Site classification report

1556 Henry Lawson Drive, St Fillans NSW 2850

Ref: R43408r
Date: 19 March 2024

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Document control					
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Rev	**Report number**	**Date**	**Prepared by**	**Checked by**	**Revision details/status**
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1. Summary

1.1 Investigation summary

A site investigation was conducted for a proposed new residential dwelling at 1556 Henry Lawson Drive, St Fillans NSW. This report contains details of the geotechnical site investigation and the soil test conducted, and includes classification for swelling, shrinkage movement, Atterberg limits and soil aggressiveness.

Soil sampling was conducted according to the Australian Standard 1726 and site classification in accordance with Australian Standard 2870 by qualified field and laboratory personnel.

1.2 Site conditions and soil profile summary

Soil at borehole location comprised silty sand over gravelly sand to gravelly to clayey sand and clayey sand and sandy clay subsoil with abundant grey mottles to the drilling depth. The soil moisture was less than plastic limit to equal to plastic limit to the drilling depth.

1.3 Site classification summary

The site classification is **Class M-D (Moderately reactive)** with deep seated moisture change if the foundations are extended into the natural subsoil below the topsoil with adequate bearing capacity. The soil samples analysed indicate the site has an estimated maximum surface movement (*Ys*) of 20-25mm.

All footings for the same structure should be founded on strata of similar soil stiffness and reactivity to minimise the risk of differential movements.

Topsoil, soft soil, or uncontrolled fill are not suitable for foundations. Footings should be founded on natural soil or controlled fill in accordance with AS3798 (*Guidelines on Earthworks for Commercial and Residential Developments*).

The assessment and site classification are based on conditions, soil profile and soil moisture outlined in this report. Site conditions can vary due to fluctuations in seasonal factors and soil moisture. The site should be reassessed if surface or subsurface conditions differ from those described in the report. The site should be reassessed if conditions change including, but not limited to, removal of trees, cut earthworks or placement of fill.

Soil management around the perimeter of the building should be aimed at avoiding extremes in subsoil moisture as this can lead to excessive shrinkage and swelling of the soil and footing movement. Owners are referred to the soil management section and Appendix 5 for more detail. Report limitations are described in Appendix 6.

2. Introduction

A site investigation was conducted for a proposed new residential dwelling at 1556 Henry Lawson Drive, St Fillans NSW. A geotechnical investigation was undertaken over the site to classify the soil for shrink swell movement (reactivity) and exposure classification for concrete to enable footing design. Soil samples were analysed for linear shrinkage, liquid limit, saturated extract electrical conductivity (EC_e) and pH.

3. Objectives

A site investigation was conducted in accordance with the Australian Standards 1726 *Geotechnical Site Investigation*. The site classification in accordance with the Australian Standard 2870 *Residential Slabs and Footings* to determine the soil classification status of the proposed building site. The classification assessment in this report is to provide guidance in the design of slabs and footings of residential buildings or commonly encountered foundations.

4. Investigation

4.1 Site location and ownership

Client	Matt Stott
Location	1556 Henry Lawson Drive Lot 248 DP755429 St Fillans NSW 2850
Mailing address	PO Box 1250 Mudgee NSW 2850

4.2 Field inspection

The site was inspected on 1 March 2024. Details are contained in Table 1.

Table 1. General site information

Area	Approximately 106.4ha
Topography	Mid slope, 2-5% Southeast
Vegetation	Scattered grass cover
History and land use	Vacant
Proposed building	New residential dwelling
Trees nearby	Nil
Others	Nil

4.3 Site investigation

Soil properties were determined by soil borings with a Landcruiser mounted Eziprobe drill rig with flight auger. The test holes were drilled on 1 March 2024.

The location of each investigation site is described in Appendix 1. Bore logs of each location were taken and these are reported in Appendix 2. Borehole locations, sampling and description of the soil profile was made, and characteristics estimated as per AS 1726.

5. Results

5.1 Site conditions and soil profile

Soil at borehole location comprised pale brown silty sand over yellow gravelly sand to yellowish brown gravelly to reddish brown clayey sand and clayey sand and sandy clay subsoil with abundant grey mottles to the drilling depth. The soil moisture was less than plastic limit to equal to plastic limit to the drilling depth.

5.2 Laboratory analysis results summary

Disturbed soil samples were collected from representative layers and evaluated by determining Atterberg Limits. Laboratory results for samples evaluated are presented in full as the laboratory report in Appendix 3. The soil had a low to moderate liquid limit and low linear shrinkage.

5.3 Soil consistency

Soil consistency at the borehole locations was firm to stiff to the drilling depth

5.4 Aggressive soils

Soil saturated extract electrical conductivity (EC_e) was determined to be <4dS/m in the soil sample tested. Soil pH was 6.2 for the soil sample analysed (Appendix 4).

5.5 Groundwater

The site is subject to surface water and shallow groundwater flows. Heavy grey mottled clays were identified throughout the soil profile indicating shallow seasonal groundwater flows. Groundwater levels fluctuate with climate and site conditions.

6. Recommendations

6.1 Site classification

The site classification is **Class M-D (Moderately reactive)** with deep seated moisture change if the foundations are extended into the natural subsoil below the topsoil with adequate bearing capacity.

An estimation of design surface movement (*Ys*) was determined from the shrink swell index (AS1289.7.1.1), soil index tests and soil profile identification as recommended in AS 2870. The soil samples analysed indicate the site has an estimated maximum surface movement (*Ys*) of 20-25mm.

All footings for the same structure should be founded on strata of similar soil stiffness and reactivity to minimise the risk of differential movements.

Topsoil, soft soil, soil with inadequate bearing capacity or uncompacted fill are not suitable for foundations. Footings should be founded on natural soil or controlled fill in accordance with AS3798 (*Guidelines on Earthworks for Commercial and Residential Developments*).

Site classification by surface movement

Classification class	Maximum design surface movement (Ys)
S (slightly reactive)	0-20 mm
M (moderately reactive)	20-40 mm
H1 (highly reactive)	40-60 mm
H2 (highly reactive)	60-75 mm
E (extremely reactive)	>75 mm
P (abnormal site conditions)	-

The assessment and site classification are based on conditions, soil profile and soil moisture outlined in this report. Site conditions can vary due to fluctuations in seasonal factors and soil moisture. The site should be reassessed if surface or subsurface conditions differ from those described in the report. The site should be reassessed if conditions change including, but not limited to, removal of trees, cut earthworks or placement of fill.

6.2 Exposure classification

Soil saturated extract electrical conductivity (EC_e) was determined to be <4dS/m in the soil sample tested. Soil pH was 6.2 for the soil sample analysed. Exposure classification for concrete is A2 (Appendix 4).

6.3 Surface water and groundwater

Adequate surface and subsurface drainage are recommended to reduce abnormal moisture changes and maintain satisfactory footing performance. Additional information to be implemented for the design, installation and maintenance of surface and subsurface drainage is outlined in AS2870 and CSIRO documents BTF18, BTF19 and BTF22.

6.4 Foundation maintenance

Foundation maintenance needs to be maintained in accordance with CSIRO document BTF18, *Foundation Maintenance and Footing performance – A Homeowners Guide.*

7. Soil management

Soil classifications are based on the characteristic surface movement that has 5% chance of being exceeded in the life of building, which may be taken as 50 years according to AS2870.

Backfill material should be suitably compacted according to the Australian standards and time allowed for settlement.

It is important that the soil around the perimeter of the dwelling be maintained to prevent extreme moisture changes as this can lead to excessive shrinkage and swelling of the soil and footing movement.

Excessive watering of gardens around the perimeter should be avoided. Construction of sub surface drains and perimeter paths can also be useful to prevent excessive wetting and drying of the subsoil.

Drainage should be designed and constructed to avoid any possibility of water ponding against or near the dwelling.

The ground in the immediate vicinity of the dwelling should be graded to slope 50mm away from the dwelling over a distance of 1 metre from the dwelling. Any paving should also be suitably sloped. Important information about the site classification is presented in Appendix 5. Report limitations are in Appendix 6.

8. References

AS 1726 Geotechnical Site Investigations

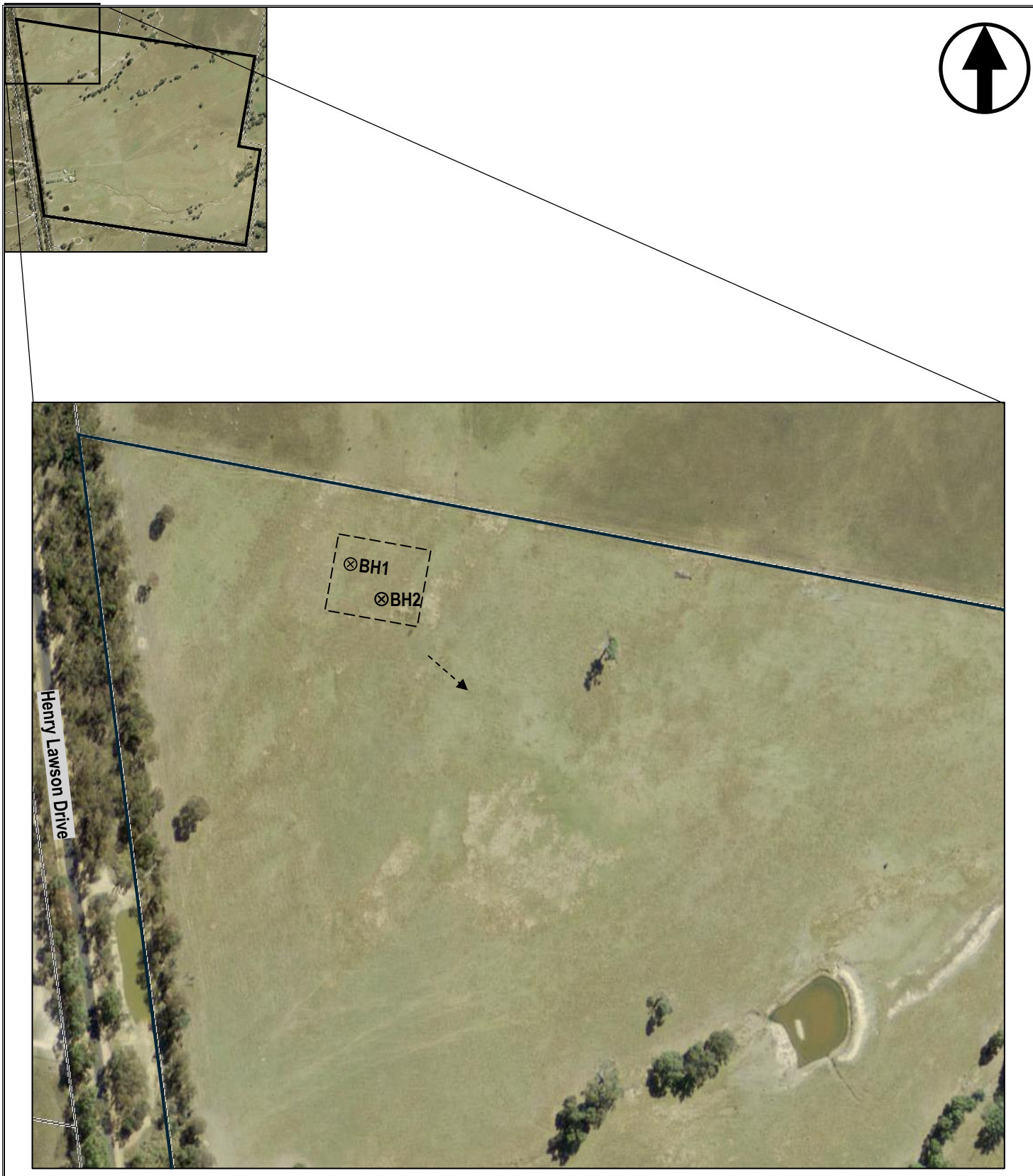
AS 2870 *Residential Slabs and Footings - Construction* (Standards Australia: Homebush)

AS 3798 Guidelines *on Earthworks for Commercial and Residential Developments*

Meyerhof GG (1976) *Bearing Capacity and Settlement of Pile Foundations* (American Society of Civil Engineers)

Appendices

Appendix 1. Aerial image and borehole locations
Appendix 2. Bore logs
Appendix 3. Soil index properties test report
Appendix 4. EC and pH results and aggressive soils extract from *AS 2870*
Appendix 5. Important information about the site classification report
Appendix 6. Limitations of the investigation
Appendix 7. Soil Descriptions and Abbreviations



Legend

⊗ Borehole

Proposed building location (approximate location)

Slope

Lot boundary

Approximate Scale 1:2500

0 25 50 100m

Appendix 1. Aerial image and borehole locations		
1556 Henry Lawson Drive, St Fillans NSW 2850		
	Envirowest Consulting Pty Ltd	
Job: R43408r	Drawn by: HT	Date: 8/03/2024

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Geotechnical Log - Borehole

1

UTM	: 55H	**Drill Rig**	: Eziprobe Landcruiser	**Job Number**	: 43408
Easting (m)	: 746,742.87	**Driller Supplier**	: Envirowest Consulting	**Client**	: Mat Stott
Northing (m)	: 6,407,351.71	**Logged By**	: HT	**Project**	: R
Ground Elevation	: 502.04 (m)	**Reviewed By**	: AR	**Location**	: 1556 Henry Lawson Drive, Saint Fillans NSW, Australia
Total Depth	: 3 m BGL	**Date**	: 01/03/2024	**Loc Comment**	:

DCP graph	Depth (m)	Soil Origin	Graphic Log	Classification Code	Material Description	Moisture	Consistency/Density	Samples: Disturbed sample	Remark
	0.2	Topsoil		SM	Topsoil Silty SAND (SM) : loose to medium dense, pale brown, fine grained, moist.	M	L-MD		
		Natural		SW	Natural Gravelly SAND (SW) : medium dense to dense, yellow, fine to medium grained, medium sized gravel, trace low plasticity clay, moist.		MD-D	D	
	1 1	Natural		SC	Natural Gravelly to clayey SAND (SC) : dense to very dense, medium plasticity clay, yellow brown, medium grained, fine sized gravel, moist, with grey mottles .		D-VD		
	1.4	Natural		SC	Natural Clayey SAND (SC) : dense, medium plasticity clay, reddish brown, fine grained, with fine sized gravel, moist, grey mottles .		D	D	
	2 2	Natural		CI-CH	Natural Sandy to gravelly CLAY (CI-CH) : stiff, medium to high plasticity, reddish brown, fine to medium sized gravel, fine to medium grained sand, inorganic, w ≈ pl, heavy grey mottles .	w ≈ PL	St	D	
	3				**1 Terminated at 3m**				

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Geotechnical Log - Borehole

2

UTM	: 55H	**Drill Rig**	: Eziprobe Landcruiser	**Job Number**	: 43408
Easting (m)	: 746,759.02	**Driller Supplier**	: Envirowest Consulting	**Client**	: Mat Stott
Northing (m)	: 6,407,344.71	**Logged By**	: HT	**Project**	: R
Ground Elevation	: 502.21 (m)	**Reviewed By**	: AR	**Location**	: 1556 Henry Lawson Drive, Saint Fillans NSW, Australia
Total Depth	: 3 m BGL	**Date**	: 01/03/2024	**Loc Comment**	:

DCP graph	Depth (m)	Soil Origin	Graphic Log	Classification Code	Material Description	Moisture	Consistency/Density	Samples	Remark
	0	Topsoil		SM	Topsoil Silty SAND (SM) : loose to medium dense, pale brown, fine grained, moist.	M	L-MD		
	0.2	Natural		SW	Natural Gravelly SAND (SW) : medium dense to dense, yellow, fine to medium grained, medium sized gravel, trace low plasticity clay, moist.		MD-D		
	1	Natural		SC	Natural Gravelly to clayey SAND (SC) : dense to very dense, medium plasticity clay, yellow brown, medium grained, fine sized gravel, moist, with grey mottles .		D-VD		
	1.4	Natural		SC	Natural Clayey SAND (SC) : dense, medium plasticity clay, reddish brown, fine grained, with fine sized gravel, moist, grey mottles .		D		
	2	Natural		CI-CH	Natural Sandy CLAY (CI-CH) : firm to stiff, medium to high plasticity, brown, fine to medium grained sand, with fine sized gravel, inorganic, w ≈ pl, heavy grey mottles .	w ≈ PL	F-St		
	2.1								
	3				**2 Terminated at 3m**				

Material Test Report

Report Number: **43408-1**
Issue Number: 1
Date Issued: 19/03/2024
Client: Matt Stott

Project Number: 43408
Project Name:
Project Location: 1556 Henry Lawson Dr, Mudgee, NSW, 2850
Work Request: 1403
Date Sampled: 04/03/2024
Dates Tested: 04/03/2024 - 14/03/2024
Sampling Method: AS 1289.1.2.1 6.5.3 - Power auger drilling
Preparation Method: AS 1289.1.1 - Sampling and Preparation of Soils
Location: 1556 Henry Lawson Dr, Mudgee, NSW, 2850

Envirowest Consulting Pty Ltd
Envirowest Testing Services
9 Cameron Place Orange NSW 2800
Phone: (02) 6361 4954
Email: admin@envirowest.net.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Ethan Lewin
Laboratory Manager
NATA Accredited Laboratory Number: 15372

Sample Details					
Sample Number	O24-1403A	O24-1403B	O24-1403C		
Date Sampled	04/03/2024	04/03/2024	04/03/2024		
Sample Location	BH1	BH1	BH1		
Sample Depth	800mm	1500mm	2600mm		
Material	Pale yellow, gravelly sand	Red brown, clayey sand	Red brown, silty clay		
Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)				**Min**	**Max**
Sample History	Oven Dried	Oven Dried	Oven Dried		
Preparation Method	Dry Sieve	Dry Sieve	Dry Sieve		
Liquid Limit (%)	14	23	27		
Plastic Limit (%)	**	**	**		
Plasticity Index (%)	**	**	**		
Linear Shrinkage (AS 1289 3.4.1)				**Min**	**Max**
Sample History	Oven Dried	Oven Dried	Oven Dried		
Preparation Method	Dry Sieve	Dry Sieve	Dry Sieve		
Moisture Condition Determined By	AS 1289.3.1.2	AS 1289.3.1.2	AS 1289.3.1.2		
Linear Shrinkage (%)	0.5	5.0	6.0		
Cracking Crumbling Curling	None	Curling	Curling		

Appendix 4. EC and pH results

Laboratory Report

Client:	Matt Stott PO Box 1250 Mudgee NSW 2850
Site:	1556 Henry Lawson Drive St Fillans NSW 2850
Report Number:	R43408r
Tests Completed:	07/03/2024

Test	Units	Borehole and depth (mm)
		1 (600)
Field Texture	**Texture Class**	Gravelly Sand
pH		6.2
Electrical conductivity	**dS/m**	0.04
Saturated extract electrical conductivity (ECe)	**dS/m**	0.08

Tested by: Thilak Suresh 07/03/2024

Reference Methods:

Field texture: McDonald RC, Isbell RF, Speight JG, Walker, Hopkins MS (1990) Australian Soil and Land Survey Field Handbook pp.115-124 (Inkata Press: Melbourne)

pH: AS1289.4.3.1-1997 Method of testing soil for engineering purposes – Soil Chemical Tests-Determination of the pH value of a soil – Electrometric method

Salinity: Rayment GE and Higginson FR (1992) Australian Laboratory Handbook of Soil and Water Chemical Methods (Method 3A1, pp.15-16) (Inkata Press Melbourne) Electrical conductivity of saturated extract is based on conversions of EC (1:5) and soil texture class, to give a more accurate assessment of soil salinity hazard (Salavich PG and Peterson GH (1993) Estimating the electrical conductivity of soil paste extracts from 1:5 soil water suspensions and texture. Australian Journal of Soil Research 31, 3-81)

Appendix 4. Aggressive soils, extract from Australian Standards, *AS 2870.*

Exposure classification for concrete in saline soils

Saturated extract electrical conductivity (EC_e), *dS/m*	Exposure classification
<4	A1
4-8	A2
8-16	B1
>16	B2

Notes:

1. Guidance on concrete in saline soils can be found in CCAA T56
2. Exposure classifications are from AS 3600
3. The currently accepted method of determining the salinity level of the soil is by measuring the extract electrical conductivity (*EC*) of a soil and water mixture in deciSiemens per metre (dS/m) and using conversion factors that allow for the soil texture, to determine the saturated extract electrical conductivity (EC_e)
4. The division between a non-saline and saline soil is generally regarded as an EC_e value of 4dS/m, therefore no increase in the minimum concrete strength is required below this value

Exposure classification for concrete in sulfate soils

Exposure conditions			Exposure classification	
Sulfates (expressed as SO_4)*		pH	Soil conditions A**	Soil conditions B†
In soil (ppm)	In groundwater (ppm)			
<5,000	<1,000	>5.5	A2	A1
5,000-10,000	1,000-3,000	4.5-5.5	B1	A2
10,000-20,000	3,000-10,000	4-4.5	B2	B1
>20,000	>10,000	<4	C2	B2

* Approximately 100ppm SO_4 = 80ppm SO_3

** Soil conditions A – high permeability soils (e.g. sands and gravels) that are in groundwater

† Soil conditions B – low permeability soils (e.g. silts and clays) or all soils above groundwater

Minimum design characteristic strength (f_c') and curing requirements for concrete

Exposure classification	Minimum f_c'MPa	Minimum initial curing requirement
A1	20	Cure continuously for at least 3 days
A2	25	
B1	32	Cure continuously for at least 7 days
B2	40	
C1	≥50	
C2	≥50	

Minimum reinforcement cover for concrete

Exposure classification	Minimum cover in saline soils * mm	Minimum cover in sulfate soils ** (mm)
A1	See Clause 5.3.2	40
A2	45	50
B1	50	60
B2	55	65
C1	†	70
C2	†	85

* Where a damp-proofing membrane is installed, the minimum reinforcement cover in saline soils may be reduced to 30mm.

** Where a damp-proofing membrane is installed, the minimum reinforcement cover in sulfate soils may be reduced by 10mm.

† Saline soils have a maximum exposure classification of B2 as per Table 5.1.

Appendix 5. Important information about the site classification report

Background
The intention of the Australian Standard 2870-2011, Residential slabs and footings is to provide guidance in the design of slabs and footings of residential buildings on commonly encountered foundations. This involves (1) site classification, (2) structural design and construction and (3) site maintenance after construction. The classification assessment in this report is the first step in providing a footing system for a residence, which will have a low risk of inadequate performance (Appendix B AS2870-2011). Even significant cracking to widths of over 3 mm usually presents only aesthetic rather than structural problems. Some minor problems should be expected during settlement or in periods of drought.

Classification
AS2870 establishes a classification system whereby reactive sites (unaffected by filling) are designated slightly, moderately, highly, or extremely reactive based on the range of ground surface movements anticipated and which are likely to have a less than 5% chance of being exceeded in the design life of the structure. Where the foundation conditions at a site need to consider aspects in addition to, or other than soil reactivity, the site is classified P.

It is neither possible nor economical to design for the extreme conditions that could occur in the foundation if a site is not properly maintained. The recommended foundation maintenance is described below. Some minor cracking and movement will occur in a significant proportion of houses, especially on reactive clays.

The method of subsurface investigation has been described in the attached report and it usually involves one or more boreholes or test pits in each lot. It may also involve the inspection of exposures in road cuttings and trenches. In making the assessment there is a risk that variations which may occur between tests or exposure locations may not be detected. The number of test pit locations undertaken is a professional estimate to provide a description of the general soil profile at the site. No subsurface investigation, no matter how comprehensive, can reveal all details and anomalies. Small local variations such as deep topsoil, fill associated with local grubbing of tree stumps, and previous trenches or pits may be undetected. If subsoil conditions encountered during the footing excavation are different from those described in the report, reclassification may be necessary. The site should be reassessed and may require revision of the classification and footing design.

Most sites are not level and often require cutting and filling to provide a level platform for construction. AS2870-2011 specifies the classification should be revised if (a) the depth of the cut exceeds 0.5m, or (b) the depth of compacted fill exceeds 0.4 m for clay or 0.8m for sand.

Foundation maintenance
All soils are affected by water. Silts are weakened by water and some sands can settle if heavily watered, but most problems arise on clay foundations. Clays swell and shrink due to changes in moisture. Sands, silts and clays should be protected from becoming extremely wet. Sites classified as M, H or E shall be maintained at essentially stable moisture conditions and extremes of wetting and drying prevented. This requires attention to the following:

(a) Drainage of the site. The site shall be graded and drained so that water cannot pond against or near the house. The ground immediately adjacent to the house shall be graded to a uniform fall of 50mm minimum away from the house over the first metre. The sub floor space for houses with suspended floors shall be graded or drained to prevent ponding, where this may affect the performance of the footing system. The site drainage requirement shall be maintained for the economic life of the building.
(b) Limitation on gardens. The development shall not interfere with the drainage requirements or the sub floor ventilation and weep hole drainage systems. Garden beds adjacent to the house should be avoided. Care should be taken to avoid over watering of gardens close to the house footings.
c) Restrictions on trees and shrubs. Planting of trees and shrubs should be avoided near the foundations of a house on reactive sites as they can cause damage, even at substantial distances, due to the drying of the clay. To reduce, but not eliminate the possibility of damage, trees should be restricted to a distance of 1 times the mature tree height for Class H and M, and 1.5 times mature tree height for Class E. Where groups of trees are involved, distances should be increased. Removal of trees from the site can also cause similar problems.
(d) Repair of leaks. Leaks in plumbing, including storm water and sewage should be repaired promptly.

A more extensive discussion of foundation maintenance is contained in CSIRO pamphlet BTF18 “Guide to Home Owners on Foundation Maintenance and Footing performance”.

Class P sites
The presence of fill, compressible soils at depth or slope may influence footing performance and these need to be considered in foundation design.

Appendix 6. Limitations of the investigation

The engineering logs describe subsurface conditions only at a specific borehole location and inferred boundaries between geotechnical units may vary.

Ground conditions can vary over relatively short distances and it may be necessary to carry out additional investigations for specific excavation and building sites. Once specific proposals are known a geotechnical review should be undertaken and if necessary additional investigations commissioned to provide the level of information required for assessing design parameters. Sub-surface conditions relevant to construction works should be assessed by contractors who can make their own interpretation of the factual data provided as borehole log and test results and perform any additional tests as necessary for their own purposes. A geotechnical engineer should be engaged to review subsurface condition during construction stages to confirm that subsurface conditions are consistent with design assumptions.

This report has been prepared for the use of the client with the express intent of providing sufficient information as described in objectives for design purposes, client requirements and cost constraints. The level of confidence of the conclusion reached is governed by the scope of the investigation and the availability and quality of existing data. Where limitations or uncertainties are known, they are identified in the report. No liability can be accepted for failure to identify conditions or issues which arise in the future, and which could not reasonably have been predicted using the scope of the investigation and the information obtained.

The investigation identifies the actual subsurface conditions only at those points where samples are taken, when they are taken. Data derived through sampling and subsequent laboratory testing are interpreted by geologists, engineers or scientists who then render an opinion about overall subsurface conditions, the nature and extent of the investigation and its likely impact on the proposed development. Actual conditions may differ from those inferred to exist, because no professional, no matter how well qualified, and no sub surface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock, or time. The actual interface between materials may be far more gradual or abrupt than a report indicates.

There are always some variations in subsurface conditions across a site that cannot be defined even by exhaustive investigation. Hence it is unlikely that the measurements and values obtained from sampling and testing during the investigation will represent the extremes of conditions which exist within the site. Actual conditions in areas not sampled may differ from predictions. It is thus important to understand the limitations of the investigation and recognise that Envirowest Consulting Pty Ltd are not responsible for these limitations.

Appendix 7. Soil Descriptions and Abbreviations

These notes summarize abbreviations commonly used in borelogs and test pit reports.

Classification code

GW well graded gravels, gravel sand, no fines
GP poorly graded gravels
GM silty gravel, poorly graded gravel silt sand
GC clayey gravels, poorly graded gravel sand clay
SW well graded sands, gravely sands, no fines
SP poorly graded sands, gravely sands, no fines
SM silty sands, poorly graded sand clay
SC clayey sands, poorly graded sand clay
CL inorganic clays, low plasticity, gravely clay, sandy clay, silty clay, lean clay
CI inorganic clays, medium plasticity, gravely clay, sandy clay, silty clay, lean clay
OL organic silt, organic silty clay, low plasticity
ML inorganic silts, fine sandy or silty soils with low plasticity
MH inorganic silts, fine sandy or silty soils with medium plasticity
CH inorganic clay, high plasticity, fat clays
OH organic clay medium to high plasticity
Pt peat, or other highly organic soils

Samples

U undisturbed
D disturbed
W water sample
B bulk
E environmental sample
VOC volatile organic compounds

Moisture

D Dry
M Moist, can be moulded
W Wet, free water on hands
PL plastic limit
LL liquid limit

Consistency (approx. shear strength)

Hand penetrometer or description:

VS very soft, exudes between fingers when squeezed (<25)
S soft, moulded by light finger pressure (25-50)
F firm, moulded slightly by fingers (50-100)
St stiff, cannot be moulded by fingers, indented by thumb (100-200)
VSt very stiff, indented with difficulty by thumb (200-300)
H Hard (>300)

Density

NP non plastic
T trace
VL very low
L low
M medium
H high
VH very high

Plasticity

VL very loose
L loose
M medium
D dense
VD very dense

Degree of weathering

EW Extremely weathered
HW Highly weathered
MW Moderately weathered
SW Slightly weathered
Fs Fresh Stained
Fr Fresh

Origin

An interpretation is provided based on observations of landform, geology, and fabric, and many further include assignment of stratigraphic unit. Typical origin descriptions include

Residual Formed directly from in situ weathering with no visible structure or fabric of the parent rock or soil

Alluvial Deposited by streams and rivers (may be applied more generically as transported by water)

Topsoil Surficial soil, typically with higher levels of organic material. Topsoils buried by other transported soils are termed 'remnant topsoil'

Fill Any material which has been placed by anthropogenic process

Testing

PID Photoionization detectors
SPT Standard penetrometer test
CPT Cone penetrometer test
PP Pocket penetrometer
UCS Unconfined compressive strength
PSP Perth Sand Penetrometer
ASS Acid sulphate soils test
ECE Electrical conductivity of the saturated extract
CBR California bearing ratio
DPSH Dynamic probing super heavy

DCP Dynamic Cone Penetrometer Testing

The dynamic cone penetrometer test comprises the measurement of the soil resistance to a steel rod driven into the ground by a dropped weight. The DCP test is a simple manual test used in both sandy and clayey soils. The test is a measure of the shear strength of the soil at relatively shallow depth. The equipment uses a 9kg sliding weight with a drop height of 510mm. It is fitted with a conical tip. The equipment can be adjusted for a fall of 600mm and use of a blunt tip in accordance with AS1289.6.3.3.

Others

RQD Rock quality designation
TCR Temperature coefficient of resistance
PVC Polyvinyl chloride
UPVC Unplasticized polyvinyl chloride
TC Tungsten carbide
SFA Sectional flight auger