F

F'

PROPERTY BOUNDARY

PROPOSED BUILDING

PROPERTY BOUNDARY

APPROXIMATE GROUND SURFACE LEVEL

110
Offset - 7m NE

111
Offset - 10m NE

refusal

refusal

UNIT 1 & 2

UNIT 3

UNIT 4

PROPOSED BASEMENT BEL RL 61.4

Bottom Depth 16 m

Bottom Depth 14.2 m

ELEVATION (AHD)

76
74
72
70
68
66
64
62
60
58
56

0
20
40
60
80
100
120
140
160

DISTANCE ALONG PROFILE (m)

NOTES:
1. The ground surface level is estimated; however is largerly unknown over the existing building footprint.
2. Subsurface profile is accurate at bore locations only and may vary significantly away from bores.
3. For details of Section F-F' refer Drawing 1

GEOLOGICAL PROFILE:
UNIT 1: Filling
UNIT 2: Residual clays and extremely weathered rock
UNIT 3: Laminite and fine to medium grained sandstone (Mittagong Formation)
UNIT 4: Medium to coarse grained sandstone (Hawkesbury Sandstone)

NOTE: Summary logs only. Should be read in conjunction with detailed logs.

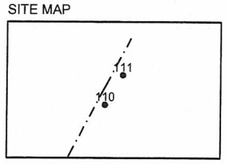
LEGEND
- Filling
- Concrete
- Laminite
- Sandstone coarse grained

ROCK STRENGTH
EL - Extremely Low
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High

SOIL CONSISTENCY
vs - very soft
s - soft
f - firm
st - stiff
vst - very stiff
h - hard
vl - very loose
l - loose
md - medium dense
d - dense
vd - very dense

TESTS / OTHER
N - Standard penetration test value
- Water level
BEL Bulk excavation level
Inferred boundary

SITE MAP



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Geotechnics / Environment / Groundwater

CLIENT: Stamford Property Services Pty Ltd

OFFICE: Sydney | DRAWN BY: GRB/LD

SCALE: 1:500 (H) 1:100 (V) @ A3 | DATE: 17.01.2011

TITLE: **INTERPRETED GEOLOGICAL SECTION F - F'**
Proposed Macquarie Village
110 - 114 Herring Road, Macquarie Park

PROJECT No: 72138
DRAWING No: 7
REVISION: 0

P:\72138 NORTH RYDE, Stamford Hotel GRB\Drawings\72138-7.dwg, 31/01/2011 9:33:23 AM

Appendix B

Results of Field Work

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.

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

Symbols & Abbreviations

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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

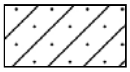
Soils


Topsoil

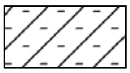

Peat


Clay

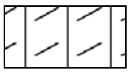

Silty clay

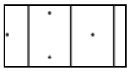

Sandy clay

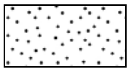

Gravelly clay

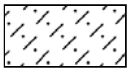

Shaly clay

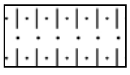

Silt


Clayey silt


Sandy silt

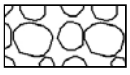

Sand

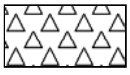

Clayey sand


Silty sand


Gravel


Sandy gravel


Cobbles, boulders

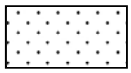

Talus

Sedimentary Rocks

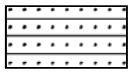

Boulder conglomerate

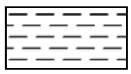

Conglomerate


Conglomeratic sandstone

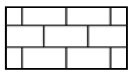

Sandstone


Siltstone


Laminite

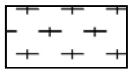

Mudstone, claystone, shale

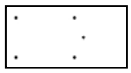

Coal


Limestone

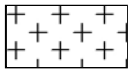
Metamorphic Rocks

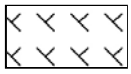

Slate, phyllite, schist

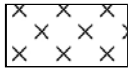

Gneiss

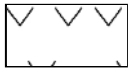

Quartzite

Igneous Rocks


Granite


Dolerite, basalt, andesite


Dacite, epidote


Tuff, breccia


Porphyry

BOREHOLE LOG

CLIENT: Stamford Property Services Pty Ltd
PROJECT: Macquarie Village
LOCATION: 110-114 Herring Road, Macquarie Park

SURFACE LEVEL: 68 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/--

BORE No: 101
PROJECT No: 72138
DATE: 20/12/2010
SHEET 1 OF 2

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
68	0.18	CONCRETE - 180mm										
	0.3	FILLING - poorly compacted, grey gravel filling										
	0.65	CONCRETE - 350mm										
67	1	FILLING - poorly compacted, yellow brown, sandstone cobbles and boulders filling							A/E			
66	2.0	CONCRETE - 300mm						Note: Unless otherwise stated, rock is fractured along rough planar bedding planes dipping between 0°- 10°				
	2.3	FILLING - poorly compacted, grey gravel filling										
65	2.9	SANDSTONE - high strength, moderately then highly weathered, fractured to slightly fractured, light grey and red-purple, medium to coarse grained sandstone							C	96	84	PL(A) = 1.6
64	4								C	100	100	
	4.2							4m: J85°, pl, ro, fe				
	4.36	LAMINITE - high then medium strength, moderately weathered, slightly fractured, dark grey laminite						4.18m: CORE LOSS: 20mm	C	100	77	PL(A) = 0.6
	4.82	SANDSTONE - high strength, fresh and fresh stained then slightly weathered, slightly fractured and unbroken, medium to coarse grained sandstone with distinct laminations						4.2m: J80°, pl, ro, fe 4.34m: CORE LOSS: 20mm 4.75m: Cz, 20mm 5.23m: Cs, 10mm	C	100	92	
63	5								C	100	94	PL(A) = 1.2
62	6								C	100	100	
									C	100	100	PL(A) = 1.1
61	7											PL(A) = 2
60	8								C	100	97	PL(A) = 1.6
59	9											PL(A) = 1
									C	100	100	

RIG: Multi-drill **DRILLER:** Traccess **LOGGED:** PGH **CASING:** NW to 2.0m

TYPE OF BORING: Diatube 0.00-0.18m & 0.3-0.60m; Solid flight auger (TC-bit) 0.18-0.30 & 0.60-2.0m; NMLC-Coring 2.0-2.3m & 2.8-12.0m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Difficulty recovering samples in filling due to collapsing ground conditions

SURVEY DATUM:

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)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Stamford Property Services Pty Ltd
PROJECT: Macquarie Village
LOCATION: 110-114 Herring Road, Macquarie Park

SURFACE LEVEL: 68 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/--

BORE No: 101
PROJECT No: 72138
DATE: 20/12/2010
SHEET 2 OF 2

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
58		SANDSTONE - high strength, fresh and fresh stained then slightly weathered, slightly fractured and unbroken, medium to coarse grained sandstone with distinct laminations *(continued)*							C	100	100	PL(A) = 2.5
57	11								C	100	100	PL(A) = 2
56	12 12.0	Bore discontinued at 12.0m										
55	13											
54	14											
53	15											
52	16											
51	17											
50	18											
49	19											

RIG: Multi-drill **DRILLER:** Traccess **LOGGED:** PGH **CASING:** NW to 2.0m

TYPE OF BORING: Diatube 0.00-0.18m & 0.3-0.60m; Solid flight auger (TC-bit) 0.18-0.30 & 0.60-2.0m; NMLC-Coring 2.0-2.3m & 2.8-12.0m

WATER OBSERVATIONS: No free groundwater observed whilst augering

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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

MACQUARIE VILLAGE

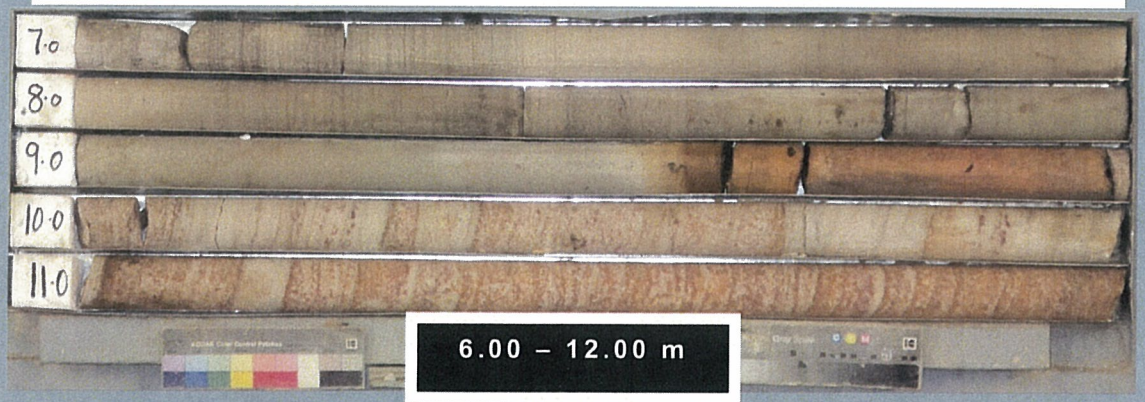
BORE 101 PROJECT 72138 20 DECEMBER 2010

2.90 – 6.00 m

DOUGLAS PARTNERS PTY LTD

MACQUARIE VILLAGE

BORE 101 PROJECT 72138 20 DECEMBER 2010



6.00 – 12.00 m

BOREHOLE LOG

CLIENT: Stamford Property Services Pty Ltd
PROJECT: Macquarie Village
LOCATION: 110-114 Herring Road, Macquarie Park

SURFACE LEVEL: 72.2 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/--

BORE No: 102
PROJECT No: 72138
DATE: 9/12/2010
SHEET 1 OF 2

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
72	0.05	ASPHALT - 50mm thick						Note: Unless otherwise stated, rock is fractured along rough planar bedding planes dipping between 0°- 10°	E/A			
	0.46	FILLING (ROADBASE) - grey blue metal gravel filling							E/A			
	0.66	CLAY - red brown clay with ironstone bands							E/A			
71	1.0	SANDSTONE - extremely low strength, extremely weathered, sandstone with high strength ironstone bands						1m: CORE LOSS: 360mm				
	1.36	SANDSTONE - extremely low and low strength with medium to high strength ironstone bands, extremely and highly weathered, fractured, red brown and light grey, medium grained sandstone							C	82	77	PL(A) = 0.8 PL(A) = 0.6
70	2							2.77m: J50°, pl, ro				
	3.0	SANDSTONE - medium to high strength, moderately weathered, fractured and slightly fractured, light grey, fine to medium grained sandstone - distinct and indistinct laminations from 3.7 to 4.6m						3.07m: Cz, 20mm 3.7m: Cs, 10mm	C	100	88	PL(A) = 0.7
69	3											
	4											
	4.2	SANDSTONE - high strength, slightly and moderately weathered, slightly fractured, light grey and light orange, medium grained sandstone										PL(A) = 1.8
68	5								C	100	100	PL(A) = 1.3
	6											
	6.2	SANDSTONE - medium to high strength, moderately weathered, slightly fractured, orange brown, medium grained sandstone						6.22m: Cs, 10mm 6.36m: Cz, pl, ro, cly				PL(A) = 0.5
	6.7	SANDSTONE - high strength, slightly weathered then fresh, slightly fractured, light orange then grey, medium grained sandstone 7.4-7.5m: distinct laminations						7.13m: Cs, 10mm				PL(A) = 1.1
66	7											
65	8								C	100	100	PL(A) = 1.6
64	9											PL(A) = 1.6
63								9.78m: J70°, pl, ro, cln				

RIG: Bobcat **DRILLER:** SS **LOGGED:** PGH **CASING:** HW to 13.05m

TYPE OF BORING: Solid flight auger (TC-bit) to 0.90m; NMLC-Coring to 13.05m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

SURVEY DATUM:

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)

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BOREHOLE LOG

CLIENT: Stamford Property Services Pty Ltd
PROJECT: Macquarie Village
LOCATION: 110-114 Herring Road, Macquarie Park

SURFACE LEVEL: 72.2 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/--

BORE No: 102
PROJECT No: 72138
DATE: 9/12/2010
SHEET 2 OF 2

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
62	11	SANDSTONE - high strength, slightly weathered then fresh, slightly fractured, light orange then grey, medium grained sandstone *(continued)*										PL(A) = 1.3
61	12	12.45-13.05m: distinct laminations						11.36m: Cs, 10mm	C	100	98	PL(A) = 1.7
60	13	13.05 Bore discontinued at 13.05m										
59	14											
58	15											
57	16											
56	17											
55	18											
54	19											
53												

RIG: Bobcat **DRILLER:** SS **LOGGED:** PGH **CASING:** HW to 13.05m
TYPE OF BORING: Solid flight auger (TC-bit) to 0.90m; NMLC-Coring to 13.05m
WATER OBSERVATIONS: No free groundwater observed whilst augering
REMARKS:

SURVEY DATUM:

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)

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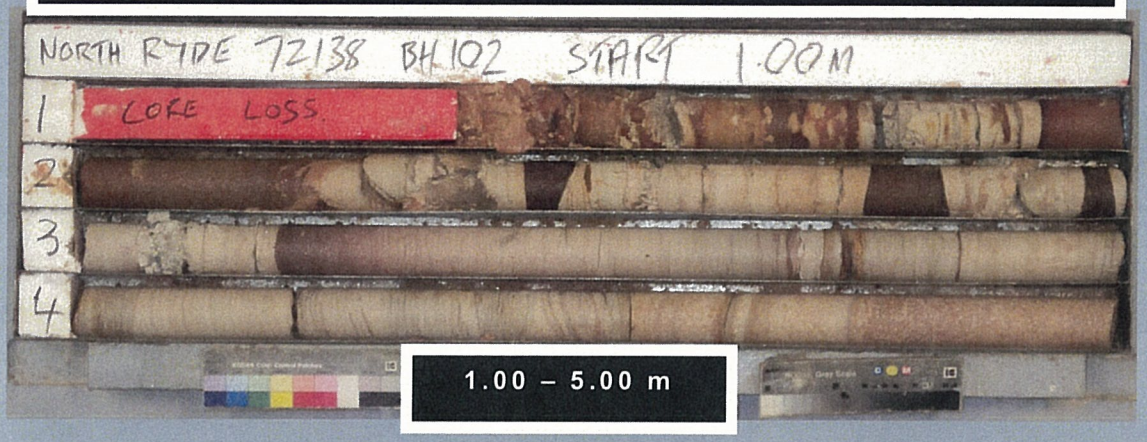
DOUGLAS PARTNERS PTY LTD

MACQUARIE VILLAGE

BORE 102 PROJECT 72138 9 DECEMBER 2010



1.00 – 5.00 m

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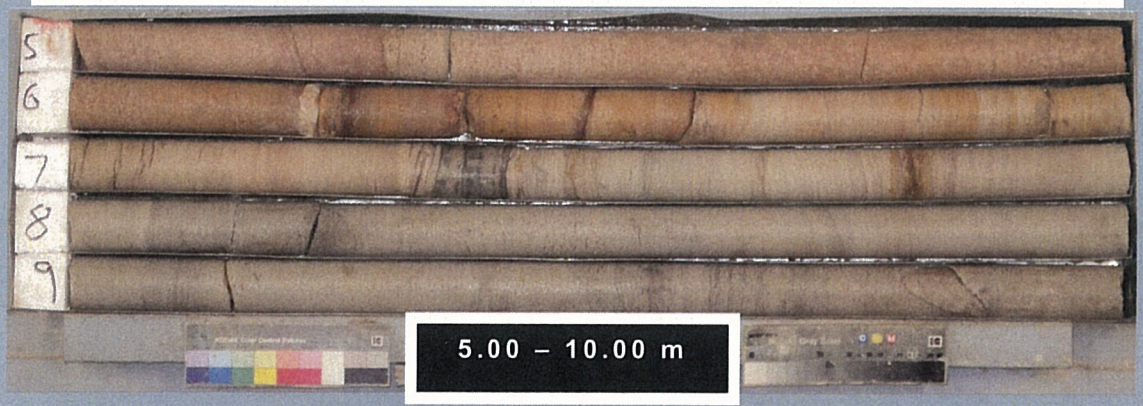
MACQUARIE VILLAGE

BORE 102 PROJECT 72138 9 DECEMBER 2010



5.00 – 10.00 m


DOUGLAS PARTNERS PTY LTD
MACQUARIE VILLAGE
BORE 102 PROJECT 72138 9 DECEMBER 2010
10
11
12
13
END OF HOLE AT 13.05 M
10.00 – 13.05 m

BOREHOLE LOG

CLIENT: Stamford Property Services Pty Ltd
PROJECT: Macquarie Village
LOCATION: 110-114 Herring Road, Macquarie Park

SURFACE LEVEL: 72.3 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/--

BORE No: 103
PROJECT No: 72138
DATE: 14/12/2010
SHEET 1 OF 2

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
72	0.05	ASPHALT - 50mm							A/E			
	0.4	FILLING (ROADBASE) - grey blue metal gravel filling							A/E			
		SANDSTONE - extremely low strength, extremely weathered, orange and grey sandstone						Note: Unless otherwise stated, rock is fractured along rough planar bedding planes dipping between 0°- 10°	A/E			
71	1								S			11,17,22 N = 39
	1.61							1.5m: CORE LOSS: 110mm				
70	1.95	SANDSTONE - very low to low strength, highly weathered, slightly fractured, orange, medium grained sandstone										
	2.4	SANDSTONE - medium strength, fresh and moderately weathered, slightly fractured, light grey, medium grained sandstone with distinct laminations						2.38m: Cs, 10mm 2.52m: J70°- 85°, pl, ro, cln 2.84m: J55°, pl, ro, he 2.95m: Cs, 20mm	C	96		PL(A) = 0.6 PL(A) = 0.9
69	3.3	SANDSTONE - high strength, slightly and moderately weathered then fresh, slightly fractured and unbroken, light orange and light grey, medium grained sandstone - siltstone laminations from 3.3 to 4.0m										
68												PL(A) = 1.3
67									C	100		PL(A) = 1.8
66								5.85m: J70°, pl, ro, fe				PL(A) = 1.8
65												PL(A) = 1.6
64								7.81m: Cs, 8mm				PL(A) = 1.1
									C	100		
63												PL(A) = 1.5

RIG: DT 100 **DRILLER:** SY **LOGGED:** PGH **CASING:** HW to 1.50m

TYPE OF BORING: Solid flight auger (TC-bit) to 1.50m; NMLC-Coring to 14.08m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Standpipe installed to 14.0m; Groundwater measured at 4.3m on 20/12/10, 4.7 on 22/12/10 and 4.6m on 11/1/11

SURVEY DATUM:

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)

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BOREHOLE LOG

CLIENT: Stamford Property Services Pty Ltd
PROJECT: Macquarie Village
LOCATION: 110-114 Herring Road, Macquarie Park

SURFACE LEVEL: 72.3 AHD
EASTING:
NORTHING:
DIP/AZIMUTH: 90°/--

BORE No: 103
PROJECT No: 72138
DATE: 14/12/2010
SHEET 2 OF 2

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
62		SANDSTONE - high strength, slightly and moderately weathered then fresh, slightly fractured and unbroken, light orange and light grey, medium grained sandstone *(continued)*										PL(A) = 2
61	11											PL(A) = 1.4
									C	100		
60	12											PL(A) = 1.5
59	13								C	100		PL(A) = 1.5
58	14 14.08	Bore discontinued at 14.08m										
57	15											
56	16											
55	17											
54	18											
53	19											

RIG: DT 100 **DRILLER:** SY **LOGGED:** PGH **CASING:** HW to 1.50m

TYPE OF BORING: Solid flight auger (TC-bit) to 1.50m; NMLC-Coring to 14.08m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Standpipe installed to 14.0m; Groundwater measured at 4.3m on 20/12/10, 4.7 on 22/12/10 and 4.6m on 11/1/11

SURVEY DATUM:

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,	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)

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DOUGLAS PARTNERS PTY LTD

MACQUARIE VILLAGE

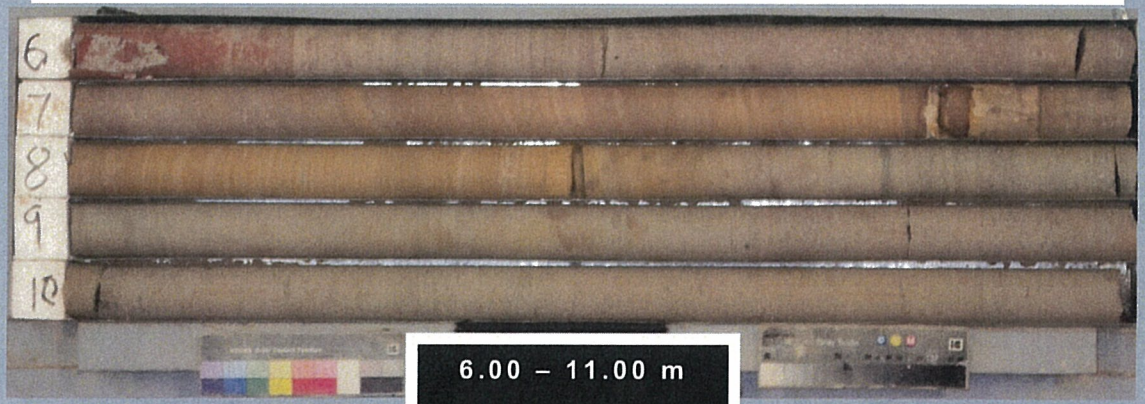
BORE 103 PROJECT 72138 14 DECEMBER 2010

1.50 – 6.00 m

DOUGLAS PARTNERS PTY LTD

MACQUARIE VILLAGE

BORE 103 PROJECT 72138 14 DECEMBER 2010



6.00 – 11.00 m

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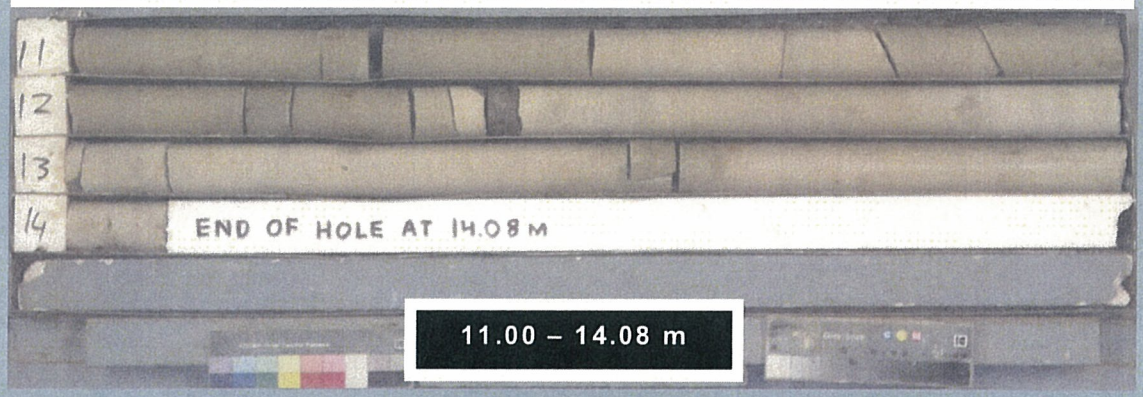
MACQUARIE VILLAGE

BORE 103 PROJECT 72138 14 DECEMBER 2010



11.00 – 14.08 m