

AS2870-2011 SITE ASSESSMENT

328 Lune River Road

Ida Bay

September 2020



GEO-ENVIRONMENTAL

S O L U T I O N S

Disclaimer: The author does not warrant the information contained in this document is free from errors or omissions. The author shall not in any way be liable for any loss, damage or injury suffered by the User consequent upon, or incidental to, the existence of errors in the information.

Introduction

Client:	DarkLab
Date of inspection:	24/8/20
Location:	328 Lune River Road, Ida Bay.
Land description:	Approx. 5ha lot
Building type:	Existing tourist site
Investigation:	Geo-Probe540UD and hand auger
Inspected by:	G. McDonald & JP Cumming

Background information

Map:	Mineral Resources Tasmania 1:25 0000 South East Tasmania Sheet
Rock type:	Triassic sandstone/Quaternary alluvium
Soil depth:	Variable to 3.0m
Planning overlay:	Biodiversity Protection Area Scenic Landscape Corridor
Local meteorology:	Annual rainfall approx. 1000 mm
Local services:	Tank water with on site wastewater disposal required

Site conditions

Slope and aspect:	5% west facing slope
Site drainage:	Imperfect subsoil drainage
Vegetation:	Native flora
Weather conditions:	Cloudy, approx. 20mm rainfall received in preceding 7 days.
Ground surface:	Moist surface conditions

Investigation

A number of excavations were completed to identify the distribution of, and variation in soil materials on the site. Representative excavations from various construction areas indicated on the site plan were chosen for testing and classification according to AS2870-2011 (see profile summaries).

Profile Summaries – Visitor centre area 1

Hole 1 Depth (m)	Hole 2 Depth (m)	Horizon	Description
0 – 0.40	0 – 0.50	FILL	FILL – Mixed GRAVELS (GP) , slightly moist very dense consistency, clear boundary to
0.40 – 0.60	0.50 – 0.80	A1	Light Grey Silty SAND (SM) , single grain, very moist to wet soft consistency, gradual boundary to
0.60 – 1.0	0.80 – 1.10	B2	Grey CLAYEY SAND (SC) , massive structure, very moist to wet soft consistency, gradual boundary to
1.0 – 1.60	1.10 – 1.70	B21	Greyish Brown CLAY (CH) , massive structure, very moist to wet soft consistency, high plasticity, gradual boundary to
1.60 – 1.90	1.70 - 2.0	BC	Greenish Grey CLAY (CH) , massive structure, slightly moist very firm consistency, high plasticity, trace fine gravels, auger refusal on boulders/rock

Notes – Bore hole 1 and 2 were located adjacent the existing train shed and feature shallow surface fill overlying deep plastic clay soils. The soils were also very moist to wet with poor bearing capacity. An allowable bearing capacity of 100kPa is estimated below a depth of 1.6m.

Profile Summaries – Visitor centre area 2

Hole 3 Depth (m)	Hole 4 Depth (m)	Horizon	Description
0 – 0.20	0 – 0.30	A1	Grey Silty SAND (SM) , single grain, moist dense consistency, few fine roots, gradual boundary to
0.20 – 0.30	0.30 – 1.20	A2	Light Grey Silty SAND (SM) , single grain, trace of clay, moist soft consistency, gradual boundary to
0.30 – 1.50	0.60 – 1.20	B2	Mixed Grey & Brownish Yellow CLAY (CH) , massive structure, slightly moist firm to very firm consistency, high plasticity, gradual boundary to
1.50 – 2.40	1.20 – 2.60	B21	Mixed Brownish Yellow & Grey SILTY/SANDY CLAY (CI) , massive structure, slightly moist very firm consistency, medium plasticity, approx. 10% fine gravels, auger refusal in hole 3, hole 4 gradual boundary to
	2.60 – 3.0	BC	Light Brownish Grey CLAYEY SILT (ML) , ~10% clay, massive structure, slightly moist medium dense consistency, low plasticity, no refusal

Notes – Bore hole 3 was located on the lower area of the site and bore hole 4 was located adjacent to the old concrete slab at the northern end of the site. Perched groundwater was present at approximately 0.3m depth in hole 3, and 1.2m depth in hole 4. An allowable bearing capacity of 100kPa is estimated below a depth of 1.2m.

Profile Summaries – Existing wastewater area – From 2018 Report

Hole 5 Depth (m)	Hole 6 Depth (m)	Horizon	Description
0 – 0.10	0 – 0.30	A1	Grey Silty SAND (SM) , single grain, moist dense consistency, few fine roots, gradual boundary to
0.10 – 0.50	0.30 – 0.60	A2	Light Grey Silty SAND (SM) , single grain, moist dense consistency, gradual boundary to
0.50 – 1.10	0.60 – 1.20	B2	Olive Grey CLAY (CH) , massive structure, moist firm consistency, high plasticity, gradual boundary to
1.10 – 1.90	1.20 – 2.0+	B21	Light Greenish Grey CLAY (CH) , massive structure, slightly moist stiff consistency, high plasticity, gradual boundary to
1.90 – 2.40		BC	Greenish Grey Clayey SAND (SC) , ~15% clay, massive structure, slightly moist hard consistency, low plasticity, auger refusal on rock

Profile Summaries – Sculpture site

Hole 7 Depth (m)	Hole 8 Depth (m)	Horizon	Description
0 – 0.20	0 – 0.20	A1	Greyish Brown Silty SAND (SM) , single grain, moist to wet soft consistency, few fine roots, few gravels and rocks, gradual boundary to
0.20 – 0.50	0.20 – 0.40	B2	Mixed Brownish Yellow & Grey SILTY/SANDY CLAY (CL) , slightly moist very firm consistency, medium plasticity, approx. 20% gravels and stones, auger refusal on dolerite

Notes – The sculpture site is located on a small rise and is underlain by shallow rocky soils on Jurassic dolerite/basalt.

Sculpture Site Geomorphology

The landscape close to the proposed culture site is mapped as featuring Organosols (peat) soils which have conservation significance (Western Tasmania Blanket Bogs). The peat soils are distinct in containing a thick organic peat humus layer and often wet subsurface conditions supporting button grass vegetation. The soils in the area of the proposed sculpture site are shallow soils on Jurassic dolerite/Basalt and are definitely not classified as Organosols according to the Australian Soil Classification (CSIRO 2016). It is concluded that the sculpture site is not located on Organosols of conservation significance.

The area is also mapped as having geo-conservation significance due to the Lune River Area Jurassic Basalts and Gemstone Association deposits. The deposits are of particular importance where the silicified plant fossils are present within the rock sequence. Whilst no evidence of the fossil features was identified in the rock at the site, there is a possibility the features maybe present. The limited shallow excavation for foundations of the sculpture is not anticipated to shave a significant effect upon the underlying rock. The works do not involve large bulk excavation and there will be no significant change to site hydrology. As a result the works are deemed to be of low impact and considered highly unlikely to impact upon the underlying deposits.

Site Classification

According to AS2870-2011 the visitor centre site is classified as **Class P** due to abnormal moisture conditions and poor bearing capacity. Soil reactivity is expected to be consistent with Class H-1.

According to AS2870-2011 the sculpture site is classified as **Class M**, that is a moderately reactive clay.

Wind Classification

The AS 4055-2012 *Wind load for Housing* classification of the site is:

Region:	A
Terrain category:	TC2
Shielding Classification:	NS
Topographic Classification:	T1
Wind Classification:	N3
Design Wind Gust Speed ($V_{h,u}$)	50 m/sec

Construction recommendations

All site Earthworks must comply with AS3798-2012. Attention should be paid to the preparation of a consistent footing surface, and appropriate backfilling in accordance with recommendations in AS2870-2011 for reactive clay sites. In addition, adequate drainage must be installed surrounding the construction areas to ensure soil strength is not compromised by excessive soil moisture.

During construction GES will need to be notified of any major variation to the foundation conditions as outlined in this report.

A handwritten signature in blue ink, consisting of several overlapping loops and a long horizontal stroke extending to the right.

Dr John Paul Cumming B.Agr.Sc (hons) PhD CPSS GAICD
Environmental and Engineering Soil Scientist

Site Plans

APPENDIX 1



