Geotechnical Investigation Report

Assessment Site: 44 Reid Street, Wilcannia NSW

Client: Public Works Advisory - Bathurst

Address: 140 William Street, Bathurst NSW 2795

(Our Reference: 38166-GR01_A)

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Disclaimer

This report has been prepared solely for Public Works Advisory in accordance with the scope provided by the client and for the purpose(s) as outlined throughout this report.

Barnson Pty Ltd accepts no liability or responsibility for or in respect of any use or reliance upon this report and its supporting material by anyone other than the client.

Project Name:	44 Reid Street, Wilcannia NSW
Client:	Public Works Advisory
Project No.	38166
Report Reference	38166-GR01_A
Date:	28.02.2022
Revision:	Revision A

Prepared by:	**Reviewed by:**
	
Tobias Spora Dip.Eng Civil Engineer	Luke Morris B.E. MIEAust CPEng (NPER) Director

1.0 INTRODUCTION

The following is a report on the geotechnical assessment of a site in accordance with AS1726-1993 “Geotechnical Site Investigations”.

The site investigation was carried out by Barnson Pty Ltd, on behalf of Public Works Advisory for a proposed industrial unit development at 44 Reid Street, Wilcannia NSW.

Plate 1 – Area of Investigation

Public Works Advisory is proposing to construct a Baaka Cultural Centre at 44 Reid Street, Wilcannia NSW. The proposed site features that are covered by this investigation are as follows;

- Proposed Baaka Cultural Centre

The investigation comprised of three (3) boreholes together with field mapping near the site. Details of the field work and laboratory testing are given in the report together with comments relevant to design and construction practice.

1.1 Terminology

The methods used in this report to describe the soil profiles, including visual classification of material types encountered, are in accordance with Australian standard AS1726-1993 "Geotechnical Site Investigations".

1.2 Limitations

The geotechnical section of Barnson Pty Ltd has conducted this investigation and prepared this report in response to specific instructions from the client to whom this report is addressed. This report is intended for the sole use of the client, and only for the purpose which it is prepared. Any third party who relies on the report or any representation contained in it does so at their own risk.

1.3 Geotechnical Testing

Representative samples from the site were subjected to the following range of tests in accordance with relevant method of Australian Standard AS1289:

- Linear Shrinkage
- PH
- Dynamic Cone Penetrometer

NATA reports are attached in ***Appendix D***.

2.0 SITE DESCRIPTION

2.1 General Site Description

The site is situated in a residential area in the centre of Wilcannia NSW.

The site consists of light scattered grass and weed cover with mature trees scattered over the site.

The site is sloping is relatively flat. There are existing houses, industrial and commercial premises in the vicinity.

Plate 2 – General view of the site facing southeast.

3.0 METHOD OF INVESTIGATION

On the 17th of January 2022, a geotechnical investigation was carried out at the site of the above-mentioned development site. The field drilling was carried out by a geotechnical technician who logged the boreholes on site and undertook geological mapping of the nearby area.

A drilling rig with a 90mm auger and tungsten tip was used to excavate three (3) boreholes for the proposed building to depths of 4.0m within the proposed areas. These are identified as boreholes 1 through 3.

3.1 GPS Co-Ordinates

The boreholes were drilled as close as possible to the anticipated location of the proposed structures. GPS Co-ordinates of these were recorded on site to enable plotting of the borehole locations. The following Table 1 shows these co-ordinates.

Table 1: GPS Co-Ordinates of Boreholes

Location	Longitude	Latitude	Proposed Structure
Borehole 1	143.378376	-31.558386	Cultural Centre
Borehole 2	143.378439	-31.558485	Cultural Centre
Borehole 3	143.378576	-31.558533	Cultural Centre

The boreholes were recorded on site with a Garmin Oregon 550 handheld GPS, using GDA94 Datum. The co-ordinates have an accuracy of +/- 5m. These locations are also shown on site plan in *Appendix B*.

The borehole logs of sub-surface profiles are attached in ***Appendix C***. Disturbed samples (Ds <3kg) were sampled from all relevant boreholes and returned to the Laboratory where Linear Shrinkage testing was performed to assist in the material classification.

4.0 GENERAL SUB-SURFACE CONDITIONS

4.1 Topsoil

Topsoil material was encountered at all borehole locations. The topsoil encountered was generally sandy silt to the depth shown in the borehole logs attached in ***Appendix C***.

4.2 Sub-Soil

Alluvial soils were encountered throughout the boreholes. These generally comprised of slightly moist sandy silts and silty sands to the depths as shown in the borelogs attached in ***Appendix C.***

4.3 Regional Geology

Reference to the New South Wales 1:1,000,000 Geological Map indicates the surrounding area consists of "*Flat to gently undulating plains and dunes of red and brown clayey sand, loam and lateritic soils; largely aeolian".*

Rock was not encountered during this investigation.

4.4 Seismicity

Reference is made to AS1170.4-2007 as per clause 4.1.1 the sites sub-soil class is "C – Shallow Sub-soil".

4.5 Seasonal Surface Movement

From the laboratory test results, as shown attached, an estimated ground surface movement (Ys) was calculated in accordance with AS2870-2011 (using a change in suction at the soil surface $\Delta\mu$ = 1.5pF and a depth of design suction change, Hs = 4.0m) being:

Ys = 45-50mm

The site has mature trees scattered over the area which will cause abnormal soil moisture content and thus , it is our opinion that a Site Classification of 'P' should be adopted for the site in its present condition. The soil reactivity indicates a H1-D soil classification.

Reference is made to Appendix 'H' of AS2870-2011, which gives guidance on the design of footings on reactive clay soils with the effect of trees. The footing design engineer will need to calculate the tree induced differential centre heave mound height (y_m) based on the tree height and distance of the proposed buildings from the tree or group of trees. This value should be used to design a suitable footing design in accordance with section 4 of the code.

5.0 NATA LABORATORY TESTING

Disturbed samples were taken during the field investigation. Laboratory testing was carried out on selected samples of all different material types, with details of the sampling and testing shown below:

Soil Index Properties testing were carried out on samples to aid in classification of the soils encountered and to assist in determining design parameters.

5.1 Linear Shrinkage Testing (L.S)

The shrinkage results are summarised in the below table:

Table 2: Linear Shrinkage Results

Borehole No.	Depth (m)	Proposed Structure	Linear Shrinkage (%)
Borehole 1	0.8	Cultural Centre	3.0
Borehole 1	2.0	Cultural Centre	9.0
Borehole 2	0.8	Cultural Centre	3.5
Borehole 2	2.0	Cultural Centre	7.0
Borehole 3	0.8	Cultural Centre	2.5
Borehole 3	2.0	Cultural Centre	7.0

The above test results confirm the material as low to medium plasticity.

5.2 Acid Sulphates

Acidic ground conditions can be caused by dissolved "aggressive" carbon dioxide, pure and very soft waters, organic and mineral acids and bacterial activity. PH testing was conducted on the site samples to determine if any acidic conditions were present in the soils encountered.

Table 3: PH Testing Results

Borehole No.	Sample Depth (m)	Proposed Structure	PH	Exposure Classification
Borehole 1	0.8	Cultural Centre	7.7	A2
Borehole 2	0.8	Cultural Centre	7.8	A2
Borehole 3	0.8	Cultural Centre	7.0	A2

These results show the exposure classification as per Table 5.2 AS2870-2011. Groundwater was not encountered during this investigation.

6.0 SUB-SURFACE BEARING CAPACITIES

6.1 Bearing Capacities General

All the below soil strengths are applicable to the sites at the time of the investigation.

Elevation of moisture content will cause a marked decrease in bearing capacity with soil types listed.

Table 4: In-Situ Site Bearing Capacities

Borehole No.	Soil Strata	Depth of Strata (m)	Ultimate Base Bearing Capacity (kPa)	Factored Limit State Ø = 0.52 (kPa)
Borehole 1	Very Stiff SILT	0.3-0.5	300	156
Borehole 1	Hard SAND	0.5-4.0	>500	260
Borehole 2	Stiff SILT	0.3-0.6	150	80
Borehole 2	Hard SAND	0.6-4.0	>500	260
Borehole 3	Very Stiff SILT	0.3-0.6	300	156
Borehole 3	Hard SAND	0.6-4.0	>500	260

A Geotechnical reduction factor of 0.52 has been applied to all listed ultimate bearing capacities (reference table 4.3.2 (i) AS2159-2009) low to moderate risk rating.

7.0 EARTHWORKS RECOMMENDATIONS

7.1 Excavations

Excavations within the natural clays will be achievable using conventional earthmoving equipment. The civil contractor should be responsible for selecting excavation equipment based on the proposed excavation depths and equipment capabilities.

7.2 General Construction Filling

All earthworks performed on site must be undertaken in a controlled manner, in accordance with a suitable earthwork's specification. Filling should be placed, compacted, inspected and tested in accordance with the Level 2 requirements of AS3798-2007.

The following conditions should also be satisfied:

- General filling must be compacted to a minimum dry density ratio of 98-100% relative to standard compaction at a moisture content of -2% to +2% of standard optimum moisture content.
- Filling should proceed in layers of 300mm maximum loose thicknesses.
- Layers of filling should be horizontal or benched to suit the surrounding topography.
- The existing subgrade should NOT be used as bulk fill.

7.3 Site Construction Batters

7.3.1 Temporary batter slopes

In soil should be graded no steeper than 2 Horizontal (H) in 1 Vertical (V), and protected from erosion by re-directing any surface water flows from the batter face, revegetating etc.

7.3.2 Permanent batter slopes

Batter slopes in with clay should be no steeper than 3 Horizontal (H) in 1 Vertical (V) and protected from erosion. Alternatively, fill embankments may be retained with properly designed and constructed retaining walls.

8.0 FOUNDATION RECOMMENDATIONS

It is anticipated the proposed footings for the proposed buildings will consist of bored concrete piers and an isolated slab on ground. The bored piers can be designed for a factored ultimate end bearing capacity on hard silty clay of 500kPa and a factored ultimate skin friction of 25kPa. Skin friction should be ignored for the pier depth through fill or minimum 1.5 times the pier diameter, to allow for soil shrinkage and the lower skin friction capacity of the overlying fill.

Workshop slab on ground can be designed as pavement slabs utilising a coefficient of subgrade reaction of k=10,000 kPa/m, short terms Young's Modulus Es=21kPa and long term El=15kPa. The fill material is likely to move differentially given it's varied composition and density. If the slab is not supported by controlled fill or piers, slab unevenness and cracking is to be expected and thus some areas of slab will require replacement before the design life of the slab is reached.

Office slabs supporting plasterboard or brick veneer walls should be designed as raft slabs to AS2870-2011, for the abovementioned site classification. Differential movement of the fill is likely, therefore all floors which support brittle walls should be supported by piers through the fill material.

9.0 CONCLUSION

The testing methods adopted are indicative of the site's sub-surface conditions to the depths excavated and to specific sampling and/or testing locations in this investigation, and only at the time the work was carried out.

The accuracy of geotechnical engineering advice provided in this report may be limited by unobserved variations in ground conditions across the site in areas between and beyond test locations and by any restrictions in the sampling and testing which was able to be carried out, as well as by the amount of data that could be collected given the project and site constraints.

These factors may lead to the possibility that actual ground conditions and materials behaviour observed at the test locations may differ from those which may be encountered elsewhere on the site.

If the sub-surface conditions are found to differ from those described in this report, we should be informed immediately to evaluate whether recommendations should be reviewed and amended if necessary.

Appendix A - General Notes

GEOTECHNICAL INVESTIGATION GENERAL NOTES

This report contains the results of a geotechnical investigation conducted for a specific purpose and client. The results should not be used by other parties, or for other purposes, as they may contain neither adequate nor appropriate information. The investigation does not cover contamination issues unless specifically required to do so by the client.

TEST HOLE LOGGING

The information on the test hole logs (boreholes, test pits, exposures etc.) is based on a visual and tactile assessment, except at the discrete locations where the test information is available (field and/or laboratory results). The borehole logs include both factual data and inferred information. Reference should be made to the relevant sheets for the explanation of logging procedures (Soil and Rock Descriptions, Core Log Sheet Notes etc.).

GROUNDWATER

Unless otherwise indicated, the water levels presented on the borehole logs are the levels of free water or seepage in the test hole recorded at the given time of measuring. The actual groundwater level may differ from this recorded level depending on material permeability's (i.e. depending on response time of the measuring instrument). Further, variations of this level could occur with time due to such effects as seasonal, environmental and tidal fluctuations or construction activities. Confirmation of groundwater levels, phreatic surfaces or piezo metric pressures can only be made by appropriate instrumentation techniques and monitoring programmes.

INTERPRETATION OF RESULTS

The discussion or recommendations contained within this report normally are based on a site evaluation from discrete borehole area. Generalised, idealised or inferred subsurface conditions (including any geotechnical cross-sections) have been assumed or prepared by interpolation and/or extrapolation of these data. As such these conditions are an interpretation and must be considered as a guide only.

CHANGE IN CONDITIONS

Local variations or anomalies in the generalised ground conditions do occur in the natural environment, particularly between discrete borehole locations. Additionally, certain design or construction procedures may have been assumed in assessing the soil-structure interaction behaviour of the site. Furthermore, conditions may change at the site from those encountered at the time of the geotechnical investigation through construction activities and constantly changing natural forces.

Any change in design, in construction methods, or in ground conditions as noted during construction, from those assumed or reported should be referred to this firm for appropriate assessment and comment.

GEOTECHNICAL VERIFICATION

Verification of the geotechnical assumptions and/or model is an integral part of the design process – investigation, construction verification and performance monitoring. Variability is a feature of the natural environment and, in many instances, verification of soil or rock quality, or foundation levels are required. There may be a requirement to extend foundation depths to modify a foundation system or to conduct monitoring because of this natural variability. Allowance for verification by geotechnical personnel accordingly should be recognised and programmed during construction.

FOUNDATIONS

Where referred to in the report, the soil or rock quality, or the recommendation depth of any foundation (piles, caissons footings etc.) is an engineering estimate. The estimate is influenced and perhaps limited, by the fieldwork method and testing carried out in connection with the site investigation, and other pertinent information as has been made available. The material quality and/or foundation depth remains, however, an estimate and therefore liable to variation. Foundation drawings, designs and specifications should provide for variations in the final depth, depending upon the ground conditions at each point of support, and allow for geotechnical verification.

REPRODUCTION OF REPORTS

Where it is desired to reproduce the information contained in our geotechnical report, or other technical information, for the inclusion in contract documents or engineering specification of the subject development, such reproductions should include at least all of the relevant test hole and test data, together with the appropriate standard description sheets and remarks made in the written report of a factual or descriptive nature.

ROCK

Rock Strength

Rock strength is a scale of strength, based on point load index testing, or field testing.

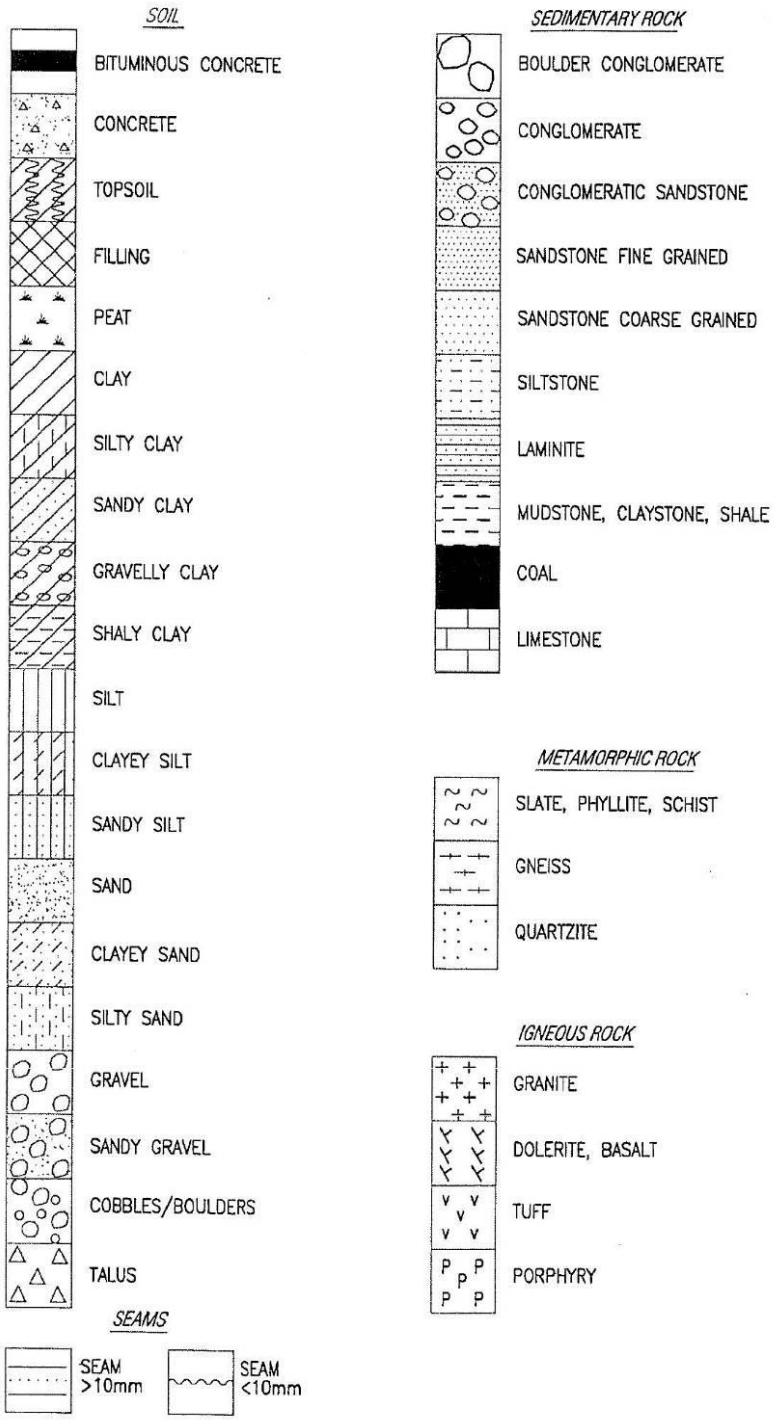
Term	Letter Symbol	Point load index (Mpa) Is (50)	Field guide to strength
Extremely low	EL	< 0.03	Easily remoulded by hand to a material with soil properties.
Very low	VL	0.03 – 0.1	Material crumbles under firm blows with sharp end of pick.
Low	L	0.1 – 0.3	Easily scored by knife, has dull sound under hammer.
Medium	M	0.3 – 1.0	Readily scored with knife, core pieces broken by hand with difficulty
High	H	1 – 3	Rock rings under hammer, core piece broken by pick only.
Very high	VH	3 – 10	Hand specimen breaks with pick after more than one blow.
Extremely high	EH	> 10	Hand specimen breaks with pick after several than one blow.

Rock Weathering

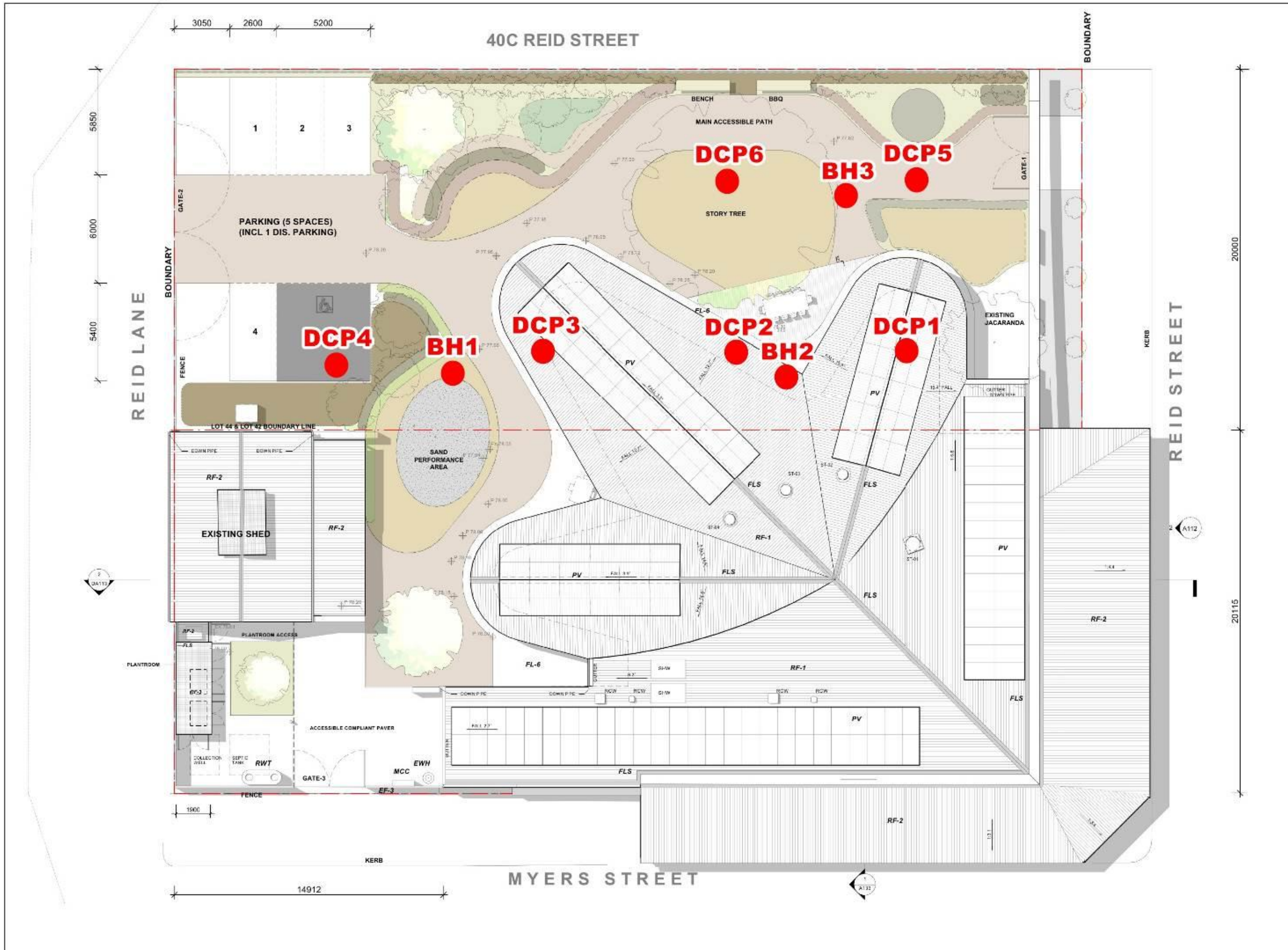
Rock weathering is the degree of rock weathering, determined in the field.

Term	Letter Symbol	Definition
Residual soil	RS	Soil developed on extremely weathered rock.
Extremely weathered rock	XW	Soil is weathered to such an extent that it has soil properties, i.e. it disintegrates or can be remoulded in water.
Distinctly weathered rock	DW	Rock strength usually changed by weathering. The rock may be discoloured, usually by iron staining, porosity is increased.
Slightly weathered rock	SW	Rock is slightly discoloured but shows little or no change of strength from fresh rock.
Fresh rock	FR	Rock shows no sign of decomposition or staining.

GRAPHIC SYMBOLS FOR SOIL & ROCK



Appendix B – Site Plan with Borehole Locations



1 PROPOSED SITE AND ROOF PLAN

GENERAL ABBREVIATIONS

ABBR	DESCRIPTION
EF-3	GALVANISED CUSTOM ORB FENCE
EWH	ELECTRICAL WATER HEATER
FL-6	FLOOR FINISH TYPE 6 - TEXTURED CONCRETE TOPPING
FLS	FLASHING
MCC	MECHANICAL DISTRIBUTION BOARD
PV	SOLAR PANEL
RCW	ROOF AIR COWL (TO ENG DET)
RF-1	ROOF FINISH TYPE - 1, COLORBOND CUSTOM ORB ACCENT, ZINCALUME
RF-2	ROOF FINISH TYPE - 2, GALVANISED TRUE OAK DEEP 21 (REVOLUTION ROOFING)
RF-3	ROOF FINISH TYPE - 3, SCAVENGER SUPPLIES MESH, PLANTROOM ENCLOSURE
RWT	RAIN WATER TANK
SHW	SOLAR HOT WATER PANEL

FOR APPROVAL

DATE	REV	ISSUE	CHECKED BY
03/07/2020	DA5	FOR APPROVAL	KYA
17/07/2020	DA6	FOR APPROVAL	KYA
28/08/2020	DA7	FOR APPROVAL	KYA
13/11/2020	DA8	FOR APPROVAL	KYA

PROJECT NAME: BAAKA CULTURAL CENTRE WILCANNIA
44 Reid St, Wilcannia NSW 2836, Australia

KAUNITZ YEUNG ARCHITECTURE
Level 3, 63 William St Darlinghurst
T +61 2 9007 2098

NO	REV	TITLE	PHASE	SCALE	DATE
DA101	DA8	SITE & ROOF PLAN	DA	1 : 100 @ A1	13/11/2020

Appendix C - Borehole Logs

Barnson
1/36 Darling Street
Dubbo NSW 2830
Telephone: 1300 BARNSON

BOREHOLE NUMBER 1

CLIENT Public Works Advisory **PROJECT NAME** Geotechnical Investigation

PROJECT NUMBER 38166 **PROJECT LOCATION** 44 Reid Street, Wilcannia NSW

DATE STARTED 17/1/22 **COMPLETED** 17/1/22 **R.L. SURFACE** ___ **DATUM** ___

DRILLING CONTRACTOR Barnson **SLOPE** 90° **BEARING** ---

EQUIPMENT Scout 1750 Drill Rig **HOLE LOCATION** Borehole 1

HOLE SIZE 90mm **LOGGED BY** HC **CHECKED BY** NR

NOTES ___

Method	Samples	Depth (m)	Graphic Log	Classification Symbol	Material Description	Dynamic Cone Penetrometer Blows / 100mm	Additional Observations
Flight Auger & Tungsten Carbide (T.C) Bit		0.3			Sandy SILT: brown	0 4 8 12 16 20 24 28 32 0 6 6 9	TOPSOIL
		0.5		ML	Sandy SILT: brown-orange: slightly moist: stiff to hard: low plasticity	5	RESIDUAL
	Disturbed Sample LS = 3.0%	1.0		SM	Silty SAND: orange: slightly moist: very dense: low plasticity	9 9 12 16 17 21 26 29 32	RESIDUAL
		1.5					
		1.9					
	Disturbed Sample LS = 9.0%	2.0		SC	Clayey Silty SAND: pale pink: slightly moist: very dense: low plasticity		RESIDUAL
		2.5					
		3.0					
		3.5					
		4.0					

Borehole 1 terminated at 4m

Barnson
1/36 Darling Street
Dubbo NSW 2830
Telephone: 1300 BARNSON

BOREHOLE NUMBER 2

CLIENT Public Works Advisory **PROJECT NAME** Geotechnical Investigation

PROJECT NUMBER 38166 **PROJECT LOCATION** 44 Reid Street, Wilcannia NSW

DATE STARTED 17/1/22 **COMPLETED** 17/1/22 **R.L. SURFACE** --- **DATUM** ---

DRILLING CONTRACTOR Barnson **SLOPE** 90° **BEARING** ---

EQUIPMENT Scout 1750 Drill Rig **HOLE LOCATION** Borehole 2

HOLE SIZE 90mm **LOGGED BY** HC **CHECKED BY** NR

NOTES

Method	Samples	Depth (m)	Graphic Log	Classification Symbol	Material Description	Dynamic Cone Penetrometer Blows / 100mm	Additional Observations
Flight Auger & Tungsten Carbide (T.C) Bit		0.3			Sandy SILT: brown	0 4 6	TOPSOIL
		0.5		ML	Sandy SILT: brown-orange: slightly moist: stiff to hard: low plasticity	4 4 5	RESIDUAL
	Disturbed Sample LS = 3.5%	0.7		SM	Silty SAND: orange: slightly moist: very dense: low plasticity	10 9 10 10 11 12 14 18 22 27 32	RESIDUAL
		1.0					
		1.5					
		1.8		SC	Clayey Silty SAND: pale orange: slightly moist: very dense: medium plasticity		RESIDUAL
	Disturbed Sample LS = 7.0%	2.0					
		2.5		SC	Clayey Silty SAND: pale pink: slightly moist: very dense: medium plasticity		RESIDUAL
		3.0					
		3.5					
		4.0					

Borehole 2 terminated at 4m

Barnson
1/36 Darling Street
Dubbo NSW 2830
Telephone: 1300 BARNSON

BOREHOLE NUMBER 3

CLIENT Public Works Advisory **PROJECT NAME** Geotechnical Investigation

PROJECT NUMBER 38166 **PROJECT LOCATION** 44 Reid Street, Wilcannia NSW

DATE STARTED 17/1/22 **COMPLETED** 17/1/22 **R.L. SURFACE** _____ **DATUM** _____

DRILLING CONTRACTOR Barnson **SLOPE** 90° **BEARING** ---

EQUIPMENT Scout 1750 Drill Rig **HOLE LOCATION** Borehole 3

HOLE SIZE 90mm **LOGGED BY** HC **CHECKED BY** NR

NOTES _____

Method	Samples	Depth (m)	Graphic Log	Classification Symbol	Material Description	Dynamic Cone Penetrometer Blows / 100mm	Additional Observations
Flight Auger & Tungsten Carbide (T.C) Bit		0.0			Sandy SILT: brown	0 4 3	TOPSOIL
		0.3		ML	Sandy SILT: brown-orange: slightly moist: stiff to hard: low plasticity	9 8 6	RESIDUAL
		0.5					
		0.6		SM	Silty SAND: orange: slightly moist: dense to very dense: low plasticity	7 9 6 8 9 9 8 12 14 21 28 32	RESIDUAL
	Disturbed Sample LS = 2.5%	1.0					
		1.5					
		1.9		SC	Clayey Silty SAND: pale orange: slightly moist: very dense: medium plasticity		RESIDUAL
	Disturbed Sample LS = 7.0%	2.0					
		2.5					
		3.0					
		3.2		SC	Clayey Silty SAND: pale pink: slightly moist: very dense: medium plasticity		RESIDUAL
		3.5					
		4.0					

Borehole 3 terminated at 4m

Appendix D – Dynamic Cone Penetrometer & NATA Laboratory Reports

barnson
DESIGN. PLAN. MANAGE
Barnson Pty Ltd A.C.N 088 342 625

16L Yarrandale Road
Dubbo NSW 2830

Ph: 1300 227 676

Consulting Civil, Structural and Geotechnical Engineers, Environmental Consultants
Project Management, NATA Soil and Concrete Laboratory

Results Of Dynamic Cone Penetrometer Tests

CLIENT: Public Works Advisory
PROJECT: Baaka Cultural Centre
LOCATION: 44 Reid Street, Wilcannia NSW
DATE: 17/1/2022

Reference: 38555-DCP1

Test Number Location	DCP 1 143.378574 -31.558611	DCP 2 143.378536 -31.558563	DCP 3 143.378401 -31.558473	DCP 4 143.37829 -31.558381	DCP 5 143.378574 -31.558443	DCP 6 143.378447 -31.558372	
RL Of Test	Surface	Surface	Surface	Surface	Surface	Surface	

Depth (mm)	DCP Blows	Allowable Bearing Capacity (kPa)	DCP Blows	Allowable Bearing Capacity (kPa)	DCP Blows	Allowable Bearing Capacity (kPa)	DCP Blows	Allowable Bearing Capacity (kPa)	DCP Blows	Allowable Bearing Capacity (kPa)	DCP Blows	Allowable Bearing Capacity (kPa)	DCP Blows	Allowable Bearing Capacity (kPa)
100	4	100	4	100	6	150	3	65	4	100	7	180	8	200
200	5	120	6	150	6	150	6	150	3	65	14	275	8	200
300	8	200	4	100	9	225	5	120	9	225	10	240	12	260
400	8	200	5	120	5	120	5	120	8	200	8	200	15	280
500	7	180	4	100	9	225	8	200	6	150	7	180	End Test	
600	9	225	10	240	9	225	7	180	7	180	6	150		
700	9	225	9	225	12	260	10	240	9	225	8	200		
800	11	250	10	240	16	290	12	260	6	150	6	150		
900	12	260	10	240	17	300	12	260	8	200	8	200		
1000	14	275	11	250	21	>300	15	280	9	225	11	250		
1100	12	260	12	260	26	>300	19	>300	9	225	10	240		
1200	16	290	14	275	29	>300	26	>300	8	200	14	275		
1300	21	>300	18	>300	32	>300	32	>300	12	260	19	>300		
1400	28	>300	22	>300					14	275	26	>300		
1500	32	>300	27	>300					21	>300	32	>300		
1600			32	>300					28	>300				
1700									32	>300				
1800														
1900														
2000														

Material Description: Sandy SILT
Above Values for Cohesive Soils only
Moisture Content of Soil: Dry

Comments:
1) Geotechnical reduction factor of 0.55 has been applied to above values. Confirm Øg with project documents
2) Estimated Bearing Values (kPa) are based on the in-situ moisture at the time of testing
3) kPa specification values to be confirmed by the client
4) Barnson advises that Gravel and Rock Material is not suitable for DCP testing and results may not be accurate.
5) All instructions and Testing method Advised by the client
6) Alternate methods like proof rolling or compaction testing maybe better suited for gravel and rocky materials
7) The material shown in photos may not suit DCP testing. Results maybe inaccurate

Test Method: AS1289.6.3.2, Cone Penetrometer [X]

Tested By: TS

Checked By: NR

Authorised By NR

Material Test Report

Barnson Pty Ltd
Dubbo Laboratory
16 L Yarrandale Road Dubbo NSW 2830
Phone: 1300 BARNSON
Email: nreardon@barnson.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Nick Reardon
Laboratory Manager
NATA Accredited Laboratory Number: 9605

Report Number: **38166-1**
Issue Number: 1
Date Issued: 01/02/2022
Client: Public Works Advisory - Bathurst
140 William Street, Bathurst NSW 2795
Contact: Andrew Day
Project Number: 38166
Project Name: Geotechnical Investigation
Project Location: 44 Reid Street, Wilcannia NSW
Work Request: 5901
Sample Number: D22-5901A
Date Sampled: 17/01/2022
Dates Tested: 18/01/2022 - 28/01/2022
Sampling Method: AS 1289.1.2.1 6.5.3 - Power auger drilling
Site Selection: Selected by Client
Sample Location: **Borehole 1, Depth: 800mm**
Material: Orange Silty SAND

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	3.0		
Cracking Crumbling Curling	None		

Material Test Report

Barnson Pty Ltd
Dubbo Laboratory
16 L Yarrandale Road Dubbo NSW 2830
Phone: 1300 BARNSON
Email: nreardon@barnson.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Nick Reardon
Laboratory Manager
NATA Accredited Laboratory Number: 9605

Report Number: **38166-1**
Issue Number: 1
Date Issued: 01/02/2022
Client: Public Works Advisory - Bathurst
140 William Street, Bathurst NSW 2795
Contact: Andrew Day
Project Number: 38166
Project Name: Geotechnical Investigation
Project Location: 44 Reid Street, Wilcannia NSW
Work Request: 5901
Sample Number: D22-5901B
Date Sampled: 17/01/2022
Dates Tested: 18/01/2022 - 28/01/2022
Sampling Method: AS 1289.1.2.1 6.5.3 - Power auger drilling
Site Selection: Selected by Client
Sample Location: **Borehole 1, Depth: 2.0m**
Material: Orange Silty SAND

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	9.0		
Cracking Crumbling Curling	None		

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140 William Street, Bathurst NSW 2795
Contact: Andrew Day
Project Number: 38166
Project Name: Geotechnical Investigation
Project Location: 44 Reid Street, Wilcannia NSW
Work Request: 5901
Sample Number: D22-5901C
Date Sampled: 17/01/2022
Dates Tested: 18/01/2022 - 28/01/2022
Sampling Method: AS 1289.1.2.1 6.5.3 - Power auger drilling
Site Selection: Selected by Client
Sample Location: **Borehole 2, Depth: 800mm**
Material: Orange Silty SAND

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	3.5		
Cracking Crumbling Curling	None		

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Issue Number: 1
Date Issued: 01/02/2022
Client: Public Works Advisory - Bathurst
140 William Street, Bathurst NSW 2795
Contact: Andrew Day
Project Number: 38166
Project Name: Geotechnical Investigation
Project Location: 44 Reid Street, Wilcannia NSW
Work Request: 5901
Sample Number: D22-5901D
Date Sampled: 17/01/2022
Dates Tested: 18/01/2022 - 28/01/2022
Sampling Method: AS 1289.1.2.1 6.5.3 - Power auger drilling
Site Selection: Selected by Client
Sample Location: **Borehole 2, Depth: 2.0m**
Material: Pale Orange Clayey Silty SAND

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	7.0		
Cracking Crumbling Curling	Curling		

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Report Number: **38166-1**
Issue Number: 1
Date Issued: 01/02/2022
Client: Public Works Advisory - Bathurst
140 William Street, Bathurst NSW 2795
Contact: Andrew Day
Project Number: 38166
Project Name: Geotechnical Investigation
Project Location: 44 Reid Street, Wilcannia NSW
Work Request: 5901
Sample Number: D22-5901E
Date Sampled: 17/01/2022
Dates Tested: 18/01/2022 - 28/01/2022
Sampling Method: AS 1289.1.2.1 6.5.3 - Power auger drilling
Site Selection: Selected by Client
Sample Location: **Borehole 3, Depth: 800mm**
Material: Orange Silty SAND

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	2.5		
Cracking Crumbling Curling	Cracking		

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Material Test Report

Report Number: **38166-1**
Issue Number: 1
Date Issued: 01/02/2022
Client: Public Works Advisory - Bathurst
140 William Street, Bathurst NSW 2795
Contact: Andrew Day
Project Number: 38166
Project Name: Geotechnical Investigation
Project Location: 44 Reid Street, Wilcannia NSW
Work Request: 5901
Sample Number: D22-5901F
Date Sampled: 17/01/2022
Dates Tested: 18/01/2022 - 28/01/2022
Sampling Method: AS 1289.1.2.1 6.5.3 - Power auger drilling
Site Selection: Selected by Client
Sample Location: **Borehole 3, Depth: 2.0m**
Material: Pale Orange Clayey Silty SAND

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	7.0		
Cracking Crumbling Curling	None		

barnson
DESIGN.PLAN.MANAGE
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WORLD RECOGNISED ACCREDITATION

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