Appendix B

Test Pit and Borehole Logs

Explanatory Notes

ENVIRONMENTAL TEST PIT LOG

TP1

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments Pty Ltd
PROJECT: Prosposed Wet n Wild Theme Park
LOCATION: Reservoir Rd, Prospect

DATE: 18/10/2010
SURFACE RL: 81.2 m AHD
COORDS: 306810.7 m E 6257310.8 m N MGA94 56
EXCAVATION METHOD:

Test Pit Information					Field Material Information					
WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppmv)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered			81.0	0.20		TOPSOIL, Clayey SILT, dark brown		M		TOPSOIL
	PP =215kPa	0.70m D-TP1a 0.80m	80.5	0.5		Silty CLAY, high plasticity, mottled red/brown		MC~PL	VSt	RESIDUAL
		1.00m B 1.30m	80.0	1.0						
				1.5						
		1.80m D-TP1b 1.90m	79.5	1.70		Silty CLAY, high plasticity (crumbly), mottled grey/brown, with siltstone bands		MC<PL	H	
			79.0	2.00		TEST PIT TP1 TERMINATED AT 2.00 m				

LOGGED: NJH | CHECKED: JE | DATE: 23/11/2010

ENVIRONMENTAL TEST PIT LOG
TP2

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments Pty Ltd
PROJECT: Prosposed Wet n Wild Theme Park
LOCATION: Reservoir Rd, Prospect

DATE: 18/10/2010
SURFACE RL: 83.4 m AHD
COORDS: 306845.2 m E 6257300.0 m N MGA94 56
EXCAVATION METHOD:

Test Pit Information					Field Material Information					
WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppmv)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered						TOPSOIL, Clayey SILT, dark brown		M		TOPSOIL
	PP =150kPa			0.10		Silty CLAY, high plasticity, mottled red/brown		MC~PL	VSt	RESIDUAL
			83.0	0.5						
	PP =170kPa	1.00m D-TP2a 1.10m	82.5	1.0						
	PP =310kPa	1.50m D-TP2b 1.60m	82.0	1.50		Silty CLAY, medium plasticity, mottled grey/red/brown, with siltstone bands		MC<PL	H	
			81.5	2.00		TEST PIT TP2 TERMINATED AT 2.00 m				
			81.0							

LOGGED: NJH | CHECKED: JE | DATE: 23/11/2010

ENVIRONMENTAL TEST PIT LOG

TP3

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments Pty Ltd
PROJECT: Prosposed Wet n Wild Theme Park
LOCATION: Reservoir Rd, Prospect

DATE: 18/10/2010
SURFACE RL: 80.0 m AHD
COORDS: 306771.9 m E 6257407.3 m N MGA94 56
EXCAVATION METHOD:

Test Pit Information					Field Material Information					
WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppmv)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered	PP =170kPa		80.0			TOPSOIL, Clayey SILT, dark brown		M		TOPSOIL
				0.30		Silty CLAY, high plasticity, mottled red/brown/grey		MC<PL	H	RESIDUAL
	PP =320kPa	0.50m D-TP3a 0.60m	79.5	0.5						
	PP =370kPa	1.00m B 1.30m	79.0	1.0						
	PP >400kPa	1.50m D-TP3b 1.60m	78.5	1.50		Silty Sandy CLAY, medium plasticity, with siltstone bands				
				1.80		TEST PIT TP3 TERMINATED AT 1.80 m				
			78.0	2.0						

LOGGED: NJH | CHECKED: JE | DATE: 23/11/2010

ENVIRONMENTAL TEST PIT LOG

TP4

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments Pty Ltd
PROJECT: Prosposed Wet n Wild Theme Park
LOCATION: Reservoir Rd, Prospect

DATE: 18/10/2010
SURFACE RL: 75.7 m AHD
COORDS: 306674.6 m E 6257390.4 m N MGA94 56
EXCAVATION METHOD:

Test Pit Information					Field Material Information					
WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppmv)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered	PP =490kPa		75.5	0.30		TOPSOIL, Clayey SILT, dark brown		M		TOPSOIL
	PP >400kPa	0.50m D-TP4a 0.60m	75.0	0.5		Silty CLAY, high plasticity, mottled red/brown		MC~PL	H	RESIDUAL
	PP =460kPa			1.00		Silty CLAY, high plasticity, mottled grey/red/brown, with siltstone bands				
	PP =410kPa	1.50m D-TP4b 1.60m	74.5	1.5						
			74.0	2.00		TEST PIT TP4 TERMINATED AT 2.00 m				
			73.5							

LOGGED: NJH | CHECKED: JE | DATE: 23/11/2010

ENVIRONMENTAL TEST PIT LOG

TP5

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments Pty Ltd
PROJECT: Prosposed Wet n Wild Theme Park
LOCATION: Reservoir Rd, Prospect

DATE: 18/10/2010
SURFACE RL: 82.8 m AHD
COORDS: 306734.8 m E 6257229.8 m N MGA94 56
EXCAVATION METHOD:

Test Pit Information					Field Material Information					
WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppmv)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered	PP =380kPa		82.5	0.30		TOPSOIL, Clayey SILT, dark brown		M		TOPSOIL
	PP =340kPa	0.60m D-TP5a 0.70m	82.0	0.5		Silty CLAY, high plasticity, mottled red/brown/grey, with siltstone bands		MC~PL	H	RESIDUAL
		1.00m B 1.30m	81.5	1.0						
	PP >600kPa	1.50m D-TP5b 1.60m		1.5						
			81.0	1.80		SILTSTONE, grey		HW	EL - VL	BEDROCK
				2.00		TEST PIT TP5 TERMINATED AT 2.00 m				
			80.5							

LOGGED: NJH | CHECKED: JE | DATE: 23/11/2010

ENVIRONMENTAL TEST PIT LOG

TP6

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments Pty Ltd
PROJECT: Prosposed Wet n Wild Theme Park
LOCATION: Reservoir Rd, Prospect

DATE: 18/10/2010
SURFACE RL: 88.5 m AHD
COORDS: 306778.7 m E 6257160.3 m N MGA94 56
EXCAVATION METHOD:

Test Pit Information					Field Material Information					
WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppmv)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered	PP =100kPa		88.5			TOPSOIL, Clayey SILT, dark brown		M		TOPSOIL
				0.20		Silty CLAY, high plasticity, mottled red/brown/grey		MC~PL	VSt	RESIDUAL
	PP =210kPa	0.50m D-TP6a 0.60m	88.0	0.5						
			87.5	1.0						
	PP =580kPa	1.50m D-TP6b 1.60m	87.0	1.50		Silty CLAY, high plasticity, mottled grey/red/brown, with siltstone bands, grey		MC<PL	H	
				1.80		SILTSTONE (SHALE), grey		HW	EL - VL	BEDROCK
			86.5	2.00		TEST PIT TP6 TERMINATED AT 2.00 m				

LOGGED: NJH | CHECKED: JE | DATE: 23/11/2010

ENVIRONMENTAL TEST PIT LOG
TP7

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments Pty Ltd
PROJECT: Prosposed Wet n Wild Theme Park
LOCATION: Reservoir Rd, Prospect

DATE: 18/10/2010
SURFACE RL: 88.3 m AHD
COORDS: 306634.0 m E 6256996.2 m N MGA94 56
EXCAVATION METHOD:

Test Pit Information					Field Material Information					
WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppmv)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
						TOPSOIL, Clayey SILT, dark brown		M		TOPSOIL
				0.10		FILL, Silty CLAY, high plasticity, mottled red/brown/grey, with siltstone bands, some waste concrete, bonded asbestos cement sheet fragments encountered		MC~PL	H	FILL
Not Encountered	PP >600kPa	0.50m D-TP7a 0.60m	88.0	0.5						
		1.20m B	87.5	1.0						
	PP >600kPa	1.50m D-TP7b 1.60m	87.0	1.5						
			86.5	2.00		TEST PIT TP7 TERMINATED AT 2.00 m				
			86.0							

LOGGED: NJH | CHECKED: JE | DATE: 23/11/2010

ENVIRONMENTAL TEST PIT LOG

TP8

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments Pty Ltd
PROJECT: Prosposed Wet n Wild Theme Park
LOCATION: Reservoir Rd, Prospect

DATE: 18/10/2010
SURFACE RL: 85.2 m AHD
COORDS: 306656.1 m E 6257059.7 m N MGA94 56
EXCAVATION METHOD:

Test Pit Information					Field Material Information						
WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppmv)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered			85.0	0.20		TOPSOIL, Clayey SILT, dark brown		M		TOPSOIL
	PP =120kPa					FILL, Silty CLAY, high plasticity, yellowy brown becoming greyer with depth, siltstone bands		MC~PL	H	FILL
	PP =410kPa	0.50m D-TP8a 0.60m	84.5	0.5						
			84.0	1.0						
	PP =220kPa	1.50m D-TP8b 1.60m	83.5	1.5						
				1.90		SILTSTONE, dark red/grey		HW	EL - VL	BEDROCK
				2.00		TEST PIT TP8 TERMINATED AT 2.00 m				
			83.0							

LOGGED: NJH | CHECKED: JE | DATE: 23/11/2010

ENVIRONMENTAL TEST PIT LOG

TP9

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments Pty Ltd
PROJECT: Prosposed Wet n Wild Theme Park
LOCATION: Reservoir Rd, Prospect

DATE: 18/10/2010
SURFACE RL: 83.6 m AHD
COORDS: 306651.7 m E 6257116.4 m N MGA94 56
EXCAVATION METHOD:

Test Pit Information					Field Material Information					
WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppmv)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered	PP >600kPa		83.5			TOPSOIL, Clayey SILT, dark brown		M		TOPSOIL
				0.30		Silty CLAY, high plasticity, mottled red/brown/grey becoming greyer with depth		MC~PL	VSt - H	RESIDUAL
	PP >600kPa	0.50m D-TP9a 0.60m	83.0	0.5						
		1.00m B 1.30m	82.5	1.0						
	PP =300kPa	1.50m D-TP9b 1.60m	82.0	1.5						
				1.90		SILTSTONE, red/brown/grey		HW	EL - VL	BEDROCK
			81.5	2.00		TEST PIT TP9 TERMINATED AT 2.00 m				

LOGGED: NJH | CHECKED: JE | DATE: 23/11/2010

ENVIRONMENTAL TEST PIT LOG

TP10

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments Pty Ltd
PROJECT: Prosposed Wet n Wild Theme Park
LOCATION: Reservoir Rd, Prospect

DATE: 19/10/2010
SURFACE RL: 80.9 m AHD
COORDS: 306686.3 m E 6257235.5 m N MGA94 56
EXCAVATION METHOD:

Test Pit Information					Field Material Information					
WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppmv)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered						TOPSOIL, Clayey SILT, brown		M		TOPSOIL
				0.20		Silty CLAY, high plasticity, mottled brown/grey/red, with siltstone bands Becoming greyer with depth		MC~PL	H	RESIDUAL
	PP =320kPa	0.50m D-TP10a 0.60m	80.5	0.5						
			80.0	1.0						
	PP =280kPa	1.50m D-TP10b 1.60m	79.5	1.5						
			79.0	2.00		TEST PIT TP10 TERMINATED AT 2.00 m				
			78.5							

LOGGED: NJH | CHECKED: JE | DATE: 23/11/2010

ENVIRONMENTAL TEST PIT LOG

TP11

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments Pty Ltd
PROJECT: Prosposed Wet n Wild Theme Park
LOCATION: Reservoir Rd, Prospect

DATE: 19/10/2010
SURFACE RL: 79.7 m AHD
COORDS: 306634.9 m E 6257193.6 m N MGA94 56
EXCAVATION METHOD:

Test Pit Information					Field Material Information					
WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppmv)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered			79.5	0.30		TOPSOIL,		M		TOPSOIL
	PP =120kPa	0.50m D-TP11a 0.60m	79.0	0.5		Silty CLAY, high plasticity, mottled red/brown, some organic matter		MC~PL	St	RESIDUAL
		1.10m B 1.40m	78.5	1.0						
	PP =190kPa	1.50m D-TP11b 1.60m	78.0	1.5						
				1.80		Silty CLAY, high plasticity, mottled grey, red, brown			VSt	
			77.5	2.0						
				2.20		TEST PIT TP11 TERMINATED AT 2.20 m				

LOGGED: NJH | CHECKED: JE | DATE: 23/11/2010

ENVIRONMENTAL TEST PIT LOG

TP12

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments Pty Ltd
PROJECT: Prosposed Wet n Wild Theme Park
LOCATION: Reservoir Rd, Prospect

DATE: 19/10/2010
SURFACE RL: 86.6 m AHD
COORDS: 306569.4 m E 6257079.2 m N MGA94 56
EXCAVATION METHOD:

Test Pit Information					Field Material Information					
WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppmv)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered			86.5	0.30		TOPSOIL, Clayey SILT, dark brown		M		TOPSOIL
	PP =240kPa	0.50m D-TP12a 0.60m	86.0	0.5		Silty CLAY, high plasticity, mottled red/brown		MC~PL	VSt	RESIDUAL
			85.5	1.0						
	PP >600kPa	1.50m D-TP12b 1.60m	85.0	1.30		SILTSTONE, fine grained, grey/red/brown		HW	EL - VL	BEDROCK
				1.5						
			84.5	1.80		TEST PIT TP12 TERMINATED AT 1.80 m				
				2.0						

LOGGED: NJH | CHECKED: JE | DATE: 23/11/2010

ENVIRONMENTAL TEST PIT LOG

TP13

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments Pty Ltd
PROJECT: Prosposed Wet n Wild Theme Park
LOCATION: Reservoir Rd, Prospect

DATE: 19/10/2010
SURFACE RL: 81.9 m AHD
COORDS: 306607.9 m E 6257333.0 m N MGA94 56
EXCAVATION METHOD:

Test Pit Information					Field Material Information					
WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppmv)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered			81.5	0.15		TOPSOIL, Clayey SILT, brown		M		TOPSOIL
	PP =180kPa	0.50m D-TP13a 0.60m		0.5		Silty CLAY, high plasticity, mottled red/brown/grey, with some organic matter		MC~PL	St	RESIDUAL
		1.00m B 1.30m	81.0	1.0						
	PP =220kPa	1.50m D-TP13b 1.60m	80.5	1.50		Silty CLAY, high plasticity, mottled grey/red/brown, siltstone bands			VSt	
			80.0	1.80		SILTSTONE, grey/red		HW - EW	EL - VL	BEDROCK
				2.00		TEST PIT TP13 TERMINATED AT 2.00 m				
			79.5							

LOGGED: NJH | CHECKED: JE | DATE: 23/11/2010

ENVIRONMENTAL TEST PIT LOG

TP14

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments Pty Ltd
PROJECT: Prosposed Wet n Wild Theme Park
LOCATION: Reservoir Rd, Prospect

DATE: 19/10/2010
SURFACE RL: 88.1 m AHD
COORDS: 306536.0 m E 6257366.1 m N MGA94 56
EXCAVATION METHOD:

Test Pit Information					Field Material Information					
WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppmv)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered			88.0	0.20		TOPSOIL, Clayey SILT, brown		M		TOPSOIL
	PP =260kPa	0.70m D-TP14a 0.80m	87.5	0.5		Silty CLAY, high plasticity, mottled red/brown/grey		MC~PL	VSt	RESIDUAL
			87.0	1.0						
	PP =590kPa	1.50m D-TP14b 1.60m	86.5	1.40		Silty CLAY, high plasticity, grey, siltstone throughout, red		MC<PL	H	
				1.5						
				1.80		SILTSTONE, grey/red		HW	EL - VL	BEDROCK
			86.0	2.00		TEST PIT TP14 TERMINATED AT 2.00 m				

LOGGED: NJH | CHECKED: JE | DATE: 23/11/2010

ENVIRONMENTAL TEST PIT LOG

TP15

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments Pty Ltd
PROJECT: Prosposed Wet n Wild Theme Park
LOCATION: Reservoir Rd, Prospect

DATE: 20/10/2010
SURFACE RL: 90.2 m AHD
COORDS: 306481.7 m E 6257250.9 m N MGA94 56
EXCAVATION METHOD:

Test Pit Information					Field Material Information					
WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppmv)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered			90.0	0.00		TOPSOIL, Clayey SILT, dark brown/red		M		TOPSOIL
				0.30		Silty CLAY, high plasticity, red/brown		MC~PL	H	RESIDUAL
	PP =340kPa	0.50m D-TP15a QA1 0.60m		0.5						
				0.60		Silty CLAY, high plasticity, mottled red/brown/grey, with siltstone bands				
			89.5							
				1.0						
		1.20m	89.0							
		B								
	PP =280kPa	1.50m D-TP15b 1.60m		1.5						
			88.5							
				1.80		SILTSTONE, grey-red		HW	EL - VL	BEDROCK
				2.00		TEST PIT TP15 TERMINATED AT 2.00 m				
			88.0							

LOGGED: NJH | CHECKED: JE | DATE: 23/11/2010

ENVIRONMENTAL TEST PIT LOG

TP16

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments Pty Ltd
PROJECT: Prosposed Wet n Wild Theme Park
LOCATION: Reservoir Rd, Prospect

DATE: 20/10/2010
SURFACE RL: 94.1 m AHD
COORDS: 306449.6 m E 6257333.6 m N MGA94 56
EXCAVATION METHOD:

Test Pit Information					Field Material Information						
WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppmv)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered			94.0	0.5		FILL, Clayey SILT, dark brown, with siltstone and gravel throughout				FILL Backfilled swimming pool - surface sinkhole
			93.5	0.70		TEST PIT TP16 TERMINATED AT 0.70 m				
			93.0	1.0						
			92.5	1.5						
			92.0	2.0						

LOGGED: NJH | CHECKED: JE | DATE: 23/11/2010

ENVIRONMENTAL TEST PIT LOG

TP17

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments Pty Ltd
PROJECT: Prosposed Wet n Wild Theme Park
LOCATION: Reservoir Rd, Prospect

DATE: 20/10/2010
SURFACE RL: 90.5 m AHD
COORDS: 306462.8 m E 6257376.8 m N MGA94 56
EXCAVATION METHOD:

Test Pit Information					Field Material Information					
WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppmv)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered						TOPSOIL, clayey SILT, dark brown, becoming red with depth		M		TOPSOIL
				0.30		Silty CLAY, high plasticity, red		MC~PL	H	RESIDUAL
	PP >600kPa	0.50m D-TP17a QA2 0.60m	90.0	0.5						
		0.90m		0.90		Silty CLAY, high plasticity, mottled red/grey, with siltstone bands				
	PP =350kPa	B 1.20m	89.5	1.0						
				1.30		SILTSTONE, grey-red-brown		HW	EL - VL	BEDROCK
	PP =530kPa	1.50m D-TP17b 1.60m	89.0	1.5						
				1.80		TEST PIT TP17 TERMINATED AT 1.80 m				
			88.5	2.0						

LOGGED: NJH | CHECKED: JE | DATE: 23/11/2010

ENVIRONMENTAL TEST PIT LOG

TP18

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments Pty Ltd
PROJECT: Prosposed Wet n Wild Theme Park
LOCATION: Reservoir Rd, Prospect

DATE: 20/10/2010
SURFACE RL: 89.1 m AHD
COORDS: 306398.0 m E 6257364.2 m N MGA94 56
EXCAVATION METHOD:

Test Pit Information					Field Material Information					
WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppmv)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered			89.0			TOPSOIL, Clayey SILT, dark brown		M		TOPSOIL
				0.30		Silty CLAY, high plasticity, red		MC~PL	VSt	RESIDUAL
	PP =250kPa	0.50m D-TP18a 0.60m	88.5	0.5						
				0.60		Silty CLAY, high plasticity, mottled red/grey, with siltstone bands				
			88.0	1.0						
				1.40		SILTSTONE, grey-red-brown		HW	EL - VL	BEDROCK
	PP =580kPa	1.50m D-TP18b QA3 1.60m	87.5	1.5						
				2.00		TEST PIT TP18 TERMINATED AT 2.00 m				
			87.0							

LOGGED: NJH | CHECKED: JE | DATE: 23/11/2010

ENVIRONMENTAL TEST PIT LOG

TP19

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments Pty Ltd
PROJECT: Prosposed Wet n Wild Theme Park
LOCATION: Reservoir Rd, Prospect

DATE: 20/10/2010
SURFACE RL: 96.2 m AHD
COORDS: 306386.2 m E 6257269.2 m N MGA94 56
EXCAVATION METHOD:

Test Pit Information					Field Material Information						
WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppmv)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered	PP =590kPa	0.50m D-TP19a QA4 0.60m	96.0	0.30		TOPSOIL, Clayey SILT, brown/red		M		TOPSOIL
			95.5	0.5		Silty CLAY, high plasticity, red, with sandstone bands, grey		MC<PL	H	RESIDUAL
		1.00m		1.00		Silty CLAY, medium plasticity, mottled red-brown-yellow-black, with shale		MC~PL		
	PP >600kPa	B 1.30m 1.40m D-TP19b 1.50m	95.0	1.40		TEST PIT TP19 TERMINATED AT 1.40 m				
			94.5	1.5						
			94.0	2.0						

LOGGED: NJH | CHECKED: JE | DATE: 23/11/2010

ENVIRONMENTAL TEST PIT LOG

TP20

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments Pty Ltd
PROJECT: Prosposed Wet n Wild Theme Park
LOCATION: Reservoir Rd, Prospect

DATE: 20/10/2010
SURFACE RL: 95.7 m AHD
COORDS: 306368.9 m E 6257183.1 m N MGA94 56
EXCAVATION METHOD:

Test Pit Information					Field Material Information					
WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppmv)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered			95.5	0.20		TOPSOIL, Clayey SILT, dark brown		M		TOPSOIL
	PP =240kPa	0.50m D-TP20a 0.60m		0.5		Silty CLAY, high plasticity, red/brown		MC~PL	VSt	RESIDUAL
			95.0	0.60		Silty CLAY, high plasticity, mottled grey/red/brown				
				1.0						
			94.5							
	PP >600kPa	1.50m D-TP20b 1.60m		1.50		Silty CLAY, high plasticity, mottled grey/red, with siltstone bands		MC<PL	H	
			94.0							
				2.00		TEST PIT TP20 TERMINATED AT 2.00 m				
			93.5							

LOGGED: NJH | CHECKED: JE | DATE: 23/11/2010

ENVIRONMENTAL TEST PIT LOG

TP21

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments Pty Ltd
PROJECT: Prosposed Wet n Wild Theme Park
LOCATION: Reservoir Rd, Prospect

DATE: 20/10/2010
SURFACE RL: 95.7 m AHD
COORDS: 306334.9 m E 6257279.9 m N MGA94 56
EXCAVATION METHOD:

Test Pit Information					Field Material Information					
WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppmv)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered			95.5	0.30		TOPSOIL, Clayey SILT, dark brown/red		M		TOPSOIL
	PP =490kPa	0.50m D-TP21a QA5 0.60m	95.0	0.5		Silty CLAY, high plasticity, mottled red/brown/grey		MC<PL	H	RESIDUAL
	PP >600kPa	0.90m B 1.20m	94.5	1.00		Silty CLAY, high plasticity, mottled red/brown/grey, with siltstone bands				
	PP >600kPa	1.50m D-TP21b 1.60m	94.0	1.5						
				1.80		SILTSTONE, grey/red		HW	EL - VL	BEDROCK
			93.5	2.00		TEST PIT TP21 TERMINATED AT 2.00 m				

LOGGED: NJH | CHECKED: JE | DATE: 23/11/2010

ENVIRONMENTAL TEST PIT LOG

TP22

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments Pty Ltd
PROJECT: Prosposed Wet n Wild Theme Park
LOCATION: Reservoir Rd, Prospect

DATE: 20/10/2010
SURFACE RL: 90.5 m AHD
COORDS: 306347.3 m E 6257359.6 m N MGA94 56
EXCAVATION METHOD:

Test Pit Information					Field Material Information					
WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppmv)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered						TOPSOIL, Clayey SILT, dark brown		M		TOPSOIL
				0.20		Silty CLAY, high plasticity, reddish brown		MC~PL	H	RESIDUAL
	PP =520kPa	0.50m D-TP21a 0.60m	90.0	0.5						
		0.90m								
	PP =520kPa	B	89.5	1.00		Silty CLAY, high plasticity, mottled red/brown/grey, with siltstone bands				
		1.20m								
	PP >600kPa	1.50m D-TP22b 1.60m	89.0	1.5						
				1.70		SILTSTONE, grey-red-brown		HW	EL - VL	BEDROCK
				1.90		TEST PIT TP22 TERMINATED AT 1.90 m				
			88.5	2.0						
			88.0							

LOGGED: NJH | CHECKED: JE | DATE: 23/11/2010

ENVIRONMENTAL TEST PIT LOG

TP23

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments Pty Ltd
PROJECT: Prosposed Wet n Wild Theme Park
LOCATION: Reservoir Rd, Prospect

DATE: 20/10/2010
SURFACE RL: 84.5 m AHD
COORDS: 306364.7 m E 6257433.0 m N MGA94 56
EXCAVATION METHOD:

Test Pit Information					Field Material Information					
WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppmv)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered			84.0	0.30		TOPSOIL, Clayey SILT, dark brown		M		TOPSOIL
	PP =300kPa	0.50m D-TP23a QA6 0.60m		0.5		Silty CLAY, high plasticity, brown		MC~PL	VSt	RESIDUAL
	PP =320kPa		83.5	0.60 1.00		Silty CLAY, high plasticity, mottled brown/grey			H	
	PP >600kPa	1.50m D-TP23b 1.60m	83.0	1.5		Silty CLAY, high plasticity, mottled brown/grey, with siltstone bands				
				1.60		SILTSTONE, grey-red-brown		HW	EL - VL	BEDROCK
			82.5	1.90 2.0		TEST PIT TP23 TERMINATED AT 1.90 m				
			82.0							

LOGGED: NJH | CHECKED: JE | DATE: 23/11/2010

ENVIRONMENTAL TEST PIT LOG

TP24

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments Pty Ltd
PROJECT: Prosposed Wet n Wild Theme Park
LOCATION: Reservoir Rd, Prospect

DATE: 20/10/2010
SURFACE RL: 92.2 m AHD
COORDS: 306482.8 m E 6257071.9 m N MGA94 56
EXCAVATION METHOD:

Test Pit Information					Field Material Information						
WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	PID (ppmv)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE/AESTHETICS AND ADDITIONAL OBSERVATIONS
Not Encountered			92.0	0.30		TOPSOIL, Clayey SILT, dark brown		M		TOPSOIL
	PP =350kPa	0.50m D-TP24a 0.60m	91.5	0.5		Silty CLAY, high plasticity, brown		MC~PL	VSt	RESIDUAL
	PP =480kPa		91.0	1.00		Silty CLAY, high plasticity, mottled brown/grey, with siltstone bands			H	
	PP >600kPa		90.5	1.5						
				1.70		SILTSTONE, grey-red-brown		HW	EL - VL	BEDROCK
			90.0	1.90		TEST PIT TP24 TERMINATED AT 1.90 m				
				2.0						

LOGGED: NJH | CHECKED: JE | DATE: 23/11/2010

GEOTECHNICAL BOREHOLE LOG

BH1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 18/10/2010
DATE COMPLETED: 18/10/2010
SURFACE RL: 78.53 m AHD
COORDS: 306741.02 m E 6257290.29 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Information					
METHOD	WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	Not Encountered	0.50m	0.50m	78.5	0			CLAY, high plasticity, mottled grey red	MC>PL	VSt - H	RESIDUAL
		SPT 4, 4, 7 N=11	D	78.0	0.5						
		0.95m	0.95m	77.5	1.0						
		1.50m	1.50m	77.0	1.5						
		SPT 3, 4, 9 N=13	D								
		1.95m	1.95m 2.00m	76.5	2.0						
			U50 2.45m	76.0	2.5						
		3.00m	3.00m	75.5	3.0						
		SPT 6, 18 N=R	D								
		3.30m	3.30m		3.30			SILTSTONE, dark grey, some clay bands	EW	VL	BEDROCK
				75.0	3.5						
				74.5	4.0			CONTINUED AS CORED BOREHOLE			
				74.0	4.5						

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

CORED BOREHOLE LOG
BH1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 18/10/2010
DATE COMPLETED: 18/10/2010
SURFACE RL: 78.53 m AHD
COORDS: 306741.02 m E 6257290.29 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Description					
METHOD	WATER	CORE RECOVERY	RQD	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	WEATHERING	INFERRED STRENGTH $Is_{(50)}$ MPa (EL -0.03, VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)	DEFECT DESCRIPTION AND ADDITIONAL OBSERVATIONS (defect type, inclination, planarity, roughness, thickness, infilling)
				78.5							
				78.0	0.5						
				77.5	1.0						
				77.0	1.5						
				76.5	2.0						
				76.0	2.5						
				75.5	3.0						
				75.0	3.5						
					4.00		START CORING AT 4.00m				
				74.5			CORE LOSS 0.25m (4.00-4.25)				
NMLC	(Not Observed)	91	24		4.25		Interbedded SANDSTONE, fine grained, pale grey banded orange brown and dark grey banded orange brown Siltstone	MW			JT 30° PR S
				74.0	4.5						

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

CORED BOREHOLE LOG
BH1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 18/10/2010
DATE COMPLETED: 18/10/2010
SURFACE RL: 78.53 m AHD
COORDS: 306741.02 m E 6257290.29 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Description					
METHOD	WATER	CORE RECOVERY	RQD	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	WEATHERING	INFERRED STRENGTH $Is_{(50)}$ MPa (EL -0.03, VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)	DEFECT DESCRIPTION AND ADDITIONAL OBSERVATIONS (defect type, inclination, planarity, roughness, thickness, infilling)
NMLC	(Not Observed)	91	24	73.5			Interbedded SANDSTONE, fine grained, pale grey banded orange brown and dark grey banded orange brown Siltstone	MW			JT 20° PR S
				73.0	5.5						
				72.5	6.0						
					6.10		SILTSTONE, pale and dark grey Carbonaceous 6.2m to 6.3m	SW			BP 1° PR S
				72.0	6.5						BP 1° ST S
					7.00						BP 1° ST S
				71.5			CORED BOREHOLE BH1 TERMINATED AT 7.00 m				
				71.0	7.5						
				70.5	8.0						
				70.0	8.5						
				69.5	9.0						
				69.0	9.5						

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

GEOTECHNICAL BOREHOLE LOG

BH2

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 18/10/2010
DATE COMPLETED: 18/10/2010
SURFACE RL: 76.97 m AHD
COORDS: 306674.89 m E 6257313.30 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Information					
METHOD	WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	Not Encountered			76.97	0.20			TOPSOIL, SILT, brown	M		TOPSOIL
		0.50m	0.50m	76.5	0.5			Sandy Silty Gravelly CLAY, high plasticity, grey brown	MC>PL	F - St	SLOPE WASH
		SPT 0, 1, 3 N=4 0.95m	D 0.95m		0.65			CLAY, high plasticity, mottled grey red			RESIDUAL
			1.00m	76.0	1.00			Silty CLAY, high plasticity, yellow		VSt	
		1.50m	U50 **1.50m**	75.5	1.5			Mottled yellow, orange, red and grey			**STANDPIPE PIEZOMETER INSTALLED** Class 18 PVC 50mm Casing and Screw Joined Machined Slotted Screen construction as follows: Monument Type - Road Box 0.0-3.00m Drill Cuttings 3.00-3.51m Bentonite Pellets 3.51-6.51m Slotted screen in geofabric sock with 5mm gravel backfill 0.88m Water Level 18/10/2010
		SPT 3, 5, 7 N=12 1.95m	D 1.95m	75.0	2.0						
				74.5	2.5						
		3.00m	3.00m	74.0	2.90 3.0			CLAY, high plasticity, mottled grey red (extremely weathered claystone)	MC<PL	H - EL	
		SPT 2, 13, 9/60mm N=R 3.36m	D 3.45m	73.5	3.5			Carbonaceous material, some seepage			
								CONTINUED AS CORED BOREHOLE			
				73.0	4.0						
				72.5	4.5						
				72.0							

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

CORED BOREHOLE LOG
BH2

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 18/10/2010
DATE COMPLETED: 18/10/2010
SURFACE RL: 76.97 m AHD
COORDS: 306674.89 m E 6257313.30 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Description					
METHOD	WATER	CORE RECOVERY	RQD	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	WEATHERING	INFERRED STRENGTH $Is_{(50)}$ MPa (EL -0.03, VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)	DEFECT DESCRIPTION AND ADDITIONAL OBSERVATIONS (defect type, inclination, planarity, roughness, thickness, infilling)
				76.5	0.5						
				76.0	1.0						
				75.5	1.5						
				75.0	2.0						
				74.5	2.5						
				74.0	3.0						
				73.5	3.50		START CORING AT 3.50m				
NMLC							SHALE, dark grey with orange brown around defects	MW			JT 30° Fe PR S
				73.0	4.0						
				72.5	4.5						BP 5° Fe PR S
											JT 65° Fe PR S
				72.0	4.95						

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

CORED BOREHOLE LOG
BH2

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 18/10/2010
DATE COMPLETED: 18/10/2010
SURFACE RL: 76.97 m AHD
COORDS: 306674.89 m E 6257313.30 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Description					
METHOD	WATER	CORE RECOVERY	RQD	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	WEATHERING	INFERRED STRENGTH $Is_{(50)}$ MPa (EL 0.03, VL 0.1, L 0.3, M 1, H 3, VH 10, EH)	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)	DEFECT DESCRIPTION AND ADDITIONAL OBSERVATIONS (defect type, inclination, planarity, roughness, thickness, infilling)
NMLC				71.5	5.21		SANDSTONE, fine grained, pale grey with dark grey laminations				BP PR S
					5.43		SHALE, grey, clayey in parts				JT 90° PR S
					5.5		SANDSTONE, fine grained, pale grey with dark grey laminations				
					5.80		SHALE, dark grey some orange, fractured, clayey				
				71.0	6.0						BP 5° ST S
					6.15		SANDSTONE, fine grained, pale grey with dark grey laminations				
					6.30		CORE LOSS 0.21m (6.30-6.51) Grinding low strength shale away				
				70.5	6.51		CORED BOREHOLE BH2 TERMINATED AT 6.51 m				
				70.0	7.0						
				69.5	7.5						
				69.0	8.0						
				68.5	8.5						
				68.0	9.0						
				67.5	9.5						
				67.0							

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

GEOTECHNICAL BOREHOLE LOG

BH3

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 18/10/2010
DATE COMPLETED: 18/10/2010
SURFACE RL: 83.38 m AHD
COORDS: 306599.93 m E 6257151.17 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Information					
METHOD	WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	Not Encountered	0.50m	0.50m	83.0	0.20			FILL, SILT, brown, rootlets			FILL
					0.5			FILL, Sandy Clayey SILT, orange, some pebbles			
		SPT 11, 2, 9 N=11	D		0.60			FILL, GRAVEL, Possibly Slag, sandy brown, some coal gravel			
		0.95m	0.95m	82.5	1.0						Gravel not possible to auger through. moved rig 1.0m SE, also steel in ground moved again
				82.0	1.50			BOREHOLE BH3 TERMINATED AT 1.50 m On Fill			
				81.5	2.0						
				81.0	2.5						
				80.5	3.0						
				80.0	3.5						
				79.5	4.0						
				79.0	4.5						
				78.5							

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

GEOTECHNICAL BOREHOLE LOG

BH4

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 18/10/2010
DATE COMPLETED: 18/10/2010
SURFACE RL: 83.33 m AHD
COORDS: 306595.08 m E 6257156.94 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Information					
METHOD	WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	Not Encountered			83.0	0.20			FILL, Clayey Sandy SILT, abundant rootlets			FILL
					0.5			FILL, Sandy GRAVEL			
				82.5	1.0						
				82.0	1.50			Silty CLAY, medium plasticity, red	MC<PL	St - VSt	RESIDUAL
				81.5	2.0						
				81.0	2.5						
		3.00m		80.5	3.0						
		SPT 7, 10, 10 N=20 3.45m		80.0	3.5						
			4.00m	79.5	4.0						
			U50	79.0	4.50			Silty CLAY, mottled grey, red and orange			
			4.60m		4.60			SHALE, dark grey	EW	EL	BEDROCK
				78.5							

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

GEOTECHNICAL BOREHOLE LOG

BH4

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 18/10/2010
DATE COMPLETED: 18/10/2010
SURFACE RL: 83.33 m AHD
COORDS: 306595.08 m E 6257156.94 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Information					
METHOD	WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	Not Encountered			78.0	5.00			SHALE, dark grey, occasional light grey claystone bands	MW	EL - VL	
				77.5	5.5						
					6.00			BOREHOLE BH4 TERMINATED AT 6.00 m			
				77.0	6.5						
				76.5	7.0						
				76.0	7.5						
				75.5	8.0						
				75.0	8.5						
				74.5	9.0						
				74.0	9.5						
				73.5							

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

GEOTECHNICAL BOREHOLE LOG

BH5

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 19/10/2010
DATE COMPLETED: 19/10/2010
SURFACE RL: 74.01 m AHD
COORDS: 306698.21 m E 6257440.42 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Information					
METHOD	WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	Not Encountered				0.20			TOPSOIL, SILT,			TOPSOIL
		0.50m SPT 2, 4, 6 N=10 0.95m	0.50m D 0.95m	73.5	0.5			Silty CLAY, medium plasticity, mottled yellow grey, with roots	MC>PL	VSt - H	RESIDUAL
		1.50m SPT 3, 6, 8 N=14 1.95m	1.50m D 1.95m	73.0 72.5 72.0	1.0 1.5 2.0			Becoming yellow orange with some gravel/rock fragments			**STANDPIPE PIEZOMETER INSTALLED** Class 18 PVC 50mm Casing and Screw Joined Machined Slotted Screen construction as follows: Monument Type - Road Box 0.0-5.03m Drill Cuttings 5.03-5.53m Bentonite Pellets 5.53-8.53m Slotted screen in geofabric sock with 5mm gravel backfill 0.0m Water Level 19/10/2010
				71.5	2.50			CLAYSTONE, grey, plastic when wet	EW	VL	BEDROCK Minimal Groundwater Seepage Observed
				70.5	3.50			CLAY, high plasticity, some carbonaceous bands		EL	
				70.0 69.5	4.0 4.5			CONTINUED AS CORED BOREHOLE			

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

CORED BOREHOLE LOG
BH5

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 19/10/2010
DATE COMPLETED: 19/10/2010
SURFACE RL: 74.01 m AHD
COORDS: 306698.21 m E 6257440.42 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Description					
METHOD	WATER	CORE RECOVERY	RQD	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	WEATHERING	INFERRED STRENGTH $Is_{(50)}$ MPa (EL -0.03, VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)	DEFECT DESCRIPTION AND ADDITIONAL OBSERVATIONS (defect type, inclination, planarity, roughness, thickness, infilling)
				73.5	0.5						
				73.0	1.0						
				72.5	1.5						
				72.0	2.0						
				71.5	2.5						
				71.0	3.0						
				70.5	3.5						
				70.0	4.0		START CORING AT 4.12m				
NMLC				69.5	4.12 4.5 4.62 4.82		CLAYSTONE, brown/grey 4.37m to 4.39m Sidentic Band SILTSTONE, dark grey, carbonaceous CLAYSTONE, dark grey	EW - HW			BP 3° PR S

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

CORED BOREHOLE LOG
BH5

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 19/10/2010
DATE COMPLETED: 19/10/2010
SURFACE RL: 74.01 m AHD
COORDS: 306698.21 m E 6257440.42 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Description					
METHOD	WATER	CORE RECOVERY	RQD	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	WEATHERING	INFERRED STRENGTH $Is_{(50)}$ MPa (EL 0.03, VL 0.1, L 0.3, M 1, H 3, VH 10, EH)	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)	DEFECT DESCRIPTION AND ADDITIONAL OBSERVATIONS (defect type, inclination, planarity, roughness, thickness, infilling)
NMLC				68.5	5.5		CLAYSTONE, dark grey	EW - HW			BP 3° PR S JT 20° PR POL
				68.0	6.0						
					6.13		CLAYSTONE, grey orange				
					6.30		SILTSTONE, dark grey, bedded				
				67.5	6.5		Becoming orange				BP 1° PR S
				67.0	7.0						
				66.5	7.5						JT 60° PR S JT 20° PR S
				66.0	8.0		7.93m to 7.99m Carbonaceous band				
				65.5	8.5						
					8.53		CORED BOREHOLE BH5 TERMINATED AT 8.53 m				
				65.0	9.0						
				64.5	9.5						

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

GEOTECHNICAL BOREHOLE LOG

BH6

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 19/10/2010
DATE COMPLETED: 19/10/2010
SURFACE RL: 83.47 m AHD
COORDS: 306662.89 m E 6257168.30 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Information					
METHOD	WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	Not Encountered			83.0	0.40			FILL, SAND/BRICK/CONCRETE/STEEL	M		FILL
		0.50m	0.50m		0.5			FILL, Silty CLAY, medium plasticity, orange brown			
		SPT 2, 5, 4 N=9	D		0.80			Silty CLAY, medium plasticity, mottled red, orange, grey	MC~PL	St - VSt	RESIDUAL
		0.95m	0.95m	82.5	1.0						
		1.50m	1.50m	82.0	1.5						
		SPT 5, 6, 10 N=16	D								
		1.95m	1.95m	81.5	2.00			Silty CLAY, medium plasticity, mottled grey red	MC<PL	VSt - H	
				81.0	2.5						
					2.70			Silty CLAY, medium plasticity, light grey			
		3.00m	3.00m	80.5	3.0						
		SPT 11, 10, 16 N=26	D								
		3.45m	3.45m	80.0	3.5						
			3.90m		3.90			SILTSTONE, dark grey, carbonaceous in part	EW	EL	BEDROCK
			D	79.5	4.0						
			4.50m	79.0	4.50			BOREHOLE BH6 TERMINATED AT 4.50 m			
				78.5							

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

GEOTECHNICAL BOREHOLE LOG

BH7

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 19/10/2010
DATE COMPLETED: 19/10/2010
SURFACE RL: 90.97 m AHD
COORDS: 306750.92 m E 6257122.22 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Information					
METHOD	WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	Not Encountered				0.10			FILL, SILT, brown, abundant rootlets			FILL
								FILL, Silty CLAY, brown mottled yellow, orange and red			
		0.50m	0.50m	90.5	0.5						
		SPT 2, 4, 6 N=10	D								
		0.95m	0.95m								
			1.00m	90.0	1.0			Fine grained pink brown sand			Concrete? Moved hole west 1.0m. Moved 4.0m SW
			U50								
		1.50m	1.55m	89.5	1.50			SAND, fine to medium grained, light brown, friable, interbedded with low strength clay bands and stronger ironstone bands	D	VD	RESIDUAL
		SPT 5, 12/50mm N=R	1.60m								
		1.70m	D								
			1.95m	89.0	2.0						
				88.5	2.5						
				88.0	3.0						
				87.5	3.5						
				87.0	4.0						
					4.30			SHALE, brown grey	HW - MW	VL - L	BEDROCK
				86.5	4.5						
NMLC								CONTINUED AS CORED BOREHOLE			
				86.0							

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

CORED BOREHOLE LOG
BH7

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 19/10/2010
DATE COMPLETED: 19/10/2010
SURFACE RL: 90.97 m AHD
COORDS: 306750.92 m E 6257122.22 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Description					
METHOD	WATER	CORE RECOVERY	RQD	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	WEATHERING	INFERRED STRENGTH $Is_{(50)}$ MPa (EL -0.03, VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)	DEFECT DESCRIPTION AND ADDITIONAL OBSERVATIONS (defect type, inclination, planarity, roughness, thickness, infilling)
				90.5	0.5						
				90.0	1.0						
				89.5	1.5						
				89.0	2.0						
				88.5	2.5						
				88.0	3.0						
				87.5	3.5						
				87.0	4.0						
				86.5	4.5		START CORING AT 4.53m				
NMLC		100	52	86.0	4.53		SHALE, dark grey, with clay bands and infill in joints	HW - MW			BP 3° Fe SN PR S JT 60° PR S Cemented

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

CORED BOREHOLE LOG
BH7

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 19/10/2010
DATE COMPLETED: 19/10/2010
SURFACE RL: 90.97 m AHD
COORDS: 306750.92 m E 6257122.22 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Description					
METHOD	WATER	CORE RECOVERY	RQD	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	WEATHERING	INFERRED STRENGTH $Is_{(50)}$ MPa (EL 0.03, VL 0.1, L 0.3, M 1, H 3, VH 10, EH)	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)	DEFECT DESCRIPTION AND ADDITIONAL OBSERVATIONS (defect type, inclination, planarity, roughness, thickness, infilling)
NMLC		100	52	85.5	5.20		SHALE, dark grey, with clay bands and infill in joints Increased clay	HW - MW			
					5.5		SHALE, dark grey				JT 75° Fe SN PR S JT 30° Fe SN PR S
				85.0	6.00		Siderite at base CLAYSTONE, medium plasticity, light brown				
					6.38						
				84.5	6.5		SILTSTONE, dark green grey				BP 3° Fe SN PR S BP 3° Fe SN PR S JT 85° Fe SN PR S
					6.90						
				84.0	7.0		SANDSTONE, fine to medium grained, light grey, abundant carbonaceous laminations 1 to 2mm thickness, dipping at 2°-5°	SW - MW			JT 75° Fe SN PR S BP 1° PR S
				83.5	7.5						BP 1° PR S
					7.60		CORED BOREHOLE BH7 TERMINATED AT 7.60 m				
				83.0	8.0						
				82.5	8.5						
				82.0	9.0						
				81.5	9.5						
				81.0							

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

GEOTECHNICAL BOREHOLE LOG

BH8

SHEET 1 OF 4

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 20/10/2010
DATE COMPLETED: 20/10/2010
SURFACE RL: 83.98 m AHD
COORDS: 306625.10 m E 6257041.21 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Information					
METHOD	WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	Not Encountered			83.5	0.50			TOPSOIL, Silty CLAY, brown, organic			TOPSOIL Concrete dug out of side of hole 0.3m down
		0.50m SPT 2, 2, 3 N=5 0.95m	0.50m					Silty CLAY, high plasticity, grey, some rock fragments	MC>PL	F	RESIDUAL
			1.00m U50 D 1.45m	83.0	0.90 1.0			CLAY, high plasticity, mottled red, grey and orange	MC<PL	H	
		1.50m SPT 3, 7, 9 N=16 1.95m	1.50m D 1.95m	82.5	1.5						**STANDPIPE PIEZOMETER INSTALLED** Class 18 PVC 50mm Casing and Screw Joined Machined Slotted Screen construction as follows: Monument Type - Road Box 0.0-6.56m Drill Cuttings 6.56-7.06m Bentonite Pellets 7.06-10.06m Slotted screen in geofabric sock with 5mm gravel backfill 4.91m Water Level 20/10/2010
				82.0	2.0						
				81.5	2.5 2.60			CLAYSTONE, brown green	EW	EL	BEDROCK
				81.0	3.0						
				80.5	3.5						
				80.0	4.0						
				79.5	4.5						
				79.0							

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

GEOTECHNICAL BOREHOLE LOG

BH8

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 20/10/2010
DATE COMPLETED: 20/10/2010
SURFACE RL: 83.98 m AHD
COORDS: 306625.10 m E 6257041.21 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Information					
METHOD	WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE AND ADDITIONAL OBSERVATIONS
								CLAYSTONE, brown green	EW	EL	BEDROCK
NMLC				78.5	5.5			CONTINUED AS CORED BOREHOLE			
				78.0	6.0						
				77.5	6.5						
				77.0	7.0						
				76.5	7.5						
				76.0	8.0						
				75.5	8.5						
				75.0	9.0						
				74.5	9.5						
				74.0							

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

CORED BOREHOLE LOG
BH8

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 20/10/2010
DATE COMPLETED: 20/10/2010
SURFACE RL: 83.98 m AHD
COORDS: 306625.10 m E 6257041.21 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Description					
METHOD	WATER	CORE RECOVERY	RQD	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	WEATHERING	INFERRED STRENGTH $Is_{(50)}$ MPa (EL -0.03, VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)	DEFECT DESCRIPTION AND ADDITIONAL OBSERVATIONS (defect type, inclination, planarity, roughness, thickness, infilling)
							START CORING AT 5.20m				
NMLC		88	49		5.20		CORE LOSS 0.30m (5.20-5.50)				
				78.5	5.50		SHALE, dark grey	EW - MW			BP 1° PR S
					5.59		CLAYSTONE, brown, sandy bands				
					5.65		SANDSTONE, fine grained, light grey, laminated organic stiff bands	SW			JT 90° PR RF BP 1° PR S
				78.0	6.03		CLAYSTONE, brown				
					6.04		SANDSTONE, fine grained, light grey, laminated carbonaceous siltstone bands				BP 1° PR S BP 1° PR S BP 1° PR S
					6.40		CLAYSTONE, brown				
				77.5	6.50		SHALE, dark grey, some carbonaceous material				BP 1° PR S BP 1° PR S
				77.0	7.0						
				76.5	7.5						
					7.60		CLAYSTONE, light grey				
		100			7.70		SHALE, dark grey				BP 1° PR S BP 1° PR S
				76.0	8.00		SANDSTONE, fine grained, carbonaceous laminations	F			BP 1° PR S
				75.5	8.5						JT-IS 85° Pyrite PR RF
				75.0	9.00		SHALE, dark grey black, carbonaceous in part				BP 1° PR S BP 1° PR S
				74.5	9.5						
					9.64		CLAYSTONE, light grey				
					9.70		SHALE, dark grey black, carbonaceous in part				BP 1° PR S BP 1° PR S
				74.0							

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

CORED BOREHOLE LOG
BH8

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 20/10/2010
DATE COMPLETED: 20/10/2010
SURFACE RL: 83.98 m AHD
COORDS: 306625.10 m E 6257041.21 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Description					
METHOD	WATER	CORE RECOVERY	RQD	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	WEATHERING	INFERRED STRENGTH $Is_{(50)}$ MPa (EL 0.03, VL 0.1, L 0.3, M 1, H 3, VH 10, EH)	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)	DEFECT DESCRIPTION AND ADDITIONAL OBSERVATIONS (defect type, inclination, planarity, roughness, thickness, infilling)
					10.06		CORED BOREHOLE BH8 TERMINATED AT 10.06 m				
				73.5	10.5						
				73.0	11.0						
				72.5	11.5						
				72.0	12.0						
				71.5	12.5						
				71.0	13.0						
				70.5	13.5						
				70.0	14.0						
				69.5	14.5						
				69.0							

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

GEOTECHNICAL BOREHOLE LOG

BH9

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 20/10/2010
DATE COMPLETED: 20/10/2010
SURFACE RL: 79.98 m AHD
COORDS: 306623.65 m E 6257169.72 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Information					
METHOD	WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	Not Encountered			79.5	0.50			TOPSOIL, Clayey SILT, brown, organic	W		TOPSOIL
		0.50m SPT 2, 4, 6 N=10 0.95m	0.50m D 0.95m 1.00m U50 1.45m 1.50m D 1.95m	79.0 78.5 78.0	1.0 1.30 1.5 2.0			Gravelly CLAY, high plasticity, mottled grey and orange, black iron stained angular gravel, rock fragments Silty CLAY, high plasticity, mottled grey orange	MC~PL	VSt - H	RESIDUAL **STANDPIPE PIEZOMETER INSTALLED** Class 18 PVC 50mm Casing and Screw Joined Machined Slotted Screen construction as follows: Monument Type - Road Box 0.0-3.59m Drill Cuttings 3.59-4.09m Bentonite Pellets 4.09-7.09m Slotted screen in geofabric sock with 5mm gravel backfill 1.18m Water Level 20/10/2010
		1.50m SPT 3, 5, 6 N=11 1.95m		77.5 77.0 76.5 76.0	2.5 2.80 3.0 3.5 4.0			SHALE, dark grey green	EW - HW	VL	BEDROCK
				75.5	4.5			CONTINUED AS CORED BOREHOLE			

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

CORED BOREHOLE LOG

BH9

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 20/10/2010
DATE COMPLETED: 20/10/2010
SURFACE RL: 79.98 m AHD
COORDS: 306623.65 m E 6257169.72 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Description					
METHOD	WATER	CORE RECOVERY	RQD	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	WEATHERING	INFERRED STRENGTH $Is_{(50)}$ MPa (EL -0.03, VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)	DEFECT DESCRIPTION AND ADDITIONAL OBSERVATIONS (defect type, inclination, planarity, roughness, thickness, infilling)
				79.5	0.5						
				79.0	1.0						
				78.5	1.5						
				78.0	2.0						
				77.5	2.5						
				77.0	3.0						
				76.5	3.5						
				76.0	4.0		START CORING AT 4.09m				
					4.09		CORE LOSS 0.09m (4.09-4.18)				
NMLC		97	68	75.5	4.18		SHALE, dark grey green, clayey in part	EW			BP 1° PR S
					4.5						
					4.67		SHALE, dark grey	SW - MW			JT 90° Fe SN PR
					4.90		CLAYSTONE, light brown				

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

CORED BOREHOLE LOG
BH9

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 20/10/2010
DATE COMPLETED: 20/10/2010
SURFACE RL: 79.98 m AHD
COORDS: 306623.65 m E 6257169.72 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Description				
METHOD	WATER	CORE RECOVERY	RQD	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	WEATHERING	INFERRED STRENGTH $Is_{(50)}$ MPa (EL -0.03, VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)	DEFECT DESCRIPTION AND ADDITIONAL OBSERVATIONS (defect type, inclination, planarity, roughness, thickness, infilling)
NMLC		97	68	74.5	5.20		CLAYSTONE, light brown	SW - MW			
					5.40		SHALE, grey, clayey in part				
					5.47		CLAYSTONE, light brown				
					5.5		SANDSTONE, fine grained, carbonaceous laminations 1 to 2mm thickness, some medium grained bands	F			BP 1° PR S
				74.0	6.0						BP 5° PR RF BP 10° PR RF BP-IS Clay PR S
				73.5	6.5						
				73.0	7.0						
					7.09		CORED BOREHOLE BH9 TERMINATED AT 7.09 m				
				72.5	7.5						
				72.0	8.0						
				71.5	8.5						
				71.0	9.0						
				70.5	9.5						

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

GEOTECHNICAL BOREHOLE LOG

BH10

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 21/10/2010
DATE COMPLETED: 21/10/2010
SURFACE RL: 83.62 m AHD
COORDS: 306476.42 m E 6257451.35 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Information					
METHOD	WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	Not Encountered		0.50m	83.5	0.5			CLAY, high plasticity, mottled grey red	MC>PL	St - VSt	RESIDUAL
			U50 0.85m	83.0	1.0						
		1.50m	1.50m	82.5	1.50						
		SPT 4, 6, 11 N=17 1.95m	D 1.95m	82.0	2.0			Silty CLAY, high plasticity, mottled grey, orange and red, contains extremely weathered rock fragments	MC<PL		**STANDPIPE PIEZOMETER INSTALLED** Class 18 PVC 50mm Casing and Screw Joined Machined Slotted Screen construction as follows: Monument Type - Road Box 0.0-6.25m Drill Cuttings 6.25-6.75m Bentonite Pellets 6.75-9.75m Slotted screen in geofabric sock with 5mm gravel backfill 9.26m Water Level 21/10/2010
				81.5	2.5						
				81.0	3.0						
				80.5	3.5						
				80.0	4.0			CONTINUED AS CORED BOREHOLE			
				79.5	4.5						
				79.0							

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

CORED BOREHOLE LOG

BH10

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 21/10/2010
DATE COMPLETED: 21/10/2010
SURFACE RL: 83.62 m AHD
COORDS: 306476.42 m E 6257451.35 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Description					
METHOD	WATER	CORE RECOVERY	RQD	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	WEATHERING	INFERRED STRENGTH $Is_{(50)}$ MPa (EL -0.03, VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)	DEFECT DESCRIPTION AND ADDITIONAL OBSERVATIONS (defect type, inclination, planarity, roughness, thickness, infilling)
				83.5	0.5						
				83.0	1.0						
				82.5	1.5						
				82.0	2.0						
				81.5	2.5						
				81.0	3.0						
				80.5	3.5						
				80.0	3.65		START CORING AT 3.65m				
NMLC		100	74				SILTSTONE, dark grey green, clay bands common	EW			JT 50° PR S
					3.98		SILTSTONE, black, carbonaceous				
				79.5	4.10 4.13		CLAYSTONE	HW			
							SILTSTONE, dark green grey, carbonaceous bands				
					4.5						JT 50° PR S
				79.0							JT 50° PR S
					4.80 4.85		CLAYSTONE				
							SILTSTONE, dark green grey, carbonaceous bands				

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

CORED BOREHOLE LOG
BH10

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 21/10/2010
DATE COMPLETED: 21/10/2010
SURFACE RL: 83.62 m AHD
COORDS: 306476.42 m E 6257451.35 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Description				
METHOD	WATER	CORE RECOVERY	RQD	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	WEATHERING	INFERRED STRENGTH $Is_{(50)}$ MPa (EL 0.03, VL 0.1, L 0.3, M 1, H 3, VH 10, EH)	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)	DEFECT DESCRIPTION AND ADDITIONAL OBSERVATIONS (defect type, inclination, planarity, roughness, thickness, infilling)
NMLC		100	74	78.5			throughout SILTSTONE, dark green grey, carbonaceous bands throughout	HW			
				78.0	5.5						
					5.80		SANDSTONE, fine grained				
					5.90		SILTSTONE, dark grey green, some iron staining of joints and carbonaceous banding				JT 90° PR S
				77.5	6.0						
				77.0	6.5						
					6.75		SILTSTONE, dark black grey, carbonaceous	MW			BP 1° PR S
					6.88		SANDSTONE, fine grained, light grey				BP 1° PR S
				76.5	7.0						
					7.36		SILTSTONE, dark grey, sandstone laminations 1 to 2mm				
				76.0	7.5						
		100	93		8.0						BP 1° PR S
				75.5							BP 1° PR S
					8.40		SANDSTONE, fine grained, light grey				BP 1° PR S
					8.45		SIDERITE	SW			
					8.53		SANDSTONE, fine grained, light grey, carbonaceous laminations				
				75.0							
					9.0						BP 1° U S
				74.5							BP 3° U S
					9.5						BP 3° U S
				74.0							
					9.75		CORED BOREHOLE BH10 TERMINATED AT 9.75 m				

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

GEOTECHNICAL BOREHOLE LOG

BH11

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 21/10/2010
DATE COMPLETED: 21/10/2010
SURFACE RL: 94.72 m AHD
COORDS: 306456.07 m E 6257300.36 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Information					
METHOD	WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	Not Encountered	0.50m	0.50m	94.5	0.5			Silty CLAY, mottled red, grey and orange	MC<PL	VSt - H	RESIDUAL
		SPT 4, 7, 11 N=18	D	94.0	1.0			Too hard for U50			
		0.95m	0.95m	93.5	1.30			SHALE, dark grey green	EW	VL	BEDROCK
				93.0	1.5						
				92.5	2.0						
				92.0	2.5			CONTINUED AS CORED BOREHOLE			
				91.5	3.0						
				91.0	3.5						
				90.5	4.0						
				90.0	4.5						

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

CORED BOREHOLE LOG

BH11

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 21/10/2010
DATE COMPLETED: 21/10/2010
SURFACE RL: 94.72 m AHD
COORDS: 306456.07 m E 6257300.36 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Description					
METHOD	WATER	CORE RECOVERY	RQD	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	WEATHERING	INFERRED STRENGTH $Is_{(50)}$ MPa (EL 0.03, VL 0.1, L 0.3, M 1, H 3, VH 10, EH)	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)	DEFECT DESCRIPTION AND ADDITIONAL OBSERVATIONS (defect type, inclination, planarity, roughness, thickness, infilling)
				94.5	0.5						
				94.0	1.0						
				93.5	1.5						
				93.0	2.0						
				92.5	2.5		START CORING AT 2.56m				
NMLC		96	28	92.0	2.56		CORE LOSS 0.11m (2.56-2.67)	EW - HW			JT 90° Fe SN PR RF
					2.67		SHALE, dark grey green, iron stained				JT 90° PR RF
				91.5	3.0						JT 70° PR RF
					3.25		SANDSTONE, fine grained, light grey, interbedded with siltstone, dark grey green iron stained				
				91.0	3.5		Clay bands at 3.46m and 3.71m				JT 70° PR RF
				90.5	4.0						
					4.51		SANDSTONE, light brown white	HW			BP 2° PR S BP 2° PR S
				90.0	4.74		SHALE, dark grey green	SW			BP-IS 2° Clay PR S
							Clay band	MW			BP 2° PR S

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

CORED BOREHOLE LOG
BH11

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 21/10/2010
DATE COMPLETED: 21/10/2010
SURFACE RL: 94.72 m AHD
COORDS: 306456.07 m E 6257300.36 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Description					
METHOD	WATER	CORE RECOVERY	RQD	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	WEATHERING	INFERRED STRENGTH $Is_{(50)}$ MPa (EL 0.03, VL 0.1, L 0.3, M 1, H 3, VH 10, EH)	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)	DEFECT DESCRIPTION AND ADDITIONAL OBSERVATIONS (defect type, inclination, planarity, roughness, thickness, infilling)
NMLC		99	77	89.5	5.00		SHALE, dark grey green, orange iron staining around defects	MW			JT 60° PR RF BP 1° PR S
				89.0	5.5						
					5.66		SANDSTONE				
					5.94						JT 85° PR RF Cemented
					6.00		SHALE, grey	SW			
				88.5			SHALE, dark grey green, orange iron staining around defects	MW			JT 85° SN PR RF JT 30° PR RF JT 30° PR RF JT 60° PR RF
					6.5						BP 1° Fe SN U RF
				88.0							
					7.0		Becomes brown, more clay				BP 1° Fe SN PR S
				87.5	7.20		SANDSTONE, fine to medium grained, light grey	SW			BP 1° Fe SN PR S BP 1° Fe SN PR S
					7.47						BP 1° Fe SN PR S
					7.51		CLAYSTONE, medium plasticity, light grey				
				87.0			SANDSTONE, fine to medium grained, light grey				
					7.91		CORED BOREHOLE BH11 TERMINATED AT 7.91 m				
				86.5	8.0						
					8.5						
				86.0							
					9.0						
				85.5							
					9.5						
				85.0							

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

GEOTECHNICAL BOREHOLE LOG

BH12

SHEET 1 OF 1

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 21/10/2010
DATE COMPLETED: 21/10/2010
SURFACE RL: 81.39 m AHD
COORDS: 306568.94 m E 6257199.78 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Information					
METHOD	WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	Not Encountered	0.50m	0.50m	81.0	0.50			TOPSOIL, Silty CLAY, brown	M		TOPSOIL
		SPT 1, 3, 2 N=5 0.95m	D 0.95m	80.5	1.0			FILL, Silty CLAY, mottled grey, orange and brown	MC>PL	St	FILL
					1.20			CLAY, high plasticity, grey mottled red orange	MC<PL	VSt - H	RESIDUAL
				80.0	1.5						
				79.5	2.0						
				79.0	2.5						
		3.00m	3.00m	78.5	3.0			Some rock fragments			
		SPT 12, 2/150mm N=R 3.30m	D 3.45m	78.0	3.45						
					3.5			SILTSTONE, grey green, some high plasticity clay bands	EW	VL - L	BEDROCK
				77.5	4.0						
			4.30m D 4.50m	77.0	4.50						
								BOREHOLE BH12 TERMINATED AT 4.50 m			
				76.5							

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GEOTECHNICAL BOREHOLE LOG

BH13

SHEET 1 OF 3

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 22/10/2010
DATE COMPLETED: 22/10/2010
SURFACE RL: 87.29 m AHD
COORDS: 306477.13 m E 6257147.65 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Information					
METHOD	WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE AND ADDITIONAL OBSERVATIONS
					0.10			TOPSOIL			TOPSOIL
AD/T	Not Encountered	0.50m SPT 3, 6, 7 N=13 0.95m	0.50m D 0.95m 1.00m U50 1.25m	87.0 86.5 86.0	0.5 1.0 1.40			Silty CLAY, mottled grey red	D	St VSt - H	RESIDUAL
				85.5 85.0	1.5 2.0 2.5			SILTSTONE, dark grey green	EW	VL - L	BEDROCK
				84.5 84.0 83.5 83.0 82.5	3.0 3.5 4.0 4.5			CONTINUED AS CORED BOREHOLE			

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

CORED BOREHOLE LOG
BH13

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 22/10/2010
DATE COMPLETED: 22/10/2010
SURFACE RL: 87.29 m AHD
COORDS: 306477.13 m E 6257147.65 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Description					
METHOD	WATER	CORE RECOVERY	RQD	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	WEATHERING	INFERRED STRENGTH $Is_{(50)}$ MPa (EL -0.03, VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)	DEFECT DESCRIPTION AND ADDITIONAL OBSERVATIONS (defect type, inclination, planarity, roughness, thickness, infilling)
				87.0	0.5						
				86.5	1.0						
				86.0	1.5						
				85.5	2.0						
				85.0	2.5		START CORING AT 2.54m				
NMLC		96	43	84.5	2.54		CORE LOSS 0.12m (2.54-2.66)				
					2.66		SHALE, dark grey green	EW			
					2.74		SANDSTONE, fine grained, light grey, organic laminations				
					3.0						BP 1° PR S
					3.05		CLAYSTONE, high plasticity, grey mottled green				
				84.0	3.28		SHALE, grey green, orange staining around defects, common siderite nodules	HW			JT 10° U RF
				83.5	3.5						JT 10° Fe SN PR S
				83.0	4.0						JT 10° PR S JT 5° PR S BP 1° Fe SN PR S
				82.5	4.5						BP 1° Fe SN PR S
											BP 1° Fe SN PR S

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

CORED BOREHOLE LOG
BH13

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 22/10/2010
DATE COMPLETED: 22/10/2010
SURFACE RL: 87.29 m AHD
COORDS: 306477.13 m E 6257147.65 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Description				
METHOD	WATER	CORE RECOVERY	RQD	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	WEATHERING	INFERRED STRENGTH $Is_{(50)}$ MPa (EL 0.03, VL 0.1, L 0.3, M 1, H 3, VH 10, EH)	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)	DEFECT DESCRIPTION AND ADDITIONAL OBSERVATIONS (defect type, inclination, planarity, roughness, thickness, infilling)
NMLC		100	65	82.0	5.5		SHALE, grey green, orange staining around defects, common siderite nodules	HW			BP 1° SN PR S
					5.62						BP 1° PR S
				81.5			CLAYSTONE, grey green and orange				BP PR RF
											JT 3° SN U S
					6.00						JT 3° SN U S
							SHALE, grey green and black, with carbonaceous bands				
					6.20						
				81.0			SHALE, with clay bands				
					6.5						Clay Band 20mm
											Clay Band 20mm
				80.5	6.80						
							SHALE, grey green, orange staining around defects				JT 30° Fe SN PR S
					7.0						JT 30° Fe SN PR S
				80.0							
					7.5						
				79.5							
					7.90						BP 1° PR S
					8.0		CLAYSTONE, high plasticity, grey				
					8.15						
							CORED BOREHOLE BH13 TERMINATED AT 8.15 m				
				79.0							
					8.5						
				78.5							
					9.0						
				78.0							
					9.5						
				77.5							

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

GEOTECHNICAL BOREHOLE LOG

BH14

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 22/10/2010
DATE COMPLETED: 22/10/2010
SURFACE RL: 83.36 m AHD
COORDS: 306587.06 m E 6257380.55 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Information					
METHOD	WATER	FIELD TEST	SAMPLE	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	MOISTURE/ WEATHERING	CONSISTENCY/ RELATIVE DENSITY/ STRENGTH	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	Not Encountered			83.36	0.15			TOPSOIL			TOPSOIL
		0.50m	0.50m	83.0	0.5			Silty CLAY, high plasticity, mottled grey red	MC>PL	S - F	RESIDUAL
		SPT 1, 2, 2 N=4 0.95m	D 0.95m	82.5	1.0			Some black rock fragments			
			1.00m U50 1.35m	82.0	1.5				MC<PL	St - VSt	
		1.50m	1.50m								
		SPT 7, 6, 10 N=16 1.95m	D 1.95m	81.5	2.0						
				81.0	2.5						
					2.70			SHALE, dark grey green, banded with light grey high plasticity clay	EW	VL - L	BEDROCK
				80.5	3.0						
				80.0	3.5						
				79.5	4.0			CONTINUED AS CORED BOREHOLE			
				79.0	4.5						
				78.5							

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

CORED BOREHOLE LOG

BH14

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 22/10/2010
DATE COMPLETED: 22/10/2010
SURFACE RL: 83.36 m AHD
COORDS: 306587.06 m E 6257380.55 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Description					
METHOD	WATER	CORE RECOVERY	RQD	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	WEATHERING	INFERRED STRENGTH $Is_{(50)}$ MPa (EL -0.03, VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)	DEFECT DESCRIPTION AND ADDITIONAL OBSERVATIONS (defect type, inclination, planarity, roughness, thickness, infilling)
				83.0	0.5						
				82.5	1.0						
				82.0	1.5						
				81.5	2.0						
				81.0	2.5						
				80.5	3.0						
				80.0	3.5						
				79.5			START CORING AT 4.01m				
					4.01						
NMLC		99	84		4.10		SHALE, dark grey green	EW			
					4.22		CLAYSTONE, light grey				BP 1° PR S
				79.0			Clayey SHALE, dark grey green, orange staining around defects				BP 1° PR S
					4.5						
				78.5							BP 1° PR S

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

CORED BOREHOLE LOG
BH14

RCA AUSTRALIA
GEOTECHNICAL • ENVIRONMENTAL

PROJECT No: 7600
CLIENT: Prospect Aquatic Investments
PROJECT: Wet 'n' Wild
LOCATION: Reservoir Road, Prospect

DATE COMMENCED: 22/10/2010
DATE COMPLETED: 22/10/2010
SURFACE RL: 83.36 m AHD
COORDS: 306587.06 m E 6257380.55 m N MGA94 56
DRILL MODEL / MOUNTING: Truck mounted

Borehole Information						Field Material Description				
METHOD	WATER	CORE RECOVERY	RQD	RL (m AHD)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents) (ROCK NAME; grain size, colour, minor constituents)	WEATHERING	INFERRED STRENGTH $Is_{(50)}$ MPa (EL 0.03, VL 0.1, L 0.3, M 1, H 3, VH 10, EH)	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)	DEFECT DESCRIPTION AND ADDITIONAL OBSERVATIONS (defect type, inclination, planarity, roughness, thickness, infilling)
NMLC		99	84	78.0	5.5		Clayey SHALE, dark grey green, orange staining around defects	EW			FZ
				77.5	6.0						FZ
				77.0	6.5						JT 50° Fe SN PR S
				76.5	7.0						
					7.02		CORED BOREHOLE BH14 TERMINATED AT 7.02 m				
				76.0	7.5						
				75.5	8.0						
				75.0	8.5						
				74.5	9.0						
				74.0	9.5						
				73.5							

LOGGED: CRM | CHECKED: JE | DATE: 18/11/2010

Explanatory Notes – Soil Description

In engineering terms soil includes every type of uncemented or partially cemented inorganic material found in the ground. In practice, if the material can be remoulded by hand in its field condition or in water it is described as a soil. The dominant soil constituent is given in capital letters, with secondary textures in lower case. The dominant feature is assessed from the Unified Soil Classification system and a soil symbol is used to define a soil layer.

METHOD

Method	Description
AS	Auger Screwing
AD/V	Auger Drilling with V Bit
AD/T	Auger Drilling with TC bit
BH	Backhoe
CT	Cable Tool Rig
N	Natural Exposure
X	Existing Excavation
E	Excavator
EH	Excavator with Hammer
HA	Hand Auger
HQ	Diamond Core-63mm
NMLC	Diamond Core-52mm
NQ	Diamond Core-47mm
PT	Push Tube
RR	Rock Roller
DB	Washbore Drag Bit
WS	Washbore
AT	Air Track
DT	Diatube
Percussion	Percussion Drilling

Water


Water level at date shown


Seepage

NOT ENCOUNTERED: The borehole/test pit was dry soon after excavation. Inflow may have been observed had the borehole/test pit been left open for a longer period.

NOT OBSERVED: The observation of groundwater, whether present or not, was not possible due to drilling water, surface seepage or cave in of the borehole/test pit.

SAMPLING

Sample	Description
B	Bulk Disturbed Sample
D	Disturbed Sample
SPT	Standard Penetration Test
U50	Undisturbed Sample-50mm
ES	Soil Sample, Environmental
EW	Water Sample, Environmental
G	Gas Sample

UNIFIED SOIL CLASSIFICATION

The appropriate symbols are selected on the result of visual examination, field tests and available laboratory tests, such as sieve analysis, liquid limit and plasticity index.

USC Symbol	Description
GW	Well graded gravel
GP	Poorly graded gravel
GM	Silty gravel
GC	Clayey gravel
SW	Well graded sand
SP	Poorly graded sand
SM	Silty sand
SC	Clayey sand
ML	Silt of low plasticity
CL	Clay of low plasticity
OL	Organic soil of low plasticity
CI	Clay of medium plasticity
MH	Silt of high plasticity
CH	Clay of high plasticity
OH	Organic soil of high plasticity
Pt	Peaty soil

MOISTURE CONDITION

Dry	Cohesive soils are friable or powdery Cohesionless soil grains are free-running.
Moist	Soil feels cool, darkened in colour Cohesive soils can be moulded Cohesionless soil grains tend to adhere.
Wet	Cohesive soils usually weakened Free water forms on hands when handling.

For cohesive soils the following codes may also be used:

MC>PL	Moisture Content greater than the Plastic Limit.
MC-PL	Moisture Content near the Plastic Limit.
MC<PL	Moisture Content less than the Plastic Limit.

PLASTICITY

The potential for soil to undergo change in volume with moisture change is assessed from its degree of plasticity. The classification of the degree of plasticity in terms of the Liquid Limit (LL) is as follows.

Description of Plasticity	LL(%)
Low	<35
Medium	35 to 50
High	>50

COHESIVE SOILS – CONSISTENCY

The consistency of a cohesive soil is defined by descriptive terminology such as very soft, soft, firm, stiff, very stiff and hard. These terms are assessed by the shear strength of the soil as observed visually, by hand penetrometer values and by resistance to deformation to hand moulding. A Hand Penetrometer may be used in the field or the laboratory to provide an approximate assessment of the unconfined compressive strength (UCS) of cohesive soils. Undrained shear strength Cu = 0.5×UCS. The UCS values are recorded in kPa as follows:

Strength	Symbol	Unconfined Compressive Strength, q_u (kPa)
Very Soft	VS	< 25
Soft	S	25 to 50
Firm	F	50 to 100
Stiff	St	100 to 200
Very Stiff	VSt	200 to 400
Hard	H	> 400

COHESIONLESS SOILS – RELATIVE DENSITY

Relative density terms such as very loose, loose, medium, dense and very dense are used to describe silty and sandy material, and these are usually based on resistance to drilling penetration or the Standard Penetration Test (SPT) N values. Other condition terms, such as friable, powdery or crumbly may also be used.

Term	Symbol	Density Index	N Value (blows/0.3m)
Very Loose	VL	0 to 15	0 to 4
Loose	L	15 to 35	4 to 10
Medium Dense	MD	35 to 65	10 to 30
Dense	D	65 to 85	30 to 50
Very Dense	VD	>85	>50

COHESIONLESS SOILS PARTICLE SIZE DESCRIPTIVE TERMS

Name	Subdivision	Size
Boulders		>200 mm
Cobbles		63 mm to 200 mm
Gravel	Coarse	20 mm to 63 mm
	medium	6 mm to 20 mm
	Fine	2.36 mm to 6 mm
Sand	Coarse	0.6 mm to 2.36 mm
	medium	0.2 mm to 0.6 mm
	fine	0.075 mm to 0.2 mm

Explanatory Notes - Rock Description

METHOD

Refer soil description sheet.

WATER

Refer soil description sheet.

ROCK QUALITY

The fracture spacing is shown where applicable and the Rock Quality Designation (RQD) or Total Core Recovery (TCR) is given where:

TCR (%) = $\frac{\text{length of core recovered}}{\text{length of core run}}$

RQD (%) = $\frac{\text{sum of axial lengths of core > 100mm long}}{\text{length of core run.}}$

ROCK MATERIAL WEATHERING

Rock weathering is described using the abbreviations and definitions used in AS1726.

Symbol	Term	Definition
EW	Extremely Weathered	Rock is weathered to such an extent that it has 'soil' properties, ie, it either disintegrates or can be remoulded in water.
HW	Highly Weathered	The rock substance is affected by weathering to the extent that limonite staining or bleaching affects the whole rock substance and other signs of chemical or physical decomposition are evident. Porosity and strength is usually decreased compared to the fresh rock. The colour and strength of the fresh rock is no longer recognisable.
MW	Moderately Weathered	The whole of the rock substance is discoloured. Usually by iron staining or bleaching, to the extent that the colour of the fresh rock is no longer recognisable.
SW	Slightly weathered	Rock is slightly discoloured but shows little or no change of strength from fresh rock.
F	Fresh	Rock shows no sign of decomposition or staining.

ROCK STRENGTH

Rock strength is described using AS1726 and ISRM – Commission on Standardisation of Laboratory and Field Tests, 'Suggested method of determining the Uniaxial Compressive Strength of Rock materials and the Point Load Index' as follows:

Term	Symbol	Point Load Index Is_{50} (MPa)
Extremely Low	EL	<0.03
Very Low	VL	0.03 to 0.1
Low	L	0.1 to 0.3
Medium	M	0.3 to 1
High	H	1 to 3
Very High	VH	3 to 10
Extremely High	EH	>10

◀ Diametral Point Load Index test.

▼ Axial Point Load Index test.

DEFECT SPACING/BEDDING THICKNESS

Measured at right angles to defects of same set or bedding.

Term	Defect Spacing	Bedding
Extremely closely spaced	<6 mm	Thinly laminated
	6 to 20 mm	Laminated
Very closely spaced	20 to 60 mm	Very thin
Closely spaced	0.06 to 0.2 m	Thin
Moderately widely spaced	0.2 to 0.6 m	Medium
Widely spaced	0.6 to 0.2 m	Thick
Very widely spaced	>2 m	Very thick

DEFECT DESCRIPTION

Type	Definition
JT	Joint
BP	Bed Parting
CO	Contact
CS	Clay Seam
CZ	Crush Zone
DK	Dyke
DZ	Decomposed Zone
FC	Fracture
FZ	Fracture Zone
FL	Foliation
FLT	Fault
VN	Vein
SM	Seam
IS	Infilled Seam
SZ	Shear zone

Planarity	Roughness
PR – Planar	RF – Rough
IR – Irregular	VR – Very Rough
ST – stepped	S – Smooth
U – Undulating	SL – Slickensides
CU - Curved	POL – Polished

Symbol	Coating or infill
X	Carbonaceous
CA	Calcite
Fe	Iron oxide
KT	Chlorite
Clay	Clay
CN	Clean
Qz	Quartz
SN	Stain
VNR	Veneer

The inclinations of defects are measured from perpendicular to the core axis.

Appendix C

Laboratory Test Results

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES1021581**	Page	: 1 of 6
Client	: **ROBERT CARR & ASSOCIATES P/L**	Laboratory	: Environmental Division Sydney
Contact	: MR JEREMY EVERITT	Contact	: Charlie Pierce
Address	: P O BOX 175 CARRINGTON NSW, AUSTRALIA 2294	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: jeremye@rca.com.au	E-mail	: sydney.enviro.services@alsglobal.com
Telephone	: +61 49029200	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 49029299	Facsimile	: +61-2-8784 8500
Project	: 7600	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: 129880-81	Date Samples Received	: 27-OCT-2010
Sampler	: NH,CM	Issue Date	: 03-NOV-2010
Site	: PROSPECT		
		No. of samples received	: 16
Quote number	: SY/309/10	No. of samples analysed	: 16

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Inorganic Chemist	Inorganics
Hoa Nguyen	Inorganic Chemist	Inorganics
Sarah Millington	Senior Inorganic Chemist	Inorganics
Wisam.Marassa	Metals Coordinator	Inorganics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insuffient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

Analytical Results

Sub-Matrix: SOIL				Client sample ID	BH6-3-3.45M	BH8-1.5-1.95M	BH12-3.0-3.45M	BH14-1.5-1.95M	BH1-1.5-1.95M
				Client sampling date / time	19-OCT-2010 15:00	20-OCT-2010 15:00	21-OCT-2010 15:00	22-OCT-2010 15:00	18-OCT-2010 15:00
Compound	CAS Number	LOR	Unit		ES1021581-001	ES1021581-002	ES1021581-003	ES1021581-004	ES1021581-005
EA002 : pH (Soils)									
pH Value	----	0.1	pH Unit		6.7	6.2	6.4	5.0	5.0
EA010: Conductivity									
Electrical Conductivity @ 25°C	----	1	µS/cm		628	102	269	719	926
EA055: Moisture Content									
^ Moisture Content (dried @ 103°C)	----	1.0	%		16.3	15.8	11.8	16.8	15.2
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)									
Sulfate as SO4 2-	14808-79-8	50	mg/kg		200	50	150	550	570
ED045G: Chloride Discrete analyser									
Chloride	16887-00-6	10	mg/kg		790	340	320	890	1460

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH1-3-3.45M Client sampling date / time: 18-OCT-2010 15:00 ES1021581-006	BH2-1.5-1.95M 18-OCT-2010 15:00 ES1021581-007	BH2-3-3.45M 18-OCT-2010 15:00 ES1021581-008	BH5-1.5-1.95M 19-OCT-2010 15:00 ES1021581-009	BH6-1.5-1.95M 19-OCT-2010 15:00 ES1021581-010
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	**6.0**	**8.2**	**8.2**	**7.8**	**5.3**
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	**771**	**594**	**666**	**895**	**409**
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	**11.4**	**17.6**	**16.8**	**16.6**	**14.1**
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)								
Sulfate as SO4 2-	14808-79-8	50	mg/kg	**280**	**150**	**160**	**250**	**650**
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	10	mg/kg	**1020**	**680**	**810**	**1210**	**280**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH7-1.5-1.95M Client sampling date / time: 19-OCT-2010 15:00 ES1021581-011	Client sample ID: BH9-1.5-1.95M Client sampling date / time: 20-OCT-2010 15:00 ES1021581-012	Client sample ID: TP7-1.2-1.5M Client sampling date / time: 18-OCT-2010 15:00 ES1021581-013	Client sample ID: TP9-1.0-1.3M Client sampling date / time: 18-OCT-2010 15:00 ES1021581-014	Client sample ID: TP17-0.9-1.2M Client sampling date / time: 20-OCT-2010 15:00 ES1021581-015
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	**9.7**	**5.9**	**8.4**	**5.5**	**5.9**
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	**486**	**712**	**345**	**287**	**76**
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	**8.2**	**18.0**	**19.2**	**12.6**	**15.2**
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)								
Sulfate as SO4 2-	14808-79-8	50	mg/kg	**290**	**200**	**330**	**410**	**190**
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	10	mg/kg	**170**	**1150**	**60**	**150**	**20**

Analytical Results

Sub-Matrix: SOIL			Client sample ID	TP19-1.0-1.3M	----	----	----	----
			Client sampling date / time	20-OCT-2010 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1021581-016	----	----	----	----
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	8.0	----	----	----	----
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	674	----	----	----	----
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	18.8	----	----	----	----
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)								
Sulfate as SO4 2-	14808-79-8	50	mg/kg	250	----	----	----	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	10	mg/kg	200	----	----	----	----

RCA LABORATORIES
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CONSTRUCTION MATERIALS TESTING

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NATA Accredited Laboratory: 9811
Construction Materials Testing

Atterberg Limits Report

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6156-001**
Client Address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		
Job Number:	**7600**	Report Date:	**10/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	-
Location	**Prospect , Sydney**	**Page 1 of 1**	

Lab No:	**L6156**	Sample History	Sample Location
Date Sampled:	**22/10/2010**	Oven dried prep (50°C), oven dried (105-110°C)	Location: TP1
Date Tested:	**04/11/2010**		Depth: 1.0-1.3m
Sampled By:	**CM**		Material: Silty CLAY
Sample Method:	**AS1289.1.2.1-6.5.4**		
Material Source:	**Site Won**		Spec Description: -
For Use As:	**Site Classification**		Lot Number: -
Remarks:	-		Spec Number: -

Plasticity Tests	Test Method	Specification Minimum	Result	Specification Maximum
Liquid Limit (%) W_L	**AS1289.3.1.1**		**57**	
Plastic Limit (%) W_P	**AS1289.3.2.1**		**20**	
Plastic Index I_P	**AS1289.3.3.1**		**37**	
Linear Shrinkage (%) LS	**AS1289.3.4.1**		**-**	

Explanation of Symbols

W_L - Liquid Limit	NO - Not Obtainable
W_P - Plastic Limit	NP - Non Plastic
I_P - Plasticity Index	
LS - Linear Shrinkage	

NATA WORLD RECOGNISED ACCREDITATION

This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025.

APPROVED SIGNATORY

Luke New
NATA Accred No:9811

FORM NUMBER

RP23-2

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CONSTRUCTION MATERIALS TESTING

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NATA Accredited Laboratory: 9811
Construction Materials Testing

Atterberg Limits Report

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6157-001**
Client Address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		
Job Number:	**7600**	Report Date:	**10/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	-
Location	**Prospect , Sydney**	**Page 1 of 1**	

Lab No:	**L6157**	Sample History	Sample Location
Date Sampled:	**22/10/2010**	Oven dried prep (50°C), oven dried (105-110°C)	Location: TP13
Date Tested:	**03/11/2010**		Depth: 1.0-1.3m
Sampled By:	**CM**		Material: Silty CLAY
Sample Method:	**AS1289.1.2.1-6.5.4**		
Material Source:	**Site Won**		Spec Description: -
For Use As:	**Site Classification**		Lot Number: -
Remarks:	-		Spec Number: -

Plasticity Tests	Test Method	Specification Minimum	Result	Specification Maximum
Liquid Limit (%) W_L	**AS1289.3.1.1**		**54**	
Plastic Limit (%) W_P	**AS1289.3.2.1**		**18**	
Plastic Index I_P	**AS1289.3.3.1**		**36**	
Linear Shrinkage (%) LS	**AS1289.3.4.1**		**-**	

Explanation of Symbols

W_L - Liquid Limit	NO - Not Obtainable
W_P - Plastic Limit	NP - Non Plastic
I_P - Plasticity Index	
LS - Linear Shrinkage	

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Atterberg Limits Report

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6158-001**
Client Address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		
Job Number:	**7600**	Report Date:	**10/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	-
Location	**Prospect , Sydney**	**Page 1 of 1**	

Lab No:	**L6158**	Sample History	Sample Location
Date Sampled:	**22/10/2010**	Oven dried prep (50°C), oven dried (105-110°C)	Location: TP7
Date Tested:	**03/11/2010**		Depth: 1.2-1.5m
Sampled By:	**CM**		Material: Silty CLAY, FILL
Sample Method:	**AS1289.1.2.1-6.5.4**		
Material Source:	**Site Won**		Spec Description: -
For Use As:	**Site Classification**		Lot Number: -
Remarks:	-		Spec Number: -

Plasticity Tests	Test Method	Specification Minimum	Result	Specification Maximum
Liquid Limit (%) W_L	**AS1289.3.1.1**		**42**	
Plastic Limit (%) W_P	**AS1289.3.2.1**		**13**	
Plastic Index I_P	**AS1289.3.3.1**		**29**	
Linear Shrinkage (%) LS	**AS1289.3.4.1**		**-**	

Explanation of Symbols

W_L - Liquid Limit	NO - Not Obtainable
W_P - Plastic Limit	NP - Non Plastic
I_P - Plasticity Index	
LS - Linear Shrinkage	

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Atterberg Limits Report

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6159-001**
Client Address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		
Job Number:	**7600**	Report Date:	**10/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	-
Location	**Prospect , Sydney**	**Page 1 of 1**	

Lab No:	**L6159**	Sample History	Sample Location
Date Sampled:	**22/10/2010**	Oven dried prep (50°C), oven dried (105-110°C)	Location: TP21
Date Tested:	**04/11/2010**		Depth: 0.9-1.2m
Sampled By:	**CM**		Material: Silty CLAY
Sample Method:	**AS1289.1.2.1-6.5.4**		
Material Source:	**Site Won**		Spec Description: -
For Use As:	**Site Classification**		Lot Number: -
Remarks:	-		Spec Number: -

Plasticity Tests	Test Method	Specification Minimum	Result	Specification Maximum
Liquid Limit (%) W_L	**AS1289.3.1.1**		**57**	
Plastic Limit (%) W_P	**AS1289.3.2.1**		**21**	
Plastic Index I_P	**AS1289.3.3.1**		**36**	
Linear Shrinkage (%) LS	**AS1289.3.4.1**		**-**	

Explanation of Symbols

W_L - Liquid Limit	NO - Not Obtainable
W_P - Plastic Limit	NP - Non Plastic
I_P - Plasticity Index	
LS - Linear Shrinkage	

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Atterberg Limits Report

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6160-001**
Client Address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		
Job Number:	**7600**	Report Date:	**10/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	**-**
Location	**Prospect , Sydney**	**Page 1 of 1**	

Lab No:	**L6160**	Sample History	Sample Location
Date Sampled:	**22/10/2010**	Oven dried prep (50°C), oven dried (105-110°C)	Location: TP22
Date Tested:	**03/11/2010**		Depth: 0.9-1.2m
Sampled By:	**CM**		Material: Silty CLAY
Sample Method:	**AS1289.1.2.1-6.5.4**		
Material Source:	**Site Won**		Spec Description: -
For Use As:	**Site Classification**		Lot Number: -
Remarks:	-		Spec Number: -

Plasticity Tests	Test Method	Specification Minimum	Result	Specification Maximum
Liquid Limit (%) W_L	**AS1289.3.1.1**		**67**	
Plastic Limit (%) W_P	**AS1289.3.2.1**		**22**	
Plastic Index I_P	**AS1289.3.3.1**		**45**	
Linear Shrinkage (%) LS	**AS1289.3.4.1**		**-**	

Explanation of Symbols

W_L - Liquid Limit	NO - Not Obtainable
W_P - Plastic Limit	NP - Non Plastic
I_P - Plasticity Index	
LS - Linear Shrinkage	

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Atterberg Limits Report

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6161-001**
Client Address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		
Job Number:	**7600**	Report Date:	**10/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	-
Location	**Prospect , Sydney**	**Page 1 of 1**	

Lab No:	**L6161**	Sample History	Sample Location
Date Sampled:	**22/10/2010**	Oven dried prep (50°C), oven dried (105-110°C)	Location: TP17
Date Tested:	**03/11/2010**		Depth: 0.9-1.2m
Sampled By:	**CM**		Material: Silty CLAY
Sample Method:	**AS1289.1.2.1-6.5.4**		
Material Source:	**Site Won**		Spec Description: -
For Use As:	**Site Classification**		Lot Number: -
Remarks:	-		Spec Number: -

Plasticity Tests	Test Method	Specification Minimum	Result	Specification Maximum
Liquid Limit (%) W_L	**AS1289.3.1.1**		**48**	
Plastic Limit (%) W_P	**AS1289.3.2.1**		**20**	
Plastic Index I_P	**AS1289.3.3.1**		**28**	
Linear Shrinkage (%) LS	**AS1289.3.4.1**		**-**	

Explanation of Symbols

W_L - Liquid Limit	NO - Not Obtainable
W_P - Plastic Limit	NP - Non Plastic
I_P - Plasticity Index	
LS - Linear Shrinkage	

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Atterberg Limits Report

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6162-001**
Client Address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		
Job Number:	**7600**	Report Date:	**10/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	-
Location	**Prospect , Sydney**	**Page 1 of 1**	

Lab No:	**L6162**	Sample History	Sample Location
Date Sampled:	**22/10/2010**	Oven dried prep (50°C), oven dried (105-110°C)	Location: TP15
Date Tested:	**04/11/2010**		Depth: 1.2-1.5m
Sampled By:	**CM**		Material: Silty CLAY
Sample Method:	**AS1289.1.2.1-6.5.4**		
Material Source:	**Site Won**		Spec Description: -
For Use As:	**Site Classification**		Lot Number: -
Remarks:	-		Spec Number: -

Plasticity Tests	Test Method	Specification Minimum	Result	Specification Maximum
Liquid Limit (%) W_L	**AS1289.3.1.1**		**54**	
Plastic Limit (%) W_P	**AS1289.3.2.1**		**18**	
Plastic Index I_P	**AS1289.3.3.1**		**36**	
Linear Shrinkage (%) LS	**AS1289.3.4.1**		**-**	

Explanation of Symbols

W_L - Liquid Limit	NO - Not Obtainable
W_P - Plastic Limit	NP - Non Plastic
I_P - Plasticity Index	
LS - Linear Shrinkage	

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Atterberg Limits Report

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6163-001**
Client Address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		
Job Number:	**7600**	Report Date:	**10/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	-
Location	**Prospect , Sydney**	**Page 1 of 1**	

Lab No:	**L6163**	Sample History	Sample Location
Date Sampled:	**22/10/2010**	Oven dried prep (50°C), oven dried (105-110°C)	Location: TP11
Date Tested:	**08/11/2010**		Depth: 1.1-1.4m
Sampled By:	**CM**		Material: Silty CLAY
Sample Method:	**AS1289.1.2.1-6.5.4**		
Material Source:	**Site Won**		Spec Description: -
For Use As:	**Site Classification**		Lot Number: -
Remarks:	-		Spec Number: -

Plasticity Tests	Test Method	Specification Minimum	Result	Specification Maximum
Liquid Limit (%) W_L	**AS1289.3.1.1**		**58**	
Plastic Limit (%) W_P	**AS1289.3.2.1**		**16**	
Plastic Index I_P	**AS1289.3.3.1**		**42**	
Linear Shrinkage (%) LS	**AS1289.3.4.1**		**-**	

Explanation of Symbols

W_L - Liquid Limit	NO - Not Obtainable
W_P - Plastic Limit	NP - Non Plastic
I_P - Plasticity Index	
LS - Linear Shrinkage	

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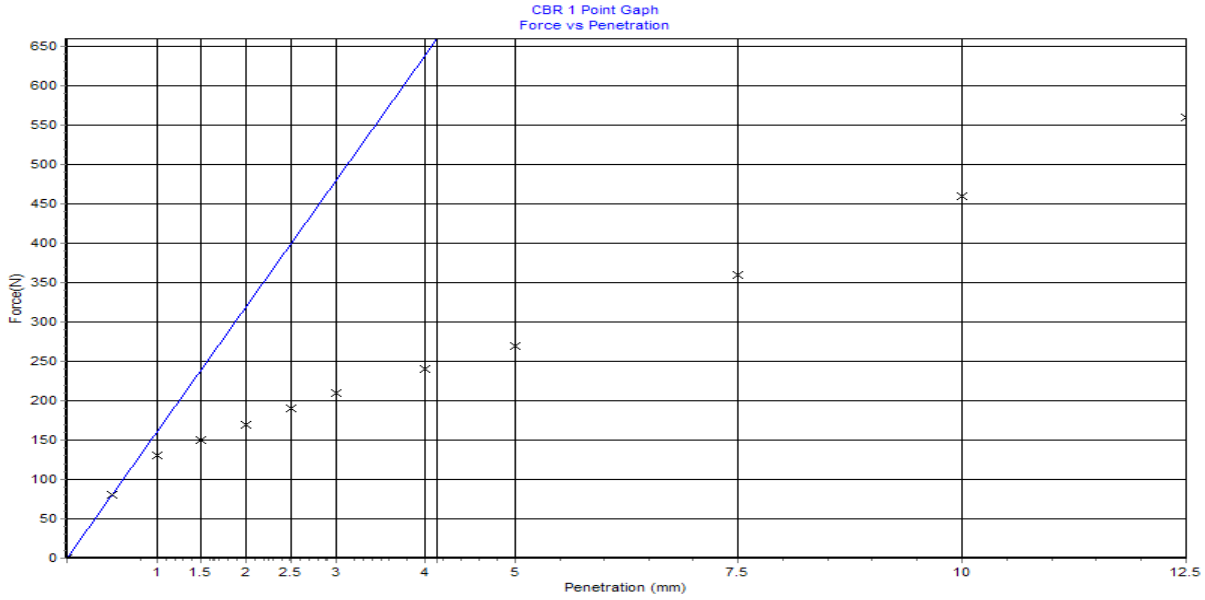
California Bearing Ratio Report (1 Point)

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6156-003**
Client address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		
Job Number:	**7600**	Report Date:	**10/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	
Location	**Prospect , Sydney**		**Page 1 of 1**
Lab No:	**L6156**	Sample Location	
Date Sampled:	**22/10/2010**	Location: TP1	
Date Tested:	**09/11/2010**	Depth: 1.0-1.3m	
Sampled By:	**CM**		
Sample Method:	**AS1289.1.2.1-6.5.4**		
Material Source:	**Site Won**	Test Method :	AS1289.6.1.1
For Use As:	**Site Classification**	Lot Number:	**-**
Remarks:	**-**	Item Number :	**-**



Maximum Dry Density - MDD (t/m³) :	**1.620**	Dry Density after Soak (t/m³) :	**1.571**
Optimum Moisture Content - OMC (%) :	**21.4**	Moisture Content after Soak (%) :	**25**
Compactive Effort :	**Standard**	Density Ratio after Soak (%) :	**97**
Nominated % Maximum Dry Density Compaction :	**100**	Field Moisture Content (%) :	**25.0**
Nominated % Optimum Moisture Content Compaction :	**100**	Moisture Content (Top) after Penetration (%) :	**28.7**
Achieved Dry Density before Soak (t/m³) :	**1.625**	Optional Moisture Content (Remainder) after Penetration (%) :	**22.4**
Achieved Percentage of Maximum Dry Density (%) :	**100**	CBR 2.5mm (%) :	**1.5**
Achieved Moisture Content (%) :	**21.1**	CBR 5.0mm (%) :	**1.5**
Achieved Percentage of Optimum Moisture Content (%) :	**99**	Minimum Specified CBR Value (%) :	**-**
Test Condition (Soaked/Unsoaked) / Soaking Period (Days) :	**Soaked / 4 days**	**CBR Value (%) :**	**1.5**
Swell (%) / Surcharge (kg):	**3.5 / 4.5 kg**	+19mm Material (%)	Oversize replacement

Soil Description : **Silty CLAY**

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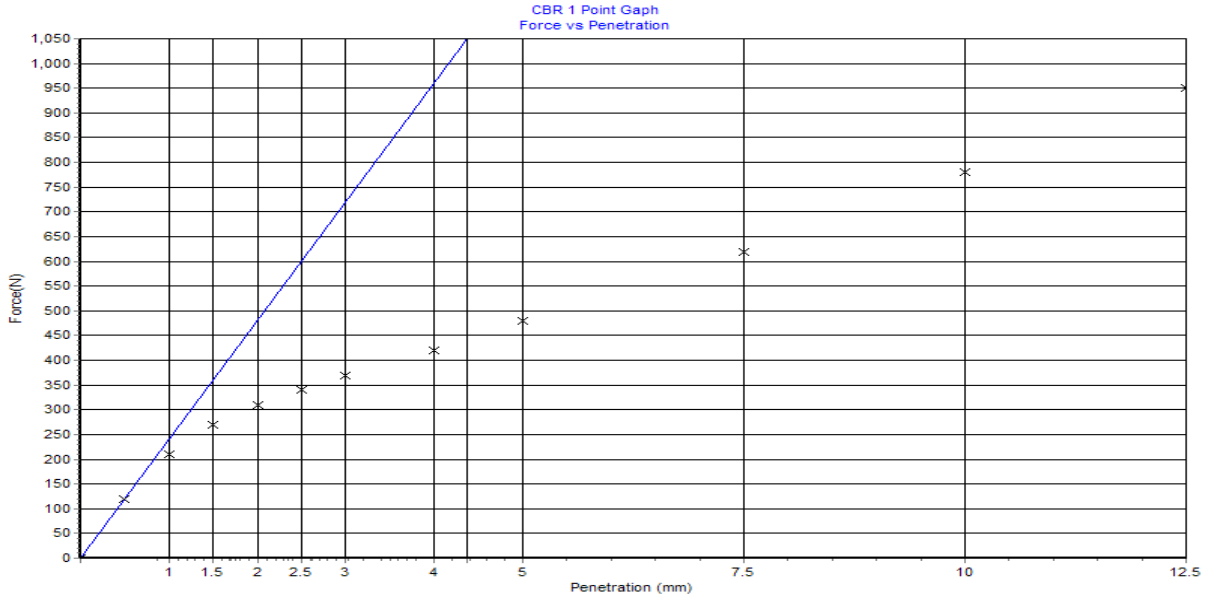
California Bearing Ratio Report (1 Point)

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6157-003**
Client address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		
Job Number:	**7600**	Report Date:	**10/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	
Location	**Prospect , Sydney**		**Page 1 of 1**
Lab No:	**L6157**	Sample Location	
Date Sampled:	**22/10/2010**	Location: TP13	
Date Tested:	**09/11/2010**	Depth: 1.0-1.3m	
Sampled By:	**CM**		
Sample Method:	**AS1289.1.2.1-6.5.4**		
Material Source:	**Site Won**	Test Method :	AS1289.6.1.1
For Use As:	**Site Classification**	Lot Number:	**-**
Remarks:	**-**	Item Number :	**-**



Maximum Dry Density - MDD (t/m³) :	**1.707**	Dry Density after Soak (t/m³) :	**1.646**
Optimum Moisture Content - OMC (%) :	**19.3**	Moisture Content after Soak (%) :	**22.2**
Compactive Effort :	**Standard**	Density Ratio after Soak (%) :	**96**
Nominated % Maximum Dry Density Compaction :	**100**	Field Moisture Content (%) :	**23.7**
Nominated % Optimum Moisture Content Compaction :	**100**	Moisture Content (Top) after Penetration (%) :	**25.2**
Achieved Dry Density before Soak (t/m³) :	**1.701**	Optional Moisture Content (Remainder) after Penetration (%) :	**22.3**
Achieved Percentage of Maximum Dry Density (%) :	**100**	CBR 2.5mm (%) :	**2.5**
Achieved Moisture Content (%) :	**19.5**	CBR 5.0mm (%) :	**2.5**
Achieved Percentage of Optimum Moisture Content (%) :	**101**	Minimum Specified CBR Value (%) :	**-**
Test Condition (Soaked/Unsoaked) / Soaking Period (Days) :	**Soaked / 4 days**	**CBR Value (%) :**	**2.5**
Swell (%) / Surcharge (kg):	**3.5 / 4.5 kg**	+19mm Material (%)	Oversize replacement

Soil Description : **Silty CLAY**

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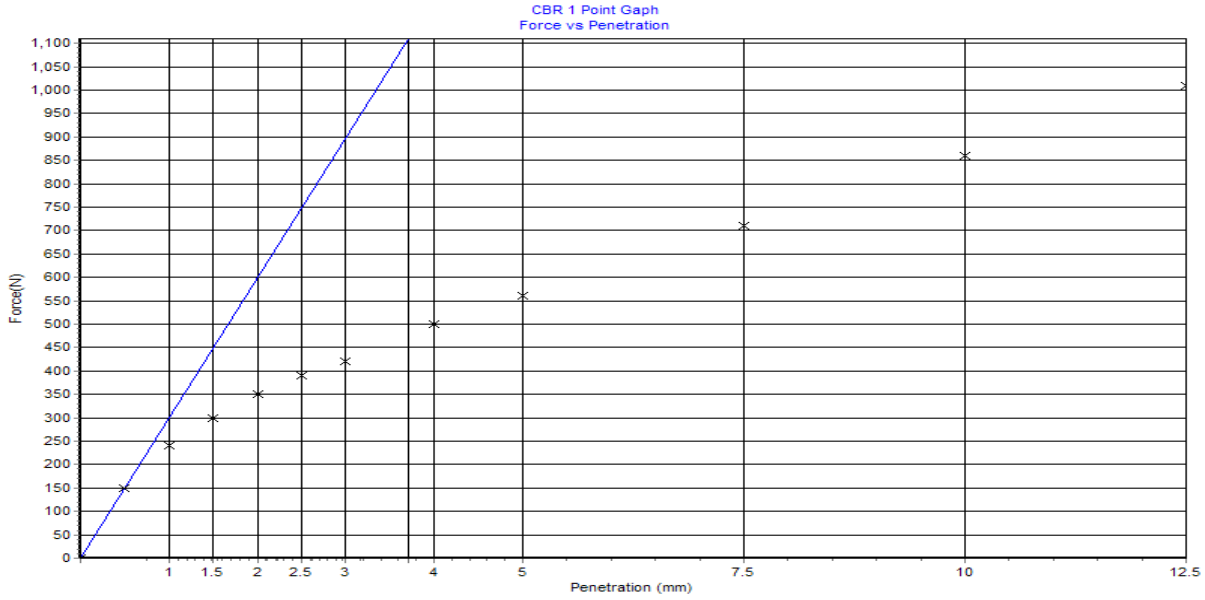
California Bearing Ratio Report (1 Point)

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6158-003**
Client address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		
Job Number:	**7600**	Report Date:	**10/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	
Location	**Prospect , Sydney**		**Page 1 of 1**
Lab No:	**L6158**	Sample Location	
Date Sampled:	**22/10/2010**	Location: TP7	
Date Tested:	**09/11/2010**	Depth: 1.2-1.5m	
Sampled By:	**CM**		
Sample Method:	**AS1289.1.2.1-6.5.4**		
Material Source:	**Site Won**	Test Method :	AS1289.6.1.1
For Use As:	**Site Classification**	Lot Number:	**-**
Remarks:	**-**	Item Number :	**-**



Maximum Dry Density - MDD (t/m³) :	**1.822**	Dry Density after Soak (t/m³) :	**1.781**
Optimum Moisture Content - OMC (%) :	**16.1**	Moisture Content after Soak (%) :	**18.8**
Compactive Effort :	**Standard**	Density Ratio after Soak (%) :	**98**
Nominated % Maximum Dry Density Compaction :	**100**	Field Moisture Content (%) :	**19.8**
Nominated % Optimum Moisture Content Compaction :	**100**	Moisture Content (Top) after Penetration (%) :	**20.9**
Achieved Dry Density before Soak (t/m³) :	**1.808**	Optional Moisture Content (Remainder) after Penetration (%) :	**17**
Achieved Percentage of Maximum Dry Density (%) :	**99**	CBR 2.5mm (%) :	**3**
Achieved Moisture Content (%) :	**16.4**	CBR 5.0mm (%) :	**3**
Achieved Percentage of Optimum Moisture Content (%) :	**102**	Minimum Specified CBR Value (%) :	**-**
Test Condition (Soaked/Unsoaked) / Soaking Period (Days) :	**Soaked / 4 days**	**CBR Value (%) :**	**3**
Swell (%) / Surcharge (kg):	**1.5 / 4.5 kg**	+19mm Material (%)	Oversize replacement

Soil Description : **Silty CLAY, FILL**

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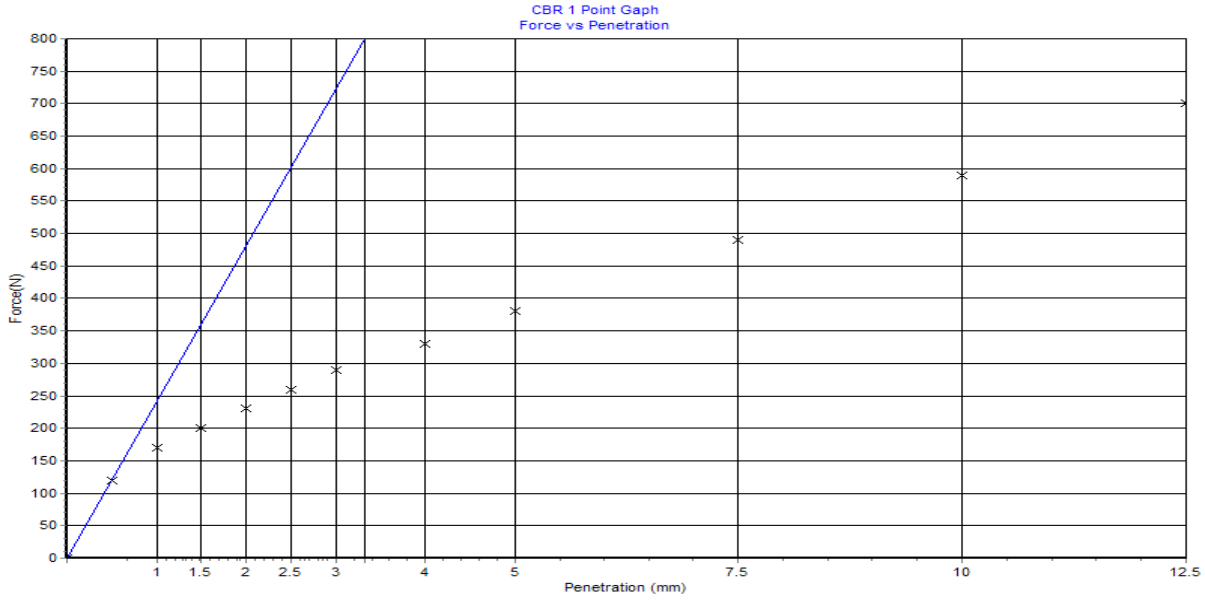
California Bearing Ratio Report (1 Point)

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6159-003**
Client address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		
Job Number:	**7600**	Report Date:	**10/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	
Location	**Prospect , Sydney**		**Page 1 of 1**
Lab No:	**L6159**	Sample Location	
Date Sampled:	**22/10/2010**	Location: TP21	
Date Tested:	**09/11/2010**	Depth: 0.9-1.2m	
Sampled By:	**CM**		
Sample Method:	**AS1289.1.2.1-6.5.4**		
Material Source:	**Site Won**	Test Method :	AS1289.6.1.1
For Use As:	**Site Classification**	Lot Number:	**-**
Remarks:	**-**	Item Number :	**-**



Maximum Dry Density - MDD (t/m³) :	**1.659**	Dry Density after Soak (t/m³) :	**1.599**
Optimum Moisture Content - OMC (%) :	**20.1**	Moisture Content after Soak (%) :	**24**
Compactive Effort :	**Standard**	Density Ratio after Soak (%) :	**96**
Nominated % Maximum Dry Density Compaction :	**100**	Field Moisture Content (%) :	**19.2**
Nominated % Optimum Moisture Content Compaction :	**100**	Moisture Content (Top) after Penetration (%) :	**28.2**
Achieved Dry Density before Soak (t/m³) :	**1.658**	Optional Moisture Content (Remainder) after Penetration (%) :	**22.3**
Achieved Percentage of Maximum Dry Density (%) :	**100**	CBR 2.5mm (%) :	**2**
Achieved Moisture Content (%) :	**20.1**	CBR 5.0mm (%) :	**2**
Achieved Percentage of Optimum Moisture Content (%) :	**100**	Minimum Specified CBR Value (%) :	**-**
Test Condition (Soaked/Unsoaked) / Soaking Period (Days) :	**Soaked / 4 days**	**CBR Value (%) :**	**2**
Swell (%) / Surcharge (kg):	**3.5 / 4.5 kg**	+19mm Material (%)	Oversize replacement

Soil Description : **Silty CLAY**

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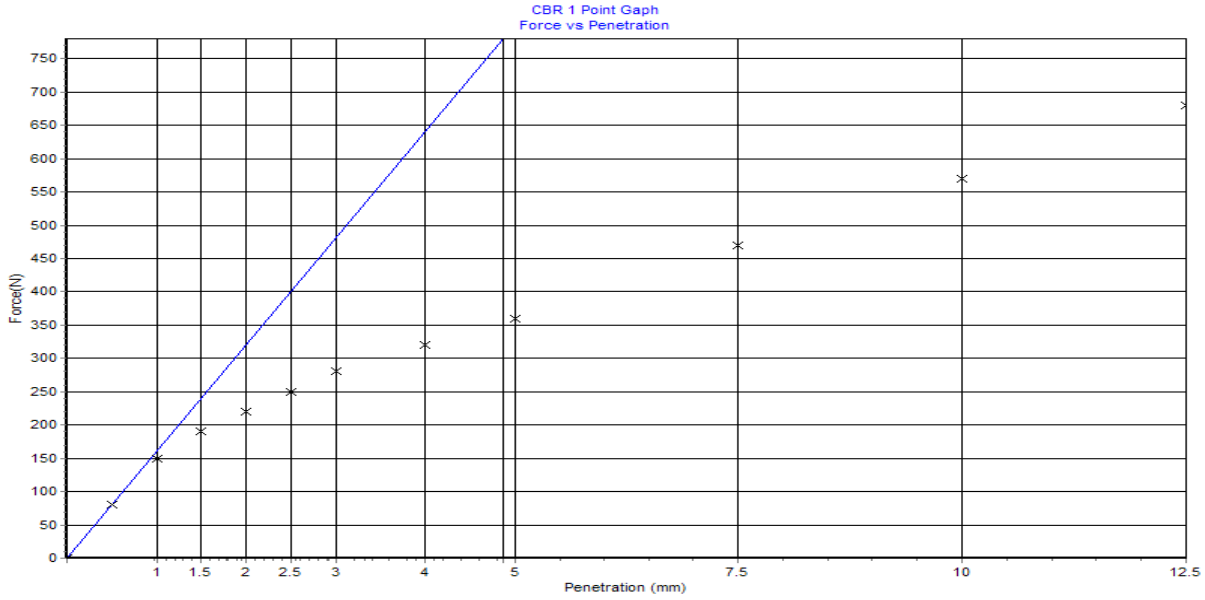
California Bearing Ratio Report (1 Point)

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6160-003**
Client address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		
Job Number:	**7600**	Report Date:	**10/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	
Location	**Prospect , Sydney**		**Page 1 of 1**
Lab No:	**L6160**	Sample Location	
Date Sampled:	**22/10/2010**	Location: TP22	
Date Tested:	**09/11/2010**	Depth: 0.9-1.2m	
Sampled By:	**CM**		
Sample Method:	**AS1289.1.2.1-6.5.4**		
Material Source:	**Site Won**	Test Method :	AS1289.6.1.1
For Use As:	**Site Classification**	Lot Number:	**-**
Remarks:	**-**	Item Number :	**-**



Maximum Dry Density - MDD (t/m³) :	**1.601**	Dry Density after Soak (t/m³) :	**1.548**
Optimum Moisture Content - OMC (%) :	**22.5**	Moisture Content after Soak (%) :	**26.2**
Compactive Effort :	**Standard**	Density Ratio after Soak (%) :	**97**
Nominated % Maximum Dry Density Compaction :	**100**	Field Moisture Content (%) :	**25.2**
Nominated % Optimum Moisture Content Compaction :	**100**	Moisture Content (Top) after Penetration (%) :	**29.3**
Achieved Dry Density before Soak (t/m³) :	**1.603**	Optional Moisture Content (Remainder) after Penetration (%) :	**24.4**
Achieved Percentage of Maximum Dry Density (%) :	**100**	CBR 2.5mm (%) :	**2**
Achieved Moisture Content (%) :	**22.6**	CBR 5.0mm (%) :	**2**
Achieved Percentage of Optimum Moisture Content (%) :	**100**	Minimum Specified CBR Value (%) :	**-**
Test Condition (Soaked/Unsoaked) / Soaking Period (Days) :	**Soaked / 4 days**	**CBR Value (%) :**	**2**
Swell (%) / Surcharge (kg):	**3.5 / 4.5 kg**	+19mm Material (%)	Oversize replacement

Soil Description : **Silty CLAY**

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Approved Signatory
Luke New
NATA Accred No:9811

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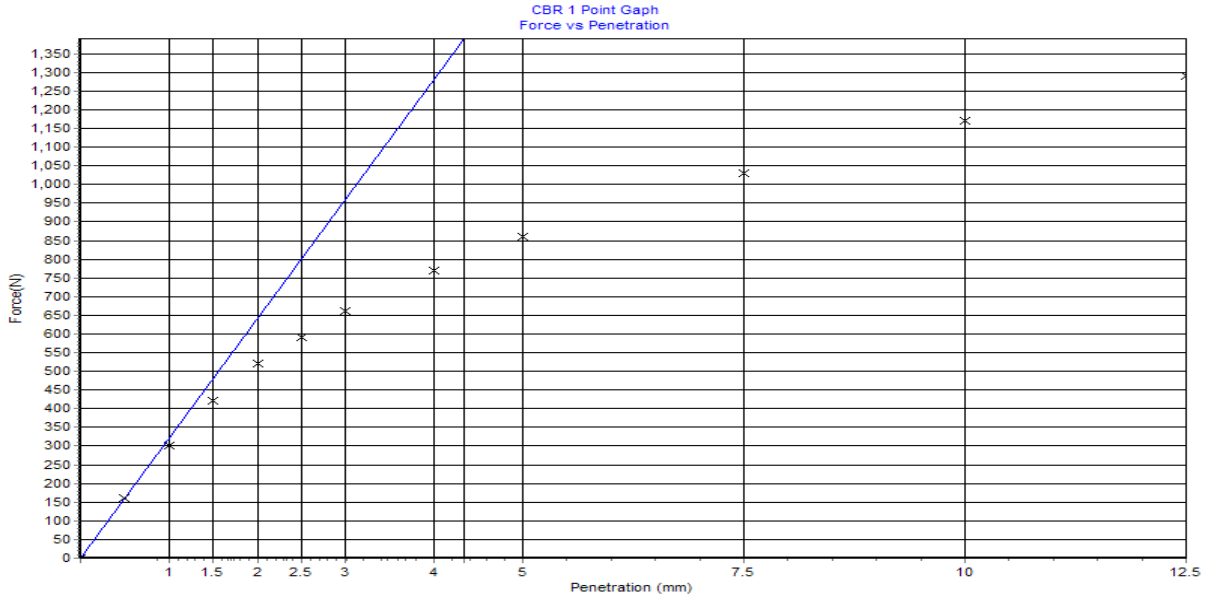
NATA Accredited Laboratory: 9811
Construction Materials Testing

California Bearing Ratio Report (1 Point)

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6161-003**
Client address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		
Job Number:	**7600**	Report Date:	**10/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	
Location	**Prospect , Sydney**		**Page 1 of 1**
Lab No:	**L6161**	Sample Location	
Date Sampled:	**22/10/2010**	Location: TP17	
Date Tested:	**09/11/2010**	Depth: 0.9-1.2m	
Sampled By:	**CM**		
Sample Method:	**AS1289.1.2.1-6.5.4**		
Material Source:	**Site Won**	Test Method :	AS1289.6.1.1
For Use As:	**Site Classification**	Lot Number:	**-**
Remarks:	**-**	Item Number :	**-**



Maximum Dry Density - MDD (t/m³) :	**1.624**	Dry Density after Soak (t/m³) :	**1.594**
Optimum Moisture Content - OMC (%) :	**21.1**	Moisture Content after Soak (%) :	**24.2**
Compactive Effort :	**Standard**	Density Ratio after Soak (%) :	**98**
Nominated % Maximum Dry Density Compaction :	**100**	Field Moisture Content (%) :	**19.9**
Nominated % Optimum Moisture Content Compaction :	**100**	Moisture Content (Top) after Penetration (%) :	**25.4**
Achieved Dry Density before Soak (t/m³) :	**1.617**	Optional Moisture Content (Remainder) after Penetration (%) :	**24.2**
Achieved Percentage of Maximum Dry Density (%) :	**100**	CBR 2.5mm (%) :	**4.5**
Achieved Moisture Content (%) :	**22.1**	CBR 5.0mm (%) :	**4.5**
Achieved Percentage of Optimum Moisture Content (%) :	**105**	Minimum Specified CBR Value (%) :	**-**
Test Condition (Soaked/Unsoaked) / Soaking Period (Days) :	**Soaked / 4 days**	**CBR Value (%) :**	**4.5**
Swell (%) / Surcharge (kg):	**1.5 / 4.5 kg**	+19mm Material (%)	Oversize replacement

Soil Description : **Silty CLAY**

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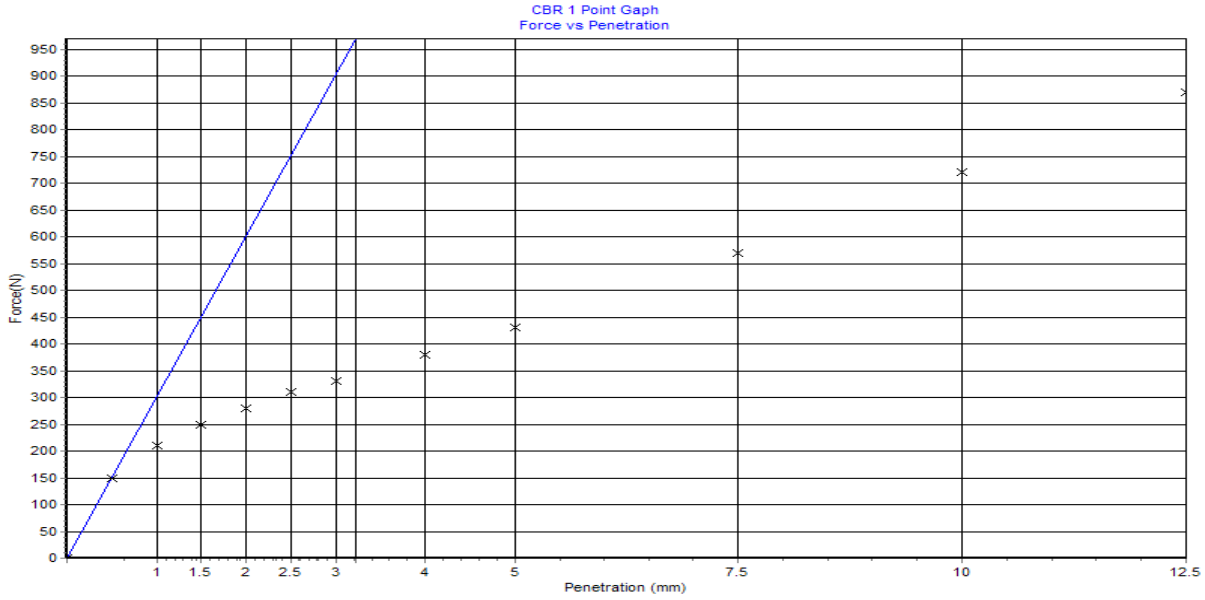
California Bearing Ratio Report (1 Point)

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6162-003**
Client address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		
Job Number:	**7600**	Report Date:	**10/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	
Location	**Prospect , Sydney**		**Page 1 of 1**
Lab No:	**L6162**	Sample Location	
Date Sampled:	**22/10/2010**	Location: TP15	
Date Tested:	**09/11/2010**	Depth: 1.2-1.5m	
Sampled By:	**CM**		
Sample Method:	**AS1289.1.2.1-6.5.4**		
Material Source:	**Site Won**	Test Method :	AS1289.6.1.1
For Use As:	**Site Classification**	Lot Number:	**-**
Remarks:	**-**	Item Number :	**-**



Maximum Dry Density - MDD (t/m³) :	**1.629**	Dry Density after Soak (t/m³) :	**1.600**
Optimum Moisture Content - OMC (%) :	**21.1**	Moisture Content after Soak (%) :	**23.9**
Compactive Effort :	**Standard**	Density Ratio after Soak (%) :	**98**
Nominated % Maximum Dry Density Compaction :	**100**	Field Moisture Content (%) :	**22.1**
Nominated % Optimum Moisture Content Compaction :	**100**	Moisture Content (Top) after Penetration (%) :	**27.1**
Achieved Dry Density before Soak (t/m³) :	**1.637**	Optional Moisture Content (Remainder) after Penetration (%) :	**22.3**
Achieved Percentage of Maximum Dry Density (%) :	**100**	CBR 2.5mm (%) :	**2.5**
Achieved Moisture Content (%) :	**20.8**	CBR 5.0mm (%) :	**2**
Achieved Percentage of Optimum Moisture Content (%) :	**99**	Minimum Specified CBR Value (%) :	**-**
Test Condition (Soaked/Unsoaked) / Soaking Period (Days) :	**Soaked / 4 days**	**CBR Value (%) :**	**2.5**
Swell (%) / Surcharge (kg):	**2.5 / 4.5 kg**	+19mm Material (%)	Oversize replacement

Soil Description : **Silty CLAY**

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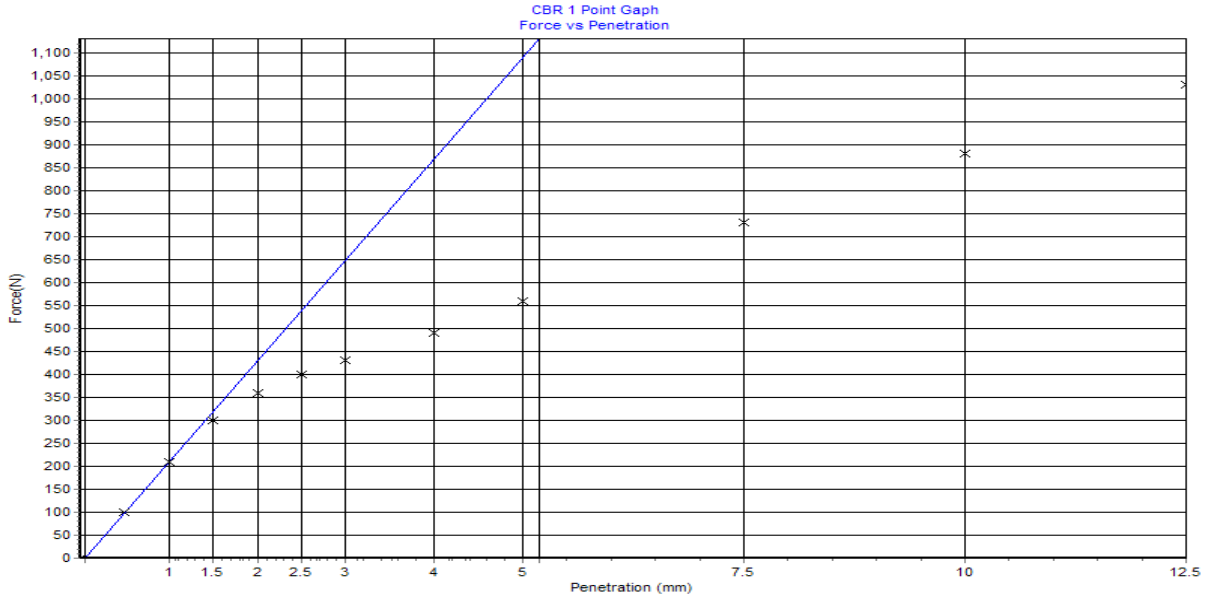
California Bearing Ratio Report (1 Point)

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6163-003**
Client address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		
Job Number:	**7600**	Report Date:	**10/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	
Location	**Prospect , Sydney**		**Page 1 of 1**
Lab No:	**L6163**	Sample Location	
Date Sampled:	**22/10/2010**	Location: TP11	
Date Tested:	**09/11/2010**	Depth: 1.1-1.4m	
Sampled By:	**CM**		
Sample Method:	**AS1289.1.2.1-6.5.4**		
Material Source:	**Site Won**	Test Method :	AS1289.6.1.1
For Use As:	**Site Classification**	Lot Number:	**-**
Remarks:	**-**	Item Number :	**-**



Maximum Dry Density - MDD (t/m³) :	**1.592**	Dry Density after Soak (t/m³) :	**1.575**
Optimum Moisture Content - OMC (%) :	**20.1**	Moisture Content after Soak (%) :	**25.1**
Compactive Effort :	**Standard**	Density Ratio after Soak (%) :	**99**
Nominated % Maximum Dry Density Compaction :	**100**	Field Moisture Content (%) :	**23.9**
Nominated % Optimum Moisture Content Compaction :	**100**	Moisture Content (Top) after Penetration (%) :	**25.1**
Achieved Dry Density before Soak (t/m³) :	**1.605**	Optional Moisture Content (Remainder) after Penetration (%) :	**23.8**
Achieved Percentage of Maximum Dry Density (%) :	**101**	CBR 2.5mm (%) :	**3**
Achieved Moisture Content (%) :	**20.1**	CBR 5.0mm (%) :	**3**
Achieved Percentage of Optimum Moisture Content (%) :	**100**	Minimum Specified CBR Value (%) :	**-**
Test Condition (Soaked/Unsoaked) / Soaking Period (Days) :	**Soaked / 4 days**	**CBR Value (%) :**	**3**
Swell (%) / Surcharge (kg):	**2.0 / 4.5 kg**	+19mm Material (%)	Oversize replacement

Soil Description : **Silty CLAY**

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Emerson Class Number Report

Client :	**Village Roadshow Ltd**	Report Number:	**7600 - L6156-002**
Client Address :	**Level 1, 500 Chapel Street South Yarra VIC 3141**	Report Date:	**10/11/2010**
Job Number :	**7600**	Order Number:	
Project :	**Wet 'n' Wild Theme Park**	Test Method:	**AS 1289.3.8.1**
Location :	**Prospect , Sydney**		

Lab No :	L6156			
ID No :	L6156			
Lot No :	-			
Item No :	-			
Sampling Method :	AS1289.1.2.1-6.5.4			
Date Sampled :	22/10/2010			
Date Tested :	4/11/2010			
Material Source :	Site Won			
For Use As :	Site Classification			
Sample Location :	Location: TP1 Depth: 1.0-1.3m			
Soil Description :	**Silty CLAY**			
Type of Water Used :	**Distilled Water**			
Temperature of Water (°C) :	**24.000**			
Emerson Class Number :	**Class 4**			
Remarks :				

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Emerson Class Number Report

Client :	**Village Roadshow Ltd**	Report Number:	**7600 - L6157-002**
Client Address :	**Level 1, 500 Chapel Street South Yarra VIC 3141**	Report Date:	**10/11/2010**
Job Number :	**7600**	Order Number:	
Project :	**Wet 'n' Wild Theme Park**	Test Method:	**AS 1289.3.8.1**
Location :	**Prospect , Sydney**		

Lab No :	L6157			
ID No :	L6157			
Lot No :	-			
Item No :	-			
Sampling Method :	AS1289.1.2.1-6.5.4			
Date Sampled :	22/10/2010			
Date Tested :	4/11/2010			
Material Source :	Site Won			
For Use As :	Site Classification			
Sample Location :	Location: TP13 Depth: 1.0-1.3m			
Soil Description :	**Silty CLAY**			
Type of Water Used :	**Distilled Water**			
Temperature of Water (°C) :	**24.000**			
Emerson Class Number :	**Class 2**			
Remarks :				

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Emerson Class Number Report

Client :	**Village Roadshow Ltd**	Report Number:	**7600 - L6158-002**
Client Address :	**Level 1, 500 Chapel Street South Yarra VIC 3141**	Report Date:	**10/11/2010**
Job Number :	**7600**	Order Number:	
Project :	**Wet 'n' Wild Theme Park**	Test Method:	**AS 1289.3.8.1**
Location :	**Prospect , Sydney**		

Lab No :	L6158			
ID No :	L6158			
Lot No :	-			
Item No :	-			
Sampling Method :	AS1289.1.2.1-6.5.4			
Date Sampled :	22/10/2010			
Date Tested :	4/11/2010			
Material Source :	Site Won			
For Use As :	Site Classification			
Sample Location :	Location: TP7 Depth: 1.2-1.5m			
Soil Description :	**Silty CLAY, FILL**			
Type of Water Used :	**Distilled Water**			
Temperature of Water (°C) :	**24.000**			
Emerson Class Number :	**Class 4**			
Remarks :				

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Emerson Class Number Report

Client :	**Village Roadshow Ltd**	Report Number:	**7600 - L6159-002**
Client Address :	**Level 1, 500 Chapel Street South Yarra VIC 3141**	Report Date:	**10/11/2010**
Job Number :	**7600**	Order Number:	
Project :	**Wet 'n' Wild Theme Park**	Test Method:	**AS 1289.3.8.1**
Location :	**Prospect , Sydney**		

Lab No :	L6159			
ID No :	L6159			
Lot No :	-			
Item No :	-			
Sampling Method :	AS1289.1.2.1-6.5.4			
Date Sampled :	22/10/2010			
Date Tested :	4/11/2010			
Material Source :	Site Won			
For Use As :	Site Classification			
Sample Location :	Location: TP21 Depth: 0.9-1.2m			
Soil Description :	**Silty CLAY**			
Type of Water Used :	**Distilled Water**			
Temperature of Water (°C) :	**24.000**			
Emerson Class Number :	**Class 2**			

Remarks :

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Emerson Class Number Report

Client :	**Village Roadshow Ltd**	Report Number:	**7600 - L6160-002**
Client Address :	**Level 1, 500 Chapel Street South Yarra VIC 3141**	Report Date:	**10/11/2010**
Job Number :	**7600**	Order Number:	
Project :	**Wet 'n' Wild Theme Park**	Test Method:	**AS 1289.3.8.1**
Location :	**Prospect , Sydney**		

Lab No :	L6160			
ID No :	L6160			
Lot No :	-			
Item No :	-			
Sampling Method :	AS1289.1.2.1-6.5.4			
Date Sampled :	22/10/2010			
Date Tested :	4/11/2010			
Material Source :	Site Won			
For Use As :	Site Classification			
Sample Location :	Location: TP22 Depth: 0.9-1.2m			
Soil Description :	**Silty CLAY**			
Type of Water Used :	**Distilled Water**			
Temperature of Water (°C) :	**23.000**			
Emerson Class Number :	**Class 2**			
Remarks :				

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Emerson Class Number Report

Client :	**Village Roadshow Ltd**	Report Number:	**7600 - L6161-002**
Client Address :	**Level 1, 500 Chapel Street South Yarra VIC 3141**	Report Date:	**10/11/2010**
Job Number :	**7600**	Order Number:	
Project :	**Wet 'n' Wild Theme Park**	Test Method:	**AS 1289.3.8.1**
Location :	**Prospect , Sydney**		

Lab No :	L6161			
ID No :	L6161			
Lot No :	-			
Item No :	-			
Sampling Method :	AS1289.1.2.1-6.5.4			
Date Sampled :	22/10/2010			
Date Tested :	4/11/2010			
Material Source :	Site Won			
For Use As :	Site Classification			
Sample Location :	Location: TP17 Depth: 0.9-1.2m			
Soil Description :	**Silty CLAY**			
Type of Water Used :	**Distilled Water**			
Temperature of Water (°C) :	**23.000**			
Emerson Class Number :	**Class 4**			
Remarks :				

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Emerson Class Number Report

Client :	**Village Roadshow Ltd**	Report Number:	**7600 - L6162-002**
Client Address :	**Level 1, 500 Chapel Street South Yarra VIC 3141**	Report Date:	**10/11/2010**
Job Number :	**7600**	Order Number:	
Project :	**Wet 'n' Wild Theme Park**	Test Method:	**AS 1289.3.8.1**
Location :	**Prospect , Sydney**		

Lab No :	L6162			
ID No :	L6162			
Lot No :	-			
Item No :	-			
Sampling Method :	AS1289.1.2.1-6.5.4			
Date Sampled :	22/10/2010			
Date Tested :	4/11/2010			
Material Source :	Site Won			
For Use As :	Site Classification			
Sample Location :	Location: TP15 Depth: 1.2-1.5m			
Soil Description :	**Silty CLAY**			
Type of Water Used :	**Distilled Water**			
Temperature of Water (°C) :	**23.000**			
Emerson Class Number :	**Class 3**			
Remarks :				

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Emerson Class Number Report

Client :	**Village Roadshow Ltd**	Report Number:	**7600 - L6163-002**
Client Address :	**Level 1, 500 Chapel Street South Yarra VIC 3141**	Report Date:	**10/11/2010**
Job Number :	**7600**	Order Number:	
Project :	**Wet 'n' Wild Theme Park**	Test Method:	**AS 1289.3.8.1**
Location :	**Prospect , Sydney**		

Lab No :	L6163			
ID No :	L6163			
Lot No :	-			
Item No :	-			
Sampling Method :	AS1289.1.2.1-6.5.4			
Date Sampled :	22/10/2010			
Date Tested :	4/11/2010			
Material Source :	Site Won			
For Use As :	Site Classification			
Sample Location :	Location: TP11 Depth: 1.1-1.4m			
Soil Description :	**Silty CLAY**			
Type of Water Used :	**Distilled Water**			
Temperature of Water (°C) :	**23.000**			
Emerson Class Number :	**Class 4**			
Remarks :				

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Atterberg Limits Report

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6164-001**
Client Address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		
Job Number:	**7600**	Report Date:	**03/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	-
Location	**Prospect , Sydney**	**Page 1 of 1**	

Lab No:	**L6164**	Sample History	Sample Location
Date Sampled:	**22/10/2010**	Oven dried prep (50°C), oven dried (105-110°C)	Location: TP3
Date Tested:	**01/11/2010**		Depth: 1.0-1.3m
Sampled By:	**CM**		Material: Silty CLAY
Sample Method:	**AS1289.1.2.1-6.5.4**		
Material Source:	**Site Won**		Spec Description: -
For Use As:	**Site Classification**		Lot Number: -
Remarks:	-		Spec Number: -

Plasticity Tests	Test Method	Specification Minimum	Result	Specification Maximum
Liquid Limit (%) W_L	**AS1289.3.1.1**		**64**	
Plastic Limit (%) W_P	**AS1289.3.2.1**		**22**	
Plastic Index I_P	**AS1289.3.3.1**		**42**	
Linear Shrinkage (%) LS	**AS1289.3.4.1**		**-**	

Explanation of Symbols

W_L - Liquid Limit	NO - Not Obtainable
W_P - Plastic Limit	NP - Non Plastic
I_P - Plasticity Index	
LS - Linear Shrinkage	

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Emerson Class Number Report

Client :	**Village Roadshow Ltd**	Report Number:	**7600 - L6164-002**
Client Address :	**Level 1, 500 Chapel Street South Yarra VIC 3141**	Report Date:	**03/11/2010**
Job Number :	**7600**	Order Number:	
Project :	**Wet 'n' Wild Theme Park**	Test Method:	**AS 1289.3.8.1**
Location :	**Prospect , Sydney**		

Lab No :	L6164			
ID No :	L6164			
Lot No :	-			
Item No :	-			
Sampling Method :	AS1289.1.2.1-6.5.4			
Date Sampled :	22/10/2010			
Date Tested :	1/11/2010			
Material Source :	Site Won			
For Use As :	Site Classification			
Sample Location :	Location: TP3 Depth: 1.0-1.3m			
Soil Description :	**Silty CLAY**			
Type of Water Used :	**Distilled Water**			
Temperature of Water (°C) :	**25.000**			
Emerson Class Number :	**Class 2**			
Remarks :				

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Atterberg Limits Report

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6165-001**
Client Address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		
Job Number:	**7600**	Report Date:	**03/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	-
Location	**Prospect , Sydney**	**Page 1 of 1**	

Lab No:	**L6165**	Sample History	Sample Location
Date Sampled:	**22/10/2010**	Oven dried prep (50°C), oven dried (105-110°C)	Location: TP5
Date Tested:	**01/11/2010**		Depth: 1.0-1.3m
Sampled By:	**CM**		Material: Silty CLAY
Sample Method:	**AS1289.1.2.1-6.5.4**		
Material Source:	**Site Won**		Spec Description: -
For Use As:	**Site Classification**		Lot Number: -
Remarks:	-		Spec Number: -

Plasticity Tests	Test Method	Specification Minimum	Result	Specification Maximum
Liquid Limit (%) W_L	**AS1289.3.1.1**		**61**	
Plastic Limit (%) W_P	**AS1289.3.2.1**		**21**	
Plastic Index I_P	**AS1289.3.3.1**		**40**	
Linear Shrinkage (%) LS	**AS1289.3.4.1**		**-**	

Explanation of Symbols

W_L - Liquid Limit	NO - Not Obtainable
W_P - Plastic Limit	NP - Non Plastic
I_P - Plasticity Index	
LS - Linear Shrinkage	

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Emerson Class Number Report

Client :	**Village Roadshow Ltd**	Report Number:	**7600 - L6165-002**
Client Address :	**Level 1, 500 Chapel Street South Yarra VIC 3141**	Report Date:	**03/11/2010**
Job Number :	**7600**	Order Number:	
Project :	**Wet 'n' Wild Theme Park**	Test Method:	**AS 1289.3.8.1**
Location :	**Prospect , Sydney**		

Lab No :	L6165			
ID No :	L6165			
Lot No :	-			
Item No :	-			
Sampling Method :	AS1289.1.2.1-6.5.4			
Date Sampled :	22/10/2010			
Date Tested :	1/11/2010			
Material Source :	Site Won			
For Use As :	Site Classification			
Sample Location :	Location: TP5 Depth: 1.0-1.3m			
Soil Description :	**Silty CLAY**			
Type of Water Used :	**Distilled Water**			
Temperature of Water (°C) :	**25.000**			
Emerson Class Number :	**Class 2**			
Remarks :				

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Atterberg Limits Report

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6166-001**
Client Address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		
Job Number:	**7600**	Report Date:	**03/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	-
Location	**Prospect , Sydney**	**Page 1 of 1**	

Lab No:	**L6166**	Sample History	Sample Location
Date Sampled:	**22/10/2010**	Oven dried prep (50°C), oven dried (105-110°C)	Location: TP9
Date Tested:	**02/11/2010**		Depth: 1.0-1.3m
Sampled By:	**CM**		Material: Silty CLAY
Sample Method:	**AS1289.1.2.1-6.5.4**		
Material Source:	**Site Won**		Spec Description: -
For Use As:	**Site Classification**		Lot Number: -
Remarks:	-		Spec Number: -

Plasticity Tests	Test Method	Specification Minimum	Result	Specification Maximum
Liquid Limit (%) W_L	**AS1289.3.1.1**		**66**	
Plastic Limit (%) W_P	**AS1289.3.2.1**		**22**	
Plastic Index I_P	**AS1289.3.3.1**		**44**	
Linear Shrinkage (%) LS	**AS1289.3.4.1**		**-**	

Explanation of Symbols

W_L - Liquid Limit	NO - Not Obtainable
W_P - Plastic Limit	NP - Non Plastic
I_P - Plasticity Index	
LS - Linear Shrinkage	

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Emerson Class Number Report

Client :	**Village Roadshow Ltd**	Report Number:	**7600 - L6166-002**
Client Address :	**Level 1, 500 Chapel Street South Yarra VIC 3141**	Report Date:	**03/11/2010**
Job Number :	**7600**	Order Number:	
Project :	**Wet 'n' Wild Theme Park**	Test Method:	**AS 1289.3.8.1**
Location :	**Prospect , Sydney**		

Lab No :	L6166			
ID No :	L6166			
Lot No :	-			
Item No :	-			
Sampling Method :	AS1289.1.2.1-6.5.4			
Date Sampled :	22/10/2010			
Date Tested :	1/11/2010			
Material Source :	Site Won			
For Use As :	Site Classification			
Sample Location :	Location: TP9 Depth: 1.0-1.3m			
Soil Description :	**Silty CLAY**			
Type of Water Used :	**Distilled Water**			
Temperature of Water (°C) :	**25.000**			
Emerson Class Number :	**Class 2**			
Remarks :				

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Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6167-001**
Client Address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		
Job Number:	**7600**	Report Date:	**03/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	-
Location	**Prospect , Sydney**	**Page 1 of 1**	

Lab No:	**L6167**	Sample History	Sample Location
Date Sampled:	**22/10/2010**	Oven dried prep (50°C), oven dried (105-110°C)	Location: TP19
Date Tested:	**01/11/2010**		Depth: 1.0-1.3m
Sampled By:	**CM**		Material: Silty CLAY
Sample Method:	**AS1289.1.2.1-6.5.4**		
Material Source:	**Site Won**		Spec Description: -
For Use As:	**Site Classification**		Lot Number: -
Remarks:	-		Spec Number: -

Plasticity Tests	Test Method	Specification Minimum	Result	Specification Maximum
Liquid Limit (%) W_L	**AS1289.3.1.1**		**50**	
Plastic Limit (%) W_P	**AS1289.3.2.1**		**19**	
Plastic Index I_P	**AS1289.3.3.1**		**31**	
Linear Shrinkage (%) LS	**AS1289.3.4.1**		**-**	

Explanation of Symbols

W_L - Liquid Limit	NO - Not Obtainable
W_P - Plastic Limit	NP - Non Plastic
I_P - Plasticity Index	
LS - Linear Shrinkage	

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Emerson Class Number Report

Client :	**Village Roadshow Ltd**	Report Number:	**7600 - L6167-002**
Client Address :	**Level 1, 500 Chapel Street South Yarra VIC 3141**	Report Date:	**03/11/2010**
Job Number :	**7600**	Order Number:	
Project :	**Wet 'n' Wild Theme Park**	Test Method:	**AS 1289.3.8.1**
Location :	**Prospect , Sydney**		

Lab No :	L6167			
ID No :	L6167			
Lot No :	-			
Item No :	-			
Sampling Method :	AS1289.1.2.1-6.5.4			
Date Sampled :	22/10/2010			
Date Tested :	1/11/2010			
Material Source :	Site Won			
For Use As :	Site Classification			
Sample Location :	Location: TP19 Depth: 1.0-1.3m			
Soil Description :	**Silty CLAY**			
Type of Water Used :	**Distilled Water**			
Temperature of Water (°C) :	**25.000**			
Emerson Class Number :	**Class 4**			
Remarks :				

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Atterberg Limits Report

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6168-001**
Client Address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		
Job Number:	**7600**	Report Date:	**03/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	-
Location	**Prospect , Sydney**	**Page 1 of 1**	

Lab No:	**L6168**	Sample History	Sample Location
Date Sampled:	**22/10/2010**	Oven dried prep (50°C), oven dried (105-110°C)	Location: BH1
Date Tested:	**01/11/2010**		Depth: 0.5-0.95m
Sampled By:	**CM**		Material: Silty CLAY
Sample Method:	**AS1289.1.2.1-6.5.4**		
Material Source:	**Site Won**		Spec Description: -
For Use As:	**Site Classification**		Lot Number: -
Remarks:	-		Spec Number: -

Plasticity Tests	Test Method	Specification Minimum	Result	Specification Maximum
Liquid Limit (%) W_L	**AS1289.3.1.1**		**60**	
Plastic Limit (%) W_P	**AS1289.3.2.1**		**19**	
Plastic Index I_P	**AS1289.3.3.1**		**41**	
Linear Shrinkage (%) LS	**AS1289.3.4.1**		**-**	

Explanation of Symbols

W_L - Liquid Limit	NO - Not Obtainable
W_P - Plastic Limit	NP - Non Plastic
I_P - Plasticity Index	
LS - Linear Shrinkage	

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Emerson Class Number Report

Client :	**Village Roadshow Ltd**	Report Number:	**7600 - L6168-002**
Client Address :	**Level 1, 500 Chapel Street South Yarra VIC 3141**	Report Date:	**03/11/2010**
Job Number :	**7600**	Order Number:	
Project :	**Wet 'n' Wild Theme Park**	Test Method:	**AS 1289.3.8.1**
Location :	**Prospect , Sydney**		

Lab No :	L6168			
ID No :	L6168			
Lot No :	-			
Item No :	-			
Sampling Method :	AS1289.1.2.1-6.5.4			
Date Sampled :	22/10/2010			
Date Tested :	1/11/2010			
Material Source :	Site Won			
For Use As :	Site Classification			
Sample Location :	Location: BH1 Depth: 0.5-0.95m			
Soil Description :	**Silty CLAY**			
Type of Water Used :	**Distilled Water**			
Temperature of Water (°C) :	**25.000**			
Emerson Class Number :	**Class 2**			

Remarks :

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Atterberg Limits Report

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6169-001**
Client Address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		
Job Number:	**7600**	Report Date:	**03/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	-
Location	**Prospect , Sydney**	**Page 1 of 1**	

Lab No:	**L6169**	Sample History	Sample Location
Date Sampled:	**22/10/2010**	Oven dried prep (50°C), oven dried (105-110°C)	Location: BH2
Date Tested:	**01/11/2010**		Depth: 0.5-0.95m
Sampled By:	**CM**		Material: Silty CLAY
Sample Method:	**AS1289.1.2.1-6.5.4**		
Material Source:	**Site Won**		Spec Description: -
For Use As:	**Site Classification**		Lot Number: -
Remarks:	-		Spec Number: -

Plasticity Tests	Test Method	Specification Minimum	Result	Specification Maximum
Liquid Limit (%) W_L	**AS1289.3.1.1**		**28**	
Plastic Limit (%) W_P	**AS1289.3.2.1**		**13**	
Plastic Index I_P	**AS1289.3.3.1**		**15**	
Linear Shrinkage (%) LS	**AS1289.3.4.1**		**-**	

Explanation of Symbols

W_L - Liquid Limit	NO - Not Obtainable
W_P - Plastic Limit	NP - Non Plastic
I_P - Plasticity Index	
LS - Linear Shrinkage	

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Emerson Class Number Report

Client :	**Village Roadshow Ltd**	Report Number:	**7600 - L6169-002**
Client Address :	**Level 1, 500 Chapel Street South Yarra VIC 3141**	Report Date:	**03/11/2010**
Job Number :	**7600**	Order Number:	
Project :	**Wet 'n' Wild Theme Park**	Test Method:	**AS 1289.3.8.1**
Location :	**Prospect , Sydney**		

Lab No :	L6169			
ID No :	L6169			
Lot No :	-			
Item No :	-			
Sampling Method :	AS1289.1.2.1-6.5.4			
Date Sampled :	22/10/2010			
Date Tested :	1/11/2010			
Material Source :	Site Won			
For Use As :	Site Classification			
Sample Location :	Location: BH2 Depth: 0.5-0.95m			
Soil Description :	**Silty CLAY**			
Type of Water Used :	**Distilled Water**			
Temperature of Water (°C) :	**25.000**			
Emerson Class Number :	**Class 2**			

Remarks :

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Atterberg Limits Report

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6170-001**
Client Address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		
Job Number:	**7600**	Report Date:	**03/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	-
Location	**Prospect , Sydney**	**Page 1 of 1**	

Lab No:	**L6170**	Sample History	Sample Location
Date Sampled:	**22/10/2010**	Oven dried prep (50°C), oven dried (105-110°C)	Location: BH13
Date Tested:	**01/11/2010**		Depth: 0.5-0.95m
Sampled By:	**CM**		Material: Silty CLAY
Sample Method:	**AS1289.1.2.1-6.5.4**		
Material Source:	**Site Won**		Spec Description: -
For Use As:	**Site Classification**		Lot Number: -
Remarks:	-		Spec Number: -

Plasticity Tests	Test Method	Specification Minimum	Result	Specification Maximum
Liquid Limit (%) W_L	**AS1289.3.1.1**		**50**	
Plastic Limit (%) W_P	**AS1289.3.2.1**		**21**	
Plastic Index I_P	**AS1289.3.3.1**		**29**	
Linear Shrinkage (%) LS	**AS1289.3.4.1**		**-**	

Explanation of Symbols

W_L - Liquid Limit	NO - Not Obtainable
W_P - Plastic Limit	NP - Non Plastic
I_P - Plasticity Index	
LS - Linear Shrinkage	

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Emerson Class Number Report

Client :	**Village Roadshow Ltd**	Report Number:	**7600 - L6170-002**
Client Address :	**Level 1, 500 Chapel Street South Yarra VIC 3141**	Report Date:	**03/11/2010**
Job Number :	**7600**	Order Number:	
Project :	**Wet 'n' Wild Theme Park**	Test Method:	**AS 1289.3.8.1**
Location :	**Prospect , Sydney**		

Lab No :	L6170			
ID No :	L6170			
Lot No :	-			
Item No :	-			
Sampling Method :	AS1289.1.2.1-6.5.4			
Date Sampled :	22/10/2010			
Date Tested :	1/11/2010			
Material Source :	Site Won			
For Use As :	Site Classification			
Sample Location :	Location: BH13 Depth: 0.5-0.95m			
Soil Description :	**Silty CLAY**			
Type of Water Used :	**Distilled Water**			
Temperature of Water (°C) :	**25.000**			
Emerson Class Number :	**Class 2**			

Remarks :

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Atterberg Limits Report

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6171-001**
Client Address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		
Job Number:	**7600**	Report Date:	**03/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	-
Location	**Prospect , Sydney**	**Page 1 of 1**	

Lab No:	**L6171**	Sample History	Sample Location
Date Sampled:	**22/10/2010**	Oven dried prep (50°C), oven dried (105-110°C)	Location: BH7
Date Tested:	**01/11/2010**		Depth: 0.5-0.95m
Sampled By:	**CM**		Material: Silty CLAY
Sample Method:	**AS1289.1.2.1-6.5.4**		
Material Source:	**Site Won**		Spec Description: -
For Use As:	**Site Classification**		Lot Number: -
Remarks:	-		Spec Number: -

Plasticity Tests	Test Method	Specification Minimum	Result	Specification Maximum
Liquid Limit (%) W_L	**AS1289.3.1.1**		**52**	
Plastic Limit (%) W_P	**AS1289.3.2.1**		**20**	
Plastic Index I_P	**AS1289.3.3.1**		**32**	
Linear Shrinkage (%) LS	**AS1289.3.4.1**		**-**	

Explanation of Symbols

W_L - Liquid Limit	NO - Not Obtainable
W_P - Plastic Limit	NP - Non Plastic
I_P - Plasticity Index	
LS - Linear Shrinkage	

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Emerson Class Number Report

Client :	**Village Roadshow Ltd**	Report Number:	**7600 - L6171-002**
Client Address :	**Level 1, 500 Chapel Street South Yarra VIC 3141**	Report Date:	**03/11/2010**
Job Number :	**7600**	Order Number:	
Project :	**Wet 'n' Wild Theme Park**	Test Method:	**AS 1289.3.8.1**
Location :	**Prospect , Sydney**		

Lab No :	L6171			
ID No :	L6171			
Lot No :	-			
Item No :	-			
Sampling Method :	AS1289.1.2.1-6.5.4			
Date Sampled :	22/10/2010			
Date Tested :	1/11/2010			
Material Source :	Site Won			
For Use As :	Site Classification			
Sample Location :	Location: BH7 Depth: 0.5-0.95m			
Soil Description :	**Silty CLAY**			
Type of Water Used :	**Distilled Water**			
Temperature of Water (°C) :	**25.000**			
Emerson Class Number :	**Class 4**			

Remarks :

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Shrink Swell Index Report

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6142-001**
Client Address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		**Page 1 of 1**
Job Number:	**7600**	Report Date:	**10/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	
Location	**Prospect , Sydney**	Test Method :	**AS1289.7.1.1**
Lab No:	**L6142**	Sample Location	
Date Sampled:	**22/10/2010**	Location: BH2	
Date Tested:	**01/11/2010**	Depth: 1.0-1.35m	
Sampled By:	**CM**		
Sample Method:	**AS1289.1.2.1-6.5.3**		
Material Source:	**Site Won**		
For Use As:	**Site Classification**	Lot Number:	**-**
Remarks:	**-**	Item Number :	**-**

Shrinkage Moisture Content (%) :	**22.43**	Swell MC Before(%):	**21.5**
Shrinkage (%) :	**3.9**	Swell MC After(%) :	**21.6**
Unit Weight (t/m³) :	**2.01**	PP Before (kPa):	**250**
Swell (%) :	**0.2**	PP After (kPa):	**250**
Shrink Swell Index (Iss %):	**2.2**		

Visual Classification :	**Silty CLAY**
Inert Material Estimate(%):	**5**
Cracking :	**Moderate**
Crumbling :	**Nil**

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Shrink Swell Index Report

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6143-001**
Client Address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		**Page 1 of 1**
Job Number:	**7600**	Report Date:	**10/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	
Location	**Prospect , Sydney**	Test Method :	**AS1289.7.1.1**
Lab No:	**L6143**	Sample Location	
Date Sampled:	**22/10/2010**	Location: BH12	
Date Tested:	**01/11/2010**	Depth: 1.5-1.85m	
Sampled By:	**CM**		
Sample Method:	**AS1289.1.2.1-6.5.3**		
Material Source:	**Site Won**		
For Use As:	**Site Classification**	Lot Number:	**-**
Remarks:	**-**	Item Number :	**-**

Shrinkage Moisture Content (%) :	**17.67**	Swell MC Before(%):	**21.0**
Shrinkage (%) :	**2.1**	Swell MC After(%) :	**21.1**
Unit Weight (t/m³) :	**2.04**	PP Before (kPa):	**175**
Swell (%) :	**0.0**	PP After (kPa):	**175**
Shrink Swell Index (Iss %):	**1.2**		

Visual Classification :	**Silty CLAY**
Inert Material Estimate(%):	**5**
Cracking :	**Moderate**
Crumbling :	**Nil**

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Shrink Swell Index Report

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6144-001**
Client Address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		**Page 1 of 1**
Job Number:	**7600**	Report Date:	**10/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	
Location	**Prospect , Sydney**	Test Method :	**AS1289.7.1.1**
Lab No:	**L6144**	Sample Location	
Date Sampled:	**22/10/2010**	Location: BH8	
Date Tested:	**01/11/2010**	Depth: 1.0-1.35m	
Sampled By:	**CM**		
Sample Method:	**AS1289.1.2.1-6.5.3**		
Material Source:	**Site Won**		
For Use As:	**Site Classification**	Lot Number:	**-**
Remarks:	**-**	Item Number :	**-**

Shrinkage Moisture Content (%) :	**25.73**	Swell MC Before(%):	**18.7**
Shrinkage (%) :	**5.0**	Swell MC After(%) :	**20.7**
Unit Weight (t/m³) :	**2.06**	PP Before (kPa):	**200**
Swell (%) :	**0.2**	PP After (kPa):	**325**
Shrink Swell Index (Iss %):	**2.8**		

Visual Classification :	**Silty CLAY**
Inert Material Estimate(%):	**5**
Cracking :	**Mild**
Crumbling :	**Nil**

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Shrink Swell Index Report

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6145-001**
Client Address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		**Page 1 of 1**
Job Number:	**7600**	Report Date:	**10/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	
Location	**Prospect , Sydney**	Test Method :	**AS1289.7.1.1**
Lab No:	**L6145**	Sample Location	
Date Sampled:	**22/10/2010**	Location: BH7	
Date Tested:	**01/11/2010**	Depth: 1.0-1.35m	
Sampled By:	**CM**		
Sample Method:	**AS1289.1.2.1-6.5.3**		
Material Source:	**Site Won**		
For Use As:	**Site Classification**	Lot Number:	**-**
Remarks:	**-**	Item Number :	**-**

Shrinkage Moisture Content (%) :	**18.85**	Swell MC Before(%):	**12.1**
Shrinkage (%) :	**1.4**	Swell MC After(%) :	**16.3**
Unit Weight (t/m³) :	**2.05**	PP Before (kPa):	**450**
Swell (%) :	**0.2**	PP After (kPa):	**450**
Shrink Swell Index (Iss %):	**0.8**		

Visual Classification :	**Silty CLAY**
Inert Material Estimate(%):	**5**
Cracking :	**Mild**
Crumbling :	**Nil**

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Shrink Swell Index Report

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6146-001**
Client Address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		**Page 1 of 1**
Job Number:	**7600**	Report Date:	**10/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	
Location	**Prospect , Sydney**	Test Method :	**AS1289.7.1.1**
Lab No:	**L6146**	Sample Location	
Date Sampled:	**22/10/2010**	Location: BH13	
Date Tested:	**03/11/2010**	Depth: 1.0-1.35m	
Sampled By:	**CM**		
Sample Method:	**AS1289.1.2.1-6.5.3**		
Material Source:	**Site Won**		
For Use As:	**Site Classification**	Lot Number:	**-**
Remarks:	**-**	Item Number :	**-**

Shrinkage Moisture Content (%) :	**17.26**	Swell MC Before(%):	**22.8**
Shrinkage (%) :	**2.6**	Swell MC After(%) :	**27.2**
Unit Weight (t/m³) :	**2.02**	PP Before (kPa):	**450**
Swell (%) :	**4.2**	PP After (kPa):	**150**
Shrink Swell Index (Iss %):	**2.6**		

Visual Classification :	**Silty CLAY**
Inert Material Estimate(%):	**5**
Cracking :	**Mild**
Crumbling :	**Nil**

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Shrink Swell Index Report

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6147-001**
Client Address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		**Page 1 of 1**
Job Number:	**7600**	Report Date:	**10/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	
Location	**Prospect , Sydney**	Test Method :	**AS1289.7.1.1**
Lab No:	**L6147**	Sample Location	
Date Sampled:	**22/10/2010**	Location: BH14	
Date Tested:	**06/11/2010**	Depth: 1.0-1.35m	
Sampled By:	**CM**		
Sample Method:	**AS1289.1.2.1-6.5.3**		
Material Source:	**Site Won**		
For Use As:	**Site Classification**	Lot Number:	**-**
Remarks:	**-**	Item Number :	**-**

Shrinkage Moisture Content (%) :	**20.8**	Swell MC Before(%):	**19.6**
Shrinkage (%) :	**3.4**	Swell MC After(%) :	**20.7**
Unit Weight (t/m³) :	**2.1**	PP Before (kPa):	**150**
Swell (%) :	**1.5**	PP After (kPa):	**325**
Shrink Swell Index (Iss %):	**2.3**		

Visual Classification :	**Silty CLAY**
Inert Material Estimate(%):	**5**
Cracking :	**Mild**
Crumbling :	**Nil**

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Shrink Swell Index Report

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6148-001**
Client Address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		**Page 1 of 1**
Job Number:	**7600**	Report Date:	**10/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	
Location	**Prospect , Sydney**	Test Method :	**AS1289.7.1.1**
Lab No:	**L6148**	Sample Location	
Date Sampled:	**22/10/2010**	Location: BH1	
Date Tested:	**09/11/2010**	Depth: 2.0-2.45m	
Sampled By:	**CM**		
Sample Method:	**AS1289.1.2.1-6.5.3**		
Material Source:	**Site Won**		
For Use As:	**Site Classification**	Lot Number:	**-**
Remarks:	**-**	Item Number :	**-**

Shrinkage Moisture Content (%) :	**18.4**	Swell MC Before(%):	**19.8**
Shrinkage (%) :	**3.9**	Swell MC After(%) :	**21.5**
Unit Weight (t/m³) :	**2.1**	PP Before (kPa):	**350**
Swell (%) :	**4.7**	PP After (kPa):	**200**
Shrink Swell Index (Iss %):	**3.5**		

Visual Classification :	**Silty CLAY**
Inert Material Estimate(%):	**1**
Cracking :	**Moderate**
Crumbling :	**Nil**

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Shrink Swell Index Report

Client:	**Village Roadshow Ltd**	Report Number:	**7600 - L6149-001**
Client Address:	**Level 1, 500 Chapel Street South Yarra VIC 3141**		**Page 1 of 1**
Job Number:	**7600**	Report Date:	**10/11/2010**
Project:	**Wet 'n' Wild Theme Park**	Order Number:	
Location	**Prospect , Sydney**	Test Method :	**AS1289.7.1.1**
Lab No:	**L6149**	Sample Location	
Date Sampled:	**22/10/2010**	Location: BH10	
Date Tested:	**09/11/2010**	Depth: 0.5-0.85m	
Sampled By:	**CM**		
Sample Method:	**AS1289.1.2.1-6.5.3**		
Material Source:	**Site Won**		
For Use As:	**Site Classification**	Lot Number:	**-**
Remarks:	**-**	Item Number :	**-**

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Shrinkage Moisture Content (%) :	**22.83**	Swell MC Before(%):	**23.8**
Shrinkage (%) :	**3.4**	Swell MC After(%) :	**25.4**
Unit Weight (t/m³) :	**2.04**	PP Before (kPa):	**350**
Swell (%) :	**2.4**	PP After (kPa):	**150**
Shrink Swell Index (Iss %):	**2.5**		

Visual Classification :	**Silty CLAY**
Inert Material Estimate(%):	**5**
Cracking :	**Moderate**
Crumbling :	**Nil**

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Appendix D

CSIRO Information Sheet BTF 18

Landslide Risk Assessment – Example of Qualitative Terminology for use in Assessing Risk to Property

Guidelines for Hillside Construction

Foundation Maintenance and Footing Performance: A Homeowner's Guide

CSIRO

BTF 18
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, 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 with only slight ground movement from moisture changes
M	Moderately reactive clay or silt sites, which can experience moderate ground movement from moisture changes
H	Highly reactive clay sites, which can experience high ground movement from moisture changes
E	Extremely reactive sites, which can experience extreme ground movement from moisture changes
A to P	Filled sites
P	Sites which include soft soils, such as soft clay or silt or loose sands; landslip; mine subsidence; collapsing soils; soils subject to erosion; reactive sites subject to abnormal moisture conditions or sites which cannot be classified otherwise

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).

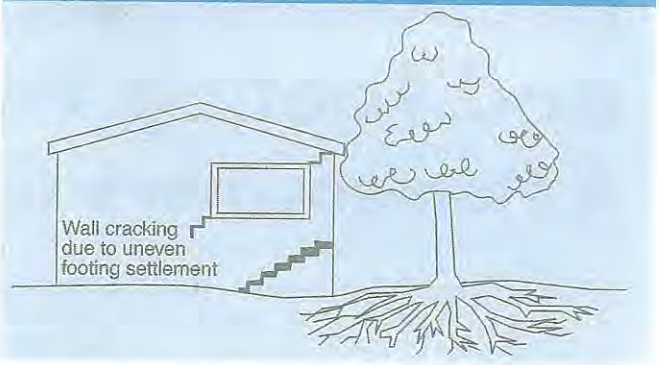
Isolated piers affected by erosion or saturation of foundations will eventually lose contact with the bearers they support and may tilt or fall over. The floors that have lost this support will become bouncy, sometimes rattling ornaments etc.

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.

Trees can cause shrinkage and damage



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.

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 ro 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 cause 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 inro 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 concenrrated in a small area of soil:

- Incorrect falls in roof guttering may result in overflows, as may gutters blocked with leaves erc.
- 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 warer 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.

AS 2870 also puhlishes 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, rhe 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 creare 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 warer will either pond or flow along the bottom of the rrench. 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.

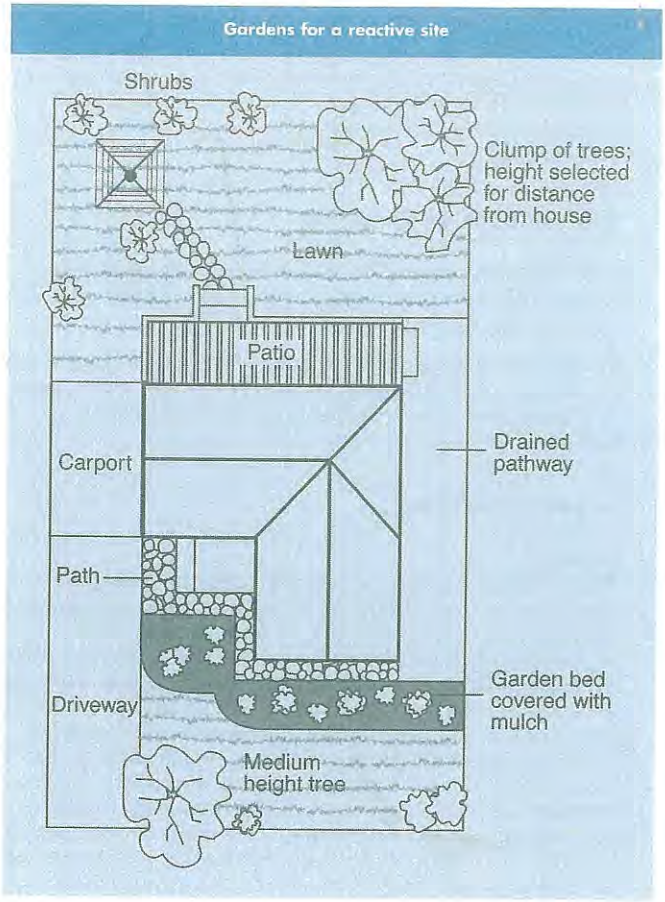
It is, however, somerimes necessary when attempring to prevent water migration that testing be carried out to establish watertable height and subsoil water flows. This subject is referred to in BTF 19 and may properly be regarded as an area for an expert consultant.

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 plancs, 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

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 noticcable 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 depend on number of cracks	4



should 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.

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APPENDIX C: LANDSLIDE RISK ASSESSMENT

QUALITATIVE TERMINOLOGY FOR USE IN ASSESSING RISK TO PROPERTY

QUALITATIVE MEASURES OF LIKELIHOOD

Approximate Annual Probability		Implied Indicative Landslide Recurrence Interval		Description	Descriptor	Level
Indicative Value	Notional Boundary					
10^{-1}	$5x10^{-2}$	10 years	20 years	The event is expected to occur over the design life.	ALMOST CERTAIN	A
10^{-2}	$5x10^{-3}$	100 years	200 years	The event will probably occur under adverse conditions over the design life.	LIKELY	B
10^{-3}	$5x10^{-4}$	1000 years	2000 years	The event could occur under adverse conditions over the design life.	POSSIBLE	C
10^{-4}	$5x10^{-5}$	10,000 years	20,000 years	The event might occur under very adverse circumstances over the design life.	UNLIKELY	D
10^{-5}	$5x10^{-6}$	100,000 years		The event is conceivable but only under exceptional circumstances over the design life.	RARE	E
10^{-6}		1,000,000 years	200.000 years	The event is inconceivable or fanciful over the design life.	BARELY CREDIBLE	F

Note: (1) The table should be used from left to right; use Approximate Annual Probability or Description to assign Descriptor, not *vice versa*.

QUALITATIVE MEASURES OF CONSEQUENCES TO PROPERTY

Approximate Cost of Damage		Description	Descriptor	Level
Indicative Value	Notional Boundary			
200%	100%	Structure(s) completely destroyed and/or large scale damage requiring major engineering works for stabilisation. Could cause at least one adjacent property major consequence damage.	CATASTROPHIC	1
60%	40%	Extensive damage to most of structure, and/or extending beyond site boundaries requiring significant stabilisation works. Could cause at least one adjacent property medium consequence damage.	MAJOR	2
20%	10%	Moderate damage to some of structure, and/or significant part of site requiring large stabilisation works. Could cause at least one adjacent property minor consequence damage.	MEDIUM	3
5%	1%	Limited damage to part of structure, and/or part of site requiring some reinstatement stabilisation works.	MINOR	4
0.5%		Little damage. (Note for high probability event (Almost Certain), this category may be subdivided at a notional boundary of 0.1%. See Risk Matrix.)	INSIGNIFICANT	5

Notes: (2) The Approximate Cost of Damage is expressed as a percentage of market value, being the cost of the improved value of the unaffected property which includes the land plus the unaffected structures.

(3) The Approximate Cost is to be an estimate of the direct cost of the damage, such as the cost of reinstatement of the damaged portion of the property (land plus structures), stabilisation works required to render the site to tolerable risk level for the landslide which has occurred and professional design fees, and consequential costs such as legal fees, temporary accommodation. It does not include additional stabilisation works to address other landslides which may affect the property.

(4) The table should be used from left to right; use Approximate Cost of Damage or Description to assign Descriptor, not vice versa

APPENDIX C: – QUALITATIVE TERMINOLOGY FOR USE IN ASSESSING RISK TO PROPERTY (CONTINUED)

QUALITATIVE RISK ANALYSIS MATRIX – LEVEL OF RISK TO PROPERTY

LIKELIHOOD		CONSEQUENCES TO PROPERTY (With Indicative Approximate Cost of Damage)				
	Indicative Value of Approximate Annual Probability	1: CATASTROPHIC 200%	2: MAJOR 60%	3: MEDIUM 20%	4: MINOR 5%	5: INSIGNIFICANT 0.5%
A – ALMOST CERTAIN	10^{-1}	VH	VH	VH	H	M or L (5)
B - LIKELY	10^{-2}	VH	VH	H	M	L
C - POSSIBLE	10^{-3}	VH	H	M	M	VL
D - UNLIKELY	10^{-4}	H	M	L	L	VL
E - RARE	10^{-5}	M	L	L	VL	VL
F - BARELY CREDIBLE	10^{-6}	L	VL	VL	VL	VL

Notes: (5) For Cell A5, may be subdivided such that a consequence of less than 0.1% is Low Risk.
(6) When considering a risk assessment it must be clearly stated whether it is for existing conditions or with risk control measures which may not be implemented at the current time.

RISK LEVEL IMPLICATIONS

Risk Level		Example Implications (7)
VH	VERY HIGH RISK	Unacceptable without treatment. Extensive detailed investigation and research, planning and implementation of treatment options essential to reduce risk to Low; may be too expensive and not practical. Work likely to cost more than value of the property.
H	HIGH RISK	Unacceptable without treatment. Detailed investigation, planning and implementation of treatment options required to reduce risk to Low. Work would cost a substantial sum in relation to the value of the property.
M	MODERATE RISK	May be tolerated in certain circumstances (subject to regulator's approval) but requires investigation, planning and implementation of treatment options to reduce the risk to Low. Treatment options to reduce to Low risk should be implemented as soon as practicable.
L	LOW RISK	Usually acceptable to regulators. Where treatment has been required to reduce the risk to this level, ongoing maintenance is required.
VL	VERY LOW RISK	Acceptable. Manage by normal slope maintenance procedures.

Note: (7) The implications for a particular situation are to be determined by all parties to the risk assessment and may depend on the nature of the property at risk; these are only given as a general guide.

APPENDIX F- EXAMPLE OF VULNERABILITY VALUES

SUMMARY OF HONG KONG VULNERABILITY RANGES FOR PERSONS, AND RECOMMENDED VALUES FOR LOSS OF LIFE FOR LANDSLIDING IN SIMILAR SITUATIONS

The following table is adapted from P J Finlay, G R Mostyn & R Fell (1999). *Landslides: Prediction of Travel Distance and Guidelines for Vulnerability of Persons.* Proc 8th. Australia New Zealand Conference on Geomechanics, Hobart. Australian Geomechanics Society, ISBN 1 86445 0029, Vol 1, pp.105-113.

Case	Range in Data	Recommended Value	Comments
Person in Open Space			
If struck by a rockfall	0.1 – 0.7	0.5	May be injured but unlikely to cause death
If buried by debris	0.8 – 1.0	1.0	Death by asphyxia almost certain
If not buried	0.1 – 0.5	0.1	High chance of survival
Persons in a Vehicle			
If the vehicle is buried/crushed	0.9 – 1.0	1.0	Death is almost certain
If the vehicle is damaged only	0 – 0.3	0.3	High chance of survival
Person in a Building			
If the building collapses	0.9 – 1.0	1.0	Death is almost certain
If the building is inundated with debris and the person buried	0.8 – 1.0	1.0	Death is highly likely
If the debris strikes the building only	0 – 0.1	0.05	Very high chance of survival

EXAMPLE OF VULNERABILITY VALUES FOR DESTRUCTION OF PEOPLE, BUILDINGS AND ROADS

The following table is adapted from Mariou Michael-Leiba, Fred Baynes, Greg Scott & Ken Granger (2002). *Quantitative Landslide Risk Assessment of Cairns.* Australian Geomechanics, June 2002.

Geomorphic Unit	Vulnerability Values		
	People	Buildings	Roads
Hill slopes	0.05	0.25	0.3
Proximal debris fan	0.5	1.0	1.0
Distal debris fan	0.05	0.1	0.3

EXAMPLE OF VULNERABILITY VALUES FOR LIFE FOR ROCKFALLS AND DEBRIS FLOWS FOR LAWRENCE HARGRAVE DRIVE PROJECT, COALCLIFF TO CLIFTON AREA, AUSTRALIA

The following table is adapted from R A Wilson, A T Moon, M Hendricks & I E Stewart (2005). *Application of quantitative risk assessment to the Lawrence Hargrave Drive Project, New South Wales,Australia.* Landslide Risk Management - Hungr, Fell, Couture & Eberhardt (eds) 2005. Taylor & Francis Group, London, ISBN 04 1538 043X.

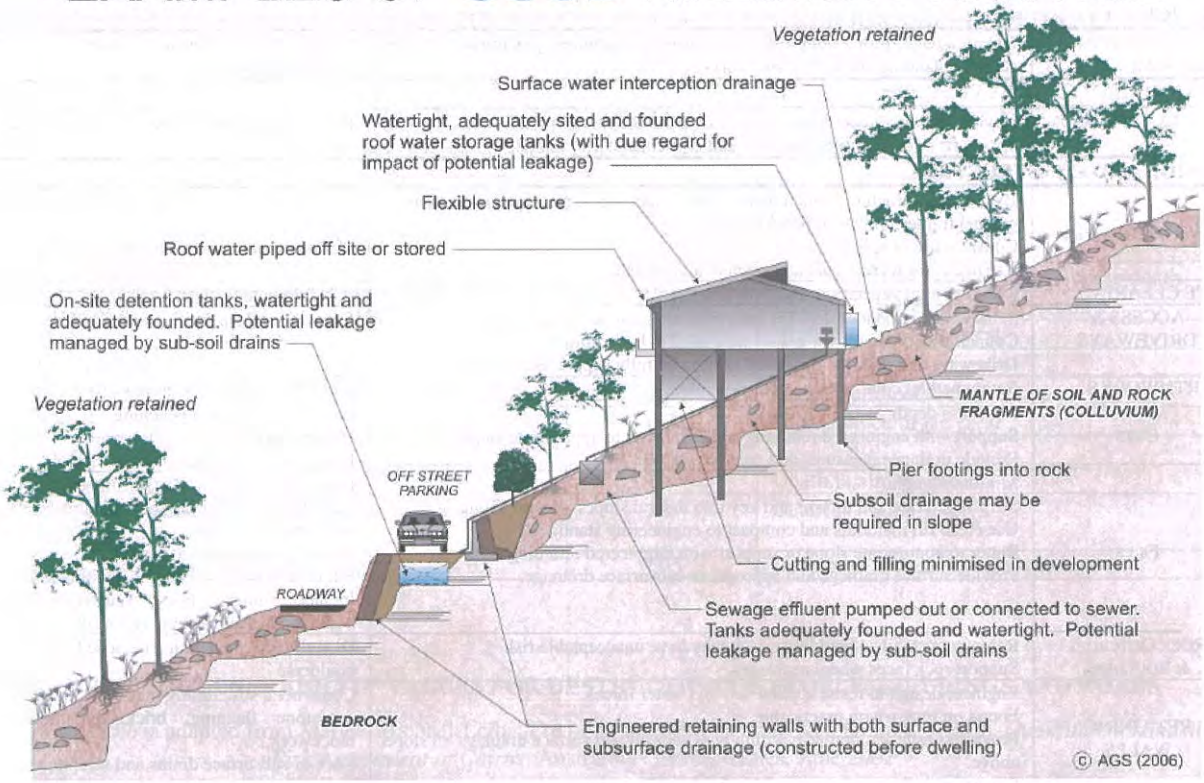
Order of magnitude of landslide crossing road (m^3)	**Rockfalls from Scarborough Cliff**		**Debris flow from Northern Amphitheatre**	
	Landslide hits car	**Car hits landslide**	**Landslide hits car**	**Car hits landslide**
0.03	0.05	0.006	–	–
0.3	0.1	0.002	–	–
3	0.3	0.03	0.001	–
30	0.7	0.03	0.01	0.001
300	1	0.03	0.1	0.003
3,000	1	0.03	1	0.003

NOTE: The above data should be applied with common sense, taking into account the circumstances of the landslide being studied. Judgment may indicate values other than the recommended value are appropriate for a particular case.

APPENDIX G - SOME GUIDELINES FOR HILLSIDE CONSTRUCTION

	GOOD ENGINEERING PRACTICE	*POOR ENGINEERING PRACTICE*
ADVICE		
GEOTECHNICAL ASSESSMENT	Obtain advice from a qualified, experienced geotechnical practitioner at early stage of planning and before site works.	Prepare detailed plan and start site works before geotechnical advice.
PLANNING		
SITE PLANNING	Having obtained geotechnical advice, plan the development with the risk arising from the identified hazards and consequences in mind.	Plan development without regard for the Risk.
DESIGN AND CONSTRUCTION		
HOUSE DESIGN	Use flexible structures which incorporate properly designed brickwork, timber or steel frames, timber or panel cladding. Consider use of split levels. Use decks for recreational areas where appropriate.	Floor plans which require extensive cutting and filling. Movement intolerant structures.
SITE CLEARING	Retain natural vegetation wherever practicable.	Indiscriminately clear the site.
ACCESS & DRIVEWAYS	Satisfy requirements below for cuts, fills, retaining walls and drainage. Council specifications for grades may need to be modified. Driveways and parking areas may need to be fully supported on piers.	Excavate and fill for site access before geotechnical advice.
EARTHWORKS	Retain natural contours wherever possible.	Indiscriminatory bulk earthworks.
CUTS	Minimise depth. Support with engineered retaining walls or batter to appropriate slope. Provide drainage measures and erosion control.	Large scale cuts and benching. Unsupported cuts. Ignore drainage requirements
FILLS	Minimise height. Strip vegetation and topsoil and key into natural slopes prior to filling. Use clean fill materials and compact to engineering standards. Batter to appropriate slope or support with engineered retaining wall. Provide surface drainage and appropriate subsurface drainage.	Loose or poorly compacted fill, which if it fails, may flow a considerable distance including onto property below. Block natural drainage lines. Fill over existing vegetation and topsoil. Include stumps, trees, vegetation, topsoil, boulders, building rubble etc in fill.
ROCK OUTCROPS & BOULDERS	Remove or stabilise boulders which may have unacceptable risk. Support rock faces where necessary.	Disturb or undercut detached blocks or boulders.
RETAINING WALLS	Engineer design to resist applied soil and water forces. Found on rock where practicable. Provide subsurface drainage within wall backfill and surface drainage on slope above. Construct wall as soon as possible after cut/fill operation.	Construct a structurally inadequate wall such as sandstone flagging, brick or unreinforced blockwork. Lack of subsurface drains and weepholes.
FOOTINGS	Found within rock where practicable. Use rows of piers or strip footings oriented up and down slope. Design for lateral creep pressures if necessary. Backfill footing excavations to exclude ingress of surface water.	Found on topsoil, loose fill, detached boulders or undercut cliffs.
SWIMMING POOLS	Engineer designed. Support on piers to rock where practicable. Provide with under-drainage and gravity drain outlet where practicable. Design for high soil pressures which may develop on uphill side whilst there may be little or no lateral support on downhill side.	
DRAINAGE		
SURFACE	Provide at tops of cut and fill slopes. Discharge to street drainage or natural water courses. Provide general falls to prevent blockage by siltation and incorporate silt traps. Line to minimise infiltration and make flexible where possible. Special structures to dissipate energy at changes of slope and/or direction.	Discharge at top of fills and cuts. Allow water to pond on bench areas.
SUBSURFACE	Provide filter around subsurface drain. Provide drain behind retaining walls. Use flexible pipelines with access for maintenance. Prevent inflow of surface water.	Discharge roof runoff into absorption trenches.
SEPTIC & SULLAGE	Usually requires pump-out or mains sewer systems; absorption trenches may be possible in some areas if risk is acceptable. Storage tanks should be water-tight and adequately founded.	Discharge sullage directly onto and into slopes. Use absorption trenches without consideration of landslide risk.
EROSION CONTROL & LANDSCAPING	Control erosion as this may lead to instability. Revegetate cleared area.	Failure to observe earthworks and drainage recommendations when landscaping.
DRAWINGS AND SITE VISITS DURING CONSTRUCTION		
DRAWINGS	Building Application drawings should be viewed by geotechnical consultant	
SITE VISITS	Site Visits by consultant may be appropriate during construction/	
INSPECTION AND MAINTENANCE BY OWNER		
OWNER'S RESPONSIBILITY	Clean drainage systems; repair broken joints in drains and leaks in supply pipes. Where structural distress is evident see advice. If seepage observed, determine causes or seek advice on consequences.	

EXAMPLES OF GOOD HILLSIDE PRACTICE



EXAMPLES OF POOR HILLSIDE PRACTICE