

Project:	Proposed new Camp Kitchen	Layers Removed:	0 (BH1 & BH2)
Chainage:	N/A	Prior to test:	N/A
Test No.:	1 & 2	Easting:	N/A
Location:	Menindee, NSW	Northing:	N/A
Direction:	Menindee, NSW	Existing Level:	N/A
Final Depth (mm BGL):	BH1- 1800mm BGL/Densly compacted brown/redish Sand, BH2- 1850mm BGL/Densly compacted brown/redish Sand	Test Level:	N/A
Date Tested:	26/10/2021		

DYNAMIC CONE PENETROMETER

SCOPE:

This test sets out the resistance of natural ground and bearing capacity of the soil by the Dynamic Cone Penetrometer with a 9 kg mass.

This report will aim to shed light on:

- a) Detecting soft or wet soil layers
- b) Defining boundaries of particular types of materials
- c) Detecting the uniformity of materials
- d) Identify the relevant strengths of materials at bearing level

The resistance recorded is expressed as the depth of penetration by either:

- a) each blow of the sliding hammer or,
- b) the number of blows per graduation interval marked on the shaft.

Test method is as per AS1289.2

1. INTRODUCTION/DESCRIPTION

In accordance with your request on the 23rd of July 2021, an investigation was conducted by Metaline Engineering Group (MEG) on the above date to provide a site classification and identify parameters for the footing system design.

2. FIELD PROCEDURE

On the 2nd of August MEG completed three boreholes to assess the subsurface conditions.

The materials encountered during the field investigation are presented in the attached borehole logs and in general consist of granular sandy reddish soil with little to no clays. Soil moisture conditions are considered consistent with the seasonal variation of the area and time of testing.

Groundwater was not encountered during the investigation. A classification explanation sheet is attached outlining the terms and symbols used in the preparation of this report.

Photos



3. SITE CLASSIFICATION

Based on the results of the investigation the site has been classified as Class "A" - site in accordance with AS 2870-2011 Residential Slabs and Footings - Site Classification by surface Movement Calculation.

No mature trees exist within/or near the proposed building envelope that impacts both, the soil classification and moisture conditions. Although due to the topographical nature of the block, adequate drainage must be provided.

4. RECOMMENDATIONS

The boreholes revealed that the existing soil profile consisted of naturally occurring sandy strata. Dynamic Cone Penetrometer was conducted at each borehole. Allowable bearings have been summarised in Appendix B.

The footings system for a conventional slab may be designed as a Class "A" site classification with any external beams founded a minimum of 310mm below existing surface level and founding on top of rock.

If piers or stumps are used on this site, they should be founded a minimum of 2000mm below existing surface level.

If strip footings are used on this site, they should be founded a minimum of 310mm below existing surface level.

It is suggested the site be stripped of all vegetation and topsoil, with any areas of soft, loose, or wet material selectively excavated to provide a consistent and stable working platform.

Footings are to be inspected and the applicable bearing capacity, or rock capping depths (50mm minimum) confirmed by a qualified Structural Engineer.

Footings are to be inspected and the applicable bearing capacity confirmed prior to pour of concrete. Slab reinforcing to also be checked and confirmed by the structural engineer or an accredited building surveyor prior to pour.

5. SITE COMMENTS

If a cut and fill operation is to be performed onsite, it is recommended that any fill be placed under controlled conditions to allow the footings to be placed in the fill.

The planting of trees close to the proposed building should be avoided. Minimum distance from the footing system should be equivalent/equal to the trees mature height.

6. FILL MATERIAL

General: Some building sites may contain areas of fill, which cannot be visually identified at the time of investigation. It is also often difficult to determine fill from natural insitu materials during a site investigation borehole. If fill is encountered during excavation of footings, and it is not described in the field investigation log, further advice must be obtained.

7. GENERAL NOTE

The following general measures are recommended in reducing the potential of future building damage:

- Monitor watering systems and avoid excessive watering
- Monitor underground services and attend any damage as soon as required.

8. PLAN



9. APPLICATION

This site classification has been prepared specifically for the above project and any data or opinions that are given should not be used out of context to any other job or purpose without analysis and overview from the undersigned. No other investigation work was provided that is not previously described.

This site classification has been based upon field and sample analysis from the locations mentioned, the nature and continuity below borehole depth is inferred and it must be considered that further investigation may be required to assess actual conditions of subsurface undisturbed soils.

This report has been prepared to the named client for their use. This report is not intended for any other party and no liability is accepted if this report is passed to another party.

During excavation it is suggested that footings are to be inspected carefully and if any irregularities occur further advice shall be sought.

Kind Regards,
Metaline Engineering Group Pty Ltd

Anthony Misagh

APPENDIX A

SITE CLASSIFICATION EXPLANATIONS:

Class	Expected Surface Movement (Ys)	Explanation
A	0mm	Includes many sand, gravel and rock sites with little/no clays. These sites have little/no expected movement and as a result zero moisture variation.
S	0 - 20mm	Slightly reactive sites which exhibit only small movements with moisture variation.
M	20 - 40mm	Moderately reactive sites exhibit moderate amounts of movement with moisture variation. These sites commonly include red/brown silty soils, some sandy clays and loamy soils.
H1	40 - 60mm	Highly reactive sites exhibit high amounts of movement with moisture variation.
H2	60 - 75mm	Highly reactive sites exhibit high amounts of movement with moisture variation.
E	>75mm	Extremely reactive sites which exhibit greater than 75mm of surface movement. Typically, these sites include deep reactive clays, such as black and dark brown soils. These sites typically demand quite expensive footing systems.

In areas of deep seated moisture changes, the site classification shall be modified by the addition of a "-D".

As indicated previously, the Site Classification must consider many aspects of the site, not just the reactivity of the soil. P sites are those that include other factors that need to be brought to the attention of the owner, builder and footing designer. A "P" classification does not indicate a specific Ys value and is described as a "Problem" site.

The reasons for a P classification include:

- | | |
|----------|--|
| P | <ul style="list-style-type: none"> • Clay fill greater <400mm Sand fill <800 • Growth &/or Removal of Trees will cause Abnormal moisture conditions in the subsurface soils; • Unusually high moisture conditions caused by water flow, ponds, dams etc; • Sites with Loose fill which can be either "controlled" or "uncontrolled". The P Classification depends upon the depth and type of fill; • Sites with poor bearing capacity, soft soils, or soils which are prone to collapse; • Sites prone to mine subsidence, land slip, piping or coastal erosion; • Sites which for one reason or another cannot be classified as normal sites |
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APPENDIX B - BH Findings

INVESTIGATION LOG

Client: NSW Planning Industry & Environment
Investigation for: Site Classification
Location: Menindee Camping Grounds, Menindee NSW
BH Location: See Plan
Date of investigation: 26/10/2021

Method: Alignment 90deg	<input type="checkbox"/> HAND AUGER <input checked="" type="checkbox"/> DRILL RIG <input type="checkbox"/> BACKHOE <input type="checkbox"/> OTHER	Moisture Condition	Consist. Density Index	BOREHOLE No. 1
DEPTH mm	MATERIAL DESCRIPTION &			
200	Brownish/yellow sand top soil	Dry	loose	
600	Brownish/red sand	Dry	Dense	
1200	Light Brown Sand	Moist/Dry	Dense	
1800	Dense Brownish Sand. Once broken, very loose sand	Moist/dry	Dense	

Test 1 - BH1

No. of Blows	DCP				
	Total Blows	Measured Depth (mm BGL)	Penetration (mm/blow)	CBR Value (%)	Allowable bearing Pressure. (inc. FOS 3)
0	0	0	0.00	N/A	0
10	10	600	80.00		55
10	20	1200	60.00		75
5	25	1800	5.00		500+

DCP at 600, 1200, 1800mm

Method: Alignment 90deg	<input type="checkbox"/> HAND AUGER <input checked="" type="checkbox"/> DRILL RIG <input type="checkbox"/> BACKHOE <input type="checkbox"/> OTHER	Moisture Condition	Consist. Density Index	BOREHOLE No. 2
DEPTH mm	MATERIAL DESCRIPTION &			
	Light Brown/Redish Clay, medium density low plasticity.	Moist	loose	
600	High Resistance and dense Red Clay	Dry	Dense	
1850				

Test 2 - BH2

No. of Blows	DCP				
	Total Blows	Measured Depth (mm BGL)	Penetration (mm/blow)	CBR Value (%)	Allowable bearing Pressure. (inc. FOS 3)
0	0	0	0.00	N/A	0
10	10	600	90.00		55
10	20	1200	75.00		75
5	25	1850	5.00		500+

DCP at 600, 1200, 1800mm