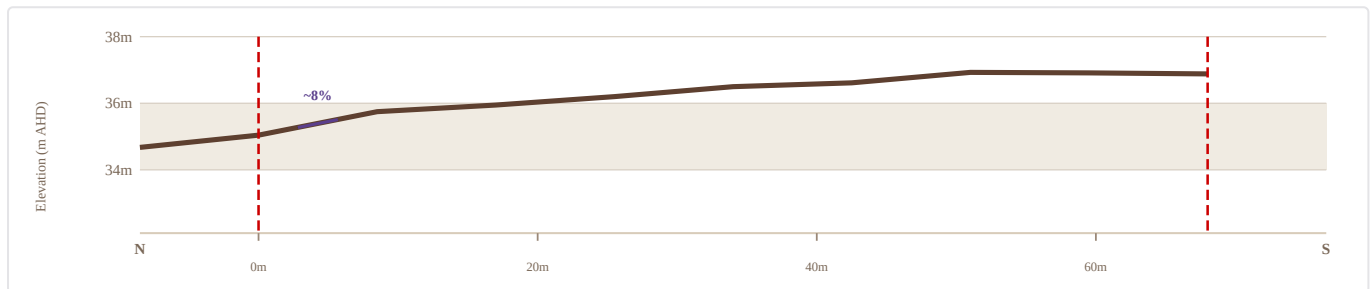
TOPOGRAPHY: ELEVATION CROSS SECTIONS

Four directional transects across the subject parcel

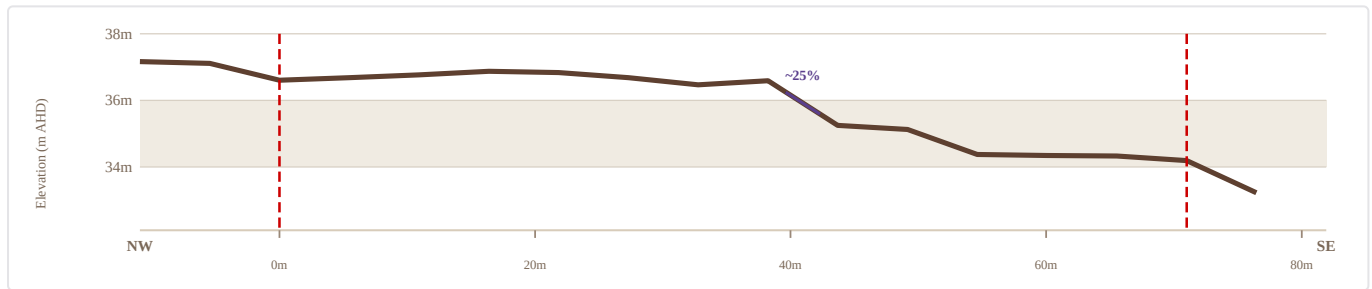
A-A' W → E TRANSECT



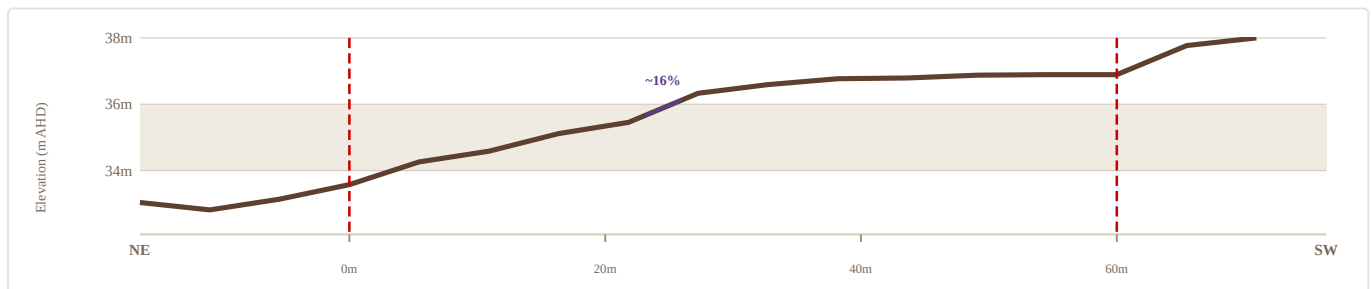
B-B' N → S TRANSECT



C-C' NW → SE TRANSECT



D-D' NE → SW TRANSECT



SITE INTERPRETATION

The steepest fall occurs along the east-west transect (A-A' (W → E)), peaking at approximately 32% within the parcel. The north-south transect (B-B' (N → S)) is the flattest at ~8%. The site falls primarily toward the south. Substantial structural retaining and cut-to-fill will be required; a geotechnical assessment of slope stability is strongly recommended before earthworks commence.

ABOUT CROSS SECTIONS

Each profile shows indicative ground surface elevation along a transect through the parcel. Cardinal sections (A-A', B-B') capture E-W and N-S slope. Diagonal sections (C-C', D-D') reveal the maximum fall direction across the site.

NOTE

Profiles are derived from the Queensland Digital Elevation Model (DEM). A formal survey is required for design.

LEGEND

- Property Boundary
- Ground Surface
- Peak Slope

3D SITE TERRAIN MODEL

Satellite imagery draped over LiDAR digital elevation model · 3D perspective view · property boundary highlighted in orange

TERRAIN CONTEXT

This model shows the local landform surrounding the site, built from a LiDAR digital elevation model overlaid with current aerial imagery. It provides a 3D perspective of how the property sits within the landscape, useful for understanding slope, adjacent topography, and the broader terrain setting.

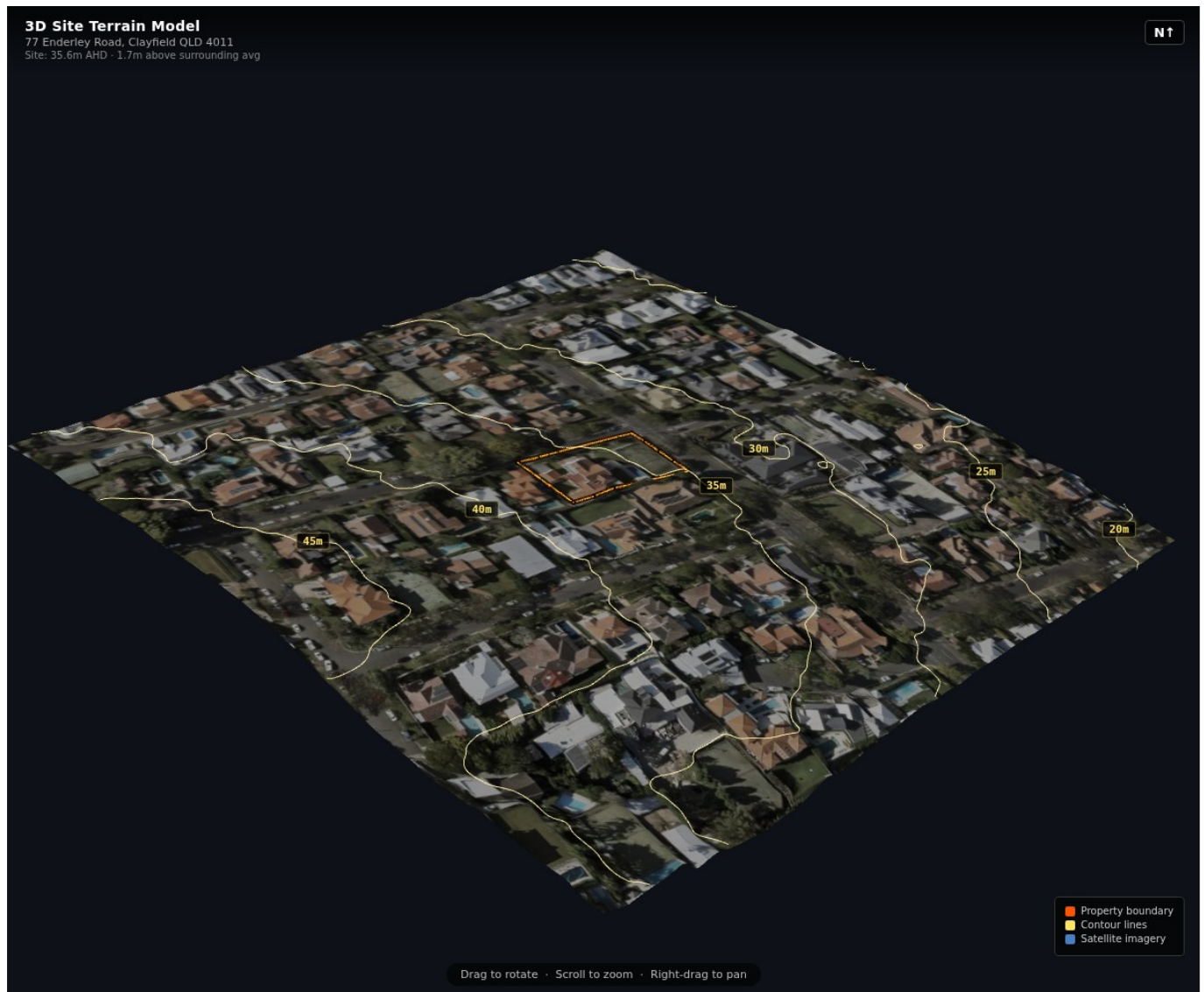
RELATIVE ELEVATION

The site elevation is compared against the average elevation within the surrounding 200m. Properties sitting above surrounding terrain typically experience better natural outfall and reduced risk of surface water inundation. Low-lying properties or those in topographic depressions may be susceptible to inflow of runoff from upslope land.

DRAINAGE & RUNOFF

Terrain slope and relative position in the landscape govern how rainfall moves during and after storm events. Elevated sites naturally shed water to lower ground; sites at the base of slopes or in hollows may accumulate concentrated surface runoff, relevant to stormwater design, sub-floor feasibility, and flood risk assessment.

SITE ELEVATION Site: 35.6m AHD · 1.7m above surrounding avg



LiDAR DEM · 200m radius · satellite imagery overlay · property boundary in orange · perspective from south · vertical scale 2.5× exaggerated for clarity

SITE CLASSIFICATION

Mapped soil order, indicative profile and AS 2870 desktop reactivity assessment

● MODERATELY REACTIVE (M)

SOILS MAP



Selected property

Sodosol

Tenosol

SOIL REACTIVITY PROFILE

DEPTH	MATERIAL	cmol/kg		REACTIVITY SHARE
		EV (expected)	P95 (conservative)	
0-0.3 m	Sand C 26% · S 62%	n/a	n/a	Non-reactive
0.3-0.6 m	Clay Clay 34%	EV 8.0 P95 54.0	High	40%
0.6-1.0 m	Clay Clay 39%	EV 9.0 P95 59.0	High	40%
1.0-2.0 m	Clay Clay 37%	EV 10.0 P95 71.0	Moderate	20%

Nearest bore: **Topsoil** → Clay (0.5m), see Historical Boreholes page

Reactivity share reflects the AS 2870 principle that moisture change, and therefore soil movement, is greatest near the surface. Shallower depth bands are assigned greater weight regardless of ECEC magnitude.

INDICATIVE SITE CLASS

M

Moderately reactive. Standard AS 2870 slab design required.

TYPICAL YS MOVEMENT

20-40 mm

Characteristic surface movement (indicative).

CLASSIFICATION CONFIDENCE

● **Medium**

Moderate variability, classification may shift with investigation.

MAPPED SOIL ORDER

Sodosol

Sodosols are texture-contrast soils with sodium-dominated subsoils that are structurally unstable and largely impermeable when wet. They have low nutrient status and are vulnerable to erosion. Sodosols occupy extensive areas of inland Queensland.

GEOTECHNICAL SIGNIFICANCE

The sodium-affected subsoil in Sodosols can disperse when wetted, creating settlement and instability risks independent of shrink-swell behaviour. Reactivity classification may understate foundation risk where dispersive behaviour is present. Perched water tables above the impermeable subsoil are common.

ASSESSMENT BASIS

Reactivity is estimated from SLGA mapped clay content and ECEC across four depth bands to 2.0 m, weighted to reflect the AS 2870 principle that shallower soils dominate surface movement. The 0-0.3 m band is assessed as non-reactive — clay falls below the AS 1726 threshold of 30% and sand exceeds 50%, indicating a non-plastic surface with negligible shrink-swell potential.

Indicative Class M — characteristic surface movement 20-40 mm (AS 2870). Standard slab-on-ground design is appropriate; the structural engineer specifies the footing system.

Desktop assessment only. Derived from SLGA regional mapping (CSIRO / TERN). No laboratory I_{ss} measured. Site-specific investigation and testing are required to confirm site class for design.

RECOMMENDED SCOPE FOR PHYSICAL SITE INVESTIGATION

- Boreholes must confirm depth of natural ground and must not terminate in fill or low-bearing-capacity soils.
- Boreholes must reach the AS 2870 depth of design suction change (H_s), typically 1.5-4.0 m depending on climate zone.
- At least one Shrink-Swell Index (I_{ss}) test is required to verify the soil reactivity predicted by this desktop model.

Preliminary planning only. Does not constitute a design-ready classification under AS 2870. A site-specific investigation and testing programme is required before design proceeds.

● 158 RECORDS FOUND

BOREHOLE LOCATION MAP

ANTICIPATED GROUND CONDITIONS



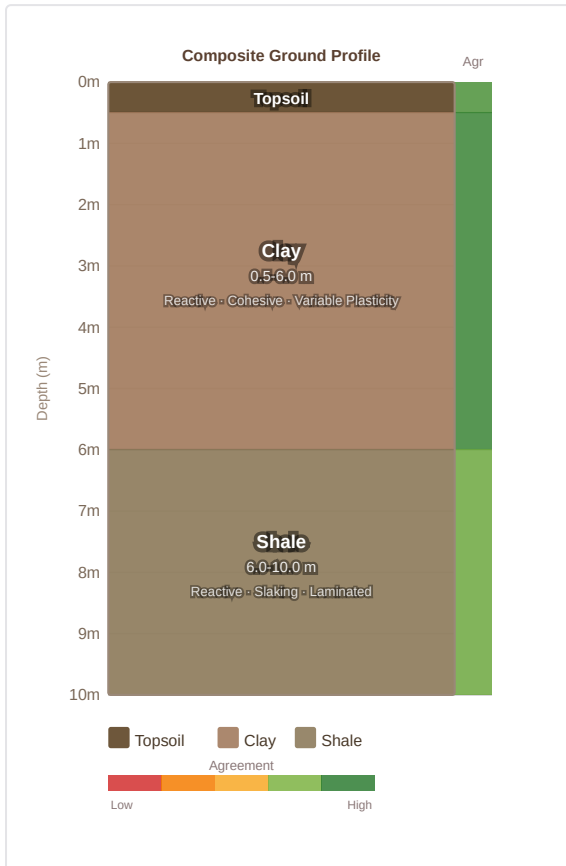
6.0-10.0 m **Shale**
Laminated weak to moderately strong rock susceptible to slaking and rapid deterioration on exposure to air and moisture. Bearing capacity can degrade quickly after excavation. Assess UCS after accounting for potential degradation. Reactive shales (smectite-bearing) may cause significant heave in footings or slabs.

ID	DIST.	EASTING	NORTHING	DEPTH	GWL	YEAR	STRATA LOG
138839	12m	505787	6966441	36.0m	-12.0m	2008	0.0-0.6m Topsoil 0.6-5.4m Clay Brown
134199	74m	505748	6966516	35.0m	-8.0m	2006	0.0-1.0m Brown Soil Top 1.0-6.0m Brown Clay
145322	87m	505713	6966506	55.0m	-4.0m	2007	0.0-1.0m Clay, Light Brown 1.0-6.0m Clay, Light Brown
145012	89m	505862	6966424	32.0m	-15.0m	2007	0.0-0.3m Topsoil 0.3-5.0m Clay, Red
134159	93m	505688	6966474	54.0m	-	2006	0.0-2.0m Topsoil 2.0-7.0m Red Clay
134295	98m	505684	6966478	84.0m	-23.0m	2006	0.0-5.0m Red Gravelly Clay 5.0-17.0m Yellow Clay
133876	141m	505915	6966423	64.0m	-28.0m	2006	0.0-0.2m Soil And Fill 0.2-4.0m Red Brown Stiff Compact Crumbly Clay
134485	157m	505621	6966430	51.0m	-10.0m	2006	0.0-4.0m Red Soil 4.0-22.0m Coloured Clays
138812	174m	505646	6966332	30.0m	-15.0m	2007	0.0-0.3m Topsoil 0.3-1.3m Fill
145626	176m	505674	6966304	73.0m	-17.0m	2007	0.0-0.5m Topsoil 0.5-3.0m Clay, Brown
79064	179m	505958	6966489	32.0m	-	1958	0.0-0.6m Soil & Sub Soil. 0.6-19.8m Weathered Shale.
145616	183m	505607	6966516	78.0m	-24.0m	2007	0.0-1.0m Topsoil 1.0-2.7m Clay. Red

LITHOLOGY

Composite ground profile synthesised from nearby borehole records

GOOD CONFIDENCE



LAYER SUMMARY

DEPTH	MATERIAL	AGREEMENT	BORES
0.0-0.5 m	Topsoil	91%	69
0.5-6.0 m	Clay	96%	70
6.0-10.0 m	Shale	80%	71

PROFILE CONFIDENCE

4/5 Good

74 boreholes combined; avg. material agreement 90%; nearest bore 12 m from site.

Synthesised from **74 boreholes** to **10.0 m** depth. Confidence factors: bore count (25%), material agreement (40%), proximity (25%), depth coverage (10%).

Method: Sampled at 0.5 m intervals, votes weighted by IDW (1/d²). Consecutive same-material intervals merged into layers. Agreement strip shows IDW-weighted dominant-material fraction (red = low consensus, through orange and yellow, to green = strong consensus). Only bores mapped to **Neranleigh-Fernvale beds** geological unit included; cross-unit outliers excluded by rock-depth comparison. Source: Queensland Groundwater Database (GWDB), Dept. of Resources.

ENGINEERING INTERPRETATION

Topsoil 0.0-0.5 m 69 bores · 91% · 48m

Organic · Not for Founding

Near-surface organic and biologically active material. Compressible, variable in consistency, and not suitable for founding. Typically 0.1-0.5 m thick but can be deeper in areas of prior agricultural or alluvial activity. Excavate to natural inorganic ground before founding. Organic content may cause long-term settlement under load.

Clay 0.5-6.0 m 70 bores · 96% · 49m

Reactive · Cohesive · Variable Plasticity

Cohesive fine-grained material; plasticity undifferentiated from available log descriptions. Shrink-swell behaviour and AS 2870 reactivity vary with mineralogy. Adequate embedment depth is generally required for footings. Consolidation settlement possible under sustained load. Site investigation is recommended to characterise plasticity and reactivity.

Shale 6.0-10.0 m 71 bores · 80% · 49m

Reactive · Slaking · Laminated

Laminated weak to moderately strong rock susceptible to slaking and rapid deterioration on exposure to air and moisture. Bearing capacity can degrade quickly after excavation. Assess UCS after accounting for potential degradation. Reactive shales (smectite-bearing) may cause significant heave in footings or slabs.

HISTORICAL IMAGERY: 1974

● HISTORICAL DATA AVAILABLE

What does the historical aerial record show for this site and surrounds?

AERIAL PHOTOGRAPH



THINGS TO NOTE

Historical aerial imagery provides a record of past land use and site conditions. Evidence of previous industrial activities, agriculture, vegetation clearing, landfill, or earthworks can indicate potential soil disturbance, contamination, or the presence of fill material that may affect foundation design.

Changes in drainage patterns, watercourse alignments, and low-lying areas visible in historical imagery can also indicate flood risk or acid sulphate soil potential that may not be apparent from current mapping.

IMPORTANT CONSIDERATIONS

- ▶ Was this site previously used for industrial, agricultural, or waste disposal purposes?
- ▶ Is there evidence of imported fill or significant earthworks?
- ▶ Have drainage lines or watercourses been altered or culverted?
- ▶ Was vegetation cleared from low-lying or estuarine areas?
- ▶ Are there any unexploded ordnance (UXO) risk areas nearby from wartime use?

DATA NOTES

Historical aerial photography is sourced from the Queensland Government's State Capture Program archive. Coverage and resolution varies by location and era. Imagery dates from approximately the 1940s to present.

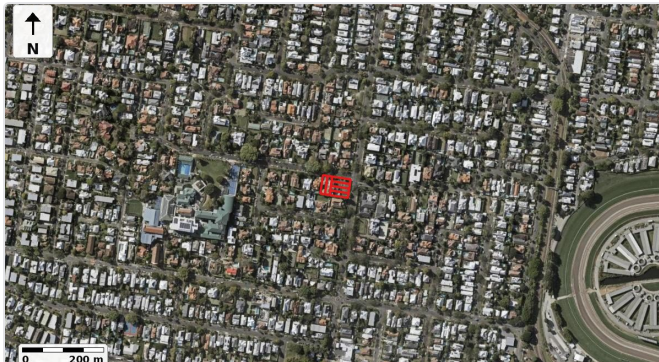
This page provides contextual information only. A Phase 1 Environmental Site Assessment (ESA) should be undertaken where historical land use concern is identified.

ENVIRONMENTAL CONSTRAINTS

Regulatory overlays and biosecurity constraints applying to this site

ACID SULPHATE SOILS

● NO MAPPED RISK



 Selected Property

No mapped ASS risk

This site is not within a mapped acid sulphate soil risk area based on available Queensland Government data.

ABOUT ASS

Acid sulphate soils contain iron sulphides that oxidise when exposed to air, producing sulphuric acid. This causes environmental damage to waterways, corrosion of infrastructure and risks to human health. Site investigation is recommended where excavation extends below the water table.

REGULATORY CONTEXT

Works in ASS risk areas may require a management plan under the *Environmental Protection Act 1994*. ASS disturbance that causes environmental harm is a prescribed activity under Queensland planning scheme overlays.

FIRE ANTS

● FIRE ANT BIOSECURITY ZONE 2



 Biosecurity Zone 2  Selected Property

Fire ant biosecurity zone 2

Movement restrictions apply to soil, turf and equipment. A Biosecurity Management Plan may be required for construction activities involving soil disturbance.

OBLIGATIONS

Red Imported Fire Ants (*Solenopsis invicta*) are subject to active biosecurity management in South East Queensland. Movement of soil, turf and equipment from declared areas requires compliance with the **Biosecurity Act 2014**. Construction sites within a zone may require a Biosecurity Management Plan and worker training.

IMPORTANT NOTICE

Zone boundaries are updated regularly by Biosecurity Queensland. The zone status shown reflects data at the time of report generation and must be independently verified prior to any earthworks or soil movement.

VERIFY BEFORE EARTHWORKS

Confirm current zone status at business.qld.gov.au/fireants before any soil disturbance.

GROUNDWATER

● DEEP

Is groundwater likely to be encountered during excavation or construction?

ESTIMATED GWL DEPTH

~12.0m

AQUIFER TYPE

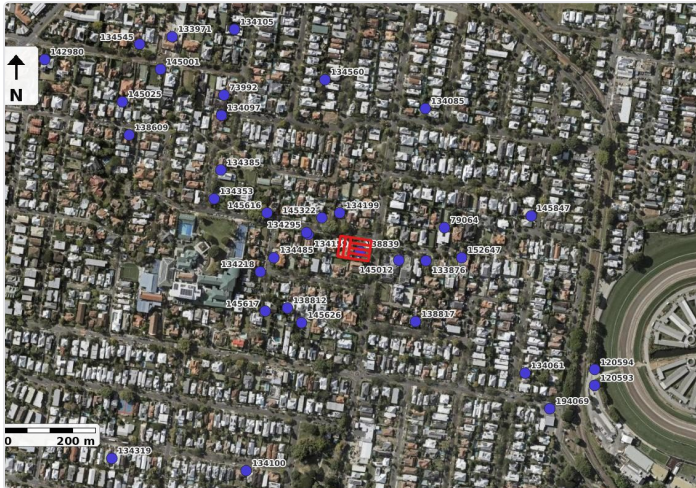
Unconfined

YIELD ESTIMATE

0.0-13.9 L/s

SALINITY

Saline, not potable



INDICATIVE DEPTH PROFILE

0 - 12.0m



Unsaturated Zone

Unsaturated soil above water table.

~12.0m



Water Table (GWL)

Estimated groundwater level based on nearby bore records. Subject to seasonal variation.

12.0 - 36m



Saturated Zone

Saturated zone, dewatering may be required.

>36m



Deep Aquifer

Unconfined aquifer.



Construction Implication

Dewatering likely required for excavations below 12.0m. Assess basement feasibility carefully.

THINGS TO KNOW

Groundwater is water held in the saturated zone beneath the earth's surface. Its depth and behaviour directly affects excavation planning, basement feasibility, dewatering requirements, and the corrosivity of ground conditions toward buried infrastructure.

Seasonal variation can cause groundwater levels to rise significantly, particularly after extended rainfall events, which may impact sites that appear dry at surface during investigation.

Note: Groundwater depths are estimated from nearby bore records held in government databases. They are indicative only and subject to seasonal and spatial variation.

QUESTIONS TO ASK

- ▶ At what depth is groundwater likely to be encountered?
- ▶ Will dewatering be required during construction?
- ▶ Is there a risk of groundwater ingress into basements or sub-floor areas?
- ▶ How does seasonal variation affect the groundwater level on this site?
- ▶ Are there any groundwater contamination concerns in the vicinity?

LEGEND



Selected Property



Shallow GWL (<3m)



Moderate GWL (3-10m)



Deep GWL (>10m)

NEARBY BORE RECORDS

158 bores within 2000m radius
Deepest record: 544.4m

Source: Queensland Groundwater Database (GWDB), Dept. of Resources

WHO SHOULD READ THIS REPORT

- ✓ Property buyer or owner
- ✓ Architect or building designer
- ✓ Mortgage broker or lender
- ✓ Structural or civil engineer
- ✓ Builder or contractor
- ✓ Town planner or council officer

LIMITATIONS OF THIS REPORT

This report is a **desk-study assessment only**. All geotechnical parameters, soil profiles, and ground condition estimates presented herein are derived from publicly available data sources including regional geological mapping, government borehole databases, and published literature. **No physical site investigation has been conducted** as part of this report.

The information is provided as a preliminary guide to assist early-stage planning and should not be relied upon for detailed engineering design, construction, or legal decisions without further site-specific investigation by a suitably qualified geotechnical professional.

DATA SOURCES & ACCURACY

All data layers sourced from third-party government and regulatory bodies are provided in good faith. LayeredGeo does not warrant the accuracy, completeness, or currency of this information.

Fire Ant zone boundaries are updated regularly by Biosecurity Queensland and should be independently verified prior to commencement of any earthworks. **Topographic data** is derived from LiDAR surveys and may not reflect recent earthworks or changes to the site.

DATA ATTRIBUTION

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PROFESSIONAL ADVICE

LayeredGeo strongly recommends that a registered geotechnical engineer conduct a site-specific investigation in accordance with **AS 1726 - Geotechnical Site Investigations** before finalising foundation design, retaining wall design, or any significant earthworks. Engineering parameters contained in this report should be treated as indicative only and superseded by laboratory testing and in-situ investigation results.



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REPORT DETAILS

Report generated: **29 June 2026** · Prepared by: **LayeredGeo Pty Ltd**

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