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ENGINEERING
CIVIL AND STRUCTURAL

SOIL INVESTIGATION

DATE: 28/09/2026

SITE: Lot 26 Reservoir Road, MYPONGA

CLIENT: Enduro Builders

REFERENCE NUMBER: 260834

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SOIL BORELOG

SITE ADDRESS: **Lot 26 Reservoir Road, MYPONGA** **REFERENCE NUMBER:** **260834**

BORE 1	BORE 2	BORE 3	BORE 4	BORE 5	COLOUR	TEXTURE	SOIL DESCRIPTION	M.C	PLASTICITY	U.S.C	INDEX - I_{ps}	BEARING
0 – 200	0 – 250	0 – 200	0 – 300	0 – 300	Dark Brown	Soft-Ga	SAND clayey, roots	B/N	VL	SM-SC	.005	LM
200 – 500	250 – 700	200 – 500	300 – 700	300 – 800	Orange Red Brown	Fi-Ga	CLAY silty sandy	B/N	H	CH	.035	LM
500 – 900	700 – 1300	500 – 1700	700 – 1400	800 – 1100	Yellow Brown	Fb-Ga	CLAY sandy gravelly, rock nodules, REFUSAL on ROCK	B	LM	CL-GM	.015	MH

SUMMARY:
The soils on this site consisted of a sand topsoil overlying moderately to highly reactive clay horizons to the extent of testing. The presence of solid rock limited the extent of testing to 1.7m.

SOIL CLASSIFICATION: **M/P (Trees); *AS2870***

SOIL CLASSIFIER: **ARKE ENGINEERING PTY LTD**

WATER TABLE: **Not encountered during soil sampling.**

SAMPLING METHOD: **Hydraulic Hammer on BORE 1-3, Hand Gear on BORE 4,5**

SOIL LOGGER: **Venky**

SAMPLING DATE: **September 2026**

NOTES:

1. The foundations have been designed in accordance with *AS2870*. As such, the footings have been deemed to satisfy a satisfactory level of performance (Category 1 to Category 2) at an economically achievable cost. Refer to *Appendix C: Table C1 and Table C2 - AS2870* in the Footing Construction Report for further details.
   If the client would like to construct a more rigid footing system to restrict the level of performance to Category 1 or better, the engineer must be contacted prior to construction.
2. Sites which have been classified as P - Problem Site have an increased potential of damage.
3. Soil sampling results are limited to the boreholes listed above and provide an indicative representation of the site conditions. The above results are to be confirmed by an engineer during construction.

SOIL CLASSIFICATION	
$0 = y_s$	**A**
$0 < y_s \leq 20$	**S**
$20 < y_s \leq 40$	**M**
$40 < y_s \leq 60$	**H1**
$60 < y_s \leq 75$	**H2**
$y_s > 75$	**E**

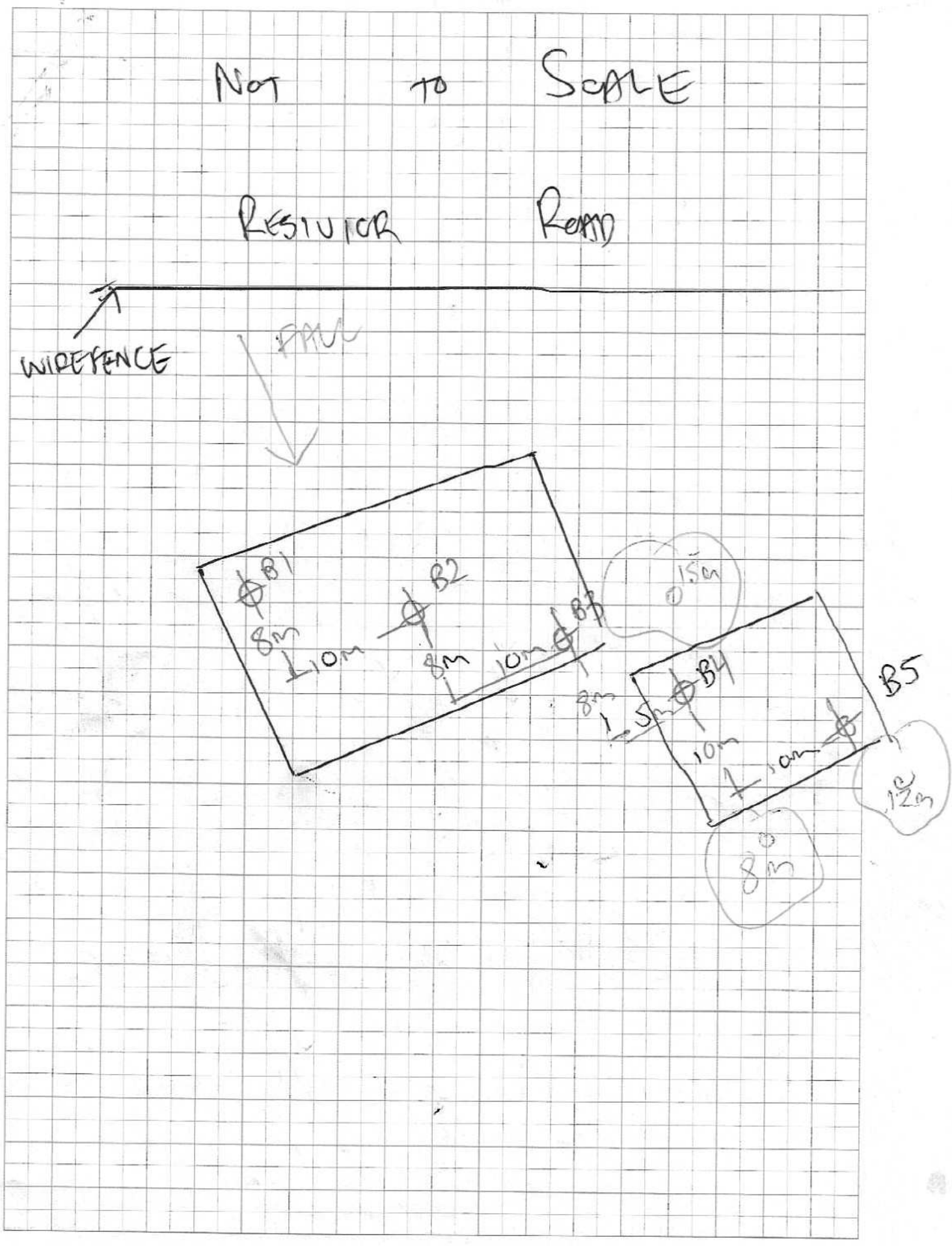
UNIFIED SOIL CLASSIFICATION (U.S.C)	
GW, GP, GM, GC	Gravelly Soils
SW, SP, SM	Sandy Soils
SC	Clayey Soils
ML	Silt Soils – Low Plasticity
CL	Clay Soils – Low Plasticity
CH	Clay Soils – High Plasticity

PLASTICITY INDEX	
VL	Very Low
L	Low
M	Medium
H	High
VH	Very High
EH	Extremely High

TEXTURE	
Fb	Friable
Fi	Firm
Hd	Hard
St	Stiff
Lo	Loose
Fine	Fine
Ga	Granular
Blk	Blocky

MOISTURE CONTENT (M.C)	
WB	Well Below (Dry)
B	Below
N	Near
N/A	Near – Above
A	Above
WA	Water Table

P – Denotes Problem Sites to *AS2870*.
D – Denotes deep seating moisture changes to *AS2870*.


NOT TO SCALE
RESIDUE ROAD
WIRE FENCE
FALL
B1
B2
B3
B4
B5
8m
10m
10m
8m
1.5m
10m
10m
1.5m
8m

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Date:	Sheet No:
28/09/2026	FS.1
Engineer:	Reference No:
MJ	260834

CHARACTERISTIC SURFACE MOVEMENT TO AS2870

Depth of Design Soil Suction Change: H_s = 4 m

Change in Suction at the Soil Surface: Δ_u = 1.2 pF

$$y_s = \frac{1}{100} \sum_{n=1}^{N} (I_{pt}\, \overline{\Delta u} h)_n \quad ; \textit{Clause 2.3.1}$$

BOREHOLE 1: CALCULATION OF FREE SOIL SWELL

Soil Horizon	D_1	D_2	Ips	alpha α	Ipt	Y_s
1	0.00	0.20	0.005	1.00	0.005	1.2
2	0.20	0.50	0.035	1.00	0.035	11.5
3	0.50	0.90	0.015	1.00	0.015	5.9
4	0.90			1.00	0.000	

Y_s = 18.6 mm.
Y_{mc} = 13.0 mm.
Y_{me} = 9.3 mm.

BOREHOLE 2: CALCULATION OF FREE SOIL SWELL

Soil Horizon	D_1	D_2	Ips	alpha α	Ipt	Y_s
1	0.00	0.25	0.005	1.00	0.005	1.5
2	0.25	0.70	0.035	1.00	0.035	16.7
3	0.70	1.30	0.015	1.00	0.015	8.1
4	1.30			1.00	0.000	

Y_s = 26.2 mm.
Y_{mc} = 18.3 mm.
Y_{me} = 13.1 mm.

BOREHOLE 3: CALCULATION OF FREE SOIL SWELL

Soil Horizon	D_1	D_2	Ips	alpha α	Ipt	Y_s
1	0.00	0.20	0.005	1.00	0.005	1.2
2	0.20	0.50	0.035	1.00	0.035	11.5
3	0.50	1.70	0.015	1.00	0.015	15.7
4	1.70			1.00	0.000	

Y_s = 28.3 mm.
Y_{mc} = 19.8 mm.
Y_{me} = 14.2 mm.

BOREHOLE 4: CALCULATION OF FREE SOIL SWELL

Soil Horizon	D_1	D_2	Ips	alpha α	Ipt	Y_s
1	0.00	0.30	0.005	1.00	0.005	1.7
2	0.30	0.70	0.035	1.00	0.035	14.7
3	0.70	1.40	0.015	1.00	0.015	9.3
4	1.40			1.00	0.000	

Y_s = 25.7 mm.
Y_{mc} = 18.0 mm.
Y_{me} = 12.9 mm.

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CHARACTERISTIC SURFACE MOVEMENT TO AS2870

Depth of Design Soil Suction Change: H_s = 4 m

Change in Suction at the Soil Surface: Δ_u = 1.2 pF

$$y_s = \frac{1}{100} \sum_{n=1}^{N} (I_{pt}\, \overline{\Delta u} h)_n \quad ; \textit{Clause 2.3.1}$$

BOREHOLE 5: CALCULATION OF FREE SOIL SWELL

Soil Horizon	D_1	D_2	Ips	alpha α	Ipt	Y_s
1	0.00	0.30	0.005	1.00	0.005	1.7
2	0.30	0.80	0.035	1.00	0.035	18.1
3	0.80	1.10	0.015	1.00	0.015	4.1
4	1.10			1.00	0.000	

Y_s =	24.0 mm.
Y_{mc} =	16.8 mm.
Y_{me} =	12.0 mm.

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CHARACTERISTIC SURFACE MOVEMENT WITH TREES TO AS2870

Depth of Design Soil Suction Change: H_s = 4 m

Change in Suction at the Soil Surface: Δ_u = 1.2 pF

GROUP OF TREES

$0.7Y_s + Y_t = Y_{mc}$

$0.5Y_s = Y_{me}$

$$y_t = \left\{ 1 - \left(\frac{\frac{D_t}{HT} - 0.5}{\frac{D_i}{HT} - 0.5} \right) \right\} y_{t\,max}$$

NOTE: For single trees, or group of trees with $D_t/HT < 0.5y_t$, should be taken as y_{tmax}. ; Clause H4 - Appendix H

BOREHOLE 1: CALCULATION OF FREE SOIL SWELL WITH TREE EFFECTS

Soil Horizon	D_1	D_2	Ips	alpha α	Ipt	$\Delta U_{layer(tree)}$	Y_{tmax}	Y_t	Y_s
1	0.00	0.20	0.005	1.00	0.005	0.014	0.0	0.0	1.2
2	0.20	0.50	0.035	1.00	0.035	0.049	0.5	0.5	11.5
3	0.50	0.90	0.015	1.00	0.015	0.097	0.6	0.6	5.9
4	0.90			1.00	0.000	0.063	0.0	0.0	

Y_s = 18.6 mm.
Y_t = 1.1 mm.
Y_{mc} = 14.1 mm.
Y_{me} = 9.3 mm.

BOREHOLE 2: CALCULATION OF FREE SOIL SWELL WITH TREE EFFECTS

Soil Horizon	D_1	D_2	Ips	alpha α	Ipt	$\Delta U_{layer(tree)}$	Y_{tmax}	Y_t	Y_s
1	0.00	0.25	0.005	1.00	0.005	0.017	0.0	0.0	1.5
2	0.25	0.70	0.035	1.00	0.035	0.066	1.0	1.0	16.7
3	0.70	1.30	0.015	1.00	0.015	0.139	1.3	1.3	8.1
4	1.30			1.00	0.000	0.090	0.0	0.0	

Y_s = 26.2 mm.
Y_t = 2.3 mm.
Y_{mc} = 20.7 mm.
Y_{me} = 13.1 mm.

BOREHOLE 3: CALCULATION OF FREE SOIL SWELL WITH TREE EFFECTS

Soil Horizon	D_1	D_2	Ips	alpha α	Ipt	$\Delta U_{layer(tree)}$	Y_{tmax}	Y_t	Y_s
1	0.00	0.20	0.005	1.00	0.005	0.014	0.0	0.0	1.2
2	0.20	0.50	0.035	1.00	0.035	0.049	0.5	0.5	11.5
3	0.50	1.70	0.015	1.00	0.015	0.153	2.8	2.8	15.7
4	1.70			1.00	0.000	0.118	0.0	0.0	

Y_s = 28.3 mm.
Y_t = 3.3 mm.
Y_{mc} = 23.1 mm.
Y_{me} = 14.2 mm.

BOREHOLE 4: CALCULATION OF FREE SOIL SWELL WITH TREE EFFECTS

Soil Horizon	D_1	D_2	Ips	alpha α	Ipt	$\Delta U_{layer(tree)}$	Y_{tmax}	Y_t	Y_s
1	0.00	0.30	0.005	1.00	0.005	0.021	0.0	0.0	1.7
2	0.30	0.70	0.035	1.00	0.035	0.069	1.0	1.0	14.7
3	0.70	1.40	0.015	1.00	0.015	0.146	1.5	1.5	9.3
4	1.40			1.00	0.000	0.097	0.0	0.0	

Y_s = 25.7 mm.
Y_t = 2.5 mm.
Y_{mc} = 20.5 mm.
Y_{me} = 12.9 mm.

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CHARACTERISTIC SURFACE MOVEMENT WITH TREES TO AS2870

Depth of Design Soil Suction Change: H_s = 4 m

Change in Suction at the Soil Surface: Δ_u = 1.2 pF

GROUP OF TREES

$0.7Y_s + Y_t = Y_{mc}$

$0.5Y_s = Y_{me}$

$$y_t = \left\{ 1 - \left(\frac{\frac{D_t}{HT} - 0.5}{\frac{D_i}{HT} - 0.5} \right) \right\} y_{t\,max}$$

NOTE: For single trees, or group of trees with $D_t/HT < 0.5y_t$ should be taken as y_{tmax}. ; Clause H4 - Appendix H

BOREHOLE 5: CALCULATION OF FREE SOIL SWELL WITH TREE EFFECTS

Soil Horizon	D_1	D_2	Ips	alpha α	Ipt	$\Delta U_{layer(tree)}$	Y_{tmax}	Y_t	Y_s
1	0.00	0.30	0.005	1.00	0.005	0.021	0.0	0.0	1.7
2	0.30	0.80	0.035	1.00	0.035	0.076	1.3	1.3	18.1
3	0.80	1.10	0.015	1.00	0.015	0.132	0.6	0.6	4.1
4	1.10			1.00	0.000	0.076	0.0	0.0	

Y_s =	24.0 mm.
Y_t =	2.0 mm.
Y_{mc} =	18.7 mm.
Y_{me} =	12.0 mm.