

Geotechnical Site Investigation

Report No: 20252

**Location: 17 Windermere Blvd, Pakenham
(Rear Fence of 13 Powell Pl, Pakenham)**

Client: Barrasons Group

Date: 18/06/2025



1. Construction Proposal:

Retaining wall.

2. Geology:

The site is situated within a geological area of Devonian Upper, Granite. The site investigation confirmed this.

3. Site Description:

The site is located in an established residential area, has a slight slope to the right-hand side and is currently occupied by a single storey residence.

4. Site Investigation:

Two (2) boreholes were drilled by hand auger at the proposed retaining wall location. The attached borehole log shows layer descriptions and depths.

5. Soil Profile:

The boreholes revealed a soil profile consisting of the following:

Borehole 1:

- 400mm of Grey/Red/Orange mixed Crushed Rock and Silty Clay FILL *overlying*
- Orange/Red/Grey Silty CLAY.

Borehole 2:

- 400mm of Grey/Red/Orange mixed Crushed Rock and Silty Clay FILL *overlying*
- Orange/Red/Grey Silty CLAY.

Note: If at any stage during construction the soil profile encountered varies from what has been given in this report then we need to be contacted to conduct another site investigation and if required, this report will need to be reviewed and/or amended.

6. Site Drainage:

No perched water table or ground water was encountered in the boreholes. Surface drainage must be considered in the design of footing systems in accordance with Clause 5.6.3 of AS 2870-2011.

7. Site Classification:

- a. **Classification:** The site is classified in accordance with Section 2 from 'AS 2870-2011 Residential Slabs and Footings – Construction' as a **Class M** (Moderately Reactive Site). This classification was determined after taking into account the soil profile encountered, the geology of the site and the climatic zone of the area.
- b. **Earthworks:** Note this classification may change if the site is subject to earthworks. As a guide, no uncontrolled fill greater than 600mm for Sand and 300mm for other material should be placed. Soil Test Express should be notified if this occurs and the site should be reassessed, and this report possibly reviewed and amended. If a site cut in excess of 400mm is undertaken, this report may need to be reviewed and amended.

Note: Load bearing edge beams and any load bearing internal beams are to be founded through any new material and into the soil layers recommended in this report.

- c. **Movement:** It should be noted that the classification assumes potential differential surface soil seasonal movements of up to 40mm could be expected. Where trees or the removal of buildings influence the site, the movement will be increased.
- d. **Abnormal moisture conditions:** The site could be subject to abnormal moisture conditions. Refer to section 8 on trees.
- e. **Articulation Joints:** For articulation joint spacing's, refer to 'Cement, Concrete and Aggregates Association – Technical Note 61 – Table 2'.

8. Trees:

There were some trees found at the time of the investigation that could cause abnormal moisture conditions to the proposed construction location. Any trees from within or around the building envelope should be removed as soon as possible to allow time for the subsoils to regain their equilibrium moisture content. **Ideally, a summer/winter cycle.**

Alternatively, the proposed structure should be isolated from the drying effect of the trees, e.g. root barriers, or deepen affected footings founding depth to 1200mm or Rock.

Note: Minimum distance between tree and proposed building = $0.75 \times \text{Mature Tree Height}$.

The footings may also be designed in accordance with AS2870-2011 Appendix H.

9. Recommended Foundation Depths for a Strip and Pad Footing System:

For a 'Class M' site, it is recommended that all strips and pads be founded down a minimum of 525mm and 500mm below finished ground level respectively. The footings must also be founded a minimum of 100mm into the Orange/Red/Grey Silty CLAY. The allowable bearing capacity of the Silty CLAY can be assumed to be 120kPa at this depth.

10. Recommended Foundation Depths for Pier/Pile Footings:

It is recommended that all pier/pile footings be founded a minimum of 1500mm below ground level and into the Orange/Red/Grey Silty CLAY. The allowable end bearing capacity of the Silty CLAY can be assumed to be 250kPa with an allowable skin friction of 20kPa.

11. Retaining Wall:

Soil Type	Φ' (deg)	Ka (Active Earth Pressure Coefficient)	Ko (At Rest Earth Pressure Coefficient)	Kp (Passive Earth Pressure)	γ (kN/m ³)	Cu (kPa)	C' (kPa)
FILL	17	0.54	0.70	1.80	18	0	0
Silty CLAY	25	0.40	0.56	2.50	20	100	10

12. Conditions of Report and Limitations:

- 12.1** The maintenance of the building foundations is the owner's responsibility and their attention should be drawn to the CSIRO information sheet named 'Guide to homeowners on foundation maintenance and footing performance'.
- 12.2** The descriptions of the soils found follows those listed in AS1726-2017 (Geotechnical Site Investigations) although colour descriptions can vary with soil moisture content and/or individual interpretation.
- 12.3** Any earthworks conducted on the site will change the recommended founding depths. If the site is levelled by cut, then the founding depths are the minimum specified. If levelling fill is placed then the recommended founding depths will increase accordingly unless the fill depths are greater than those listed in Clause 7b, if this is the case, another site assessment is required.
- 12.4** Where fill is to be placed the footing founding depths recommended will need to be increased accordingly by the depth of fill unless one of the following occurs:
- 12.4.1** The base of the footing is founded in the natural undisturbed Orange/Red/Grey Silty CLAY.
- 12.4.2** The Fill has been placed under controlled conditions and compacted to a minimum of 95% of AS1289 5.1.1 (Standard Compaction). If this is the case, then Soil Test Express should be called for an additional site inspection after filling and a revision of this report may be required.
- 12.5** It should be noted that this company has only been commissioned to undertake limited boreholes, variations in the soil profile may exist. As such, it is recommended that the information given in this report be used as an 'approximate guide only' in determining costs associated with footing construction.
- 12.6** Any variations in the soil profile that are encountered at the time of construction, which may involve significant alterations to the footings, must be notified to this company as soon as possible with all construction work being stopped immediately. If this situation arises or any significant earthworks are proposed or undertaken, then this report will need to be reviewed and, if appropriate, amended.
- 12.7** Soil Test Express expects that any relevant site information (e.g. previous filling, water courses) has been investigated by the client and this information passed on to Soil Test Express. Consequently, Soil Test Express reserves the right to amend this report upon receipt of such information or for any of the reasons listed above. In the event of an amended report for these reasons, Soil Test Express will not accept responsibility for any subsequent financial loss.
- 12.8** Soil Test Express Pty Ltd retains ownership of this report until the account is paid in full. If the client refuses to pay, then Soil Test Express Pty Ltd has the right to disclaim any recommendation made.

Mr Damien P McGorry
Geotechnical Engineer
Soil Test Express Pty Ltd

Dr Fariborz Moeinaddini
Registered Professional Engineer
PE0015074
Soil Test Express Pty Ltd

13. Site Plan:



(03) 5997 1192

admin@soiltestexpress.com.au



PO Box 233, Koo Wee Rup, VIC 3981

Shop 1/ 23-25 Station St,
Koo Wee Rup, VIC 3981

Site Location:

13-15 Powell Place,
Pakenham

GEOTECHNICAL SITE CLASSIFICATION LOGS

Proposal:

Retaining Wall

Report No:

20252

Client:

Barrasons Group

Test Date:

18/06/2025

Topography of the land:

- Uneven Surface* ☐
Essentially Level ☐
Undulating Surface ☐
Multiple Hills ☐
Slight Slope ☒
Moderate Slope ☐
Steep Slope ☐
Extreme Condition ☐

Soil Drainage:

- Good:* ☐ *Sandy*
Fair: ☒ *to*
Poor: ☐ *Clay*

Technicians Comments:

Slope Direction:

Right Hand Side

Trees



type: Various

Size: Small

Water



type:

Existing Structures:



Existing Structure Condition:

Good



Fair



Poor



Existing Structure Description : Single storey residence.

Layer Description Borehole 1

Depth

Layer Description Borehole 2

Depth

Mix: Crushed Rock & Silty Clay Fill
Grey/Red/Orange
Medium Dense
Moist

400mm

Mix: Crushed Rock & Silty Clay Fill
Grey/Red/Orange
Medium Dense
Moist

400mm

Silty Clay
Orange/Red/Grey
Medium to High Plasticity
Stiff to Very Stiff
Moist

120kPa

250kPa
@1500mm

Silty Clay
Orange/Red/Grey
Medium to High Plasticity
Stiff to Very Stiff
Moist

120kPa

250kPa
@1500mm

Borehole 1 Terminated at 1.5m

Borehole 2 Terminated at 1.5m

Soil Technician: B.Dunn

Auger Type: Hand