Douglas Partners
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Report on Geotechnical Assessment and Preliminary Site Investigation (Contamination)

Aberdeen Valley Fair Retail and Service Centre
172-186 Macqueen Street, Aberdeen

Prepared for
dwp Suters
on behalf of
Noel F Mitchell

Project 91087.00
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The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

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Report on Geotechnical Assessment and Preliminary Site Investigation (Contamination) Aberdeen Valley Fair Retail and Service Centre 172-186 Macqueen Street, Aberdeen

1. Introduction

This report presents the results of a geotechnical assessment and preliminary site investigation (PSI) for contamination undertaken for the proposed Aberdeen Valley Fair retail and service centre to be constructed at 172-186 Macqueen Street, Aberdeen. The work was undertaken for dwp Suters on behalf of Noel F Mitchell and was undertaken with reference with Douglas Partners Pty Ltd (DP) proposal NCL170132 dated 3 March 2017.

It is understood that the project is in the concept phase at present and the current investigation is required as part of the development application process.

The purpose of the geotechnical investigation was to provide preliminary information for the design of pavements, foundations and site preparation measures.

The geotechnical assessment included the drilling of three boreholes, the excavation of six test pits, laboratory testing, engineering analysis and preparation of this report.

The purpose of the PSI was to provide preliminary information on the contamination status of the site.

The PSI comprised a brief site history review, a desktop review of published geological and soil landscape maps, review of the results of the boreholes and test pits from the geotechnical investigation, development of a conceptual site model (CSM), and the preparation of this report.

The PSI for the site was undertaken with reference to NSW EPA Guidelines for Consultants Reporting on Contaminated Sites (August 2011) (Ref 1) and the National Environment Protection (Site Contamination) Measure 1999 (amended 2013 – NEPM 2013) (Ref 2).

For the purpose of the assessment, a copy of the proposed general arrangement plan (Option 2A) by dwp Suters was provided (Project No 203596, Dwg A005, Issue C, undated).

2. Proposed Development

The proposed development includes the construction of a new supermarket, service centre, bottle shop and specialty retailers together with a bulky good centre at the rear of the site and internal pavements.

Based on the existing site topography, it is expected that cuts and fills for bulk earthworks will be minimal across the site. Excavations of up to 3 m to 4 m depth, however, are expected to be required for the installation of underground storage tanks for the service centre.

Pavements are expected to be required for driveways, delivery areas and car parking. Details regarding the expected traffic loads for the pavements are not known at this time.

The provided general arrangement plan indicates that access to the site will be via driveways from Perth Street to the north, and Macqueen Street (two separate driveways) to the west. Significant landscaping is proposed around the perimeter of the site, as well as around buildings and pavement areas.

It is assumed that the proposed structures will likely comprise concrete tilt-up panel or similar construction, with structures generally in the order of one to two stories in height.

Structural loads were not known at this time.

Drawing 2 in Appendix D shows the proposed site layout.

3. Site Description

The site is defined as 172 to 186 Macqueen Street, Aberdeen, New South Wales and is identified as Lots 113 and 114 DP631908, as shown on Drawing 1, Appendix D.

The site comprises a rectangular area approximately 4.27 ha in size, with a western frontage of approximately 160 m to Macqueen Street, and a northern frontage of approximately 230 m to Perth Street. The site is bounded to the east by the Main North railway line and to the south by residential properties. The area immediately east of the rail line comprises cleared paddocks and a possible landscaping / aggregate business.

The site is relatively level, with topographic maps indicating that site levels range between about RL189 (AHD) and RL191.

4. Geology and Hydrogeology

Reference to the 1:100,000 NSW Hunter Coalfield geology map indicates that the majority of the site is underlain by the Singleton Supergroup of the Wittingham Coal Measures, which typically comprises coal seams, laminite, tuff, claystone, siltstone, sandstone and conglomerate. The north eastern portion of the site however is mapped as being underlain by Branxton Formation of the Maitland Group of rocks, which typically comprises conglomerate, sandstone and siltstone.

The regional groundwater flow regime is assumed to generally be towards the Hunter River (located approximately 500 m west of the site).

An on-line records search of groundwater wells registered with the NSW Office of Water (NOW) indicated that the nearest registered groundwater wells (GW064250 and GW059213) are located approximately 200 m south-west and 300 m north-west of the site. No information was given regarding the details and use of these groundwater wells.

Reference to the acid sulphate soil risk map, prepared by the Department of Land and Water Conservation (DLWC) indicates that the site is not mapped within an acid sulphate soil risk area.

5. Site History

5.1 Extent of Site History Review

The brief site history review for the current assessment comprised the following:

- Brief review of previous reports within close proximity of the investigation area;
- Review of Upper Hunter Shire Council records;
- Review of Section 149 (2 & 5) Planning Certificates for the site;
- Review of historical aerial photos;
- Historical title deed search;
- Searches with NSW EPA;
- A dangerous goods register search undertaken through NSW WorkCover; and
- Brief discussions with site personnel.

Details are presented in the following sections.

5.2 Review of Previous Reports

DP has previously carried out geotechnical investigations for the Perth Street railway bridge, adjacent to the north-eastern corner of the site, in 1982 and 1996. The results of the previous subsurface investigation indicate the following:

- Very stiff clay with some silt and gravel was encountered from the surface to depths of between about 1.6 m and 2 m, with underlying slightly clayey silt and silty sand to depths of between 5.1 m and 6.4 m;
- Dense to very dense grey brown sandy gravel was encountered below the clay, silt and silty sand to termination depths of between 7.2 m and 8.6 m;
- The previous investigation indicated that the sandy gravel were encountered could have been highly weathered conglomerate;
- Free groundwater was not observed within the bores at the time of the previous investigation;
- Four test pits excavated at the base of the railway cutting encountered clay over conglomerate bedrock.

5.3 Council Records Search

A search of development applications (DA) and building applications (BA) of Upper Hunter Shire Council records indicated the following for the site:

Lot 114 DP631908

- 1995 – Building Application (BA) Change of use to coffee shop (presumed to be associated with Lot 113).

Lot 113 DP631908

- 1996 – Planning Application (PA) - Erection of additional signage;
- 1996 – BA – Erection of Awing;
- 1997 – PA - Erection of additional signage;
- 1998 – BA – Single Carport;
- 1999 – DA – Subdivision – 2 Lots in 4 Lots (presumed not to have proceeded);
- 2002 – DA – Shade Sail; and
- 2012 – Complying Development – Change of use to café.

A copy of the information provided by Council is presented in Appendix C.

5.4 Review of Section 149 Planning Certificates

The Section 149 planning certificate was unavailable at the time of the investigation. These should be checked for potential contamination issues prior to the construction of the proposed development.

5.5 Review of Historical Aerial Photos

A number of historical aerial photos were reviewed for the assessment. These results of the review are summarised in Table 1 below.

Table 1: Review of Historical Aerial Photos

Year	Colour / B&W	Scale	Comment
1953	B&W	Not known	Site is clear of trees and undeveloped; New England Highway (Macqueen Street) is visible to the west of the site; Railway line is visible to the east of the site; Perth Street (to the north) is unformed; Jean O'Bryan Close (to the south) is unformed; Houses are located on the western side of Macqueen Street, opposite the site;
1972	B&W	Not known	No obvious change from 1953 aerial photo

Table 1: Review of Historical Aerial Photos (cont.)

Year	Colour / B&W	Scale	Comment
1989	Colour	1:25,000	The site is developed with the current structure; Site car park seems similar to current configuration, although there is possibly more landscaping / vegetation shown in the car park area than currently exists; Perth Street has been constructed east of Macqueen Street, however dead-ends at the railway line (no bridge present); Jean O Bryan Close is unformed; Possible track or drain heading north-east from the site through the north-west corner of Lot 114; The property immediately east of the railway line may possibly be a timber yard or similar; The property on the northern side of Perth Street, may have been used for agricultural purposes;
2003	Colour	1:25,000	The site is similar to the 1989 photo; Jean O'Bryan Close has been constructed to the south of the site; Perth Street has been extended to the east and over the railway line (bridge has been constructed); Houses have been constructed immediately south of the site;
13/1/2009	Colour	Google Earth online image	The site is similar to the 2003 photo, although a small shed-like structure seems to have been constructed in the southern central part of the site; The agricultural property on the northern side of Perth Street has been subdivided into residential properties; The timber yard on the eastern side of the railway line is no longer obvious, however the structures on this site seem relatively unchanged.
30/11/2013	Colour	Google Earth online image	There are no obvious changes to the site from the 2009 photo; Stockpiles of landscaping or aggregate supplies appear to be present at the property to the east of the railway line;
16/12/2016	Colour	Google Earth online image	There are no obvious changes to the site from the 2013 photo

5.6 Review of Title Deed Information

A title deed search was undertaken for DP by Scott Ashwood Pty Ltd. The results of the title deed search are attached in Appendix C, and are summarised in Table 2 to Table 5 below.

Figure 1, below provides a colour-coded site plan which provides background to the title deed search.

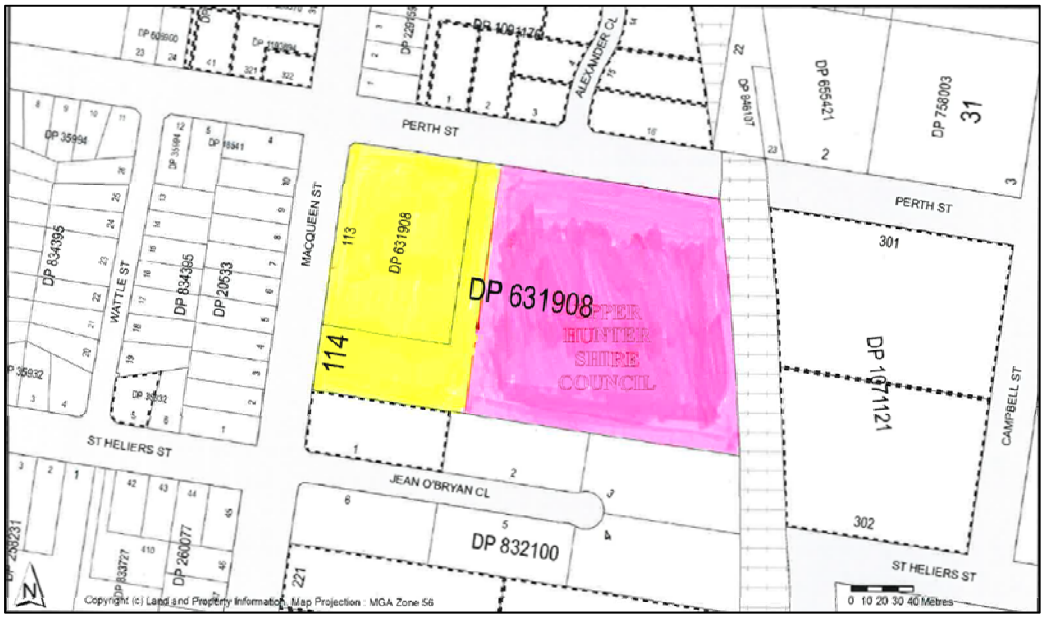


Figure 1: Background to Title Deed Search Results

Table 2: As regards to the part tinted yellow in Figure 1

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available
10.03.1913 (1913 to 1952)	Peter Doyle (Civil Servant) (& His Deceased Estate)
11.01.1923 & 24.01.1923	Teresa (or Theresa) Barbara Doyle (Spinster) Gertrude Amy Doyle (Spinster) (Assignment of interests under the Will of Peter Doyle)
18.12.1928	Teresa (or Theresa) Barbara Doyle (Spinster) Gertrude Amy Doyle (Spinster) (Assignment of interest under the Will of Peter Doyle)

Table 3: As regards the part tinted pink in Figure 1

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available
02.04.1912 (1912 to 1944)	Commissioner for Railways and Tramways Intervening name changes, now Commissioner for Railways
28.12.1944 (1944 to 1953)	Teresa (or Theresa) Barbara Doyle (Spinster) Gertrude Amy Doyle (Spinster)

Table 4: Search continued as regards the whole of the subject land

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available
09.07.1952 (1952 to 1953)	Roger Furnivall Darvall Barton (Grazier)
06.05.1953 (1953 to 1958)	Jane Gray Holloway (Widow)
30.06.1958 (1958 to 1978)	Lucy Isabel Holloway (Spinster) Marjorie Helen Holloway (Spinster)
08.02.1978 (1978 to 1979)	Marjorie Helen Holloway (Spinster)
07.08.1979 (1979 to 1979)	Brumpton Bros Transport Pty

Table 5: Search continued as regards Lot 113 D.P. 631908

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available
04.10.1979 (1979 to 1983)	Buccaneer Motel (Aberdeen) Pty Limited
11.08.1983 (1983 to 2004)	Peter Lerantges Despina Lerantges
25.02.2004 (2004 to 2013)	M.C.P. Scone Pty Limited
15.08.2013 (2013 to date)	# Noel Francis Mitchell

Several private leases and easements were identified by the search.

The search indicated the site had several land uses ranging from possible agriculture in the early 1900s to commercial retail over Lot 113 to date.

5.7 NSW WorkCover

A search of records by SafeWork NSW for information on the storage of hazardous chemicals indicates no records were located for the site. A copy of the search results is presented in Appendix C.

5.8 NSW EPA

A review of the NSW EPA contaminated land management register indicated the site and surrounds have no notices issued under the Contaminated Land Management Register.

A review of the list of contaminated sites notified to the NSW EPA indicated the site and immediately surrounding properties were not listed. A former transport depot at 87 to 89 Andrew Street, Aberdeen has been listed, however these properties are considered to pose a low risk of contamination to the site due to the distance from the subject site (approximately 400 m north-west).

A search of the NSW EPA POEO Public Register indicated that there are no POEO Licences for the site or immediately nearby properties.

5.9 Information from Site Personnel

The following information was provided by on-site personnel and a local resident who have been on the premises or have known the site from a range of 6 months to 30 years:

- The buildings were erected on the site approximately 25 to 30 years ago;
- Before the buildings were erected the site was used for cattle and horse grazing;
- All buildings have been used as commercial / retail buildings;
- No knowledge of former underground fuel tanks (USTs) or potentially contaminating site activities;
- The site comprises of two grease traps (500 L and 1000 L) approximately 2 m deep located at the rear of the building which are associated with the Butcher and Pizza Shop / Cafe.

6. Site Condition

Site conditions observed during the site inspection on 11 and 12 April 2017 are summarised below:

- The majority of the site is a grass covered paddock located within Lot 114 DP631908 and the northern portion of Lot 113 DP631908 (Figure 2);
- A retail / commercial building and carpark is located in the central western portion of the site within Lot 113 DP631908 (Figure 6);
- A gravel hardstand and asphalt carpark is located in the central western portion of the site between Macqueen Street and the building;
- The northern portion of the carpark comprises an asphalt surface (Figure 6);
- The southern portion of the carpark comprises a gravel hardstand surface (Figure 7);
- The retail / commercial building comprised of brick and metal roofing (Figure 6 and Figure 7);
- The area surrounding the retail building and the rear laneway adjacent to the building comprises gravel road base filling;
- The laneway located to the rear of the retail building contained two grease traps, a metal drum, stockpiled cardboard / rubbish and a large metal shipping container (Figure 8 and Figure 9);
- The general waste collection bins for the retail / commercial building are located to the rear of the building along with several large skip bins located at various positions around the building;
- The site is generally flat with some localised undulated sections within the paddock;
- A surface drainage easement was noted in the north western portion of Lot 114 DP631908;
- Several small localised stockpiles were present within the grass paddock and generally contained vegetation, concrete and metal sheeting / drums as shown on Drawing 1 (Figure 3 and Figure 5);
- A small open shed constructed of timber post and metal sheet roofing is located in the south central portion of the grass paddock;
- A small electrical kiosk is located in the north-eastern portion of Lot 113 along with a small bus shelter in the north-western portion of Lot 113.

The following photos show areas of the site at the time of the investigation. The approximate location and orientation of each of the photos are shown on Drawing 1 in Appendix D.

Figure 2: Grass covered paddock, looking north-west from south-east corner of site.

Figure 3: Stockpiled building materials in north-eastern portion of site, looking north.

Figure 4: South-western portion of grass covered paddock, looking east from Macqueen Street boundary.

Figure 5: Metal sheeting and drum flush with ground level in central portion of the site, looking west.

Figure 6: Asphalt and gravel hardstand car park in western portion of the site, looking south-east towards existing building from Macqueen Street boundary.

Figure 7: Gravel hardstand car park in western portion of the site, looking east towards existing building from Macqueen Street boundary.

Figure 8: Lid of grease trap located at the rear of building, looking west.

Figure 9: Rubbish and metal drum located to the rear of building, looking north-west.

7. Potential Contaminants

Based on the available site history information and observations made during the site inspection, the principal on-site sources of potential contamination are considered to be:

- Imported filling within the carpark and building surrounds which may contain a range of contaminants subject to the source;
- Possible hydrocarbon, heavy metal and nutrient impacts from the grease traps if leakage has occurred;
- Possible presence of asbestos containing materials (ACM) in localised stockpiled comprising building materials (concrete and metal);
- Possible localised hydrocarbon impact within the existing carpark laneway area from drips/spills;
- Possible pesticide, heavy metal, hydrocarbon impacts from pesticide / herbicide application.

The risk of gross contamination from off-site land uses is considered to be low due to the local topography, distance from neighbouring commercial/light industrial properties and general absence of obvious potentially polluting land uses (i.e. service stations) in the immediate vicinity of the site.

8. Conceptual Site Model

A conceptual site model (CSM) has been prepared for the site with reference to the National Environment Protection (Assessment of Site Contamination) Measure 1999 (Amendment Measure 2013) Schedule B2 (Ref 2). The CSM identifies potential contaminant sources and contaminants of concern, contaminant release mechanisms, exposure pathways and potential receptors. The CSM is presented in Table 6 below.

Table 6: Conceptual Site Model

Known and Potential Primary Sources	Primary Release Mechanism	Secondary Release Mechanism	Potential Impacted Media	Contaminants of Concern	Exposure Pathway	Potential Receptors	
						Current	Future
Possible imported filling within the site	Placement of filling on-site	Long-term leaching of contaminants via runoff, rain water infiltration / percolation or exposure/disturbance during proposed development	Soil, groundwater, surface water	TRH, BTEX, PAH, Metals, Pesticides, PCB, asbestos	Dermal contact, inhalation (dust/vapours), ingestion	Site users, site workers, Consultants, trespassers, surface water bodies, groundwater, neighbouring properties.	Potential site users, site workers, maintenance workers, construction workers, consultants, trespassers, surface water bodies, neighbouring properties, groundwater
Car parking	Spills and leaks, hydrocarbon sources	Long-term leaching of contaminants via runoff, rain water infiltration / percolation, through soil or cracks/joints in asphalt or exposure/disturbance during proposed development	Soil, groundwater, surface water	TRH, BTEX, PAH, Metals	Dermal contact, inhalation (dust/vapours), ingestion		
Pesticide use for gardens and paddock areas	Application of pesticides	Long-term leaching of contaminants via runoff, rain water infiltration / percolation, through soil exposure/disturbance during proposed development	Soil, groundwater, surface water	Pesticides, TRH, BTEX, PAH, Metals,	Dermal contact, inhalation (dust/vapours), ingestion		
Grease traps associated with existing land use	Spills and leaks	Long-term leaching of contaminants via runoff, rain water infiltration / percolation, through soil exposure/disturbance during proposed development	Soil, groundwater, surface water	TRH, BTEX, PAH, Metals, Nutrients	Dermal contact, inhalation (dust/vapours), ingestion		
Localised dumped filling / opportunistic dumping	Placement of filling on-site	Long-term leaching of contaminants via runoff, rain water infiltration / percolation or exposure/disturbance during proposed development	Soil, groundwater, surface water	TRH, BTEX, PAH, Metals, Pesticides, PCB, asbestos	Dermal contact, inhalation (dust/vapours), ingestion		

9. Field Work

9.1 Methods

The field work was undertaken on 11 and 12 April 2017 and comprised the following:

- Site inspection by an engineer from DP;
- Drilling of three boreholes (Bores 1 to 3) to depths of between 3.8 m and 4.9 m using a truck mounted drilling rig;
- Excavation of six test pits (Pits 4 to 9) to depths of between 2.3 m and 3 m using a 5.5 tonne excavator;
- Dynamic penetrometer testing (DPT) at each bore and pit location;
- Logging of the subsurface profile,
- Collection of soil samples for geotechnical testing purposes from the test bores and pits.

The approximate test locations were recorded using a hand-held GPS, which is nominally accurate to ±10 m, depending on satellite coverage, and by measuring from existing site features. The approximate test locations are shown relative to existing site features on Drawing 1, and relative to the proposed site layout on Drawing 2, both in Appendix D.

9.2 Results

The subsurface conditions encountered within the boreholes and test pits are presented in detail in the logs in Appendix A. These should be read with the preceding explanatory notes which define the descriptive terms and classification methods. DPT result sheets are also included in Appendix A.

The following is a summary of the subsurface conditions encountered in the pits and bores.

From (m)	To (m)	Description
Surface (0.0)	0.25	FILLING: generally comprising clayey sandy silt (hardstand) filling, with a gravel surface (including blue metal gravel); observed in the north-western portion of the site in the carpark area (Pits 8 and 9)
Surface	0.1	TOPSOIL: generally comprising dark brown sandy silty topsoil with trace gravel and rootlets; observed in all test locations with the exception of the hardstand area (Pits 8 and 9).
0.1 / 0.25	1.3 / Termination Depth (4.5 m)	SILTY CLAY / SANDY CLAY – Generally stiff to very stiff becoming hard dark brown to brown silty clay / sandy clay with trace subrounded gravel.
1.3 / 2.0	Termination Depth (3.8)	SANDY GRAVEL (possible extremely weathered conglomerate) – Generally dense, brown fine to coarse grained slightly clayey sandy gravel with sub-angular and sub-rounded gravel and cobbles. Encountered in Bore 1 and Pits 7 to 9, correlating generally to the south-western portion of the site.

Groundwater was not encountered in any of the pits or bores during the time they were open. It should be noted that groundwater levels are affected by factors such as soil permeability and the prevailing weather conditions and will vary with time.

No visual or olfactory signs of potential contamination were observed during the field investigation.

10. Laboratory Testing

Geotechnical laboratory testing comprised three shrink-swell tests and three standard compaction / soaked California bearing ratio (CBR) tests. The detailed results are attached and are summarised in Table 7 below.

Table 7: Results of Laboratory Testing

Location	Depth (m)	Description	FMC (%)	SOMC (%)	SMDD (t/m^3)	CBR (%)	Iss (% per ΔpF)	Swell under 4.5 kg Surcharge
1	0.5 – 0.95	Sandy silty clay	26.5	-	-	-	5.0	-
4	0.2 – 0.5	Silty clay	25.5	-	-	-	8.3(1)	-
4	0.4	Silty clay	29.5	34.0	1.34	2.5	-	4.5
5	0.2 – 0.5	Silty clay	36.8	39.0	1.27	5	-	1.0
6	0.2 – 0.5	Silty clay	30.8	33.0	1.36	2.5	-	4.0
9	0.3 – 0.6	Silty clay	18.1	-	-	-	5.2	-

Notes to Table 7:

(1) – It is noted that 16% swell was recorded during the soaking phase of testing on this sample

FMC - Field moisture content SOMC - Standard optimum moisture content

SMDD - Standard maximum dry density CBR - California bearing ratio (4 day soaked)

Iss - Shrink/Swell Index

11. Contamination Comments

The results of the PSI indicate the absence of gross contaminating activities at the site. Several minor sources of potential contamination were identified at the site including localised areas of imported filling, localised stockpiles of building materials and scrap metal potentially comprising hazardous building materials (most likely due to opportunistic dumping), grease traps, possible pesticide application and car parking activities.

The above sources of potential contamination should be further investigated by sampling and testing to confirm remediation requirements (if any). The additional assessment could be undertaken during the initial stages of construction (i.e. site clearing) and may involve analytical testing of soils to assess contamination concentrations and suitability to remain on-site, or classification for off-site disposal purposes.

The above sources of potential contamination are considered readily addressable during the design and/or construction phase of the development.

It is considered that the site is suitable for the proposed commercial development from a contamination perspective, subject to the above additional investigation and appropriate remediation and validation (if required), which is expected to comprise off-site disposal of localised materials.

12. Geotechnical Comments

12.1 Site Classification

Site classification to AS 2870 (Ref 3) is not strictly applicable to this site due to it being a commercial development rather than a residential development. However, the principles of footing design and site maintenance presented therein should be taken into account for buildings such as that proposed for the site.

Site classification of foundation soil reactivity provides an indication of the propensity of the ground surface to move with seasonal variation in moisture. Based on the procedures presented in AS 2870-2011 (Ref 3), the typical soil profiles revealed in the test pits and bores, and the results of laboratory testing, the site is classified Class E-D (extremely reactive) and will therefore require footings to be designed by engineering principles.

Design should account for potential y_s values of up to about 100 mm, prior to any earthworks, for most of the site, however the bulky goods units proposed for the north-east part of the site should be designed for potential y_s values of up to 170 mm. The process of cutting and filling will affect the site classifications and the estimated y_s values.

The above classification, and estimated y_s value, may not apply if filling greater than 0.4 m depth, or excavation greater than 0.5 m is proposed, as required by AS 2870-2011 (Ref 3).

If trees will be present on the site, the structural engineer should also account for the influence of trees on the seasonal movements, using the procedures presented in Appendix H of AS 2870. This will include estimating a value of y_t (the potential surface movement due to tree-induced suction, in addition to the normal design suction change). Estimating y_t is a function of the height of trees, and the distance of the trees from the building.

Footings should be founded within the natural very stiff to hard clay or engineered filling. Footings should not be founded in uncontrolled filling.

If site levels are to be raised, filling intended to support footings should be placed and compacted to the requirements of AS 3798-2007 (Ref 4).

Site classification, as above, is based on the information obtained from test pits and bores and on the results of laboratory testing, and have involved some interpolation between data points. In the event that the conditions encountered during construction are different to those presented in this report, it is recommended that advice be sought from this office.

Articulation joints should be provided within masonry walls in accordance with TN61 (Ref 5) in order to reduce the effects of differential movement.

It should be noted that this classification is dependent on proper site maintenance, which should be carried out in accordance with the attached CSIRO Sheet BTF 18 and Appendix B of AS 2870-2011.

Landscaping for the proposed development should take into account the extremely reactive clay soils, and be carefully selected so as not to exacerbate seasonal ground movements.

12.2 Footings

The results of laboratory testing indicate that the soils at this site have a high propensity to soften when wet. Therefore, site drainage is important to managing footing performance, and water should not be allowed to drain towards foundation areas.

Shallow strip or pad footings founded in very stiff to hard natural clay soils, or on properly placed and compacted engineered filling may be proportioned for a maximum allowable bearing pressure of 100 kPa. Footings should not be founded in uncontrolled filling.

If deep foundations are used to support structural loads, suitable pile types are expected to include traditional bored concrete piles. Steel screw piles or driven timber softwood piles are expected to have difficulty penetrating the dense coarse granular material encountered in some parts of the site (e.g. Bore 1 and Pits 7 to 9). Depending on conditions at the time of construction, casing of bored piles may be required if the underlying gravelly material is unable to stand unsupported.

Piles which are founded at a depth greater than four times the pile diameter may be proportioned for a maximum allowable end bearing pressure of 450 kPa. Due to the extremely reactive soils at the site, it is recommended that design ignore contribution from shaft adhesion due to the risk of negative skin friction developing from cyclical shrink-swell movements.

Suitable founding strata should be proved by inspection during construction. Pile holes should be free of water and debris and cleaned of side smear prior to the placement of concrete.

12.3 Engineered Filling

The following procedure is recommended for placement of engineered filling:

- Remove topsoil, uncontrolled filling and deleterious materials;
- Test roll the surface in order to determine any soft zones and assess moisture condition;

- Building areas to receive engineered filling should be compacted to a dry density ratio of 98% Standard, however should preferably be no greater than 102% in high plasticity clays. Moisture contents should be in the range OMC -3% (dry) to OMC +2% (wet) where OMC is the optimum content at standard compaction;
- The compacted clay soils should be left exposed for a minimum of time prior to placement of pavement layers and floor slabs, to minimise the occurrence of desiccation cracking or softening due to weather;
- Where site levels are to be raised, approved filling should be placed in horizontal layers not exceeding 300 mm loose thickness and compacted to the same requirements as above.

Geotechnical inspections and testing should be performed during construction in accordance with AS 3798 (Ref 4).

12.4 Pavements

12.4.1 Subgrade

The results of laboratory testing on the expected clay subgrade indicate a soaked CBR in the range 2.5% to 5%. Samples were up to 4.5% dry of optimum at the time of testing.

Therefore, based on the results of the test pits and test bores and laboratory tests, together with previous experience with similar soils, a design subgrade CBR value of 3% has been adopted for design, provisional on the inclusion of a select subgrade layer to bridge over poor subgrade soils. It may be possible to omit the selected layer within the car park and driveway areas which are subject to light vehicle traffic, however additional subgrade CBR testing would be required to show that a design subgrade CBR of 3% or greater is appropriate in these areas. Even if omitted following such assessment, a select may still be required if proof rolling indicates a yielding subgrade at the time of construction. There is also a risk of wet of optimum soils in areas where existing structures are to be demolished.

12.4.2 Design Traffic Loading

In the absence of detailed traffic data, indicative traffic loadings have been adopted from Austroads (Ref 6) based on the following:

Table 8: Indicative Design Traffic Loading

Street Type (as defined in Ref 6)	Possible Application	Indicative Design Traffic (ESA)
"Minor with two lane traffic"	Carpark and driveway areas subject only to light vehicle traffic (i.e. vehicles up to 3 tonnes)	8×10^3
"Local access in industrial area"	Driveways which include delivery vehicles	3×10^5

It is important that the pavement areas are carefully considered and separated into those areas likely to experience truck traffic and those that are unlikely to experience truck traffic. If trucks are allowed to traffic pavement areas which have been designated for car traffic, there is a risk of reduced design life and pavement damage. The above loadings are not applicable for traffic such as forklifts, loaders etc. Heavy duty pavement areas will require specific pavement design once vehicle types and loads are known.

The above traffic loadings should be reviewed as more detailed information on traffic loading becomes available. In particular, the likely number and types of trucks should be confirmed to assess the suitability of the suggested pavement thickness.

12.4.3 Pavement Thickness Design

Based on the procedures presented in Austroads 2012 (Ref 6), the recommended pavement thickness design for on-site pavements the traffic loadings above is as presented in Table 9 below.

Table 9: On-Site Pavement Thickness Design

Pavement Layer	Minimum Layer Thickness (mm)	
	Main Driveways (3×10^5 ESA)	Carpark (8×10^3 ESA)
Wearing Course	30[1]	30[1]
Basecourse	120	100
Subbase	300	190
Select Layer	Min 300[(3)]	Min 300[(3)]

Notes to Table 9:

* Where asphalt is to be used as a wearing course, a 7 mm prime seal should first be laid

1 – AC 10 or equivalent

2 – may also require a select subgrade layer to be included. Refer additional comments below

3 – if additional CBR testing of subgrade in these areas show a CBR of 3% or greater, it may be possible to omit the select layer.

Poor subgrade soils should be expected at this site. The pavement thicknesses presented above are based on a minimum subgrade CBR of 3% provisional on the incorporation of a 300 mm (minimum thickness) select subgrade layer. The select subgrade layer should have a minimum CBR of 15% in order to use the pavement thicknesses presented above.

It is noted that areas used by tightly turning heavy vehicles / trucks will be subject to high shear and torsional forces. Concrete pavements should be considered in these areas.

Any changes in overall pavement thickness between adjoining sections of road should be transitioned and not abruptly stepped.

The pavement thicknesses presented above are dependent on the provision and maintenance of adequate surface and subsurface drainage. Due to the presence of extremely reactive clay soils at this site, it is crucial that drainage be designed to prevent ponding of water in the subgrade layer beneath the pavement. Similarly, the planting of trees and shrubs adjacent to the pavements should be restricted.

12.4.4 Material Quality and Compaction Requirements

Recommended pavement material quality and compaction requirements are presented in Table 10 below.

Table 10: Material Quality and Compaction Requirements

Pavement Layer	Material Quality	Compaction
Basecourse	CBR > 80%, PI ≤ 6%, Grading in accordance with Council requirements	Compact to at least 98% dry density ratio Modified (AS 1289.5.2.1)
Subbase	CBR > 30%, PI ≤ 12%, Grading in accordance with Council requirements	Compact to at least 95% dry density ratio Modified (AS 1289.5.2.1)
Select Subgrade	CBR ≥ 15%	Compact to at least 100% dry density ratio Standard (AS 1289.5.1.1)
Subgrade (Clay)	CBR ≥ 2.5%	Compact to at least 100% dry density ratio Standard (AS 1289.5.1.1)

12.4.5 Subgrade Preparation

The following procedure is recommended for preparation of the pavement subgrade:

- Excavate to design subgrade level;
- Remove any additional topsoil, uncontrolled filling or deleterious materials;
- Test roll the surface in order to determine any soft zones and assess moisture condition. Moisture contents should be in the range OMC -4% (dry) to OMC where OMC is the optimum content at standard compaction;
- If soft or yielding subgrade is present, such as from wet-of-optimum clayey soils, either tyne and dry back to within the specified moisture range or over-excavated to a limited depth, and replace with a select subgrade material;
- Compact the tyned natural subgrade to a minimum dry density ratio of 100% Standard. The compacted clay subgrade should be left exposed for a minimum of time prior to placement of pavement layers, to minimise the occurrence of desiccation cracking and/or softening due to weather exposure;

- If raising of the subgrade level is required, all deleterious material should be removed, and approved filling placed in layers not exceeding 300 mm loose thickness and compacted to a dry density ratio of at least 100% Standard.

It is noted that the samples tested for this investigation were up to 4.5% dry of optimum at the time of field work.

It is understood that some of the pavement alignments may pass through areas where structures are to be demolished. There is a risk of uncontrolled filling, wet of optimum subgrade and other deleterious materials in these areas.

Geotechnical inspections and testing should be performed during construction in accordance with Ref 4.

12.4.6 External Pavements

Assessment of external pavements was beyond the scope of this investigation. It is noted that the general arrangement plan indicates access to the site will be provided from Macqueen Street (New England Highway), including the construction of turning lanes and a centre median.

It is expected that the NSW Roads and Maritime Service (RMS) may be a consent authority for widening / pavement upgrade works for Macqueen Street. Previous experience with RMS is that targeted geotechnical investigation, including subsurface investigation and laboratory testing to RMS standards will be required. The scope of work presented in this report does not meet RMS requirements.

13. References

1. NSW EPA Contaminated Sites (2011), 'Guidelines for Consultants Reporting on Contaminated Sites', August 2011.
2. National Environment Protection Council (2013), "National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013", 11 April 2013.
3. Australian Standard AS 2870-2011 "Residential Slabs and Footings", Standards Association of Australia, 17 January 2011.
4. Australian Standard AS 3798-2007 "Guidelines on Earthworks for Commercial and Residential Developments", 13 March 2007.
5. Cement and Concrete Aggregates Australia (2008), Technical Note 61, "Articulated Walling", August 2008
6. Austroads, "Guide to Pavement Technology (2012), Part 2: Pavement Structural Design", February 2012.

14. Limitations

Douglas Partners Pty Ltd (DP) has prepared this report for this project at 172-186 Macqueen Street, Aberdeen with reference to DP's proposal NCL170132 dated 3 March 2017 and acceptance received from Noel F Mitchell dated 24 March 2017. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Noel F Mitchell and dwp Suters for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

The scope for work for this investigation did not include the assessment of surface or sub-surface materials or groundwater for contaminants, within or adjacent to the site. Should evidence of filling of unknown origin be noted in the report, and in particular the presence of building demolition materials, it should be recognised that there may be some risk that such filling may contain contaminants and hazardous building materials.

The contents of this report do not constitute formal design components such as are required, by the Health and Safety Legislation and Regulations, to be included in a Safety Report specifying the hazards likely to be encountered during construction and the controls required to mitigate risk. This design process requires risk assessment to be undertaken, with such assessment being dependent upon factors relating to likelihood of occurrence and consequences of damage to property and to life. This, in turn, requires project data and analysis presently beyond the knowledge and project role respectively of DP. DP may be able, however, to assist the client in carrying out a risk assessment of potential hazards contained in the Comments section of this report, as an extension to the current scope of works, if so requested, and provided that suitable additional information is made available to DP. Any such risk assessment would, however, be necessarily restricted to the (geotechnical / environmental / groundwater) components set out in this report and to their application by the project designers to project design, construction, maintenance and demolition.

Douglas Partners Pty Ltd

Appendix A

About This Report
CSIRO Sheet BTF18
Sampling Methods
Soil Descriptions
Symbols and Abbreviations
Rock Descriptions
Borehole Logs (Bores 1 to 3)
Core Photoplate
Test Pit Logs (Pits 4 to 9)
Dynamic Penetrometer Test Results

About this Report

Douglas Partners

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

Foundation Maintenance and Footing Performance: A Homeowner's Guide

PUBLISHING

BTF 18-2011
replaces
Information
Sheet 10/91

Buildings can and often do move. This movement can be up, down, lateral or rotational. The fundamental cause of movement in buildings can usually be related to one or more problems in the foundation soil. It is important for the homeowner to identify the soil type in order to ascertain the measures that should be put in place in order to ensure that problems in the foundation soil can be prevented, thus protecting against building movement.

This Building Technology File is designed to identify causes of soil-related building movement, and to suggest methods of prevention of resultant cracking in buildings.

Soil Types

The types of soils usually present under the topsoil in land zoned for residential buildings can be split into two approximate groups – granular and clay. Quite often, foundation soil is a mixture of both types. The general problems associated with soils having granular content are usually caused by erosion. Clay soils are subject to saturation and swell/shrink problems.

Classifications for a given area can generally be obtained by application to the local authority, but these are sometimes unreliable and if there is doubt, a geotechnical report should be commissioned. As most buildings suffering movement problems are founded on clay soils, there is an emphasis on classification of soils according to the amount of swell and shrinkage they experience with variations of water content. The table below is Table 2.1 from AS 2870-2011, the Residential Slab and Footing Code.

Causes of Movement

Settlement due to construction

There are two types of settlement that occur as a result of construction:

- Immediate settlement occurs when a building is first placed on its foundation soil, as a result of compaction of the soil under the weight of the structure. The cohesive quality of clay soil mitigates against this, but granular (particularly sandy) soil is susceptible.
- Consolidation settlement is a feature of clay soil and may take place because of the expulsion of moisture from the soil or because of the soil's lack of resistance to local compressive or shear stresses. This will usually take place during the first few months after construction, but has been known to take many years in exceptional cases.

These problems are the province of the builder and should be taken into consideration as part of the preparation of the site for construction. Building Technology File 19 (BTF 19) deals with these problems.

Erosion

All soils are prone to erosion, but sandy soil is particularly susceptible to being washed away. Even clay with a sand component of say 10% or more can suffer from erosion.

Saturation

This is particularly a problem in clay soils. Saturation creates a bog-like suspension of the soil that causes it to lose virtually all of its bearing capacity. To a lesser degree, sand is affected by saturation because saturated sand may undergo a reduction in volume, particularly imported sand fill for bedding and blinding layers. However, this usually occurs as immediate settlement and should normally be the province of the builder.

Seasonal swelling and shrinkage of soil

All clays react to the presence of water by slowly absorbing it, making the soil increase in volume (see table below). The degree of increase varies considerably between different clays, as does the degree of decrease during the subsequent drying out caused by fair weather periods. Because of the low absorption and expulsion rate, this phenomenon will not usually be noticeable unless there are prolonged rainy or dry periods, usually of weeks or months, depending on the land and soil characteristics.

The swelling of soil creates an upward force on the footings of the building, and shrinkage creates subsidence that takes away the support needed by the footing to retain equilibrium.

Shear failure

This phenomenon occurs when the foundation soil does not have sufficient strength to support the weight of the footing. There are two major post-construction causes:

- Significant load increase.
- Reduction of lateral support of the soil under the footing due to erosion or excavation.

In clay soil, shear failure can be caused by saturation of the soil adjacent to or under the footing.

GENERAL DEFINITIONS OF SITE CLASSES

Class	Foundation
A	Most sand and rock sites with little or no ground movement from moisture changes
S	Slightly reactive clay sites, which may experience only slight ground movement from moisture changes
M	Moderately reactive clay or silt sites, which may experience moderate ground movement from moisture changes
H1	Highly reactive clay sites, which may experience high ground movement from moisture changes
H2	Highly reactive clay sites, which may experience very high ground movement from moisture changes
E	Extremely reactive sites, which may experience extreme ground movement from moisture changes

Notes

1. Where controlled fill has been used, the site may be classified A to E according to the type of fill used.
2. Filled sites. Class P is used for sites which include soft fills, such as clay or silt or loose sands; landslip; mine subsidence; collapsing soils; soil subject to erosion; reactive sites subject to abnormal moisture conditions or sites which cannot be classified otherwise.
3. Where deep-seated moisture changes exist on sites at depths of 3 m or greater, further classification is needed for Classes M to E (M-D, H1-D, H2-D and E-D).

Tree root growth

Trees and shrubs that are allowed to grow in the vicinity of footings can cause foundation soil movement in two ways:

- Roots that grow under footings may increase in cross-sectional size, exerting upward pressure on footings.
- Roots in the vicinity of footings will absorb much of the moisture in the foundation soil, causing shrinkage or subsidence.

Unevenness of Movement

The types of ground movement described above usually occur unevenly throughout the building's foundation soil. Settlement due to construction tends to be uneven because of:

- Differing compaction of foundation soil prior to construction.
- Differing moisture content of foundation soil prior to construction.

Movement due to non-construction causes is usually more uneven still. Erosion can undermine a footing that traverses the flow or can create the conditions for shear failure by eroding soil adjacent to a footing that runs in the same direction as the flow.

Saturation of clay foundation soil may occur where subfloor walls create a dam that makes water pond. It can also occur wherever there is a source of water near footings in clay soil. This leads to a severe reduction in the strength of the soil which may create local shear failure.

Seasonal swelling and shrinkage of clay soil affects the perimeter of the building first, then gradually spreads to the interior. The swelling process will usually begin at the uphill extreme of the building, or on the weather side where the land is flat. Swelling gradually reaches the interior soil as absorption continues. Shrinkage usually begins where the sun's heat is greatest.

Effects of Uneven Soil Movement on Structures

Erosion and saturation

Erosion removes the support from under footings, tending to create subsidence of the part of the structure under which it occurs. Brickwork walls will resist the stress created by this removal of support by bridging the gap or cantilevering until the bricks or the mortar bedding fail. Older masonry has little resistance. Evidence of failure varies according to circumstances and symptoms may include:

- Step cracking in the mortar beds in the body of the wall or above/below openings such as doors or windows.
- Vertical cracking in the bricks (usually but not necessarily in line with the vertical beds or perpends).

Isolated piers affected by erosion or saturation of foundations will eventually lose contact with the bearers they support and may tilt or fall over. The floors that have lost this support will become bouncy, sometimes rattling ornaments etc.

Seasonal swelling/shrinkage in clay

Swelling foundation soil due to rainy periods first lifts the most exposed extremities of the footing system, then the remainder of the perimeter footings while gradually permeating inside the building footprint to lift internal footings. This swelling first tends to create a dish effect, because the external footings are pushed higher than the internal ones.

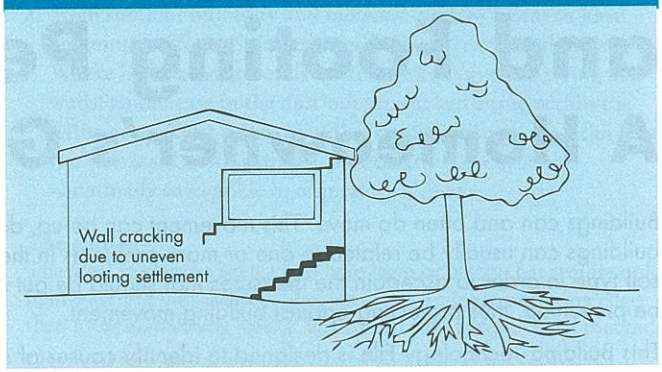
The first noticeable symptom may be that the floor appears slightly dished. This is often accompanied by some doors binding on the floor or the door head, together with some cracking of cornice mitres. In buildings with timber flooring supported by bearers and joists, the floor can be bouncy. Externally there may be visible dishing of the hip or ridge lines.

As the moisture absorption process completes its journey to the innermost areas of the building, the internal footings will rise. If the spread of moisture is roughly even, it may be that the symptoms will temporarily disappear, but it is more likely that swelling will be uneven, creating a difference rather than a disappearance in symptoms. In buildings with timber flooring supported by bearers and joists, the isolated piers will rise more easily than the strip footings or piers under walls, creating noticeable doming of flooring.

As the weather pattern changes and the soil begins to dry out, the external footings will be first affected, beginning with the locations where the sun's effect is strongest. This has the effect of lowering the external footings. The doming is accentuated and cracking reduces or disappears where it occurred because of dishing, but other cracks open up. The roof lines may become convex.

Doming and dishing are also affected by weather in other ways. In areas where warm, wet summers and cooler dry winters prevail, water migration tends to be toward the interior and doming will be accentuated, whereas where summers are dry and winters are cold and wet, migration tends to be toward the exterior and the underlying propensity is toward dishing.

Trees can cause shrinkage and damage



Movement caused by tree roots

In general, growing roots will exert an upward pressure on footings, whereas soil subject to drying because of tree or shrub roots will tend to remove support from under footings by inducing shrinkage.

Complications caused by the structure itself

Most forces that the soil causes to be exerted on structures are vertical – i.e. either up or down. However, because these forces are seldom spread evenly around the footings, and because the building resists uneven movement because of its rigidity, forces are exerted from one part of the building to another. The net result of all these forces is usually rotational. This resultant force often complicates the diagnosis because the visible symptoms do not simply reflect the original cause. A common symptom is binding of doors on the vertical member of the frame.

Effects on full masonry structures

Brickwork will resist cracking where it can. It will attempt to span areas that lose support because of subsided foundations or raised points. It is therefore usual to see cracking at weak points, such as openings for windows or doors.

In the event of construction settlement, cracking will usually remain unchanged after the process of settlement has ceased.

With local shear or erosion, cracking will usually continue to develop until the original cause has been remedied, or until the subsidence has completely neutralised the affected portion of footing and the structure has stabilised on other footings that remain effective.

In the case of swell/shrink effects, the brickwork will in some cases return to its original position after completion of a cycle, however it is more likely that the rotational effect will not be exactly reversed, and it is also usual that brickwork will settle in its new position and will resist the forces trying to return it to its original position. This means that in a case where swelling takes place after construction and cracking occurs, the cracking is likely to at least partly remain after the shrink segment of the cycle is complete. Thus, each time the cycle is repeated, the likelihood is that the cracking will become wider until the sections of brickwork become virtually independent.

With repeated cycles, once the cracking is established, if there is no other complication, it is normal for the incidence of cracking to stabilise, as the building has the articulation it needs to cope with the problem. This is by no means always the case, however, and monitoring of cracks in walls and floors should always be treated seriously.

Upheaval caused by growth of tree roots under footings is not a simple vertical shear stress. There is a tendency for the root to also exert lateral forces that attempt to separate sections of brickwork after initial cracking has occurred.

The normal structural arrangement is that the inner leaf of brickwork in the external walls and at least some of the internal walls (depending on the roof type) comprise the load-bearing structure on which any upper floors, ceilings and the roof are supported. In these cases, it is internally visible cracking that should be the main focus of attention, however there are a few examples of dwellings whose external leaf of masonry plays some supporting role, so this should be checked if there is any doubt. In any case, externally visible cracking is important as a guide to stresses on the structure generally, and it should also be remembered that the external walls must be capable of supporting themselves.

Effects on framed structures
Timber or steel framed buildings are less likely to exhibit cracking due to swell/shrink than masonry buildings because of their flexibility. Also, the doming/dishing effects tend to be lower because of the lighter weight of walls. The main risks to framed buildings are encountered because of the isolated pier footings used under walls. Where erosion or saturation causes a footing to fall away, this can double the span which a wall must bridge. This additional stress can create cracking in wall linings, particularly where there is a weak point in the structure caused by a door or window opening. It is, however, unlikely that framed structures will be so stressed as to suffer serious damage without first exhibiting some or all of the above symptoms for a considerable period. The same warning period should apply in the case of upheaval. It should be noted, however, that where framed buildings are supported by strip footings there is only one leaf of brickwork and therefore the externally visible walls are the supporting structure for the building. In this case, the subfloor masonry walls can be expected to behave as full brickwork walls.

Effects on brick veneer structures
Because the load-bearing structure of a brick veneer building is the frame that makes up the interior leaf of the external walls plus perhaps the internal walls, depending on the type of roof, the building can be expected to behave as a framed structure, except that the external masonry will behave in a similar way to the external leaf of a full masonry structure.

Water Service and Drainage

Where a water service pipe, a sewer or stormwater drainage pipe is in the vicinity of a building, a water leak can cause erosion, swelling or saturation of susceptible soil. Even a minuscule leak can be enough to saturate a clay foundation. A leaking tap near a building can have the same effect. In addition, trenches containing pipes can become watercourses even though backfilled, particularly where broken rubble is used as fill. Water that runs along these trenches can be responsible for serious erosion, interstrata seepage into subfloor areas and saturation.

Pipe leakage and trench water flows also encourage tree and shrub roots to the source of water, complicating and exacerbating the problem. Poor roof plumbing can result in large volumes of rainwater being concentrated in a small area of soil:

- Incorrect falls in roof guttering may result in overflows, as may gutters blocked with leaves etc.
- Corroded guttering or downpipes can spill water to ground.
- Downpipes not positively connected to a proper stormwater collection system will direct a concentration of water to soil that is directly adjacent to footings, sometimes causing large-scale problems such as erosion, saturation and migration of water under the building.

Seriousness of Cracking

In general, most cracking found in masonry walls is a cosmetic nuisance only and can be kept in repair or even ignored. The table below is a reproduction of Table C1 of AS 2870-2011.

AS 2870-2011 also publishes figures relating to cracking in concrete floors, however because wall cracking will usually reach the critical point significantly earlier than cracking in slabs, this table is not reproduced here.

Prevention/Cure

Plumbing
Where building movement is caused by water service, roof plumbing, sewer or stormwater failure, the remedy is to repair the problem. It is prudent, however, to consider also rerouting pipes away from the building where possible, and relocating taps to positions where any leakage will not direct water to the building vicinity. Even where gully traps are present, there is sometimes sufficient spill to create erosion or saturation, particularly in modern installations using smaller diameter PVC fixtures. Indeed, some gully traps are not situated directly under the taps that are installed to charge them, with the result that water from the tap may enter the backfilled trench that houses the sewer piping. If the trench has been poorly backfilled, the water will either pond or flow along the bottom of the trench. As these trenches usually run alongside the footings and can be at a similar depth, it is not hard to see how any water that is thus directed into a trench can easily affect the foundation's ability to support footings or even gain entry to the subfloor area.

Ground drainage
In all soils there is the capacity for water to travel on the surface and below it. Surface water flows can be established by inspection during and after heavy or prolonged rain. If necessary, a grated drain system connected to the stormwater collection system is usually an easy solution.

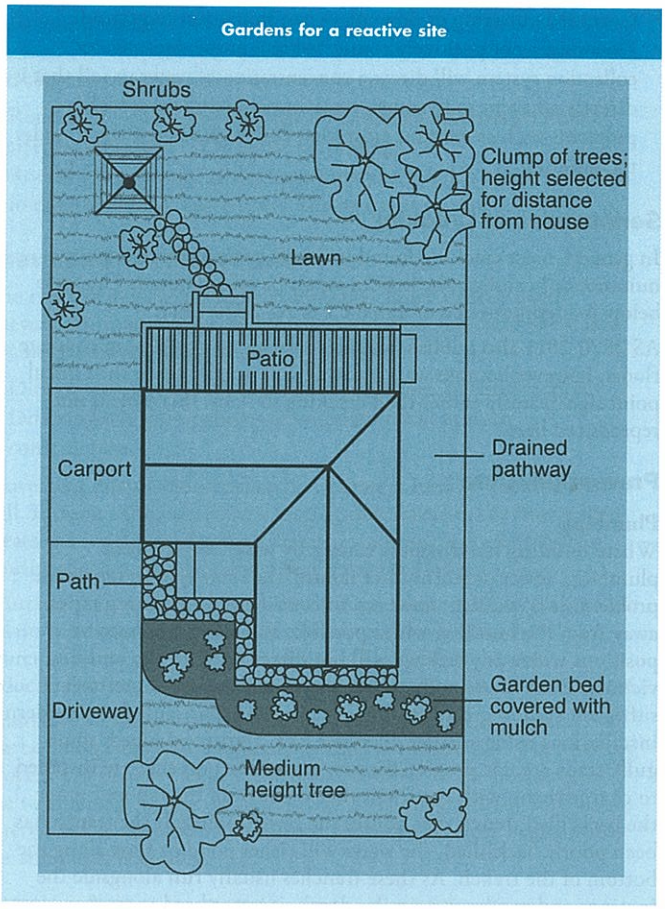
It is, however, sometimes necessary when attempting to prevent water migration that testing be carried out to establish watertable height and subsoil water flows. This subject is referred to in BTF 19 and may properly be regarded as an area for an expert consultant.

Protection of the building perimeter
It is essential to remember that the soil that affects footings extends well beyond the actual building line. Watering of garden plants, shrubs and trees causes some of the most serious water problems.

For this reason, particularly where problems exist or are likely to occur, it is recommended that an apron of paving be installed around as much of the building perimeter as necessary. This paving should

CLASSIFICATION OF DAMAGE WITH REFERENCE TO WALLS

Description of typical damage and required repair	Approximate crack width limit (see Note 3)	Damage category
Hairline cracks	<0.1 mm	0
Fine cracks which do not need repair	<1 mm	1
Cracks noticeable but easily filled. Doors and windows stick slightly.	<5 mm	2
Cracks can be repaired and possibly a small amount of wall will need to be replaced. Doors and windows stick. Service pipes can fracture. Weathertightness often impaired.	5–15 mm (or a number of cracks 3 mm or more in one group)	3
Extensive repair work involving breaking-out and replacing sections of walls, especially over doors and windows. Window and door frames distort. Walls lean or bulge noticeably, some loss of bearing in beams. Service pipes disrupted.	15–25 mm but also depends on number of cracks	4



extend outwards a minimum of 900 mm (more in highly reactive soil) and should have a minimum fall away from the building of 1:60. The finished paving should be no less than 100 mm below brick vent bases.

It is prudent to relocate drainage pipes away from this paving, if possible, to avoid complications from future leakage. If this is not practical, earthenware pipes should be replaced by PVC and backfilling should be of the same soil type as the surrounding soil and compacted to the same density.

Except in areas where freezing of water is an issue, it is wise to remove taps in the building area and relocate them well away from the building – preferably not uphill from it (see BTF 19).

It may be desirable to install a grated drain at the outside edge of the paving on the uphill side of the building. If subsoil drainage is needed this can be installed under the surface drain.

Condensation

In buildings with a subfloor void such as where bearers and joists support flooring, insufficient ventilation creates ideal conditions for condensation, particularly where there is little clearance between the floor and the ground. Condensation adds to the moisture already present in the subfloor and significantly slows the process of drying out. Installation of an adequate subfloor ventilation system, either natural or mechanical, is desirable.

Warning: Although this Building Technology File deals with cracking in buildings, it should be said that subfloor moisture can result in the development of other problems, notably:

- Water that is transmitted into masonry, metal or timber building elements causes damage and/or decay to those elements.
- High subfloor humidity and moisture content create an ideal environment for various pests, including termites and spiders.
- Where high moisture levels are transmitted to the flooring and walls, an increase in the dust mite count can ensue within the living areas. Dust mites, as well as dampness in general, can be a health hazard to inhabitants, particularly those who are abnormally susceptible to respiratory ailments.

The garden

The ideal vegetation layout is to have lawn or plants that require only light watering immediately adjacent to the drainage or paving edge, then more demanding plants, shrubs and trees spread out in that order.

Overwatering due to misuse of automatic watering systems is a common cause of saturation and water migration under footings. If it is necessary to use these systems, it is important to remove garden beds to a completely safe distance from buildings.

Existing trees

Where a tree is causing a problem of soil drying or there is the existence or threat of upheaval of footings, if the offending roots are subsidiary and their removal will not significantly damage the tree, they should be severed and a concrete or metal barrier placed vertically in the soil to prevent future root growth in the direction of the building. If it is not possible to remove the relevant roots without damage to the tree, an application to remove the tree should be made to the local authority. A prudent plan is to transplant likely offenders before they become a problem.

Information on trees, plants and shrubs

State departments overseeing agriculture can give information regarding root patterns, volume of water needed and safe distance from buildings of most species. Botanic gardens are also sources of information. For information on plant roots and drains, see Building Technology File 17.

Excavation

Excavation around footings must be properly engineered. Soil supporting footings can only be safely excavated at an angle that allows the soil under the footing to remain stable. This angle is called the angle of repose (or friction) and varies significantly between soil types and conditions. Removal of soil within the angle of repose will cause subsidence.

Remediation

Where erosion has occurred that has washed away soil adjacent to footings, soil of the same classification should be introduced and compacted to the same density. Where footings have been undermined, augmentation or other specialist work may be required. Remediation of footings and foundations is generally the realm of a specialist consultant.

Where isolated footings rise and fall because of swell/shrink effect, the homeowner may be tempted to alleviate floor bounce by filling the gap that has appeared between the bearer and the pier with blocking. The danger here is that when the next swell segment of the cycle occurs, the extra blocking will push the floor up into an accentuated dome and may also cause local shear failure in the soil. If it is necessary to use blocking, it should be by a pair of fine wedges and monitoring should be carried out fortnightly.

This BTF was prepared by John Lewer FAIB, MIAMA, Partner, Construction Diagnosis.

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Sampling

Sampling is carried out during drilling or test pitting to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provide information on colour, type, inclusions and, depending upon the degree of disturbance, some information on strength and structure.

Undisturbed samples are taken by pushing a thin-walled sample tube into the soil and withdrawing it to obtain a sample of the soil in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Test Pits

Test pits are usually excavated with a backhoe or an excavator, allowing close examination of the in-situ soil if it is safe to enter into the pit. The depth of excavation is limited to about 3 m for a backhoe and up to 6 m for a large excavator. A potential disadvantage of this investigation method is the larger area of disturbance to the site.

Large Diameter Augers

Boreholes can be drilled using a rotating plate or short spiral auger, generally 300 mm or larger in diameter commonly mounted on a standard piling rig. The cuttings are returned to the surface at intervals (generally not more than 0.5 m) and are disturbed but usually unchanged in moisture content. Identification of soil strata is generally much more reliable than with continuous spiral flight augers, and is usually supplemented by occasional undisturbed tube samples.

Continuous Spiral Flight Augers

The borehole is advanced using 90-115 mm diameter continuous spiral flight augers which are withdrawn at intervals to allow sampling or in-situ testing. This is a relatively economical means of drilling in clays and sands above the water table. Samples are returned to the surface, or may be collected after withdrawal of the auger flights, but they are disturbed and may be mixed with soils from the sides of the hole. Information from the drilling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively low reliability, due to the remoulding, possible mixing or softening of samples by groundwater.

Non-core Rotary Drilling

The borehole is advanced using a rotary bit, with water or drilling mud being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from the rate of penetration. Where drilling mud is used this can mask the cuttings and reliable identification is only possible from separate sampling such as SPTs.

Continuous Core Drilling

A continuous core sample can be obtained using a diamond tipped core barrel, usually with a 50 mm internal diameter. Provided full core recovery is achieved (which is not always possible in weak rocks and granular soils), this technique provides a very reliable method of investigation.

Standard Penetration Tests

Standard penetration tests (SPT) are used as a means of estimating the density or strength of soils and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289, Methods of Testing Soils for Engineering Purposes - Test 6.3.1.

The test is carried out in a borehole by driving a 50 mm diameter split sample tube under the impact of a 63 kg hammer with a free fall of 760 mm. It is normal for the tube to be driven in three successive 150 mm increments and the 'N' value is taken as the number of blows for the last 300 mm. In dense sands, very hard clays or weak rock, the full 450 mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form.

- In the case where full penetration is obtained with successive blow counts for each 150 mm of, say, 4, 6 and 7 as:

  4,6,7
  N=13

- In the case where the test is discontinued before the full penetration depth, say after 15 blows for the first 150 mm and 30 blows for the next 40 mm as:

  15, 30/40 mm

The results of the SPT tests can be related empirically to the engineering properties of the soils.

Dynamic Cone Penetrometer Tests / Perth Sand Penetrometer Tests

Dynamic penetrometer tests (DCP or PSP) are carried out by driving a steel rod into the ground using a standard weight of hammer falling a specified distance. As the rod penetrates the soil the number of blows required to penetrate each successive 150 mm depth are recorded. Normally there is a depth limitation of 1.2 m, but this may be extended in certain conditions by the use of extension rods. Two types of penetrometer are commonly used.

- Perth sand penetrometer - a 16 mm diameter flat ended rod is driven using a 9 kg hammer dropping 600 mm (AS 1289, Test 6.3.3). This test was developed for testing the density of sands and is mainly used in granular soils and filling.
- Cone penetrometer - a 16 mm diameter rod with a 20 mm diameter cone end is driven using a 9 kg hammer dropping 510 mm (AS 1289, Test 6.3.2). This test was developed initially for pavement subgrade investigations, and correlations of the test results with California Bearing Ratio have been published by various road authorities.

Soil Descriptions

Douglas Partners

Description and Classification Methods

The methods of description and classification of soils and rocks used in this report are based on Australian Standard AS 1726, Geotechnical Site Investigations Code. In general, the descriptions include strength or density, colour, structure, soil or rock type and inclusions.

Soil Types

Soil types are described according to the predominant particle size, qualified by the grading of other particles present:

Type	Particle size (mm)
Boulder	>200
Cobble	63 - 200
Gravel	2.36 - 63
Sand	0.075 - 2.36
Silt	0.002 - 0.075
Clay	<0.002

The sand and gravel sizes can be further subdivided as follows:

Type	Particle size (mm)
Coarse gravel	20 - 63
Medium gravel	6 - 20
Fine gravel	2.36 - 6
Coarse sand	0.6 - 2.36
Medium sand	0.2 - 0.6
Fine sand	0.075 - 0.2

The proportions of secondary constituents of soils are described as:

Term	Proportion	Example
And	Specify	Clay (60%) and Sand (40%)
Adjective	20 - 35%	Sandy Clay
Slightly	12 - 20%	Slightly Sandy Clay
With some	5 - 12%	Clay with some sand
With a trace of	0 - 5%	Clay with a trace of sand

Definitions of grading terms used are:

- Well graded - a good representation of all particle sizes
- Poorly graded - an excess or deficiency of particular sizes within the specified range
- Uniformly graded - an excess of a particular particle size
- Gap graded - a deficiency of a particular particle size with the range

Cohesive Soils

Cohesive soils, such as clays, are classified on the basis of undrained shear strength. The strength may be measured by laboratory testing, or estimated by field tests or engineering examination. The strength terms are defined as follows:

Description	Abbreviation	Undrained shear strength (kPa)
Very soft	vs	<12
Soft	s	12 - 25
Firm	f	25 - 50
Stiff	st	50 - 100
Very stiff	vst	100 - 200
Hard	h	>200

Cohesionless Soils

Cohesionless soils, such as clean sands, are classified on the basis of relative density, generally from the results of standard penetration tests (SPT), cone penetration tests (CPT) or dynamic penetrometers (PSP). The relative density terms are given below:

Relative Density	Abbreviation	SPT N value	CPT qc value (MPa)
Very loose	vl	<4	<2
Loose	l	4 - 10	2 -5
Medium dense	md	10 - 30	5 - 15
Dense	d	30 - 50	15 - 25
Very dense	vd	>50	>25

Soil Descriptions

Soil Origin

It is often difficult to accurately determine the origin of a soil. Soils can generally be classified as:

- Residual soil - derived from in-situ weathering of the underlying rock;
- Transported soils - formed somewhere else and transported by nature to the site; or
- Filling - moved by man.

Transported soils may be further subdivided into:

- Alluvium - river deposits
- Lacustrine - lake deposits
- Aeolian - wind deposits
- Littoral - beach deposits
- Estuarine - tidal river deposits
- Talus - scree or coarse colluvium
- Slopewash or Colluvium - transported downslope by gravity assisted by water. Often includes angular rock fragments and boulders.

Symbols & Abbreviations

Douglas Partners

Introduction

These notes summarise abbreviations commonly used on borehole logs and test pit reports.

Drilling or Excavation Methods

C	Core Drilling
R	Rotary drilling
SFA	Spiral flight augers
NMLC	Diamond core - 52 mm dia
NQ	Diamond core - 47 mm dia
HQ	Diamond core - 63 mm dia
PQ	Diamond core - 81 mm dia

Water

▷	Water seep
▽	Water level

Sampling and Testing

A	Auger sample
B	Bulk sample
D	Disturbed sample
E	Environmental sample
U_{50}	Undisturbed tube sample (50mm)
W	Water sample
pp	pocket penetrometer (kPa)
PID	Photo ionisation detector
PL	Point load strength Is(50) MPa
S	Standard Penetration Test
V	Shear vane (kPa)

Description of Defects in Rock

The abbreviated descriptions of the defects should be in the following order: Depth, Type, Orientation, Coating, Shape, Roughness and Other. Drilling and handling breaks are not usually included on the logs.

Defect Type

B	Bedding plane
Cs	Clay seam
Cv	Cleavage
Cz	Crushed zone
Ds	Decomposed seam
F	Fault
J	Joint
Lam	lamination
Pt	Parting
Sz	Sheared Zone
V	Vein

Orientation

The inclination of defects is always measured from the perpendicular to the core axis.

h	horizontal
v	vertical
sh	sub-horizontal
sv	sub-vertical

Coating or Infilling Term

cln	clean
co	coating
he	healed
inf	infilled
stn	stained
ti	tight
vn	veneer

Coating Descriptor

ca	calcite
cbs	carbonaceous
cly	clay
fe	iron oxide
mn	manganese
slt	silty

Shape

cu	curved
ir	irregular
pl	planar
st	stepped
un	undulating

Roughness

po	polished
ro	rough
sl	slickensided
sm	smooth
vr	very rough

Other

fg	fragmented
bnd	band
qtz	quartz

Symbols & Abbreviations

Graphic Symbols for Soil and Rock

General


Asphalt


Road base


Concrete


Filling

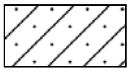
Soils


Topsoil

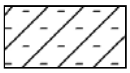

Peat


Clay

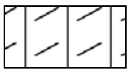

Silty clay

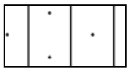

Sandy clay

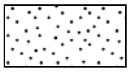

Gravelly clay

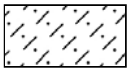

Shaly clay

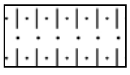

Silt


Clayey silt


Sandy silt

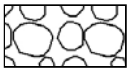

Sand

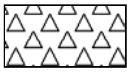

Clayey sand


Silty sand


Gravel


Sandy gravel


Cobbles, boulders

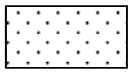

Talus

Sedimentary Rocks

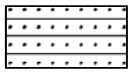

Boulder conglomerate

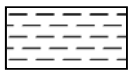

Conglomerate


Conglomeratic sandstone

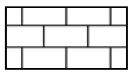

Sandstone


Siltstone


Laminite

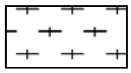

Mudstone, claystone, shale

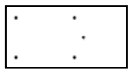

Coal


Limestone

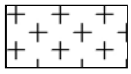
Metamorphic Rocks

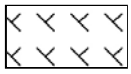

Slate, phyllite, schist

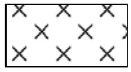

Gneiss

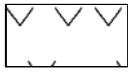

Quartzite

Igneous Rocks


Granite


Dolerite, basalt, andesite


Dacite, epidote


Tuff, breccia


Porphyry

Rock Strength

Rock strength is defined by the Point Load Strength Index ($Is_{(50)}$) and refers to the strength of the rock substance and not the strength of the overall rock mass, which may be considerably weaker due to defects. The test procedure is described by Australian Standard 4133.4.1 - 1993. The terms used to describe rock strength are as follows:

Term	Abbreviation	Point Load Index $Is_{(50)}$ MPa	Approx Unconfined Compressive Strength MPa*
Extremely low	EL	<0.03	<0.6
Very low	VL	0.03 - 0.1	0.6 - 2
Low	L	0.1 - 0.3	2 - 6
Medium	M	0.3 - 1.0	6 - 20
High	H	1 - 3	20 - 60
Very high	VH	3 - 10	60 - 200
Extremely high	EH	>10	>200

* Assumes a ratio of 20:1 for UCS to $Is_{(50)}$

Degree of Weathering

The degree of weathering of rock is classified as follows:

Term	Abbreviation	Description
Extremely weathered	EW	Rock substance has soil properties, i.e. it can be remoulded and classified as a soil but the texture of the original rock is still evident.
Highly weathered	HW	Limonite staining or bleaching affects whole of rock substance and other signs of decomposition are evident. Porosity and strength may be altered as a result of iron leaching or deposition. Colour and strength of original fresh rock is not recognisable
Moderately weathered	MW	Staining and discolouration of rock substance has taken place
Slightly weathered	SW	Rock substance is slightly discoloured but shows little or no change of strength from fresh rock
Fresh stained	Fs	Rock substance unaffected by weathering but staining visible along defects
Fresh	Fr	No signs of decomposition or staining

Degree of Fracturing

The following classification applies to the spacing of natural fractures in diamond drill cores. It includes bedding plane partings, joints and other defects, but excludes drilling breaks.

Term	Description
Fragmented	Fragments of <20 mm
Highly Fractured	Core lengths of 20-40 mm with some fragments
Fractured	Core lengths of 40-200 mm with some shorter and longer sections
Slightly Fractured	Core lengths of 200-1000 mm with some shorter and loner sections
Unbroken	Core lengths mostly > 1000 mm

Rock Descriptions

Rock Quality Designation

The quality of the cored rock can be measured using the Rock Quality Designation (RQD) index, defined as:

$$\text{RQD \%} = \frac{\text{cumulative length of 'sound' core sections} \geq \text{100 mm long}}{\text{total drilled length of section being assessed}}$$

where 'sound' rock is assessed to be rock of low strength or better. The RQD applies only to natural fractures. If the core is broken by drilling or handling (i.e. drilling breaks) then the broken pieces are fitted back together and are not included in the calculation of RQD.

Stratification Spacing

For sedimentary rocks the following terms may be used to describe the spacing of bedding partings:

Term	Separation of Stratification Planes
Thinly laminated	< 6 mm
Laminated	6 mm to 20 mm
Very thinly bedded	20 mm to 60 mm
Thinly bedded	60 mm to 0.2 m
Medium bedded	0.2 m to 0.6 m
Thickly bedded	0.6 m to 2 m
Very thickly bedded	> 2 m

BOREHOLE LOG

CLIENT: Noel F Mitchell
PROJECT: Aberdeen Valley Fair Retail and Service Centre
LOCATION: Macqueen Street, Aberdeen

SURFACE LEVEL: --
EASTING: 301157
NORTHING: 6438386
DIP/AZIMUTH: 90°/--

BORE No: 1
PROJECT No: 91087.00
DATE: 11/4/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
	0.1	TOPSOIL - Generally comprising dark brown clayey sandy silty topsoil with trace rounded gravel max diameter 30mm, and rootlets (grass covered), moist							A			
		SANDY SILTY CLAY - Stiff, dark brown, fine to medium grained sandy silty clay with trace fine subrounded gravel up to 3mm diameter, M>Wp							U_{50}			pp = 400-500
		From 0.6m, brown and very stiff to hard										
1		From 1.0m, very stiff							S			3,4,13 N = 17 pp = 300-400
		From 1.4m, with some subrounded gravel max diameter 25mm										
		From 1.5m, increased drilling resistance										
2	2.0	SANDY GRAVEL - Dense, brown, fine to coarse grained slightly clayey sandy subangular and subrounded gravel and cobbles, moist (possible extremely weathered conglomerate)							S			16,21,25 N = 46
3		From 3.5m, possible larger diameter cobbles and boulders										
	3.5	WEATHERED CONGLOMERATE - Extremely low strength, extremely weathered, brown, medium to coarse conglomerate							C	100	0	
	3.8	Bore discontinued at 3.8m, limit of investigation										
4												

RIG: Truck mounted FG101 **DRILLER:** Currie (FICO) **LOGGED:** Sebastian **CASING:**

TYPE OF BORING: 115mm diameter solid flight auger with v-bit, tc-bit to refusal at 3.5m, coring from 3.5m to termination depth

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

Aberdeen Valley Fair Retail and Service Centre

BORE 1

3.5m – 3.8m

Douglas Partners Geotechnics / Environment / Groundwater	**Core Photoplate** **Aberdeen Valley Fair Retail and Service Centre** **Macqueen Street, Aberdeen**	PROJECT: 91087.00 PLATE No: 1 REV: 0
	CLIENT: Noel F Mitchell	DATE: 31-May-17

BOREHOLE LOG

CLIENT: Noel F Mitchell
PROJECT: Aberdeen Valley Fair Retail and Service Centre
LOCATION: Macqueen Street, Aberdeen

SURFACE LEVEL: --
EASTING: 301310
NORTHING: 6438396
DIP/AZIMUTH: 90°/--

BORE No: 2
PROJECT No: 91087.00
DATE: 11/4/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
	0.1	TOPSOIL - Generally comprising dark brown sandy silty topsoil with trace gravel max diameter 5mm, and rootlets, moist (grass covered)							
		SANDY SILTY CLAY - Stiff, dark brown, fine to medium grained sandy silty clay with trace subangular and subrounded gravel max diameter 3mm, M>Wp							
		From ~0.3m, stiff to very stiff, brown		A	0.5				
		From 0.6m, very stiff to hard							
	1				1.0		pp >400		1
				S			6,17,20 N = 37		
					1.45				
		From 1.6m, pale grey and brown with trace to some subangular and subrounded gravel max diameter 30mm							
	2	From ~2.0m, pale brown, decreased gravel content							2
					2.5				
				S	2.6		pp >400 9,16,16 N = 32		
	3				2.95				3
	4				4.0				4
				S			7,17,22 N = 39		
					4.4		pp >400		
	4.45	Bore discontinued at 4.45m, limit of investigation			4.45				

RIG: Truck mounted FG101 **DRILLER:** Currie (FICO) **LOGGED:** Sebastian **CASING:**

TYPE OF BORING: 115mm diameter solid flight auger to termination

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Noel F Mitchell
PROJECT: Aberdeen Valley Fair Retail and Service Centre
LOCATION: Macqueen Street, Aberdeen

SURFACE LEVEL: --
EASTING: 301209
NORTHING: 6438476
DIP/AZIMUTH: 90°/--

BORE No: 3
PROJECT No: 91087.00
DATE: 11/4/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
	0.1	TOPSOIL - Generally comprising dark brown clayey sandy silty topsoil with some rounded gravel max diameter 30mm, and rootlets, moist (grass covered)							
		SANDY SILTY CLAY - Stiff, dark brown, fine to medium grained sandy silty clay with trace rounded gravel and cobbles max diameter 70mm, M>Wp		A	0.5				
		From 0.6m, very stiff to hard							
	1	From ~1.0m, brown, no cobbles			1.0		pp >400		
				S			5,7,10 N = 17		
					1.45				
	2								
					2.5				
				S	2.7		pp >400 5,8,19 N = 27		
	3				2.95				
	3.5	SANDY CLAY - Very stiff to hard, brown mottled orange, fine to medium grained sandy clay, M>Wp							
	4								
					4.5				
				S			8,16,20/70 refusal		
	4.87	Refusal on SPT at 4.87m			4.87				
		Bore discontinued at 4.87m, limit of investigation							

RIG: Truck mounted FG101 **DRILLER:** Currie (FICO) **LOGGED:** Sebastian **CASING:**
TYPE OF BORING: 115mm diameter solid flight auger with v-bit
WATER OBSERVATIONS: No free groundwater observed
REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Noel F Mitchell
PROJECT: Aberdeen Valley Fair Retail and Service Centre
LOCATION: Macqueen Street, Aberdeen

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: 4
PROJECT No: 91087.00
DATE: 12/4/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
	0.1	TOPSOIL - Generally comprising dark brown sandy silty topsoil with trace gravel max diameter 5mm, and rootlets, moist (grass covered)							
		SILTY CLAY - Stiff, dark brown silty clay with trace rootlets and fine to medium grained sand and fine gravel up to 3mm diameter, M>Wp							
		From 0.3m, very stiff to hard			0.2				
				U_{50}					
				B	0.4		pp >400		
					0.5		pp >400		
		From 0.7m, some fine to medium grained sand			0.6				
	1				1.0		pp >400		
				B					
	2				2.0				
	3	3.0 Pit discontinued at 3.0m, limit of investigation							
	4								

RIG: Kobelco 5.5 tonne excavator with 450mm tooth bucket

LOGGED: Sebastian

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Noel F Mitchell
PROJECT: Aberdeen Valley Fair Retail and Service Centre
LOCATION: Macqueen Street, Aberdeen

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: 5
PROJECT No: 91087.00
DATE: 12/4/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
	0.1	TOPSOIL - Generally comprising dark brown sandy silty topsoil with trace gravel max diameter 5mm, and rootlets, moist (grass covered)							
		SILTY CLAY - Stiff, dark brown silty clay with trace rootlets and fine to medium grained sand and fine gravel up to 3mm diameter, M>Wp		B	0.2				
		From 0.5m, very stiff to hard			0.5		pp >400		
		From 0.7m, brown with some fine to medium grained sand							
	1			U_{50}	1.0				
				B	1.3		pp >400		
					1.5				
	2								
	3								
	3.0	Pit discontinued at 3.0m, limit of investigation							
	4								

Dynamic Penetrometer Test (blows per 150mm): 5, 10, 15, 20

RIG: Kobelco 5.5 tonne excavator with 450mm tooth bucket

LOGGED: Sebastian

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Noel F Mitchell
PROJECT: Aberdeen Valley Fair Retail and Service Centre
LOCATION: Macqueen Street, Aberdeen

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: 6
PROJECT No: 91087.00
DATE: 12/4/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
	0.1	TOPSOIL - Generally comprising dark brown sandy silty topsoil with trace gravel max diameter 5mm, and rootlets, moist (grass covered)							
		SILTY CLAY - Stiff, dark brown silty clay with trace rootlets and fine to medium grained sand and gravel max diameter 3mm, M>Wp		B	0.2				
		From 0.5m, very stiff to hard			0.5				
		From 0.6m, brown			0.8		pp = 300-400		
1					1.0				1
		From 1.1m, pale brown with some fine to medium grained sand		U_{50}	1.3				
					1.5				
				B	1.6		pp >400		
2					2.0				2
3	3.0	Pit discontinued at 3.0m, limit of investigation							3
4									4

RIG: Kobelco 5.5 tonne excavator with 450mm tooth bucket

LOGGED: Sebastian

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Noel F Mitchell
PROJECT: Aberdeen Valley Fair Retail and Service Centre
LOCATION: Macqueen Street, Aberdeen

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: 7
PROJECT No: 91087.00
DATE: 12/4/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
	0.1	TOPSOIL - Generally comprising dark brown sandy silty topsoil with trace gravel max diameter 5mm, and rootlets, moist (grass covered)			0.2		pp = 300		
		SILTY CLAY - Stiff to very stiff, dark brown silty clay with trace rootlets and fine to medium grained sand and fine gravel up to 3mm diameter, M>Wp							
		From 0.6m, very stiff to hard			0.8				
		From 0.7m, brown		B	1.0		pp >400		
		From 1.3m, pale brown with some fine to medium grained sand			1.4				
				U_{50}	1.7		pp >400		
	2.0	SANDY GRAVEL - (Dense), brown, fine to coarse grained slightly clayey sandy subangular and subrounded gravel and cobbles, max diameter 150mm, moist (possible extremely weathered conglomerate)		B	2.0				
					2.5				
	2.7	Pit discontinued at 2.7m, limit of investigation							

RIG: Kobelco 5.5 tonne excavator with 450mm tooth bucket

LOGGED: Sebastian

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Noel F Mitchell
PROJECT: Aberdeen Valley Fair Retail and Service Centre
LOCATION: Macqueen Street, Aberdeen

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: 8
PROJECT No: 91087.00
DATE: 12/4/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
	0.25	FILLING - Generally comprising subangular and subrounded gravelly clayey sandy silt (hardstand) filling, gravel max diameter 20mm, M≥Wp, subangular gravel on surface			0.1				
				B	0.2	D			
		SILTY CLAY - Stiff, dark brown silty clay with trace fine subangular and subrounded gravel max diameter 3mm, M>Wp			0.5		pp >400		
		From 0.5m, very stiff to hard							
		From 0.7m, stiff to very stiff, brown with trace fine to coarse grained sand			0.8				
				B					
	1				1.0		pp >400		1
	1.3	SANDY GRAVEL - (Hard), brown, fine to coarse grained slightly clayey sandy subangular and subrounded gravel and cobbles, max diameter 150mm, moist (possible extremely weathered conglomerate)							
	2								2
	2.3	Pit discontinued at 2.3m, limit of investigation							
	3								3
	4								4

Dynamic Penetrometer Test (blows per 150mm): 5, 10, 15, 20

RIG: Kobelco 5.5 tonne excavator with 450mm tooth bucket

LOGGED: Sebastian

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Noel F Mitchell
PROJECT: Aberdeen Valley Fair Retail and Service Centre
LOCATION: Macqueen Street, Aberdeen

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: 9
PROJECT No: 91087.00
DATE: 12/4/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
	0.25	FILLING - Generally comprising subangular and subrounded gravelly clayey sandy silt (hardstand) filling, gravel max diameter 20mm, M≥Wp, subangular gravelon surface From 0.1m, trace subrounded cobbles max diameter 100mm Trace roots at 0.2m		D	0.1	E			
					0.3				
				B U_{50}	0.5	D	pp >400		
		SILTY CLAY - Stiff to hard, dark brown silty clay, with trace fine gravel up to 3mm diameter, M>Wp From 0.8m, brown with trace fine to coarse grained sand			0.6				
	1				1.0		pp >420		1
	1.3	SANDY GRAVEL - (Dense), brown, fine to coarse grained slightly clayey sandy subangular and subrounded gravel and cobbles, max diameter 150mm, moist (possible extremely weathered conglomerate)			1.4				
				B		D			
	2	From 2.0m, trace subrounded boulders max diameter 220mm			1.8				2
	2.8	Pit discontinued at 2.8m, limit of investigation							
	3								3
	4								4

RIG: Kobelco 5.5 tonne excavator with 450mm tooth bucket

LOGGED: Sebastian

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au

Results of Dynamic Penetrometer Tests

Client Noel F Mitchell **Project No.** 91087.00

Project Aberdeen Valley Fair Retail and Service Centre **Date** 11/04/17

Location Macqueen Street, Aberdeen **Page No.** 1 of 1

Test Location	1	2	3	4	5	6	7	8	9	
RL of Test (AHD)										
Depth (m)	**Penetration Resistance** Blows/150 mm									
0 - 0.15	1	4	5	3	2	3	2	3	8	
0.15 - 0.30	2	3	5	3	3	3	3	1	8	
0.30 - 0.45	2	2	3	2	2	3	2	2	7	
0.45 - 0.60	2	6	4	5	4	6	4	3	8	
0.60 - 0.75	4	10	10	12	10	10	7	5	10	
0.75 - 0.90	5	20	13	15	10	11	10	8	10	
0.90 - 1.05	8		14	14	10	15	14	6		
1.05 - 1.20	7		14	15	10	15	14	7		
1.20 - 1.35										
1.35 - 1.50										
1.50 - 1.65										
1.65 - 1.80										
1.80 - 1.95										
1.95 - 2.10										
2.10 - 2.25										
2.25 - 2.40										
2.40 - 2.55										
2.55 - 2.70										
2.70 - 2.85										
2.85 - 3.00										
3.00 - 3.15										
3.15 - 3.30										
3.30 - 3.45										
3.45 - 3.60										

Test Method AS 1289.6.3.2, Cone Penetrometer ☑ **Tested By** JPS

AS 1289.6.3.3, Sand Penetrometer ☐ **Checked By** JAW

Remarks Ref = Refusal, 24/110 indicates 25 blows for 110 mm penetration

Appendix B

Laboratory Test Results

Material Test Report

Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Newcastle Laboratory
15 Callistemon Close Warabrook Newcastle NSW 2310
Phone: (02) 4960 9600
Fax: (02) 4960 9601
Email: dave.millard@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

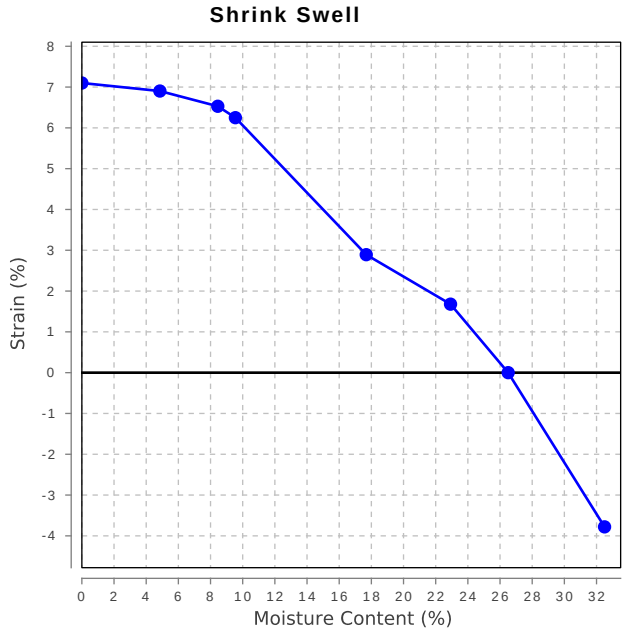
Approved Signatory: Dave Millard
Nata Accredited Laboratory Number: 828

Report Number: **91087.00-1**
Issue Number: 1
Date Issued: 18/05/2017
Client: The Mitchell Group
207 Mount Bright Road, Mount View NSW 2325
Project Number: 91087.00
Project Name: Aberdeen Valley Fair Retail and Service Centre
Project Location: Macqueen Street, Aberdeen
Work Request: 751
Sample Number: 17-751A
Date Sampled: 11/04/2017
Sampling Method: Sampled by Engineering Department
Sample Location: **1 (0.50 - 0.95m)**
Material: Sandy Silty CLAY - Brown

Shrink Swell Index (AS 1289 7.1.1 & 2.1.1)	
Iss (%)	**5.0**
Visual Description	Sandy Silty CLAY
* Shrink Swell Index (Iss) reported as the percentage vertical strain per pF change in suction.	

Core Shrinkage Test	
Shrinkage Strain - Oven Dried (%)	**7.1**
Estimated % by volume of significant inert inclusions	0
Cracking	Highly Cracked
Crumbling	No
Moisture Content (%)	26.5

Swell Test	
Initial Pocket Penetrometer (kPa)	350
Final Pocket Penetrometer (kPa)	210
Initial Moisture Content (%)	26.3
Final Moisture Content (%)	32.5
Swell (%)	**3.8**
* NATA Accreditation does not cover the performance of pocket penetrometer readings.	



Material Test Report

Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Newcastle Laboratory
15 Callistemon Close Warabrook Newcastle NSW 2310
Phone: (02) 4960 9600
Fax: (02) 4960 9601
Email: dave.millard@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

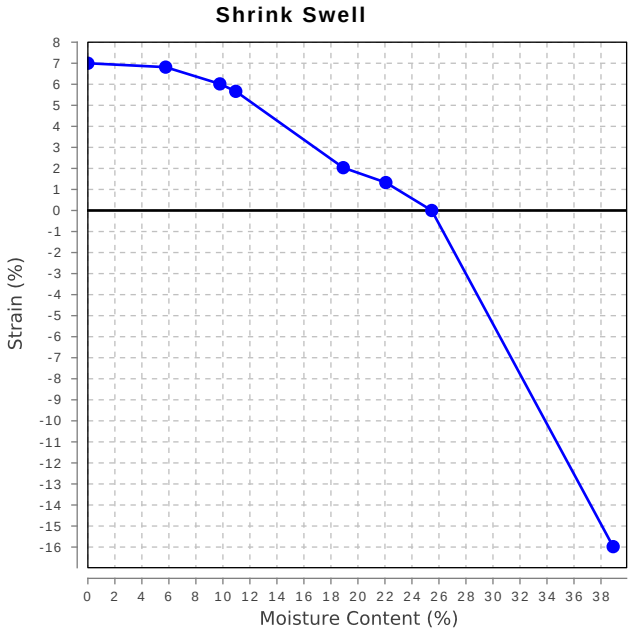
Approved Signatory: Dave Millard
Nata Accredited Laboratory Number: 828

Report Number: **91087.00-1**
Issue Number: 1
Date Issued: 18/05/2017
Client: The Mitchell Group
207 Mount Bright Road, Mount View NSW 2325
Project Number: 91087.00
Project Name: Aberdeen Valley Fair Retail and Service Centre
Project Location: Macqueen Street, Aberdeen
Work Request: 751
Sample Number: 17-751B
Date Sampled: 11/04/2017
Sampling Method: Sampled by Engineering Department
Sample Location: **4 (0.2 - 0.5m)**
Material: Silty CLAY - Dark grey

Shrink Swell Index (AS 1289 7.1.1 & 2.1.1)	
Iss (%)	**8.3**
Visual Description	Silty CLAY
* Shrink Swell Index (Iss) reported as the percentage vertical strain per pF change in suction.	

Core Shrinkage Test	
Shrinkage Strain - Oven Dried (%)	**7.0**
Estimated % by volume of significant inert inclusions	0
Cracking	Moderately Cracked
Crumbling	No
Moisture Content (%)	25.5

Swell Test	
Initial Pocket Penetrometer (kPa)	>600
Final Pocket Penetrometer (kPa)	190
Initial Moisture Content (%)	25.4
Final Moisture Content (%)	38.9
Swell (%)	**16.0**
* NATA Accreditation does not cover the performance of pocket penetrometer readings.	



Material Test Report

Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Newcastle Laboratory
15 Callistemon Close Warabrook Newcastle NSW 2310
Phone: (02) 4960 9600
Fax: (02) 4960 9601
Email: dave.millard@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

NATA
WORLD RECOGNISED ACCREDITATION

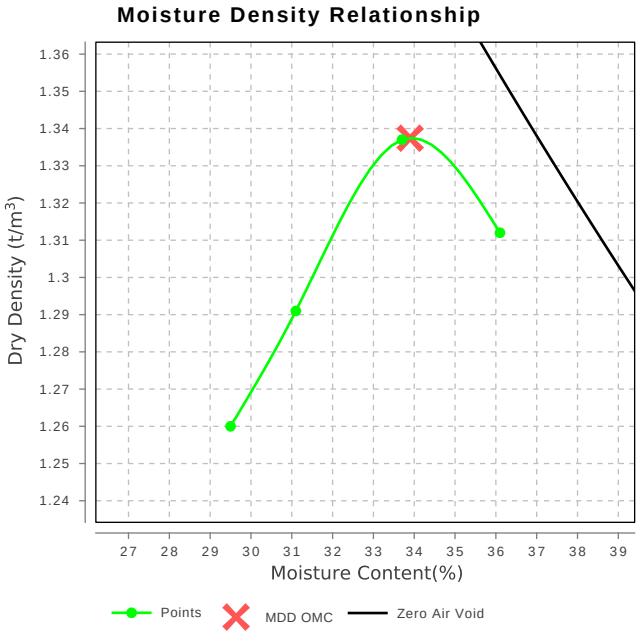
Approved Signatory: Dave Millard
Nata Accredited Laboratory Number: 828

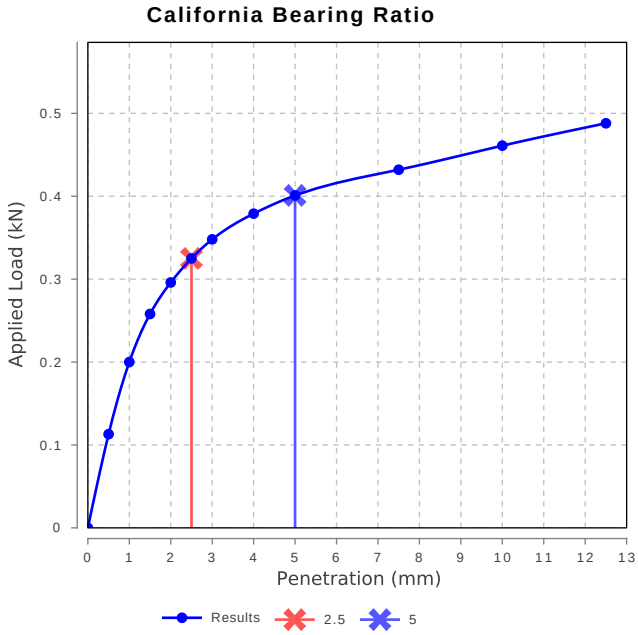
Report Number: **91087.00-1**
Issue Number: 1
Date Issued: 18/05/2017
Client: The Mitchell Group
207 Mount Bright Road, Mount View NSW 2325
Project Number: 91087.00
Project Name: Aberdeen Valley Fair Retail and Service Centre
Project Location: Macqueen Street, Aberdeen
Work Request: 751
Sample Number: 17-751C
Date Sampled: 11/04/2017
Sampling Method: Sampled by Engineering Department
Sample Location: **4 (0.4m)**
Material: Silty CLAY

Moisture Content (AS 1289 2.1.1)	
Moisture Content (%)	29.5

Dry Density - Moisture Relationship (AS 1289 5.1.1 & 2.1.1)	
Mould Type	1 LITRE MOULD A
Compaction	Standard
No. Layers	3
No. Blows / Layer	25
Maximum Dry Density (t/m^3)	1.34
Optimum Moisture Content (%)	34.0
Oversize Sieve (mm)	19
Oversize Material (%)	0

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	**2.5**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Maximum Dry Density (t/m^3)	1.34		
Optimum Moisture Content (%)	34.0		
Laboratory Density Ratio (%)	100.5		
Laboratory Moisture Ratio (%)	99.5		
Dry Density after Soaking (t/m^3)	1.28		
Field Moisture Content (%)	29.5		
Moisture Content at Placement (%)	33.7		
Moisture Content Top 30mm (%)	42.0		
Moisture Content Rest of Sample (%)	36.4		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Swell (%)	4.5		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0		





Material Test Report

Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Newcastle Laboratory
15 Callistemon Close Warabrook Newcastle NSW 2310
Phone: (02) 4960 9600
Fax: (02) 4960 9601
Email: dave.millard@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

NATA WORLD RECOGNISED ACCREDITATION

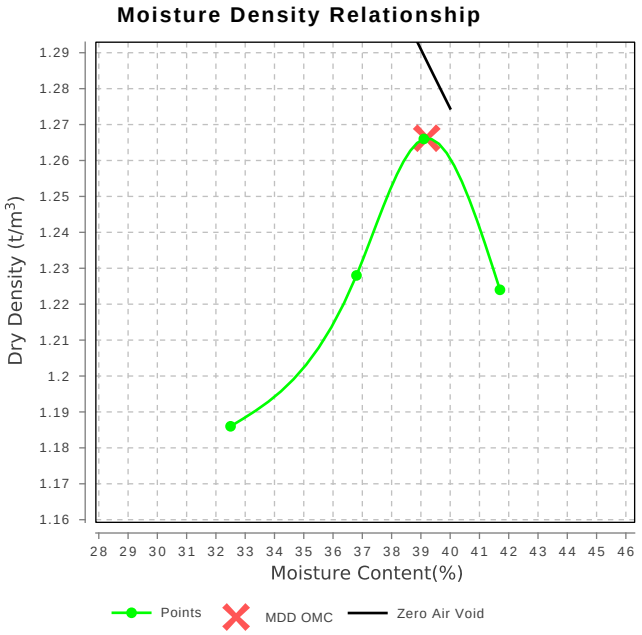
Approved Signatory: Dave Millard
Nata Accredited Laboratory Number: 828

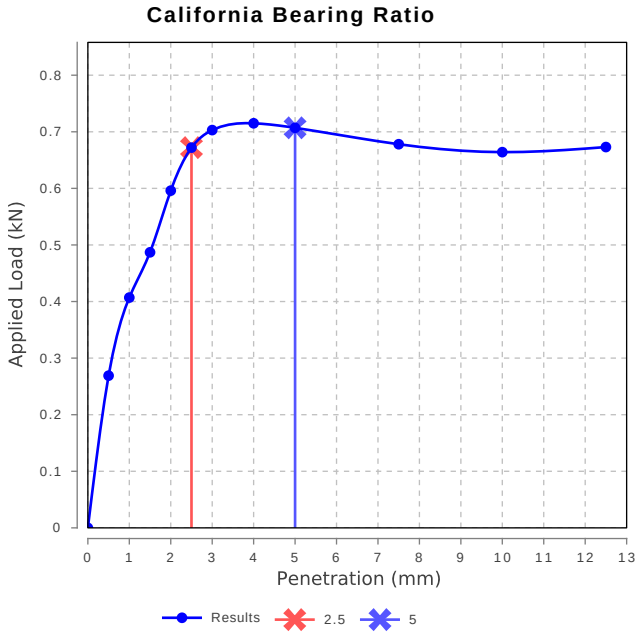
Report Number: **91087.00-1**
Issue Number: 1
Date Issued: 18/05/2017
Client: The Mitchell Group
207 Mount Bright Road, Mount View NSW 2325
Project Number: 91087.00
Project Name: Aberdeen Valley Fair Retail and Service Centre
Project Location: Macqueen Street, Aberdeen
Work Request: 751
Sample Number: 17-751D
Date Sampled: 11/04/2017
Sampling Method: Sampled by Engineering Department
Sample Location: **5 (0.2 - 0.5m)**
Material: Silty CLAY

Moisture Content (AS 1289 2.1.1)	
Moisture Content (%)	36.8

Dry Density - Moisture Relationship (AS 1289 5.1.1 & 2.1.1)	
Mould Type	1 LITRE MOULD A
Compaction	Standard
No. Layers	3
No. Blows / Layer	25
Maximum Dry Density (t/m^3)	1.27
Optimum Moisture Content (%)	39.0
Oversize Sieve (mm)	19
Oversize Material (%)	0

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	**5**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Maximum Dry Density (t/m^3)	1.27		
Optimum Moisture Content (%)	39.0		
Laboratory Density Ratio (%)	100.0		
Laboratory Moisture Ratio (%)	100.5		
Dry Density after Soaking (t/m^3)	1.25		
Field Moisture Content (%)	36.8		
Moisture Content at Placement (%)	39.3		
Moisture Content Top 30mm (%)	41.8		
Moisture Content Rest of Sample (%)	40.1		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Swell (%)	1.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0		





Material Test Report

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Newcastle Laboratory
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Fax: (02) 4960 9601
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NATA WORLD RECOGNISED ACCREDITATION

Approved Signatory: Dave Millard
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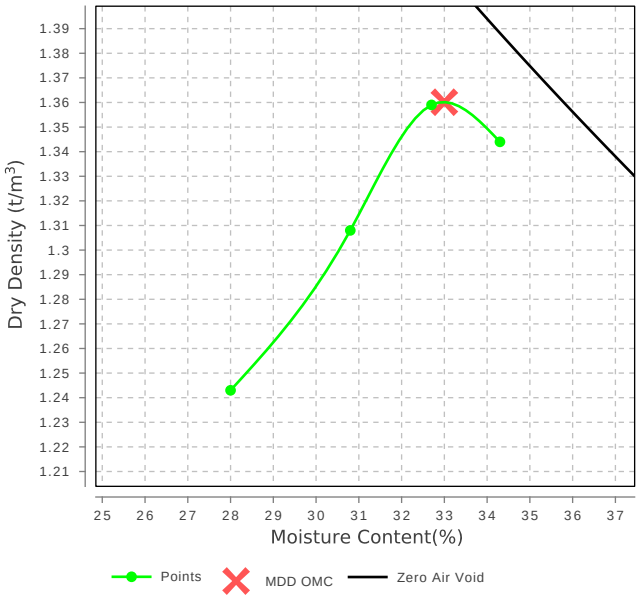
Issue Number: 1
Date Issued: 18/05/2017
Client: The Mitchell Group
207 Mount Bright Road, Mount View NSW 2325
Project Number: 91087.00
Project Name: Aberdeen Valley Fair Retail and Service Centre
Project Location: Macqueen Street, Aberdeen
Work Request: 751
Sample Number: 17-751E
Date Sampled: 11/04/2017
Sampling Method: Sampled by Engineering Department
Sample Location: **6 (0.2 - 0.5m)**
Material: Silty CLAY

Moisture Content (AS 1289 2.1.1)	
Moisture Content (%)	30.8

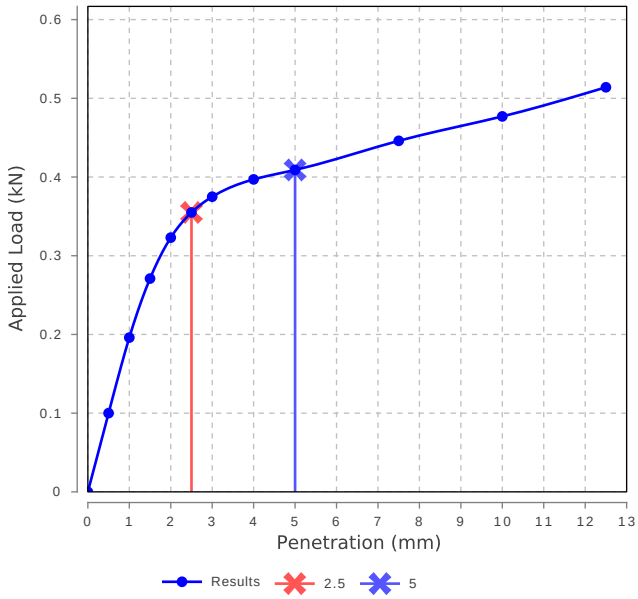
Dry Density - Moisture Relationship (AS 1289 5.1.1 & 2.1.1)	
Mould Type	1 LITRE MOULD A
Compaction	Standard
No. Layers	3
No. Blows / Layer	25
Maximum Dry Density (t/m^3)	1.36
Optimum Moisture Content (%)	33.0
Oversize Sieve (mm)	19
Oversize Material (%)	0

California Bearing Ratio (AS 1289 6.1.1 & 2.1.1)		Min	Max
CBR taken at	2.5 mm		
CBR %	**2.5**		
Method of Compactive Effort	Standard		
Method used to Determine MDD	AS 1289 5.1.1 & 2.1.1		
Maximum Dry Density (t/m^3)	1.36		
Optimum Moisture Content (%)	33.0		
Laboratory Density Ratio (%)	103.0		
Laboratory Moisture Ratio (%)	89.5		
Dry Density after Soaking (t/m^3)	1.35		
Field Moisture Content (%)	30.8		
Moisture Content at Placement (%)	29.6		
Moisture Content Top 30mm (%)	39.7		
Moisture Content Rest of Sample (%)	31.2		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Swell (%)	4.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)	0		

Moisture Density Relationship



California Bearing Ratio



Material Test Report

Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Newcastle Laboratory
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Accredited for compliance with ISO/IEC 17025 - Testing

NATA
WORLD RECOGNISED ACCREDITATION

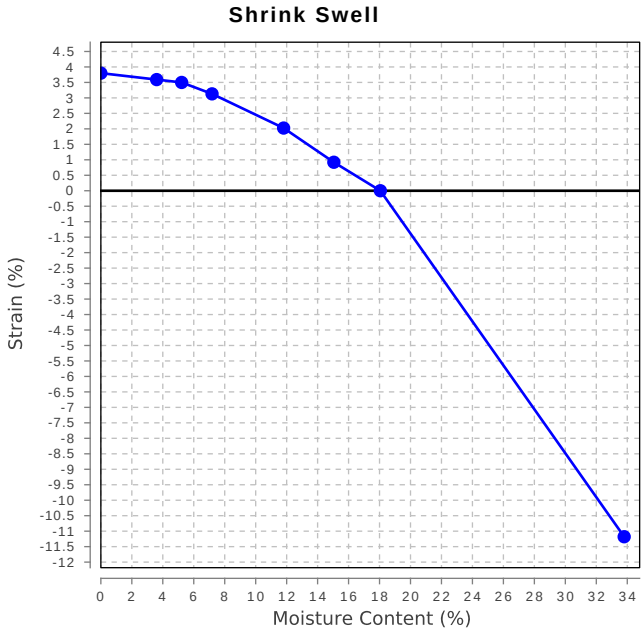
Approved Signatory: Dave Millard
Nata Accredited Laboratory Number: 828

Report Number: **91087.00-1**
Issue Number: 1
Date Issued: 18/05/2017
Client: The Mitchell Group
207 Mount Bright Road, Mount View NSW 2325
Project Number: 91087.00
Project Name: Aberdeen Valley Fair Retail and Service Centre
Project Location: Macqueen Street, Aberdeen
Work Request: 751
Sample Number: 17-751F
Date Sampled: 11/04/2017
Sampling Method: Sampled by Engineering Department
Sample Location: **9 (0.3 - 0.6m)**
Material: Silty CLAY - Dark grey/brown

Shrink Swell Index (AS 1289 7.1.1 & 2.1.1)	
Iss (%)	**5.2**
Visual Description	Silty CLAY
* Shrink Swell Index (Iss) reported as the percentage vertical strain per pF change in suction.	

Core Shrinkage Test	
Shrinkage Strain - Oven Dried (%)	**3.8**
Estimated % by volume of significant inert inclusions	0
Cracking	Moderately Cracked
Crumbling	No
Moisture Content (%)	18.1

Swell Test	
Initial Pocket Penetrometer (kPa)	>600
Final Pocket Penetrometer (kPa)	240
Initial Moisture Content (%)	22.7
Final Moisture Content (%)	33.8
Swell (%)	**11.2**
* NATA Accreditation does not cover the performance of pocket penetrometer readings.	



Appendix C

Search Results
- SafeWork NSW Search
- Council Records Search
- Title Deeds Search

NSW GOVERNMENT | SafeWork NSW

Locked Bag 2906, Lisarow NSW 2252
Customer Experience 13 10 50
ABN 81 913 830 179 | www.safework.nsw.gov.au

Our Ref: D17/109075
Your Ref: Julie Wharton

12 April 2017

Attention: Julie Wharton
Douglas Partners Pty Ltd
PO BOX 324
HRMC NSW 2310

Dear Ms Wharton

RE SITE: 172-186 Macqueen St Aberdeen NSW

I refer to your site search request received by SafeWork NSW on 29 March 2017 requesting information on Storage of Hazardous Chemicals for the above site.

A search of the records held by SafeWork NSW has not located any records pertaining to the above mentioned premises.

For further information or if you have any questions, please call us on 13 10 50 or email licensing@safework.nsw.gov.au

Yours sincerely

Customer Service Officer
Customer Experience - Operations
SafeWork NSW

Julie Wharton

From: Karen Merrick <KMerrick@upperhunter.nsw.gov.au>
Sent: Tuesday, 2 May 2017 5:07 PM
To: Paulo Sebastian
Subject: 172-186 Macqueen Street Aberdeen - Applications

Categories: Filed by Newforma

Good afternoon Paulo,

Please find below a table of applications relating to the location.

Description	Type	Year	Number	Part	var_txt	Address
Complying Development	18	2012	24	1	Change Of Use to Cafe	172-182 Macqueen Street
Development Applications	10	2002	172	1	Shade Sail In Front Of Shops At Valley Fair Shopping Complex Da In 27.	172-182 Macqueen Street
Development Applications	10	1999	238	1	Subdivision 2 Lots into 4 Lots	172-182 Macqueen Street
Building Applications	6	1998	3058	1	Single Carport	172-182 Macqueen Street
Planning Applications	5	1997	7514	1	1 Top Hamper Sign - 1 Year Period 1 Pole Sign - 1 Year Period	172-182 Macqueen Street
Building Applications	6	1996	3193	1	Awning	172-182 Macqueen Street
Planning Applications	5	1996	7530	1	1 Fascia Sign - 3 Year Period - Refused 1 Additional Sign On Advert Pa	172-182 Macqueen Street
Building Applications		1995	3124	1	Change Of Use to Coffe Shop	184-186 Macqueen Street

Regards

Karen Merrick
Senior Administration Officer
Environmental & Customer Services – Wednesday, Thursday & Friday

Phone: 02 6540 1128
Fax: 02 6545 2671
Email: kmerrick@upperhunter.nsw.gov.au

UPPERHUNTER.NSW.GOV.AU

A Quality Rural Lifestyle - in a vibrant, caring and sustainable community

scottASHWOOD PTY.LTD
An InfoTrack Company

ABN: 42 166 543 255
Ph: 02 9099 7400
Fax: 02 9232 7141
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Summary of Owners Report

LPI **Sydney**

Address: - 172 to 182 & 184 to 186 Macqueen Street, Aberdeen

Description: - Lots 113 & 114 D.P. 631908

As regards the part tinted yellow on the attached cadastre

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
10.03.1913 (1913 to 1952)	Peter Doyle (Civil Servant) (& His Deceased Estate)	Book 992 No. 649
11.01.1923 & 24.01.1923	Teresa (or Theresa) Barbara Doyle (Spinster) Gertrude Amy Doyle (Spinster) (Assignment of interests under the Will of Peter Doyle)	Book 1290 No. 421 Book 1291 No. 834
18.12.1928	Teresa (or Theresa) Barbara Doyle (Spinster) Gertrude Amy Doyle (Spinster) (Assignment of interest under the Will of Peter Doyle)	Book 1588 No. 908

As regards the part tinted pink on the attached cadastre

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
02.04.1912 (1912 to 1944)	Commissioner for Railways and Tramways Intervening name changes, now Commissioner for Railways	Book 992 No. 214
28.12.1944 (1944 to 1953)	Teresa (or Theresa) Barbara Doyle (Spinster) Gertrude Amy Doyle (Spinster)	Book 1956 No. 489

Search continued as regards the whole of the subject land

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
09.07.1952 (1952 to 1953)	Roger Furnivall Darvall Barton (Grazier)	Book 2222 No. 617
06.05.1953 (1953 to 1958)	Jane Gray Holloway (Widow)	Book 2248 No. 990
30.06.1958 (1958 to 1978)	Lucy Isabel Holloway (Spinster) Marjorie Helen Holloway (Spinster)	Book 2451 No. 150
08.02.1978 (1978 to 1979)	Marjorie Helen Holloway (Spinster)	Book 3354 No. 144
07.08.1979 (1979 to 1979)	Brumpton Bros Transport Pty	Book 3374 No. 943

scottASHWOOD PTY.LTD
An InfoTrack Company

ABN: 42 166 543 255
Ph: 02 9099 7400
Fax: 02 9232 7141
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Search continued as regards Lot 113 D.P. 631908

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
04.10.1979 (1979 to 1983)	Buccaneer Motel (Aberdeen) Pty Limited	Book 3382 No. 563 Now Vol 15062 Fol 216
11.08.1983 (1983 to 2004)	Peter Lerantges Despina Lerantges	Vol 15062 Fol 216 Now 113/631908
25.02.2004 (2004 to 2013)	M.C.P. Scone Pty Limited	113/631908
15.08.2013 (2013 to date)	# Noel Francis Mitchell	113/631908

# Denotes Current Registered Proprietor

Easements: -

- 19.05.1975 (Book 3198 No. 793) Easement for Transmission Line

Leases, excluding building or shop premises: -

- Numerous leases were found since 21.05.1991 that have since expired due to effluxion of time, or have been surrendered – these have not been investigated

---

Search continued as regards Lot 114 D.P. 631908

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
04.10.1979 (1979 to 1987)	Buccaneer Motel (Aberdeen) Pty Limited	Book 3382 No. 563 Now Vol 15062 Fol 217
02.04.1987 (1987 to 1990)	Brumpton Bros Transport Pty	Vol 15062 Fol 217 Now 114/631908
26.02.1990 (1990 to 1994)	Colin Stanley Hall Jan Affra Hall	114/631908
26.05.1994 (1994 to 2004)	Peter Lerantges Despina Lerantges	114/631908
25.02.2004 (2004 to 2013)	M.C.P. Scone Pty Limited	114/631908
15.08.2013 (2013 to date)	# Noel Francis Mitchell	114/631908

# Denotes Current Registered Proprietor

Easements: -

- 19.05.1975 (Book 3198 No. 793) Easement for Transmission Line

Leases, excluding building or shop premises: - NIL

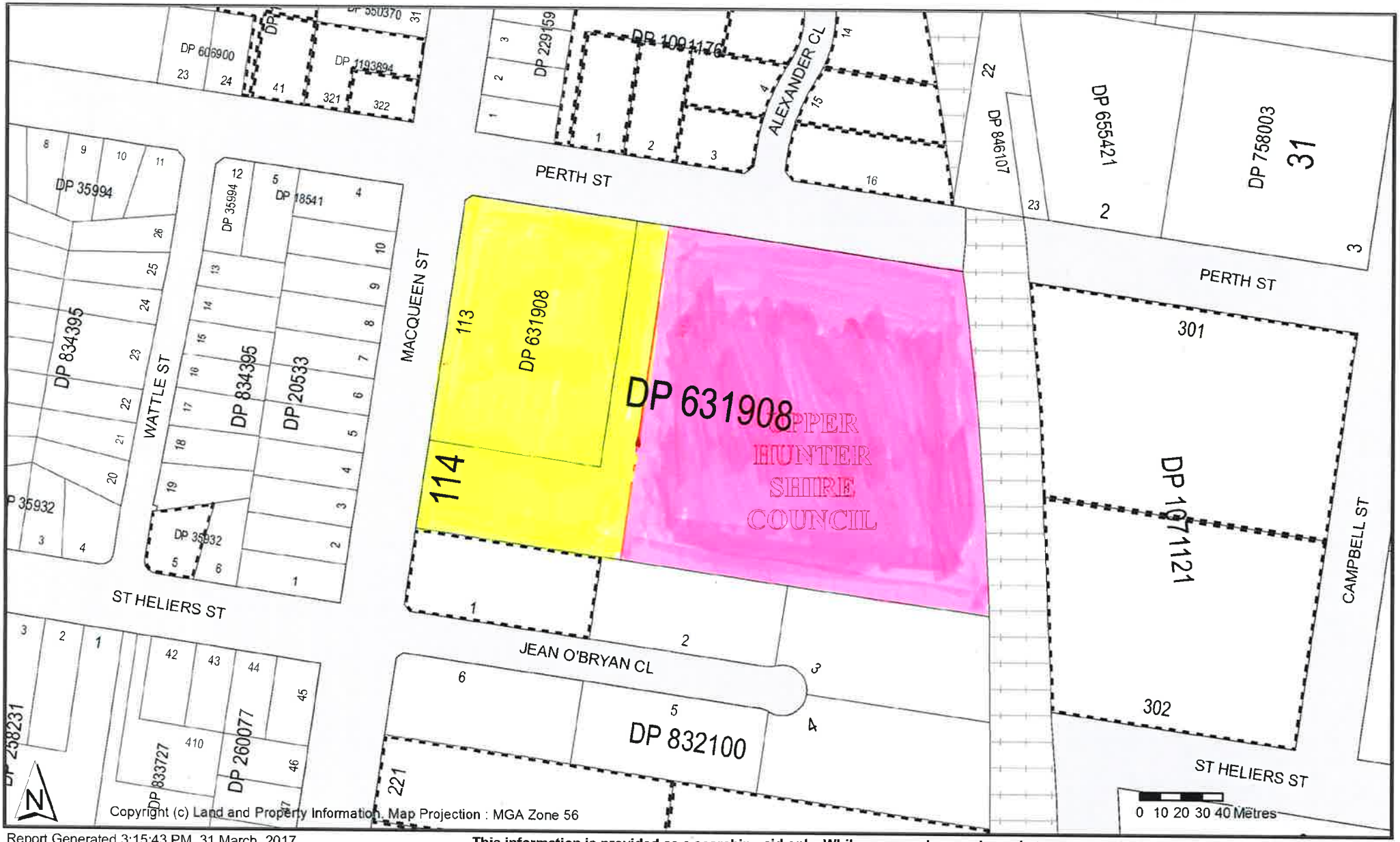
Yours Sincerely
Mark Groll

Land & Property Information

Cadastral Records Enquiry Report

Requested Parcel : Lot 114 DP 631908 **Identified Parcel** : Lot 114 DP 631908

Locality : ABERDEEN **LGA** : UPPER HUNTER **Parish** : RUSSELL **County** : DURHAM



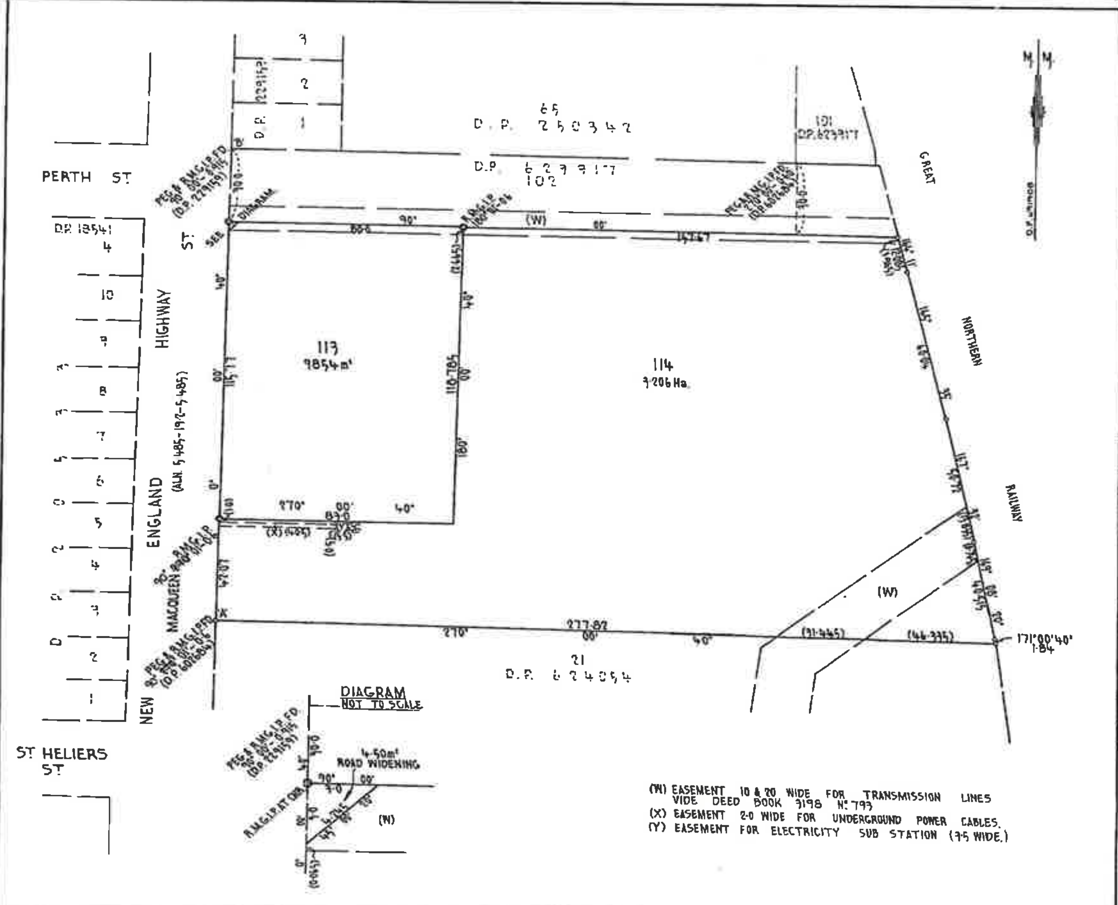
Report Generated 3:15:43 PM, 31 March, 2017

This information is provided as a searching aid only. While every endeavour is made to ensure the current cadastral pattern is accurately reflected, the Registrar General cannot guarantee the information provided. For all ACTIVITY PRIOR to SEPT 2002 you must refer to the RGs Charting and Reference Maps.

PLAN FORM 2

Plan Drawing only to appear in this space

Signatures and seals only.



* OFFICE USE ONLY

D.P. 631908

Registered: AB 2-5-1983

C.A. Nº 48/82 OF 24-12-1982

Title System: TORRENS

Purpose: SUBDIVISION

Ref. Map: U8232-32#

Last Plan: D.P. 623917

PLAN OF SUBDIVISION OF LOT 109 D.P. 623917

Reduction Ratio 1: 1000
Lengths are in metres.

Mun./Shire: SCONE

Locality: ABERDEEN

Parish: RUSSELL

County: DURHAM

(Delete if inapplicable)

GORDON VICTOR BOARDMAN
PALMER, BRUYN & WALPOLE, MUSWELLBROOK
WITH RESPECT TO LOT(1)(5) ROAD WIDENING
26-7-1982
Signature: G.V. Boardman

Panel for use only for statements of intention to dedicate public roads or to create public reserves, drainage reserves, easements or restrictions as to user

IT IS INTENDED TO DEDICATE THE AREA SHOWN AS ROAD WIDENING TO THE PUBLIC.

PURSUANT TO SECTION 88B OF THE CONVEYANCING ACT 1919-1964 IT IS INTENDED TO CREATE:
(1) EASEMENT 2·0 WIDE FOR UNDERGROUND POWER CABLE
(2) EASEMENT FOR ELECTRICITY SUB STATION

Y O O 2 A I A

Council Clerk's Certificate

I hereby certify that –

(a) the requirements of the Local Government Act, 1919 (other than the requirements for the registration of plans), and

*(b) the requirements of section 34B of the †Metropolitan Water, Sewerage and Drainage Act, 1924, as amended. †Hunter District Water, Sewerage, and Drainage Act, 1938, as amended

have been complied with by the applicant in relation to the proposed Subdivision

Subdivision No. 148/82

Date 24-12-82

(Signature) [illegible]
Council Clerk

*This part of certificate to be deleted where the application is only for a consolidated lot or the opening of a new road or where the land to be subdivided is wholly outside the areas of operations of the Metropolitan Water Sewerage and Drainage Board and the Hunter District Water Board.
†Delete if inapplicable.

M.P.D.

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

SURVEYOR'S REFERENCE: S. 2287

BEARINGS OF R.M.'S AT WESTERN CORNERS OF LOT 114 } AMENDED IN REG. GEN. DEPT AT SURVEYORS REQUEST

DP631908

I, Bruce Richard Davies, Under Secretary for Lands and Registrar General for New South Wales, certify that this negative is a photograph made as a permanent record of a document in my custody this day.

3rd May, 1983

PLAN showing land tinted Red to be acquired for Railway Purposes

ABERDEEN

Parish of Russell County of Durham

Vide Gazette 17th April 1912

Sec 6

BEDFORD

MACQUEEN

GREAT

MOUNT

RED TINT

Sec 10

Village

Sec 11

ST ANDREW

Sec 13

Sec 12

Sec 31

RED TINT

PERTH ST

Reconveyed by Railway Comm^n to P. Doyle — Ms 23/123 ※

Conveyed by Railway Comm^n to P. Doyle — Ms 23/123 ⊙

Sec 16

RED ※

Sec 17

Aberdeen

ST HEIFER ST

RED TINT

ST

Sec 19

ST

Sec 18

RED TINT

GORDON ST

Sec 23

Ms 1633 Mp

1633 - 3070

[redacted]CATE OF TITLE

14209100

NEW SOUTH WALES

PROPERTY ACT, 1900

IVA No. 32175

Vol. 14209 Fol. 100

EDITION ISSUED

22 8 1980

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Registrar General.

CANCELLED

14209 Fol. 100

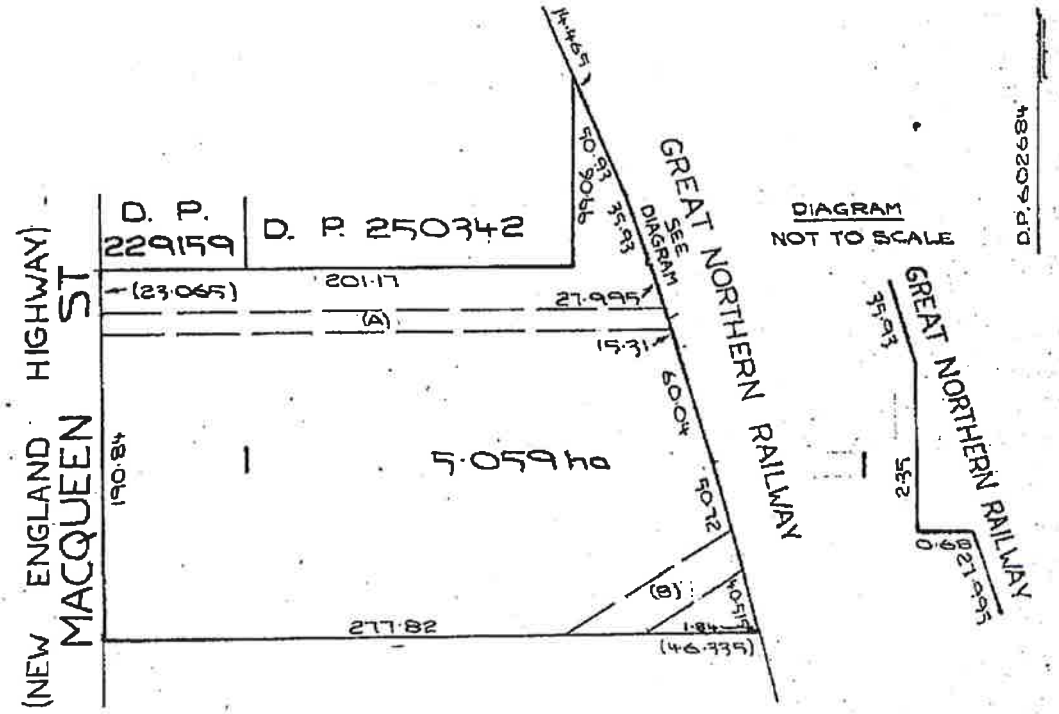
(Page 1) Vol. .....

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE REGISTRAR GENERAL'S OFFICE.

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



(A) EASEMENT FOR TRANSMISSION LINE 10 WIDE BK 3198 NO. 793
(B) EASEMENT FOR TRANSMISSION LINE 20 WIDE BK 3198 NO. 793

REDUCTION RATIO 1:2500

IVA 32175

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 1 in Deposited Plan 602684 at Aberdeen in the Shire of Scone Parish of Russell and County of Durham being land for which no Crown Grant has issued. EXCEPTING THEREOUT the mines and deposits specified in Section 134 Public Works Act, 1900.

FIRST SCHEDULE

Mortgagee

COMMERCIAL BANKING COMPANY OF SYDNEY LTD.

SECOND SCHEDULE

1. 2. Q150000 Caveat by the Registrar General; Mortgagor, Buccaneer Motel (Aberdeen) Pty. Ltd. Book 3394 No. 250.
2. 3. Book 3198 No. 793 Easement for Transmission Line affecting the part of the land above described shown so burdened in the plan hereon.
3. 4. Book 3406 No. 330 Lease to The Commercial Banking Company of Sydney Limited of Premises known as Shop 1 Aberdeen Valley Fair (together with rights) Expires 25-1-1983.
4. CAUTION The land within described in held subject to any subsisting interest (as defined in Section 28A of the Real Property Act, 1900).

DP 651908 PT2

Reg. Gen. 16-5-1983

RG 2/64

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

C.T. 22.7.8
OP 623917

Vol. 14209 Fol. 100

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	REGISTERED	Signature of Registrar General
NEW CERTIFICATE(S) OF TITLE ISSUING ON DP 623917 NO DEALING TO BE REGISTERED WITHOUT REFERENCE TO DEALINGS BRANCH.				

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	PARTICULARS	REGISTERED	Signature of Registrar General	CANCELLATION	
		This deed is cancelled as to the whole New certificates of Title have issued on 26-5-1982 for lots in Deposited Plan 623917 as follows: Lots 101 to 103 Vol 14749 209 to 211 respectively. REGISTRAR GENERAL				

(Page 2 of 2 pages)

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

[redacted]ICATE OF TITLE

NEW SOUTH WALES

[redacted]AL PROPERTY ACT, 1900

14749 211

IVA No.32175

Prior Title Vol.14209 Fol.100

Vol. 14749 Fol. 211

CANCELLED R

EDITION ISSUED

25 5 1982

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Registrar General.

14749 Fol. 211

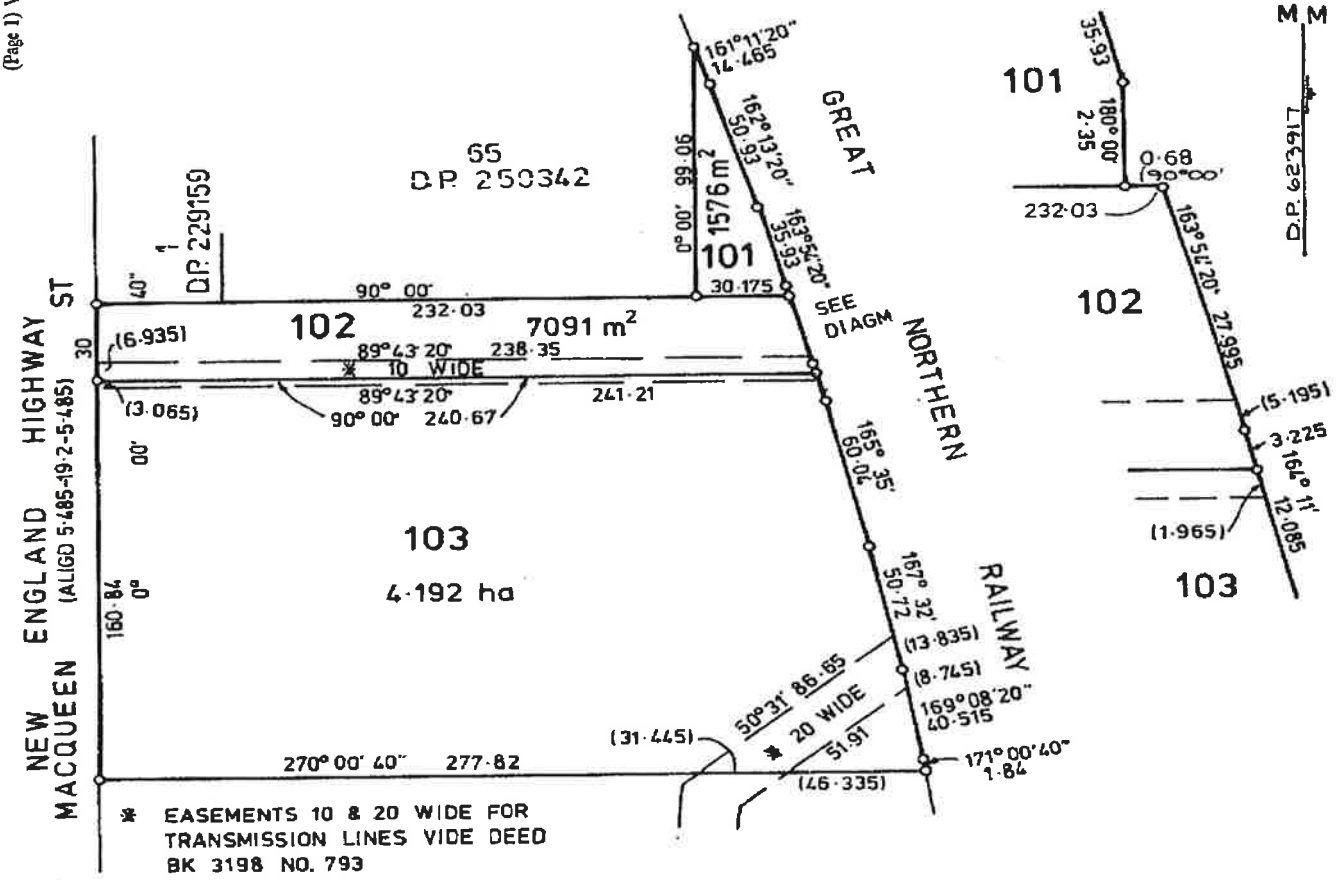
(Page 1) Vol.

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 103 in Deposited Plan 623917 at Aberdeen in the Shire of Scone Parish of Russell and County of Durham being land for which no Crown Grant has issued. EXCEPTING THEREOUT the mines and deposits specified in section 134 Public Works Act, 1900.

FIRST SCHEDULE

COMMERCIAL BANKING COMPANY OF SYDNEY LTD. Mortgagee

SECOND SCHEDULE

1. Q160000 Caveat by the Registrar General; Mortgagor, Buccaneer Motel (Aberdeen) Pty. Ltd. (~~Book 3394 No.250~~). T426528
2. Book 3198 No.793 Easements for transmissiob line affecting the part of the land above described shown so burdened in Deposited Plan 623917.
3. ~~Book 3406 No.330 Lease to The Commercial Banking Company of Sydney Limited of premises known as Shop 1 Aberdeen Valley Fair (together with right~~ Expires ~~25-1-1983~~. EXPIRED 23-2-1983
4. CAUTION The land ~~with~~ within described is held subject to any subsisting interest (as defined in Section 28A of the Real Preep Property Act, 1900.) Registered 22-8-1980.

DP 631908 PPS

Reg. Gen.
16-5-1983
RG 2/64

Vol 14749 Fol 211

99346D 8.81 D. West, Government Printer

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR | Registrar General

BUCCANEER MOTEL (ABERDEEN) PTY LIMITED BY TRANSFER T426528 REGISTERED 23-2-1983

This deed is cancelled as to Whole ex road.
New certificates of Title have issued on 3.6.1983
for lots in Deposited Plan No 631908 as follows:-
Lots 113-114 Vol 1506 Fol 216-217 respectively.

REGISTRAR GENERAL

SECOND SCHEDULE (continued)

PARTICULARS | Registrar General | CANCELLATION

D.P. 631908. The interests of the Council of the Shire of Moore in the addition to existing road shown in DP 631908. Registered 2-5-1983.

Interests created pursuant to Section 88B Conveyancing Act, 1919, by the registration of Deposited Plan. 631908. Registered 2-5-1983

The residue of land in this folio comprises road.

REGISTRAR GENERAL

NOTATIONS AND UNREGISTERED DEALINGS

T426528T WXRG 27.3.83 DP 631908R

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Req:R458701 /Doc:CT 14749-211 CT /Rev:10-Jan-2011 /Sts:OK.SC /Pgs:ALL /Prt:31-Mar-2017 15:40 /Seq:2 of 2 /Ref:aberdeen /Src:M

[redacted]

CATE OF TITLE

NEW SOUTH WALES — PROPERTY ACT, 1900

15062216

First Title : Old System

Prior Title : Vol.14749 Fol.211

Vol. [redacted] Fol.

SEE AUTO FOLIO 1983 ISSUED

15062 Fol. 216

I certify that the person named in the First Schedule is the registered proprietor of an estate in fee simple (or such other estate or interest as is set out below) in the land described subject to the recordings appearing in the Second Schedule and to the provisions of the Real Property Act, 1900.

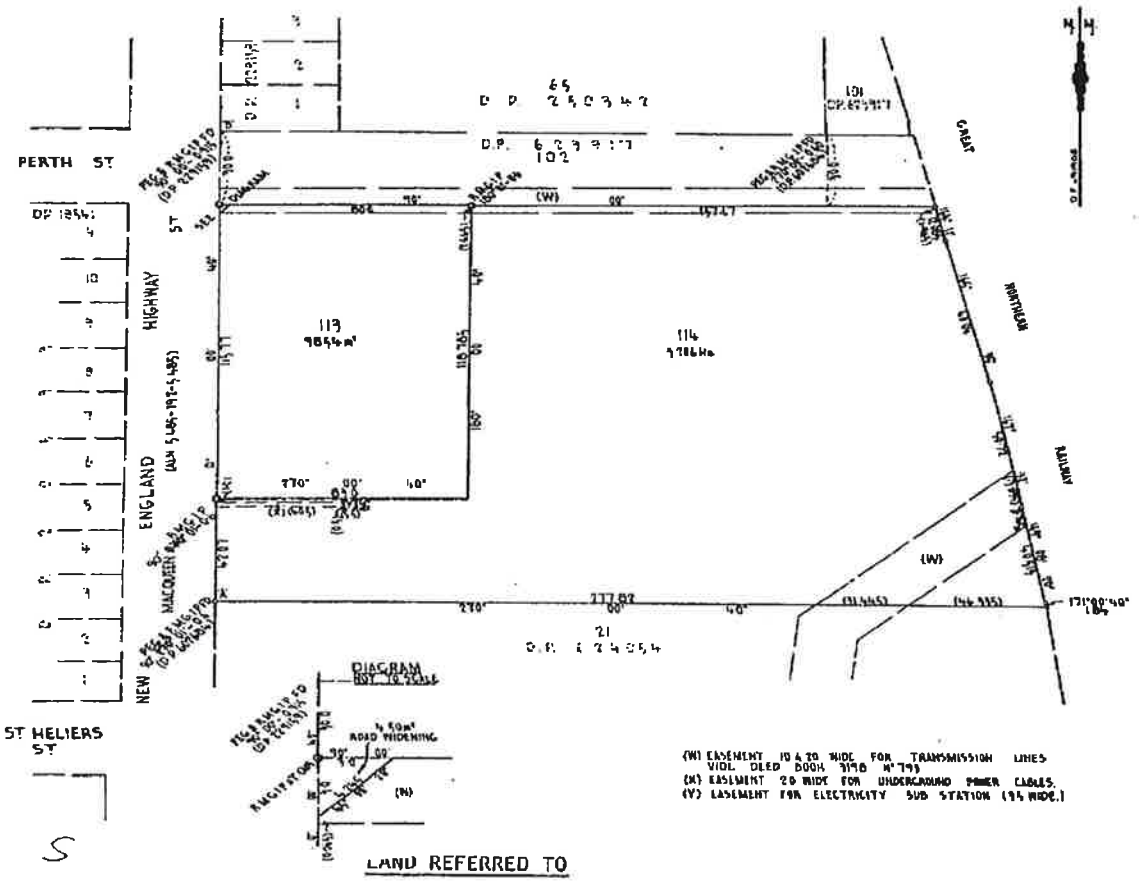
Registrar General.

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON (Page 1) Vol.

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



LAND REFERRED TO

Lot 113 in Deposited Plan 631908 at Aberdeen in the Shire of Scone Parish of Russell and County of Durham.

FIRST SCHEDULE

~~BUCCANEER MOTEL (ABERDEEN) PTY. LIMITED.~~

GRY

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown Grant.
2. Land excludes minerals - see T447400.
3. CAUTION. The land within described is held subject to any subsisting interest (as defined in Section 28A of the Real Property Act,1900) Registered 22-8-1980.
4. Book 3198 No.793 Easement for transmission line affecting the part of the land above described shown so burdened in Deposited Plan 631908.

RG 2/64

Vol. 15062 Fol. 216

L.O. 1066 D. West, Government Printer

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	Registrar General
Peter Lerantges and Despina Lerantges as joint tenants by transfer T672040. Registered 11-8-1983	

SECOND SCHEDULE (continued)

PARTICULARS	Registrar General	CANCELLATION
~~T672041 Mortgage to Buccaneer Motel (Aberdeen) Pty. Limited. Registered 11-8-1983~~		W668393
W965558 Lease to Donna A'Dell Collins of Lock-Up Shop known as Shop 3 Aberdeen Valley Fair, New England Highway, Aberdeen. Expires 7-8-1989. Registered 14-7-1987		

CANCELLED

SEE AUTO FOLIO

NOTATIONS AND UNREGISTERED DEALINGS

T672040 W668393 W965558

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CURRENT

Historical Title

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
29/3/2017 2:40PM

FOLIO: 113/631908

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 15062 FOL 216

Recorded	Number	Type of Instrument	C.T. Issue
28/3/1988		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
22/9/1988		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
21/5/1991	Z658859	LEASE	EDITION 1
27/2/1992	E285299	LEASE	
27/2/1992	E285300	LEASE	EDITION 2
6/4/1992	E368083	TRANSFER OF LEASE	
6/4/1992	E368084	MORTGAGE OF LEASE	
25/6/1993	I438637	LEASE	EDITION 3
5/8/1993	I541569	LEASE	EDITION 4
13/5/1994	U261361	DISCHARGE OF MORTGAGE	
13/5/1994	U261362	TRANSFER OF LEASE	EDITION 5
7/11/1995	O667569	LEASE	EDITION 6
30/11/1995	O729656	LEASE	EDITION 7
28/6/1996	2264804	SURRENDER OF LEASE	
28/6/1996	2264805	LEASE	EDITION 8
23/9/1996	2479603	LEASE	EDITION 9
8/11/1996	2598092	TRANSFER OF LEASE	
20/1/1997	2774459	LEASE	EDITION 10
6/3/1997	2882510	VARIATION OF LEASE	EDITION 11
14/5/1997	3059807	LEASE	EDITION 12
26/3/1998	3879043	TRANSFER OF LEASE	

END OF PAGE 1 - CONTINUED OVER

SEARCH DATE
29/3/2017 2:40PM

FOLIO: 113/631908

Recorded	Number	Type of Instrument	C.T. Issue
22/10/1998	5347358	LEASE	EDITION 13
20/11/2003	AA177447	LEASE	EDITION 14
25/2/2004	AA445790	TRANSFER	
25/2/2004	AA445791	MORTGAGE	EDITION 15
15/6/2007	AD191057	LEASE	
15/6/2007	AD191058	LEASE	EDITION 16
3/7/2008	AE68913	LEASE	EDITION 17
11/8/2011	AG428832	LEASE	EDITION 18
3/10/2012	AH272813	LEASE	EDITION 19
15/8/2013	AH950378	DISCHARGE OF MORTGAGE	
15/8/2013	AH950379	TRANSFER WITHOUT MONETARY CONSIDERATION	
15/8/2013	AH950381	MORTGAGE	EDITION 20
24/2/2014	AI187500	LEASE	EDITION 21
19/8/2014	AI827053	LEASE	EDITION 22
28/10/2014	AI990551	LEASE	EDITION 23
10/3/2015	AJ320477	LEASE	EDITION 24
30/4/2016	AK394794	DISCHARGE OF MORTGAGE	EDITION 25
29/11/2016	AK955535	REQUEST	
29/11/2016	AK955536	LEASE	EDITION 26

*** END OF SEARCH ***

Form: 01T
Release: 2
www.lpi.nsw.gov.au

TRANSFER

New South Wales
Real Property Act 1900

AA445790F

PRIVACY NOTE: this information is legally required and will become part of the public record

STAMP DUTY

Office of State Revenue use only

OFFICE OF STATE REVENUE (N.S.W. TREASURY)
CLIENT No. 3077811 STAMP No. 70
STAMP DUTY $2.00 SIGNATURE
TRANSACTION No. 1791085 DATE 13.01.04
ASSESSMENT DETAILS:

(A) **TORRENS TITLE** 113/631908 and 114/631908

(B) **LODGED BY**

Delivery Box	Name, Address or DX and Telephone	CODES
	NATIONAL AUSTRALIA BANK 197 Prospect Highway Seven Hills NSW 2147 Reference: 45A Fax: 8825 0404	T TW (Sheriff)

0400601

(C) **TRANSFEROR** Peter LERANTGES and Despina LERANTGES ~~ABN 79 788 035 167~~

OFFICE OF STATE REVENUE (N.S.W. TREASURY) 3077811 70 ALTERATION NOTED

(D) **CONSIDERATION** The transferor acknowledges receipt of the consideration of $ 672,250.00 and as regards

(E) **ESTATE** the land specified above transfers to the transferee an estate in fee simple

(F) **SHARE TRANSFERRED**

(G) Encumbrances (if applicable):

(H) **TRANSFEREE** M.C.P. SCONE PTY LIMITED ABN 89 000 401 865

(I) **TENANCY:**

(J) **DATE** 20 / 01 / 2004

I certify that the person(s) signing opposite, with whom I am personally acquainted or as to whose identity I am otherwise satisfied, signed this instrument in my presence.

Signature of witness:

Name of witness: VANYA LOZZI
Address of witness: 57 Brooke Street
Muswellbrook.

Certified correct for the purposes of the Real Property Act 1900 by the transferor.

Signature of transferor: X Peter Lerantges

X Despina Lerantges

Certified for the purposes of the Real Property Act 1900 by the person whose signature appears below.

Signature:

Signatory's name: Mark Francis COTTER
Signatory's capacity: transferee's solicitor

All handwriting must be in block capitals.

Title Search

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 113/631908

SEARCH DATE	TIME	EDITION NO	DATE
31/3/2017	3:32 PM	26	29/11/2016

LAND

LOT 113 IN DEPOSITED PLAN 631908
AT ABERDEEN
LOCAL GOVERNMENT AREA UPPER HUNTER
PARISH OF RUSSELL COUNTY OF DURHAM
TITLE DIAGRAM DP631908

FIRST SCHEDULE

NOEL FRANCIS MITCHELL (TZ AH950379)

SECOND SCHEDULE (6 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 T447400 LAND EXCLUDES MINERALS
3 BK 3198 NO 793 EASEMENT FOR TRANSMISSION LINE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
4 AI187500 LEASE TO PS SANDHU PTY LTD OF SHOP 5, ABERDEEN VALLEY FAIR, NEW ENGLAND HIGHWAY, ABERDEEN. EXPIRES: 30/9/2018. OPTION OF RENEWAL: 5 YEARS WITH ONE FURTHER OPTION OF 5 YEARS.
5 AI990551 LEASE TO DIMMOCK'S QUALITY MEATS PTY LTD OF SHOP 4, ABERDEEN VALLEY FAIR, NEW ENGLAND HIGHWAY, ABERDEEN. EXPIRES: 31/7/2017.
6 AK955536 LEASE TO SMITH BERNARD PTY LIMITED BEING SHOP 6, ABERDEEN VALLEY FAIR, 172 NEW ENGLAND HIGHWAY, ABERDEEN. EXPIRES: 31/10/2019.

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

CERTIFICATE OF TITLE

15062217

NEW SOUTH WALES

REAL PROPERTY ACT, 1900

First Title : Old System

Prior Title : Vol.14749 Fol.211

Vol. 15062 Fol. 217

CANCELLED

EDITION 7 6 1983
ISSUED

NO FOLIO

I certify that the person named in the First Schedule is the registered proprietor of an estate in fee simple (or such other estate or interest as is set out below) in the land described subject to the recordings appearing in the Second Schedule and to the provisions of the Real Property Act, 1900.

Registrar General.

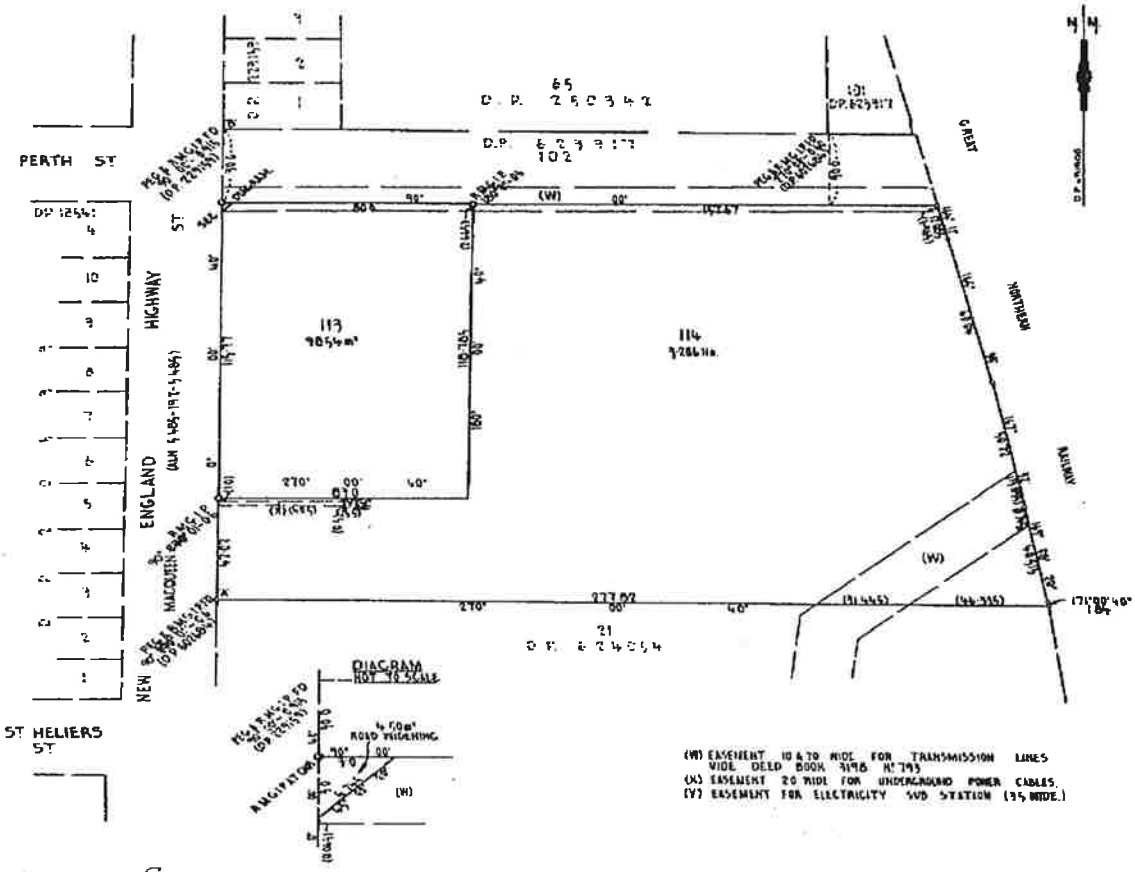
15062 Fol. 217

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON (Page 1) Vol.

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



LAND REFERRED TO

Lot 114 in Deposited Plan 631908 at Aberdeen in the Shire of Scone Parish of Russell and County of Durham.

FIRST SCHEDULE

~~BUCCANEER MOTEL (ABERDEEN) PTY. LIMITED.~~

GRY

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown Grant.
2. Land excludes minerals - see T447400.
3. CAUTION. The land within described is held subject to any subsisting interest (as defined in Section 28A of the Real Property Act,1900). Registered 22-8-1980.
4. Book 3198 No.793 Easements for transmission line affecting the part of the land above described shown so burdened in Deposited Plan 631908.
5. DP631908 Easement for underground power cable affecting the part of the land above described shown so burdened in Deposited Plan 631908.
6. DP631908 Easement for electricity substation affecting the part of the land above described shown so burdened in Deposited Plan 631908.

RG 2/64

Vol. 15062 Fol. 217

L.O. 1066 D. West, Government Printer

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	Registrar General
Brumpton Bros. Transport Pty Limited. by Transfer W818312. Registered 2-4-1987	[seal]

SECOND SCHEDULE (continued)

PARTICULARS	Registrar General	CANCELLATION
~~T702539 Mortgage to State Bank of New South Wales Registered 6-9-1983~~	[signature]	W818311

CANCELLED

SEE AUTO FOLIO

NOTATIONS AND UNREGISTERED DEALINGS

T702539m R W818311 o/m -312 T R		

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANC

Historical Title

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
29/3/2017 2:40PM

FOLIO: 114/631908

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 15062 FOL 217

Recorded	Number	Type of Instrument	C.T. Issue
28/3/1988		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
22/9/1988		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
26/2/1990	Y716353	TRANSFER	
~~26/2/1990~~	~~Y825500~~	~~REQUEST~~	EDITION 1
22/11/1990	Z345930	MORTGAGE	EDITION 2
26/5/1994	U296991	DISCHARGE OF MORTGAGE	
26/5/1994	U296992	TRANSFER	EDITION 3
25/2/2004	AA445790	TRANSFER	
25/2/2004	AA445791	MORTGAGE	EDITION 4
15/8/2013	AH950378	DISCHARGE OF MORTGAGE	
15/8/2013	AH950380	TRANSFER WITHOUT MONETARY CONSIDERATION	
15/8/2013	AH950381	MORTGAGE	EDITION 5
30/4/2016	AK394794	DISCHARGE OF MORTGAGE	EDITION 6

*** END OF SEARCH ***

aberdeen

PRINTED ON 29/3/2017

RP 13 STAMP DUTY [redacted]

Y716353

TRANSFER

REAL PROPERTY ACT, 1900

T CB 1 of 2 X R 1/2
$ 44

Torrens Title Reference	If Part Only, Delete Whole and Give Details	Location
DESCRIPTION OF LAND Note (a) *Certificate of Title* *Volume 15062 Folio 217* NOW BEING WHOLE OF LAND COMPRISED IN FOLIO 114/631908	WHOLE	*At* *ABERDEEN*

TRANSFEROR Note (b)

BRUMPTION BROS TRANSPORT PTY LIMITED

ESTATE Note (c)

(the abovenamed TRANSFEROR) hereby acknowledges receipt of the consideration of $ *$ 35,000.00* and transfers an estate in fee simple in the land above described to the TRANSFEREE

TRANSFEREE Note (d)

COLIN STANLEY HALL and JAN AFRA HALL

TENANCY Note (e)

as joint tenants/~~tenants-in-common~~

OFFICE USE ONLY

JT2

PRIOR ENCUMBRANCES Note (f)

subject to the following PRIOR ENCUMBRANCES 1. ..... 2. ..... 3. .....

DATE *30TH October, 1989.*

We hereby certify this dealing to be correct for the purposes of the Real Property Act, 1900.

EXECUTION Note (g)

Signed in my presence by the transferor who is personally known to me

THE COMMON SEAL OF BRUMPTON BROS. TRANSPORT PTY LIMITED was hereunto affixed pursuant to a resolution of its Board of Directors in the presence of:

Signature of Witness .....

Name of Witness (BLOCK LETTERS) .....

Address and occupation of Witness .....

BRUMPTON BROS. TRANSPORT PTY. LIMITED Common Seal

Director .....

Secretary .....

Signature of Transferor .....

Note (g)

Signed in my presence by the transferee who is personally known to me

Signature of Witness .....

Name of Witness (BLOCK LETTERS) .....

Address and occupation of Witness .....

Signature of Transferee xxxxxxxxxxx

Solicitor for Transferee
John A Mann.

TO BE COMPLETED BY LODGING PARTY Notes (h) and (i)

LODGED BY

L. J. KANE & CO.
RGO Box 30P

Ref:
Delivery Box Number

LOCATION OF DOCUMENTS	CT	OTHER
Herewith.	✓	
In L.T.O. with		
Produced by		

OFFICE USE ONLY

Checked	Passed	REGISTERED - -19
Signed	Extra Fee	26 FEB 1990

Secondary Directions		
Delivery Directions		

Y716354. Pps Y716353

Y82550

APPLICATION FOR CANCELLATION OF CAUTION

SECTION 28M, REAL PROPERTY ACT, 1900

R

CA 1 of 1

$ ALLOWANCE

DESCRIPTION OF LAND Note (a)

LAND affected by Caution		
Torrens Title Reference	If part only, delete WHOLE and give details	Location
Certificate of Title Folio 114/631908	WHOLE	at Aberdeen

R2/2

Applicant Note (b) COLIN STANLEY HALL and JAN AFRA HALL both of 35 Glenidol Rd, Oakville

(the abovenamed APPLICANT) being the registered proprietor of an estate in in fee simple in the land above described, hereby applies for cancellation of

Note (c) CAUTION NUMBER .... OFFICE USE ONLY OFF QG

PRIOR ENCUMBRANCES Note (d) The said land is subject to the following encumbrances and interests 1. T447400 Land Excludes Minerals 2. BK 3198 NO 793 Easements 3. DP631908 Easement 4. DP631908 Easement

Note (e) In support of this application We Colin Stanley Hall and JAN AFRA HALL both of 35 Glenidol Rd, Oakville

Note (f) solemnly and sincerely declare that—

~~1. (a) A period of 12 years~~
~~(i) has elapsed since creation of the abovementioned qualified folio of the Register from an old system deed for value, or~~
~~(ii) if the deed was not for value, 12 years has elapsed since the registration of a transfer for value.~~

b) The applicant acquired, for value and without fraud, the whole estate and interest in the said land by Transfer No. Y716353 and a period of 6 years has elapsed since
(i) the creation of the abovementioned folio of the register, or
(ii) the registration of a transfer for value — s 28m (3) (b).

(c) The caution does not include a notation that title to the land may be possessory title—s. 28j (1B)

D

2. The whole of the said land is occupied by COLIN STANLEY HALL AND JAN AFRA HALL of 35 GLENIDOL ROAD, OAKVILLE
3. The applicant has no knowledge that any person has or claims—
(a) a title by possession to, or
(b) a right of way or other easement affecting, the said land not recorded in the Register or the subject of a caveat.
4. The applicant has no knowledge that any person has or claims—
(a) ownership of any minerals within the said land, other than those excepted from the qualified certificate of title, or

Note (g) (b) any other interest whatsoever in the said land which affected it at the date of issue of the qualified certificate of title (other than as may be disclosed above) EXCEPT

Note (h) 5. The applicant has never been bankrupt nor assigned his estate for the benefit of creditors.

DATE

EXECUTION Note (i) And I make this solemn declaration conscientiously believing the same to be true and by virtue of the Oaths Act, 1900, and certify this application to be correct for the purposes of the Real Property Act, 1900

[signature] JP
Signature of Witness

ARTHUR JOHN WEST
Name of Witness (BLOCK LETTERS)

238 George St Windsor Accountant
Address and qualification of Witness

[signatures] Jan A Hall
Signature of Applicant

TO BE COMPLETED BY LODGING PARTY Notes (j) & (k)

LODGED BY L.J. KANE

Delivery Box Number 30F

LOCATION OF DOCUMENTS	CT	OTHER
Herewith.		
In L.T.O. with Y716353	✓	
Produced by		

OFFICE USE ONLY

Checked	Passed	Registered —— —19
[initials]		26 FEB 1990
Signed	Extra Fee	

Secondary Directions		
Delivery Directions	CT	30P

RP43
1985

INSTRUCTIONS FOR COMPLETION

This dealing should be lodged by hand at the Land Titles Office.

Typewriting and handwriting should be clear, legible and in permanent black or dark blue non-copying ink.

Alterations are not to be made by erasure; the words rejected are to be ruled through and initialled by the applicant in the left hand margin.

If the space provided is insufficient, additional sheets of the same size and quality of paper and having the same margins as this form should be used. Each additional sheet must be identified as an annexure and signed by the applicant and the attesting witness.

The following instructions relate to the side notes on the form.

(a) Description of land.
(i) TORRENS TITLE REFERENCE.—For a manual folio insert the Volume and Folio (e.g., Vol 8514 Fol. 126). For a computer folio insert the folio identifier (e.g., 12/701924).
(ii) PART/WHOLE.—If part only of the land in the folio of the Register is the subject of the application, delete the word "Whole" and insert the lot and plan number, portion, &c.
(iii) LOCATION.—Insert the locality shown on the Certificate of Title/Crown Grant, e.g., at Chullora. If the locality is not shown, insert the Parish and County, e.g., Ph. Lismore Co. Rous

(b) Show the full name, address and occupation or description.

(c) Insert the number of the Caution as recorded on the folio of the Register.

(d) In the memorandum of prior encumbrances, state only the registered number of any mortgage, lease, charge or writ to which this dealing is subject.

(e) Insert the full name, address and occupation of declarant. Show the name of the applicant in the case of an individual or the name and designation of the authorised officer in the case of a corporation. * Note (f) applies to clause 1 (a) only.

* (f) Unless the land is occupied by the applicant or by a person entitled under a dealing registered on the qualified certificate of title, the applicant should disclose the name and address of any occupier and by what right he/she is in occupation. If clause 1 is applicable then clauses numbered 2 to 5 inclusive need not be completed.

(g) The applicant should recite any subsisting interest known which affected the land at the date of issue of the qualified certificate of title and which is not recorded thereon. Details should be given of any known claims, including the name and address of the claimant and the facts upon which the claim is based. Section 28L of the Real Property Act imposes a penalty for failure to comply with this requirement. 1(a)

(h) Strike out if the registered proprietor is a corporation. An applicant who has been bankrupt or assigned his estate for the benefit of creditors should supply details thereof, including any discharge or other release.

(i) Execution.
GENERALLY (i) This application is a statutory declaration and must be made before a prescribed functionary for the State in which it is made. If made outside New South Wales, strike out Oaths Act 1900, and insert reference to local Act.
Any person falsely or negligently certifying is liable to the penalties provided by section 117 of the Real Property Act, 1900.
(ii) Should there be insufficient space for the execution of this application, use an annexure sheet.
AUTHORITY (iii) If the application is executed pursuant to an authority the form of execution must indicate the statutory, judicial or other authority pursuant to which the application has been executed.
CORPORATION (iv) If the application is made on behalf of a corporation, the declaration should be made by a responsible officer of the corporation, stating the position held.

(j) Insert the name, postal address, Document Exchange reference, telephone number and delivery box number of the lodging party.

(k) The lodging party is to complete the LOCATION OF DOCUMENTS panel. Place a tick in the appropriate box to indicate the whereabouts of the Certificate of Title. List, in an abbreviated form, other documents lodged, e.g., stat. dec. for statutory declaration, &c.

OFFICE USE ONLY

FIRST SCHEDULE DIRECTIONS

(A) FOLIO IDENTIFIER	(B) DIRECTION	(C) NAME
		ALLOWANCE of $44 on Y825500 approved. Deputy Registrar CM2 30/1/90

SECOND SCHEDULE AND OTHER DIRECTIONS

(D) FOLIO IDENTIFIER	(E) DIRECTION	(F) NOTFN TYPE	(G) DEALING NUMBER	(H) DETAILS

L.O. 792

97-01T

[redacted]

TRANSFER

Real Property Act, 1900

U 296992 U

B

Office of State Revenue use only

250594 2401 04 00166431Z/05 $2.00

$2

(A) LAND TRANSFERRED

Show no more than 20 References to Title. If appropriate, specify the share transferred.

Folio Identifier 114/631908

(B) LODGED BY

L.T.O. Box	Name, Address or DX and Telephone
	BOURIS COMINOS SOLICITORS 10 FLOOR 82 ELIZABETH STREET SYDNEY NSW 2000 Tel (02) 223 5741 REFERENCE (max. 15 characters):

(C) TRANSFEROR COLIN STANLEY HALL and JAN AFRA HALL

(D) acknowledges receipt of the consideration of $60,000.00

and as regards the land specified above transfers to the Transferee an estate in fee simple

(E) subject to the following **ENCUMBRANCES** 1. ..... 2. ..... 3. .....

(F) TRANSFEREE

T

LERANTGES
PETER and DESPINA LERANTGES
15 Victoria Square
ASHFIELD NSW 2131

(G) TENANCY: Joint Tenants

(H) We certify this dealing correct for the purposes of the Real Property Act, 1900. **DATED** 25 May 1994

Signed in my presence by the Transferor who is personally known to me.

.....
Signature of Witness

JILLIAN THOMAS
Name of Witness (BLOCK LETTERS)

238 George ST WINDSOR
Address of Witness

.....
Signature of Transferor

Signed in my presence by the Transferee who is personally known to

.....
Signature of Witness

.....
Name of Witness (BLOCK LETTERS)

.....
Address of Witness

C Cominos Solicitor
Signature of Transferee's
CHRIS COMINOS

CHECKED BY (office use only)

INSTRUCTIONS FOR FILLING OUT THIS FORM ARE AVAILABLE FROM THE LAND TITLES OFFICE

Title Search

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 114/631908

SEARCH DATE	TIME	EDITION NO	DATE
31/3/2017	3:32 PM	6	30/4/2016

LAND

LOT 114 IN DEPOSITED PLAN 631908
AT ABERDEEN
LOCAL GOVERNMENT AREA UPPER HUNTER
PARISH OF RUSSELL COUNTY OF DURHAM
TITLE DIAGRAM DP631908

FIRST SCHEDULE

NOEL FRANCIS MITCHELL (TZ AH950380)

SECOND SCHEDULE (5 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 T447400 LAND EXCLUDES MINERALS
3 BK 3198 NO 793 EASEMENTS FOR TRANSMISSION LINE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
4 DP631908 EASEMENT FOR UNDERGROUND POWER CABLE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
5 DP631908 EASEMENT FOR ELECTRICITY SUBSTATION AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Appendix D

Drawing 1 – Existing Site Features and Test Location Plan
Drawing 2 – Proposed Site Layout and Test Location Plan

Locality Plan

NOTES

1. Drawing adapted from Nearmap Image dated 2.11.16.
2. Test locations are approximate only and were located using Hand-held GPS and from existing site features.

LEGEND

- Test Pit Location
- Test Bore Location
- Site Boundary
- (10) Photo Locations and Orientation (approx.)
- Inferred Geology Map Boundary

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CLIENT: The Mitchell Group C/- dwp Suters		TITLE: **Test Location and Existing Site Features Plan**	PROJECT No: 91087.00
OFFICE: Newcastle	DRAWN BY: PLH	**Aberdeen Fair Retail and Service Centre**	DRAWING No: 1
SCALE: 1:1000@A3 Sheet	DATE: 31.05.2017	**172-186 Macqueen Street, Aberdeen**	REVISION: 0

Legend

- Approximate Test Pit Location
- Approximate Borehole Location

Drawing adapted from general arrangement plan by dwp Suters (Project 203596, Dwg A005, Issue C, undated)

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT:	Noel F Mitchell c/- dwp Suters		
OFFICE:	Newcastle	DRAWN BY:	JAW
SCALE:	1:1000 @ A3	DATE:	17.05.2017

TITLE: **Proposed Site Layout and Test Location Plan**
Proposed Aberdeen Valley Fair
172-186 Macqueen Street, Aberdeen

PROJECT No:	91087.00
DRAWING No:	2
REVISION:	0