Foundation Exploration
Geotechnical Engineers

8 Premier Avenue
Mitcham 3132
Phone: 0407 334 003

File No: 58289 **Date:** 7th of November, 2024.

Dawoud Rowais,
C/- 17 Capella Street,
BALWYN NORTH.

Copy to Axiomplus Architects

Dear Sir,

RE: FOUNDATION INVESTIGATION & FOOTING RECOMMENDATIONS

17 CAPELLA STREET, BALWYN NORTH

1.0 PROPOSED CONSTRUCTION:

The proposed construction comprises a double storey residence.

2.0 SCOPE OF FIELDWORK:

Engineering staff from this firm undertook investigation of this site on the 31st of October, 2024.

Three locations were tested using a Gemco flight auger drilling rig and hand augering equipment. In each location the subsurface profile was logged, sampled and appropriately strength tested.

Borehole logs and a location plan are attached to this report.

3.0 BUILDING & SITE DESCRIPTION:

3.1 Site Description

Buildings: A single storey brick veneer house on the site shall be demolished.

Surface Gradient: The surface slope across this site was measured at approximately 2-3^0 fall towards the south west.

Vegetation: There is a Pin Oak tree on the nature strip in front of this property. There are no other significant trees either on the property or in proximity to the site boundaries.

3.2 Climate Region

This site is classified as being within the Class 2, 'Wet Temperate' Climatic Region.

3.3 Wind Rating

With reference to AS4055, Wind Loads for Housing, and AS1170.2-2011, Wind Speeds, this site is in Region A, Terrain Category 3, Topographic Classification T0, and Shielding Factor, Full Shielding.

Based on these factors this site can be classified as N1 and gust wind speed can be assumed as 28 metre per second, W28.

4.0 SUBSURFACE DETAIL:

4.1 Regional Geology

The site is identified on the Geological Survey of Victoria as being located within the Province of Silurian 'Anderson Creek Formation' Siltstones and associated soil profiles.

4.2 Subsurface Profile (Boreholes)

As per attached log sheets.

4.3 Soil Moisture/Groundwater

All boreholes encountered normally moist soil conditions.

4.4 Site Classification

Due to the impending demolition, this site is classified as **CLASS P** in accordance with AS2870 - 2011.

The estimated Characteristic Surface Movement, (y_s) is 25mm to 30mm.

Provided the recommendations as set out in this report are followed, new footings may be designed and constructed in accordance with a **CLASS M** site classification.

5.0 SITE PREPARATION AND DEVELOPMENT CONSTRAINTS:

The site shall be prepared in accordance with Section 6 of AS2870 - 2011 (Residential Slabs & Footings).

For Slab Footings, in conjunction with excavation to achieve design grade levels the grade surface should be proof rolled using tracked excavation equipment or a roller compactor. Any areas of soft, loose, or wet material, which will not respond to compaction procedures, should be selectively excavated to achieve a firm working base.

6.0 FOOTING RECOMMENDATIONS:

All footing excavations and site works should be inspected by a suitably qualified and experienced Engineer, Engineering Geologist or Building Surveyor to ensure that subsurface conditions and site preparation procedures are in accordance with those outlined in this report. If any doubt exists, then this office should be contacted immediately for further advice.

6.1 Conventional Raft Slab

A Slab Footing system proportioned in accordance with a CLASS M classification can be constructed directly on grade following site preparation as outlined above.

Slab edge and any load bearing internal beams should penetrate through any Fill and be founded at least 100mm into the underlying natural Silt, Sand or Clay.

The minimum founding depth for Slab Edge Beams should not be reduced to less than 250mm.

The maximum allowable bearing pressure beneath Slab Edge and load bearing Internal Beams is 50kPa.

Should additional capacity be required then Footing Beams should penetrate through all Fill and natural Silt or Sand and be founded at least 100mm into the underlying natural Clay.

The maximum allowable bearing pressure beneath Slab Edge and load bearing Internal Beams founded into the natural Clay is 150kPa.

Slab Edge Beams and the immediately abutting lengths of any intersecting beams, which will be constructed abutting or within 300mm of the site boundary, must be deepened such that they penetrate through all Fill material and natural Sand/Silt and are founded at least 50mm into the underlying natural Clay. The minimum founding depth for these footings should not be reduced to less than 500mm.

To counteract the effects of any increased ground movement at the front of the house due to the proximity to the front Oak tree, Slab Edge Beams across the front perimeter wall of the house and garage must penetrate through all Fill material and natural Sand and be founded at least 50mm into the underlying natural Clay. The minimum founding depth for these footings should not be reduced to less than 500mm.

Slab panels should be designed as self-supporting.

All relevant parts to AS2870 Section 3.2 apply.

6.2 Strip or Pad Footings.

Strip or Pad/Stump Footings incorporated in the construction may be installed and proportioned in accordance with a **CLASS M** site classification.

Footings must penetrate through all Fill and natural Sand and be founded at least 100mm into the underlying natural Clay.

Minimum founding depths should not be reduced to less than 700mm for Strip Footings and 1000mm for Pad Footings.

Maximum bearing pressures beneath footings should not exceed 150kPa.

All relevant parts to AS2870 Section 3.6 apply.

6.3 Special Footing Recommendations

Where Strip or Pad Footings or Slab Edge Beams are located adjacent to a backfilled service trench or easement, (if any), footings must be deepened so that they are founded at least **100mm below** the level of a plane of inclination at 30^{o} extending outwards from the base of the trench for any footings founded into the Sand, (possibly edge beams), and 45^{o} extending outwards from the base of the trench for any footings founded into the Clay.

Where new continuous footings (either strip footing or slab edge beam) are being constructed directly adjacent to existing footings, similar founding depths should be adopted, subject to verification of adequate founding material being available at this depth. This will apply to the garage footings which will be located adjacent to the neighbour's garage wall footings.

7.0 CONSTRUCTION & SITE MAINTENANCE REQUIREMENTS:

Articulation of masonry walls should be provided as per details contained in the Cement and Concrete Association Note TN61. Spacing between articulation joints should not exceed a maximum of 6.0m, and should typically be provided at/or between:

- Different footing types; footings founding at significantly different founding depths or founding material.
- Points of high stress i.e., above door and window openings, changes in storey height, or above large spanning lintels.

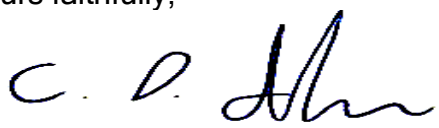
Where a rendered finish is applied to brickwork or lightweight construction, then articulation joints should be incorporated into the render finish as per masonry walls.

Surface drainage should be detailed so that runoff is collected into drains or diverted prior to it reaching the house walls.

Site maintenance requirements, specifically with respect to minimisation of soil moisture fluctuation through foundation zone soils are outlined in the attached Appendix 1. These recommendations should be followed wherever practical and appropriate.

Should there be any further queries regarding this report please contact this company.

Yours faithfully,



CHRIS D. ALKEMADE B.E. (Civ.), B.Ec.

APPENDIX 1

NOTE: This appendix is not intended to replace detailed advice given in; CSIRO BTF 18, "FOUNDATION MAINTENANCE AND FOOTING PERFORMANCE: A GUIDE TO HOMEOWNERS", and Appendix B of AS 2870 - 2011

- Ensure that the ground surface and paving around the building is graded to prevent excessive wetting of the soil profile or ponding of water adjacent to footings. Avoid the installation of lawn areas and garden beds, which require heavy watering immediately adjacent to foundations.

- Trees and large shrubs shall generally not be planted closer to buildings than 0.75 times their mature height. Greater distance may apply should a group of trees/shrubs be involved. Exceptions may apply for this site where footings are founded at 1000mm depth or greater.

- All roofgutters, downpipes and surface drains should be periodically cleaned out and checked for leakage and repaired as necessary.

- Service trenches, located alongside the building should be offset a lateral distance at least equal to their depth.

FOUNDATION EXPLORATION

Geotechnical Engineers

BOREHOLE LOGS

FILE No. 58289

Date Drilled: 31/10/2024

CLIENT: **ROWAIS**

PROJECT: 17 CAPELLA STREET, BALWYN NORTH

BOREHOLE NO.: 1 **METHOD**: Gemco Drill **LOCATION:** See Figure 1.

DEPTH (m)	STRUCTURE	DESCRIPTION	COHESION/ DENSITY/STRENGTH	SOIL MOISTURE/ GROUNDWATER	TESTING/ COMMENT
0.25m	**Fill**	Mixed silt, sand and occasional gravel and organic material, grey, brown, grey brown.	Loose	Slightly Moist	
0.9m	**Soil Profile**	Silty fine SAND, grey to light grey.	Medium Dense	Slightly Moist	
1.7m		CLAY, orange brown mottled grey and red brown, medium plasticity.	Very Stiff	Moist	
3.0m		Slightly Clayey SAND, orange brown mottled grey.	Dense	Slightly Moist	
		End of Borehole.			

BOREHOLE NO.: 2 **METHOD**: Hand Auger **LOCATION**: See Figure 1.

0.45m	**Fill**	Mixed silt, sand and occasional gravel and organic material, grey, brown, grey brown.	Loose	Slightly Moist	
0.9m	**Soil Profile**	Silty fine SAND, grey to light grey.	Medium Dense	Slightly Moist	
1.6m		CLAY, orange brown mottled grey and red brown, medium plasticity.	Very Stiff	Moist	
		End of Borehole.			

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BOREHOLE LOGS

FILE No. 58289

Date Drilled: 31/10/2024

CLIENT: **ROWAIS**

PROJECT: 17 CAPELLA STREET, BALWYN NORTH

BOREHOLE NO.: 3 **METHOD**: Hand Auger **LOCATION:** See Figure 1.

DEPTH (m)	STRUCTURE	DESCRIPTION	COHESION/ DENSITY/STRENGTH	SOIL MOISTURE/ GROUNDWATER	TESTING/ COMMENT
0.35m	**Fill**	Mixed silt, sand and occasional gravel and organic material, grey, brown, grey brown.	Loose	Slightly Moist	
0.8m	**Soil Profile**	Silty fine SAND, grey to light grey.	Medium Dense	Slightly Moist	
1.6m		CLAY, orange brown mottled grey and red brown, medium plasticity.	Very Stiff	Moist	
		End of Borehole.			

BOREHOLE NO.: **METHOD**: **LOCATION**:

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LOCATION PLAN

17 CAPELLA STREET, BALWYN NORTH

FILE NO : 58289

FIGURE : 1