

Important information about your **Coffey** Report

As a client of Coffey you should know that site subsurface conditions cause more construction problems than any other factor. These notes have been prepared by Coffey to help you interpret and understand the limitations of your report.

Your report is based on project specific criteria

Your report has been developed on the basis of your unique project specific requirements as understood by Coffey and applies only to the site investigated. Project criteria typically include the general nature of the project; its size and configuration; the location of any structures on the site; other site improvements; the presence of underground utilities; and the additional risk imposed by scope-of-service limitations imposed by the client. Your report should not be used if there are any changes to the project without first asking Coffey to assess how factors that changed subsequent to the date of the report affect the report's recommendations. Coffey cannot accept responsibility for problems that may occur due to changed factors if they are not consulted.

Subsurface conditions can change

Subsurface conditions are created by natural processes and the activity of man. For example, water levels can vary with time, fill may be placed on a site and pollutants may migrate with time. Because a report is based on conditions which existed at the time of subsurface exploration, decisions should not be based on a report whose adequacy may have been affected by time. Consult Coffey to be advised how time may have impacted on the project.

Interpretation of factual data

Site assessment identifies actual subsurface conditions only at those points where samples are taken and when they are taken. Data derived from literature and external data source review, sampling and subsequent laboratory testing are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact on the proposed development and recommended actions. Actual conditions may differ from those inferred to exist, because no professional, no matter how qualified, can reveal what is hidden by

earth, rock and time. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions. For this reason, owners should retain the services of Coffey through the development stage, to identify variances, conduct additional tests if required, and recommend solutions to problems encountered on site.

Your report will only give preliminary recommendations

Your report is based on the assumption that the site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area. This assumption cannot be substantiated until project implementation has commenced and therefore your report recommendations can only be regarded as preliminary. Only Coffey, who prepared the report, is fully familiar with the background information needed to assess whether or not the report's recommendations are valid and whether or not changes should be considered as the project develops. If another party undertakes the implementation of the recommendations of this report there is a risk that the report will be misinterpreted and Coffey cannot be held responsible for such misinterpretation.

Your report is prepared for specific purposes and persons

To avoid misuse of the information contained in your report it is recommended that you confer with Coffey before passing your report on to another party who may not be familiar with the background and the purpose of the report. Your report should not be applied to any project other than that originally specified at the time the report was issued.

Important information about your **Coffey** Report

Interpretation by other design professionals

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, retain Coffey to work with other project design professionals who are affected by the report. Have Coffey explain the report implications to design professionals affected by them and then review plans and specifications produced to see how they incorporate the report findings.

Data should not be separated from the report*

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way.

Logs, figures, drawings, etc. are customarily included in our reports and are developed by scientists, engineers or geologists based on their interpretation of field logs (assembled by field personnel) and laboratory evaluation of field samples. These logs etc. should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

Geoenvironmental concerns are not at issue

Your report is not likely to relate any findings, conclusions, or recommendations about the potential for hazardous materials existing at the site unless specifically required to do so by the client. Specialist equipment, techniques, and personnel are used to perform a geoenvironmental assessment. Contamination can create major health, safety and environmental risks. If you have no information about the potential for your site to be contaminated or create an environmental hazard, you are advised to contact Coffey for information relating to geoenvironmental issues.

Rely on Coffey for additional assistance

Coffey is familiar with a variety of techniques and approaches that can be used to help reduce risks for all parties to a project, from design to construction. It is common that not all approaches will be necessarily dealt with in your site assessment report due to concepts proposed at that time. As the project progresses through design towards construction, speak with Coffey to develop alternative approaches to problems that may be of genuine benefit both in time and cost.

Responsibility

Reporting relies on interpretation of factual information based on judgement and opinion and has a level of uncertainty attached to it, which is far less exact than the design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. To help prevent this problem, a number of clauses have been developed for use in contracts, reports and other documents. Responsibility clauses do not transfer appropriate liabilities from Coffey to other parties but are included to identify where Coffey's responsibilities begin and end. Their use is intended to help all parties involved to recognise their individual responsibilities. Read all documents from Coffey closely and do not hesitate to ask any questions you may have.

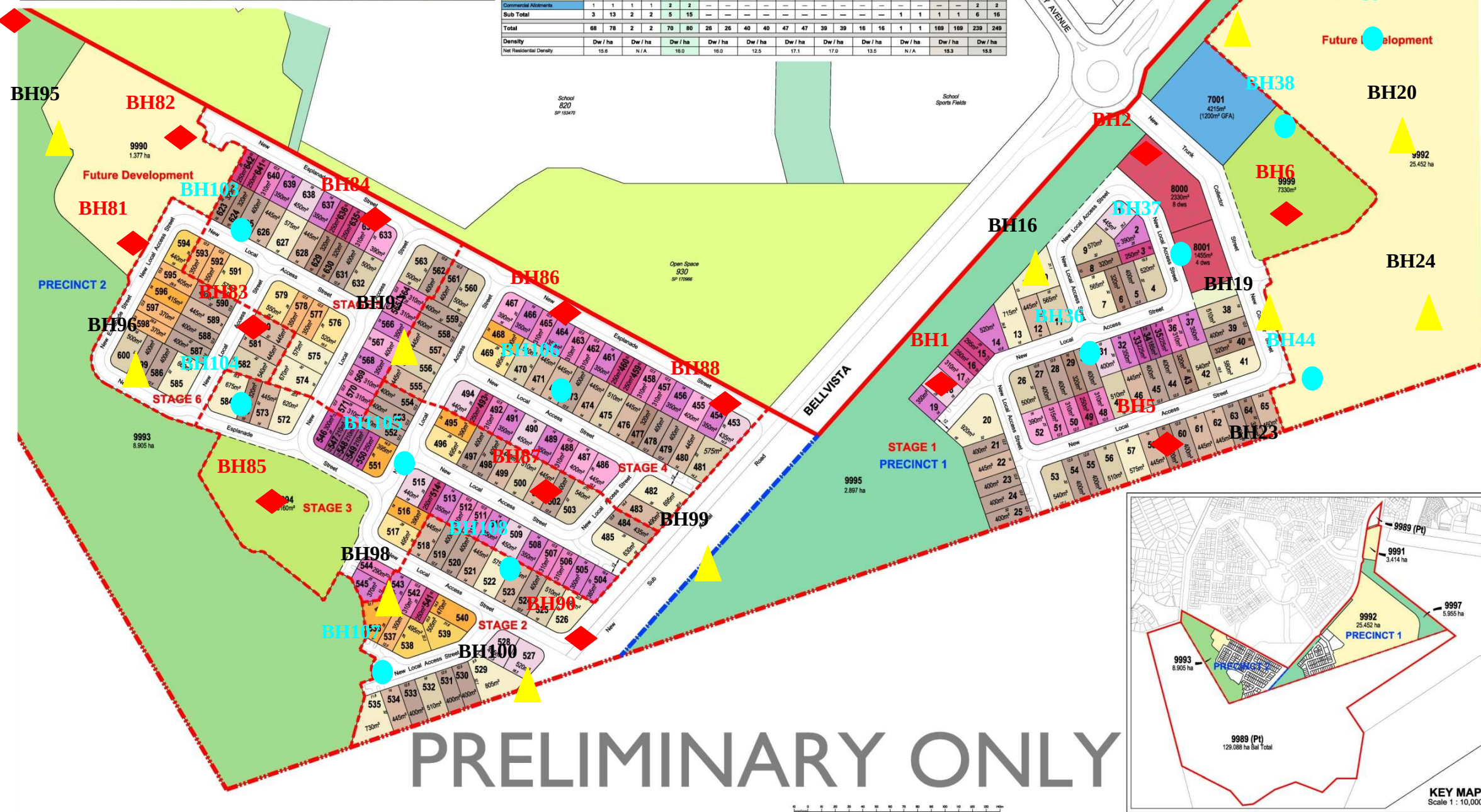
* For further information on this aspect reference should be made to "Guidelines for the Provision of Geotechnical information in Construction Contracts" published by the Institution of Engineers Australia, National headquarters, Canberra, 1987.

Figures

LAND USE BUDGET - APPLICATION 1												
Land Use	Stage 1	Balance	Sub Total	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Balance	Sub Total	Total Site	
Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	
Area of Subject Site	9.393	10.282	10.282	2.807	3.191	2.743	2.295	1.194	33.832	45.852	65.527	
Balance	9.393	10.282	2.716	2.807	3.191	2.743	2.295	1.194	33.832	45.852	65.527	
Single Family Allotments	2.716	—	2.716	1.212	1.989	1.989	1.908	0.719	—	6.899	9.806	
Medium Density Allotments	0.379	—	0.379	—	—	—	—	—	—	—	0.379	
Commercial Site	0.422	—	0.422	—	—	—	—	—	—	—	0.422	
Super Allotments	—	1.377	1.377	—	—	—	—	—	27.876	27.876	29.253	
Total Area of Allotments	3.517	1.377	4.894	1.212	1.989	1.989	1.908	0.719	27.876	34.766	39.860	
Subtotal	—	—	—	—	—	—	—	—	—	—	—	
Road	—	—	—	0.967	—	—	—	—	0.967	0.967	0.967	
Sub Arterial Road	—	—	—	—	—	—	—	—	—	—	—	
Collector Street	0.489	—	0.489	—	—	—	—	—	—	—	0.489	
Local Access Street	1.132	—	1.132	0.408	0.806	0.803	0.786	0.474	—	3.327	4.440	
Pedestrian Connections/Thresholds	0.038	—	0.038	—	—	—	—	—	—	—	0.038	
Total Area of New Road	1.645	—	1.645	1.395	0.806	0.803	0.786	0.474	—	4.314	5.309	
Open Space	—	—	—	—	—	—	—	—	—	—	—	
Active Park	0.733	—	0.733	—	0.816	—	—	—	—	0.816	1.549	
Passive Open Space	—	8.905	8.905	—	—	—	—	—	—	8.905	8.905	
Stormwater Conveyance	3.498	—	3.498	—	—	—	—	—	5.506	5.506	9.454	
Total Open Space	4.231	8.905	13.136	—	0.816	—	—	—	5.506	6.772	19.900	
Street Type	Length (m)	Length (m)	Length (m)	Length (m)	Length (m)	Length (m)	Length (m)	Length (m)	Length (m)	Length (m)	Length (m)	
Shared Access Driveway	82	—	82	30	57	34	—	—	—	121	261	
Esplanade Street	188	—	188	292	212	212	—	—	—	892	892	
Local Access Street	630	—	630	226	291	292	198	—	—	1298	1988	
Collector Street	73	—	73	—	—	—	—	—	—	—	73	
Trunk Collector Street	187	—	187	—	—	—	—	—	—	—	187	
Sub Arterial Road	—	—	—	247	—	—	—	—	—	247	247	
Total Length of New Road	952	—	952	503	533	569	504	519	—	2428	3380	

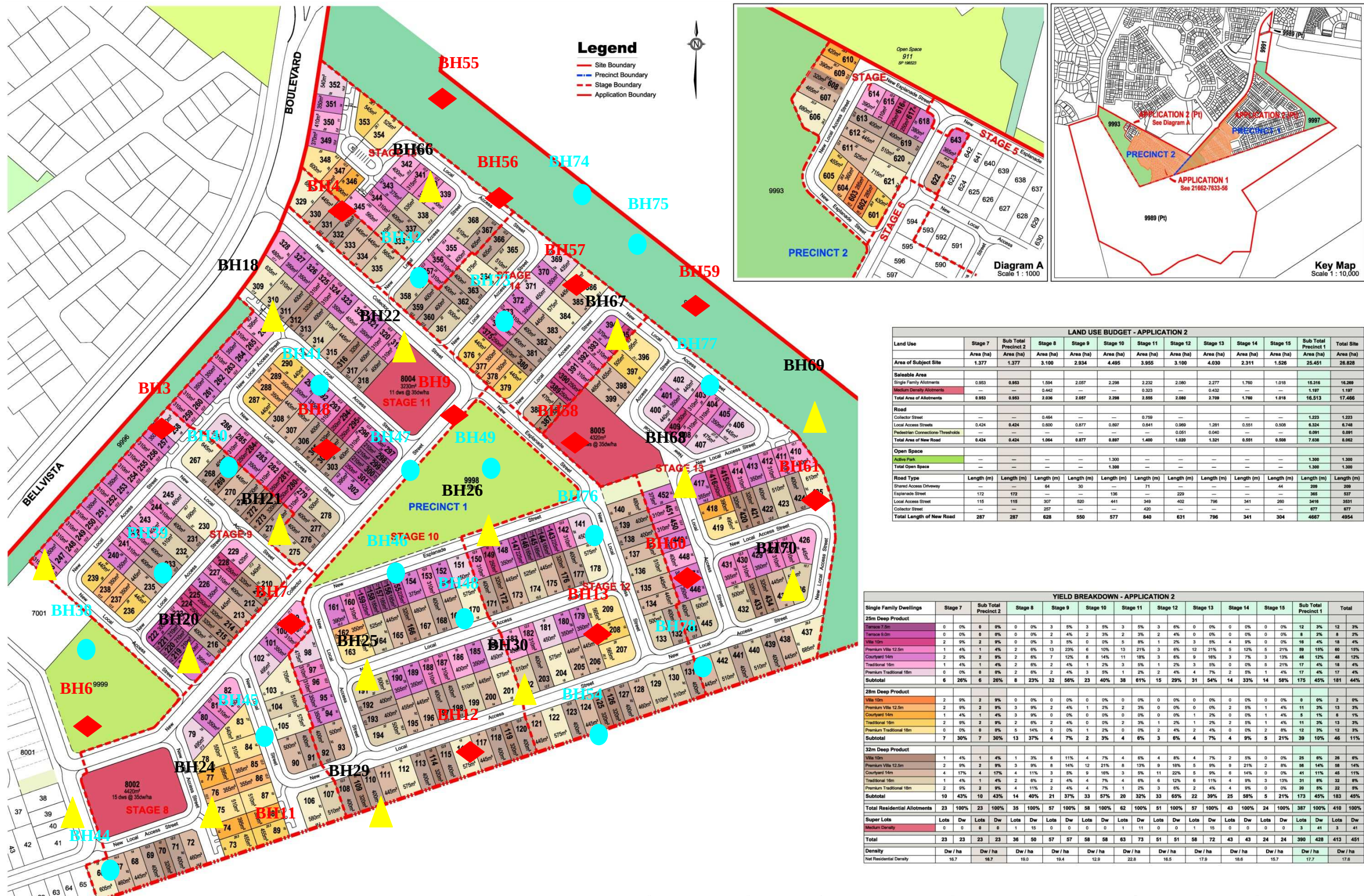
YIELD BREAKDOWN - APPLICATION 1												
Single Family Dwellings	Stage 1	Balance	Sub Total	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Balance	Sub Total	Total	
Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	
25m Deep Product	1	2%	—	1	3%	—	0%	3	8%	—	0%	—
Terrace 7.5m	2	3%	—	2	3%	—	0%	2	5%	—	0%	—
Terrace 8.0m	4	6%	—	4	6%	—	0%	4	10%	—	0%	—
Villa 10m	5	8%	—	5	8%	—	0%	5	13%	—	0%	—
Premium Villa 12.5m	6	8%	—	6	8%	—	0%	6	10%	—	0%	—
Courtyard 14m	1	2%	—	1	3%	—	0%	4	9%	—	0%	—
Traditional 16m	3	6%	—	3	6%	—	0%	3	6%	—	0%	—
Premium Traditional 18m	2	3%	—	2	3%	—	0%	2	5%	—	0%	—
Subtotal	21	32%	—	21	32%	—	0%	24	51%	—	0%	—
28m Deep Product	—	0%	—	—	0%	—	0%	—	0%	—	0%	—
Villa 10m	—	0%	—	—	0%	—	0%	—	0%	—	0%	—
Premium Villa 12.5m	—	0%	—	—	0%	—	0%	—	0%	—	0%	—
Courtyard 14m	—	0%	—	—	0%	—	0%	—	0%	—	0%	—
Traditional 16m	—	0%	—	—	0%	—	0%	—	0%	—	0%	—
Premium Traditional 18m	—	0%	—	—	0%	—	0%	—	0%	—	0%	—
Subtotal	—	0%	—	—	0%	—	0%	—	0%	—	0%	—
32m Deep Product	7	11%	—	7	11%	—	0%	1	3%	—	0%	—
Villa 10m	15	23%	—	15	23%	—	0%	15	33%	—	0%	—
Premium Villa 12.5m	7	11%	—	7	11%	—	0%	7	15%	—	0%	—
Courtyard 14m	9	14%	—	9	14%	—	0%	9	20%	—	0%	—
Traditional 16m	6	9%	—	6	9%	—	0%	6	13%	—	0%	—
Premium Traditional 18m	4	6%	—	4	6%	—	0%	4	9%	—	0%	—
Subtotal	44	69%	—	44	69%	—	0%	44	99%	—	0%	—
Total Residential Allotments	65	100%	—	65	100%	—	0%	68	100%	—	0%	—
Super Lots	—	—	—	—	—	—	—	—	—	—	—	—
Medium Density	—	—	—	—	—	—	—	—	—	—	—	—
Balance Super Allotment	—	—	—	—	—	—	—	—	—	—	—	—
Commercial Allotments	1	1	1	1	1	1	1	1	1	1	1	1
Sub Total	3	13	2	2	5	15	—	—	1	1	1	1
Total	68	78	2	2	70	80	26	40	40	47	47	39
Density	Dw / ha	Dw / ha	Dw / ha	Dw / ha	Dw / ha	Dw / ha	Dw / ha	Dw / ha	Dw / ha	Dw / ha	Dw / ha	Dw / ha
Net Residential Density	15.6	N/A	16.0	16.0	12.5	17.1	17.0	13.5	N/A	15.3	15.8	

BH80

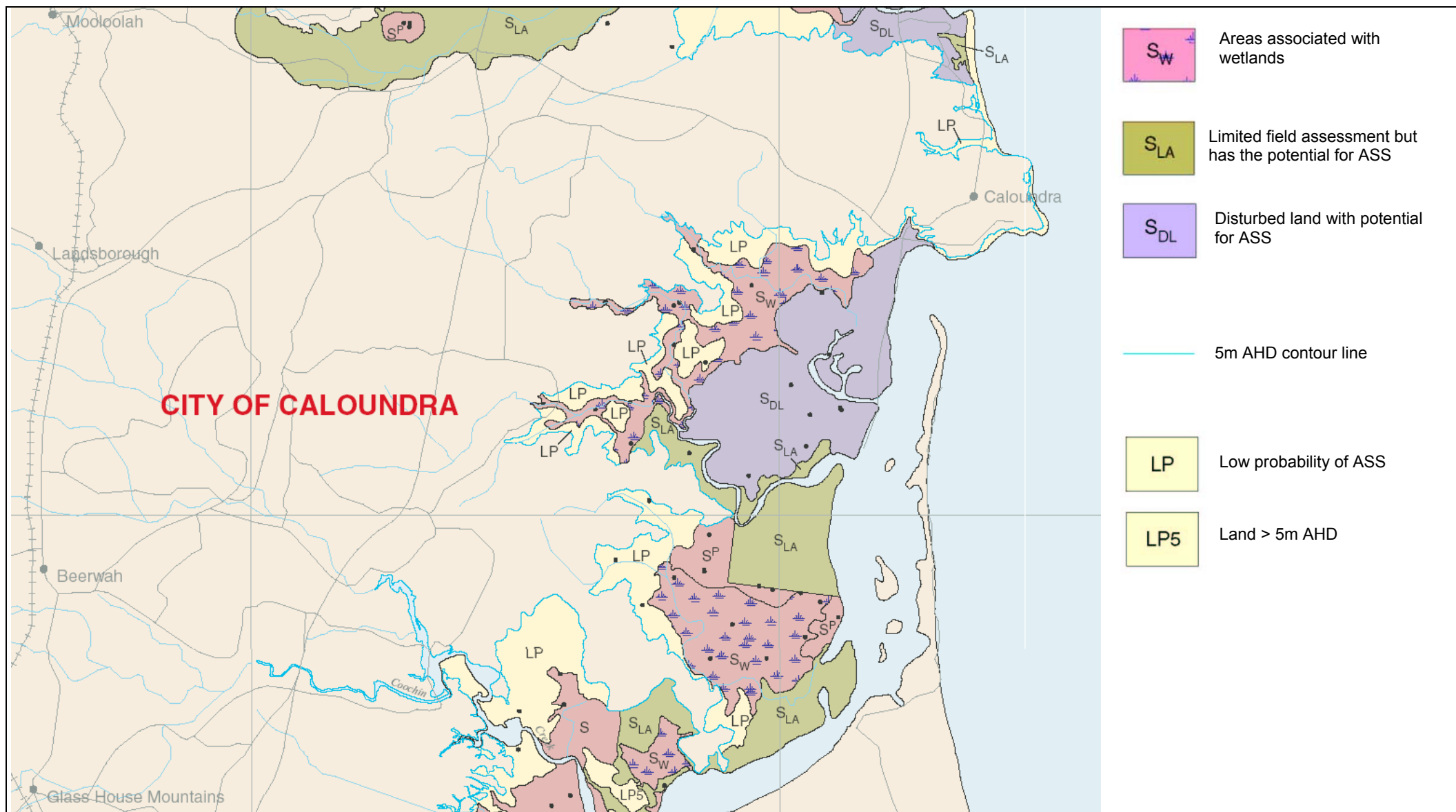


PRELIMINARY ONLY

revision	description	drawn	approved	date	BH drilled to 6m ASS to 3m BH drilled to 4m ASS to 4m BH drilled to 3m ASS to 3m ASS samples taken at 0.25m	drawn	RY	coffey geotechnics SPECIALISTS MANAGING THE EARTH	client: BROWN CONSULTING (QLD) PTY LTD	
	DCP testing to 1.5m in all BH locations					approved	AC		project: BELLVISTA 2	
	4 CBR subgrade samples					date	29-11-2010		title: PRECINCT 1 & 2 BOREHOLE LOCATIONS	
	2 Emerson in topsoil and 6 Emerson in subsoil					scale	NTS		project no: GEOTKPAR01560AA	
	4 soil samples (1kg) at varying depths up to 2m					original size	A3		figure no: FIGURE 1	



revision	description	drawn	approved	date	BH drilled to 6m ASS to 3m BH drilled to 4m ASS to 4m BH drilled to 3m ASS to 3m ASS samples taken at 0.25m	drawn	RY	coffey geotechnics SPECIALISTS MANAGING THE EARTH	client:	BROWN CONSULTING (QLD) PTY LTD	
	DCP testing to 1.5m in all BH locations					approved	AC		project:	BELLVISTA 2	
	4 CBR subgrade samples					date	29-11-2010		title:	PRECINCT 1 BOREHOLE LOCATIONS	
	2 Emerson in topsoil and 6 Emerson in subsoil					scale	NTS		project no:	GEOTKPAR01560AA	figure no: FIGURE 1
	4 soil samples (1kg) at varying depths up to 2m					original size	A3				



drawn	RY
approved	RM
date	30/06/09
scale	NTS
original size	A4

coffey
geotechnics
SPECIALISTS MANAGING
THE EARTH

client:	BROWN CONSULTING (QLD) PTY LTD	
project:	BELLVISTA STAGE 2 BELLVISTA BOULEVARD, CALOUNDRA GEOTECHNICAL INVESTIGATION	
title:	ACID SULFATE SOILS HAZARD MAP	
project no:	GEOTKPAR01560AA	figure no: FIGURE 2

Appendix A

Borehole Logs and Explanation Sheets

Borehole No. **BH2**

Engineering Log - Borehole

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **1.5.2009**

Principal:

Date completed: **1.5.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509232.017 slope: -90° R.L. Surface: 40.28
hole diameter: 100 mm Northing 7035296.399 bearing: datum: GDA94

drilling information						material substance											
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa			structure and additional observations
	1	2	3											100	200	300	
ADT				N	ASS	40			SM	SILTY SAND: fine to medium grained, dark grey, trace of organics.	M	L					DIST PP=140kPa
							SM	SILTY SAND: fine to medium grained, dark grey.									
							SP	SAND: fine to medium grained, grey, trace of silt.	M/W								
						1	SP	SAND: fine to coarse grained, pale grey.	W	L/MD							
						2	CL	SANDY CLAY: medium plasticity, orange/red and pale grey, fine to coarse grained sand, trace of gravel.	M	St		X					
						3	CH	SANDY CLAY: high plasticity, red and pale grey, fine to medium grained sand.									
										VSt		X		DIST PP=220kPa			
					</												

method AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool HA hand auger DT diatube B blank bit V V bit T TC bit *bit shown by suffix e.g. ADT	support M mud N nil C casing penetration 1 2 3 4  no resistance ranging to refusal water  10/1/98 water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Borehole No. **BH3**

Engineering Log - Borehole

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **18.4.2009**

Principal:

Date completed: **18.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509425.371 slope: -90° R.L. Surface: 5.683
hole diameter: 100 mm Northing 7035521.319 bearing: datum: GDA94

drilling information					material substance									
method	penetration	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa	structure and additional observations	
ADT	1 2 3	N						SC	CLAYEY SAND: fine to medium grained, pale brown, low plasticity fines.	M	MD		FILL	
								SM	SILTY SAND: fine to medium grained, dark grey, trace of organics.				NATURAL	
						5		SP	SAND: fine to medium grained, grey/brown, trace of silt and clay.					
						1		CH	SANDY CLAY: high plasticity, pale brown/orange and pale grey, fine to medium grained sand.		St	X	DIST PP=180kPa	
						4			...colour changing to pale grey.		VSt	X	DIST PP=240kPa	
						2						X	DIST PP=200kPa	
						3						X	DIST PP=250kPa	
						3						X	DIST PP=340kPa	
						2								
						4		CH	SANDY CLAY: high plasticity, pale grey, fine to coarse grained sand.			X	DIST PP=350kPa	
						1								
						5								
						0		SC	CLAYEY SAND: fine to coarse grained, pale grey, medium plasticity fines.		D			
						6			Borehole BH3 terminated at 6m				LIMIT OF INVESTIGATION	
						-1								
						7								
						-2								
						8								

method	support	notes, samples, tests	classification symbols and soil description	consistency/density index
AS AD RR W CT HA DT B V T *bit shown by suffix e.g. ADT	M mud C casing penetration 1 2 3 4 no resistance ranging to refusal water 10/1/98 water level on date shown water inflow water outflow	U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal	based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

Borehole No. **BH4**

Engineering Log - Borehole

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **18.4.2009**

Principal:

Date completed: **18.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509573.345 slope: -90° R.L. Surface: 6.686
hole diameter: 100 mm Northing 7035673.856 bearing: datum: GDA94

drilling information					material substance				
method	penetration	support	water	notes samples, tests, etc	depth metres	graphic log	classification symbol	material	structure and additional observations
ADT	1 2 3	N					SM	SILTY SAND: fine to medium grained, dark grey, trace of organics.	
					6		SP	SAND: fine to medium grained, grey.	
					1			...colour changing to dark brown.	
							SP	SAND: fine to medium grained, brown, with silt and trace of gravel.	
					5		CH	SANDY CLAY: medium to high plasticity, pale brown/orange and pale grey, fine to medium grained sand.	DIST PP=100kPa
					2			...colour changing to pale grey.	DIST PP=220kPa
					4				
					3				
					3				
					4				DIST PP=400kPa
					2				
					5				DIST PP=240kPa
							CL	SANDY CLAY: medium plasticity, pale grey, fine to coarse grained sand, trace of gravel.	
					1		CH	SANDY CLAY: high plasticity, pale grey, fine to medium grained sand.	DIST PP=200kPa
					6				DIST PP=200kPa
								Borehole BH4 terminated at 6m	LIMIT OF INVESTIGATION
					0				
					7				
					-1				
					8				

method	support	notes, samples, tests	classification symbols and soil description	consistency/density index
AS AD RR W CT HA DT B V T	M mud C casing penetration 1 2 3 4 water 10/1/98 water level on date shown water inflow water outflow	U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal	based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

Borehole No. **BH5**

Engineering Log - Borehole

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **1.5.2009**

Principal:

Date completed: **1.5.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509257.586 slope: -90° R.L. Surface: 2.941
hole diameter: 100 mm Northing 7035081.794 bearing: datum: GDA94

drilling information						material substance									
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa	structure and additional observations
	1	2	3												
ADT				N								M	L		
										SM	SILTY SAND: fine to medium grained, dark grey, trace of organics.				
										SP	SAND: fine to medium grained, grey, trace of silt.				
										SP	SAND: fine to medium grained, pale grey. ...colour changing to pale grey and brown. ...colour changing to dark brown.	M/W	D/VD		
										SC	CLAYEY SAND: fine to medium grained, dark brown, low plasticity fines. ...colour changing to pale grey.	W	MD		
										CH	SANDY CLAY: medium to high plasticity, pale grey, fine to medium grained sand.	M	VSt	X	DIST PP=220KPa
														X	DIST PP=240kPa
														X	DIST PP=280kPa
										CH	SANDY CLAY: high plasticity, pale grey/orange and red, fine to medium grained sand, trace of gravel.			X	DIST PP=250kPa
											Borehole BH5 terminated at 6m				LIMIT OF INVESTIGATION

method AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool HA hand auger DT diatube B blank bit V V bit T TC bit *bit shown by suffix e.g. ADT	support M mud C casing penetration 1 2 3 4 no resistance ranging to refusal water 10/1/98 water level on date shown water inflow water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Borehole No. **BH6**

Sheet 1 of 1

Project No: **GEOTKPAR01560AA**

Date started: **1.5.2009**

Date completed: **1.5.2009**

Logged by: **DF**

Checked by:

Engineering Log - Borehole

Client: **BROWN CONSULTING (QLD) PTY LTD**

Principal:

Project: **BELLVISTA 2**

Borehole Location: **REFER TO SITE PLAN**

drill model and mounting: EDSON CPI Easting: 509369.352 slope: -90° R.L. Surface: 4.099
hole diameter: 100 mm Northing 7035242.058 bearing: datum: GDA94

drilling information						material substance									
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa	structure and additional observations
	1	2	3												
ADT				N			-4			SM	SILTY SAND: fine to medium grained, dark grey, trace of organics and clay.	M	L		
										SC	CLAYEY SAND: fine to medium grained, dark grey, medium plasticity fines.				
					D										
							-3	1		SP	SAND: fine to medium grained, grey, with clay fines.	W			
										SP	SAND: fine to medium grained, pale grey.		MD		
													D		
							-2	2		SC	CLAYEY SAND: fine to medium grained, pale grey, medium plasticity fines.	M	VD		
										SC	CLAYEY SAND: fine to coarse grained, brown and grey, low plasticity fines.		D		
										SC	CLAYEY SAND: fine to medium grained, pale brown and grey, low plasticity fines.		MD		
					ASS		-1	3		CH	SANDY CLAY: medium to high plasticity, pale grey and orange, fine to medium grained sand. ...high plasticity.		St		
													VSt		
							-0	4			...colour changing to pale grey and red.				
							-1	5							
							-2	6							
							-2				Borehole BH6 terminated at 6m				LIMIT OF INVESTIGATION
							-3	7							
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method
AS auger screwing*
AD auger drilling*
RR roller/tricone
W washbore
CT cable tool
HA hand auger
DT diatube
B blank bit
V V bit
T TC bit
*bit shown by suffix
e.g. ADT

support
M mud
C casing
penetration
1 2 3 4
no resistance ranging to refusal
water
10/1/98 water level on date shown
water inflow
water outflow

notes, samples, tests
U₅₀ undisturbed sample 50mm diameter
U₆₃ undisturbed sample 63mm diameter
D disturbed sample
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
V vane shear (kPa)
P pressuremeter
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description
based on unified classification system
moisture
D dry
M moist
W wet
Wp plastic limit
WL liquid limit

consistency/density index
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

Borehole No. **BH7**

Engineering Log - Borehole

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **26.4.2009**

Principal:

Date completed: **26.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509511.686 slope: -90° R.L. Surface: 4.749
hole diameter: 100 mm Northing 7035329.518 bearing: datum: GDA94

drilling information				material substance									
method	penetration	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- kPa	structure and additional observations
ADT	1 2 3	N						SM	SILTY SAND* fine to medium grained, dark grey, trace of organics.	M	L		
						4		SP	SAND: fine to medium grained, grey, trace of silt.				
						1			...with gravel.	W	MD		
						3		SC	SILTY CLAYEY SAND: fine to medium grained, pale brown and grey, low plasticity fines.	M	MD/D		
						2		SP	SAND: fine to medium grained, dark brown, trace of silt.		VD		
						2		CH	SANDY CLAY: medium to high plasticity, pale grey/brown, fine to medium grained sand.		VSt		
						3							
						1							DIST PP=250kPa
						4			...fine to coarse grained sand, trace of gravel.				
						5							DIST PP=280kPa
						6		SC	CLAYEY SAND: fine to coarse grained, pale grey/brown, low plasticity fines.	W	D		
						-1							
						-2			Borehole BH7 terminated at 6m				LIMIT OF INVESTIGATION
						-3							
						-4							
						-5							
						-6							
						-7							
						-8							

method	support	notes, samples, tests	classification symbols and soil description	consistency/density index
AS AD RR W CT HA DT B V T *bit shown by suffix e.g. ADT	M mud C casing penetration 1 2 3 4 no resistance ranging to refusal water 10/1/98 water level on date shown water inflow water outflow	U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal	based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

Borehole No. **BH8**

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Engineering Log - Borehole

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **21.4.2009**

Principal:

Date completed: **21.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509564.073 slope: -90° R.L. Surface: 5.018
hole diameter: 100 mm Northing 7035499.905 bearing: datum: GDA94

drilling information					material substance									
method	penetration	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- kPa	meter	structure and additional observations
ADT	1 2 3	N		D		1		SM	SILTY SAND: fine to medium grained, dark grey, trace or organics.	M	MD			DIST PP=200kPa
					4	1		SP	SAND: fine to medium grained, grey. ...trace of clay.	M/W	D			
					3	2		CH	SANDY CLAY: medium to high plasticity, pale grey, fine to medium grained sand.	M	St	X		
				ASS		3		SC	CLAYEY SAND: fine to medium grained, pale grey, low plasticity fines. ...fine to coarse grained, colour changing to pale grey and pale brown.	W	MD			DIST PP=150kPa
					2	3		CH	SANDY CLAY: medium to high plasticity, pale grey and orange, fine to medium grained sand.	M	St	X		
					1	4		CL	SANDY CLAY: medium plasticity, pale grey, fine to coarse grained sand.			X		DIST PP=160kPa
					0	5								
					-1	6			Borehole BH8 terminated at 6m					LIMIT OF INVESTIGATION
					-2	7								
						8								

method AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool HA hand auger DT diatube B blank bit V V bit T TC bit *bit shown by suffix e.g. ADT	support M mud C casing penetration 1 2 3 4  no resistance ranging to refusal water  10/1/98 water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Borehole No. **BH9**

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Engineering Log - Borehole

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **1.5.2009**

Principal:

Date completed: **1.5.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 508688.458 slope: -90° R.L. Surface: 4.859
hole diameter: 100 mm Northing 7035509.614 bearing: datum: GDA94

drilling information						material substance									
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa	structure and additional observations
	1	2	3												
ADT				N						SM	SILTY SAND: fine to medium grained, dark grey, trace of organics.	M	L		
							4	1		SP	SAND: fine to medium grained, grey, trace of silt.	M/W			
										CL	SANDY CLAY: medium plasticity, grey, fine to medium grained sand.	M	St		
								2		SP	SAND: fine to medium grained, pale grey.	W	MD		
										CL	SANDY CLAY: medium plasticity, pale grey, fine to medium grained sand.		St		
										SP	SAND: fine to medium grained, pale grey.		MD		
						ASS	2	3		CH	SANDY CLAY: medium to high plasticity, pale grey and orange, fine to medium grained sand.	M	VSt	X	DIST PP=220kPa
										SC	CLAYEY SAND: fine to medium grained, pale grey, medium plasticity fines.	W	MD		
							1	4		CH	SANDY CLAY: medium to high plasticity, pale grey, fine to medium grained sand.	M	St	X	DIST PP=150kPa
							0	5						X	DIST PP=190kPa
							-1	6						X	DIST PP=200kPa
											Borehole BH9 terminated at 6m				DIST PP=200kPa LIMIT OF INVESTIGATION
							-2	7							
							-3	8							

method	support	notes, samples, tests	classification symbols and soil description	consistency/density index
AS AD RR W CT HA DT B V T *bit shown by suffix e.g. ADT	M mud C casing penetration 1 2 3 4  no resistance ranging to refusal water 10/1/98 water level on date shown water inflow water outflow	U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal	based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

Engineering Log - Borehole

Borehole No. **BH10**

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **24.4.2009**

Principal:

Date completed: **24.4.2009**Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting:				EDSON CPI		Easting: 509347.645		slope: -90°		R.L. Surface: 2.135					
hole diameter:				100 mm		Northing: 7034935.693		bearing:		datum: GDA94					
drilling information						material substance									
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material	moisture condition	consistency/ density index	pocket penetro- meter kPa	structure and additional observations
	1	2	3												
ADT			N		ASS	2				SM	SILTY SAND: fine to medium grained, dark grey, trace of organics.	M	L		DIST PP=220kPa
										SP	SAND: fine to medium grained, grey.				
										SP	SAND: fine to medium grained, grey and brown, trace of clay fines.	M/W			
										SC	CLAYEY SAND: fine to medium grained, pale grey and brown, low plasticity fines.	M	MD		
										SC	CLAYEY SAND: fine to medium grained, pale grey and orange, medium plasticity fines.				
										CH	SILTY CLAY: high plasticity, pale grey and orange, with fine grained sand.		VSt		
										CH	SANDY CLAY: high plasticity, pale grey, fine to medium grained sand.				
										CH	...colour changing to pale grey and red.				
										CH					
										CH					
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Engineering Log - Borehole

Borehole No. **BH11**

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **24.4.2009**

Principal:

Date completed: **24.4.2009**Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI						Easting: 509495.374		slope: -90°		R.L. Surface: 3.650														
hole diameter: 100 mm						Northing: 7035133.363		bearing:		datum: GDA94														
drilling information						material substance																		
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa	structure and additional observations									
	1	2	3																					
ADT				N		ASS	-3	1		SM	SILTY SAND: fine to medium grained, grey, trace of organics.	M	L		DIST PP=250kPa									
										SP	SAND: fine to medium grained, pale grey.													
										SP	SAND: fine to medium grained, brown, trace of fine grained gravel.	D/M	VD											
										SP	SAND: fine to medium grained, pale brown/orange. ...colour changing to pale brown.	M	D											
										SC	CLAYEY SAND: fine to medium grained, pale brown/orange and pale grey, medium plasticity fines.	M												
										CH	SANDY CLAY: high plasticity, pale grey and orange, fine grained sand. ...medium to high plasticity, pale grey and red, fine to medium grained sand. ...fine to coarse grained sand.		VSt			X	DIST PP=300kPa							

Borehole No. **BH12**

Engineering Log - Borehole

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **26.4.2009**

Principal:

Date completed: **26.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509628.73 slope: -90° R.L. Surface: 3.672
hole diameter: 100 mm Northing 7035225.86 bearing: datum: GDA94

drilling information						material substance												
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter				structure and additional observations
	1	2	3											100 kPa	200 kPa	300 kPa	400 meter	
ADT																		

method AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool HA hand auger DT diatube B blank bit V V bit T TC bit *bit shown by suffix e.g. ADT	support M mud C casing penetration 1 2 3 4  no resistance ranging to refusal water  10/1/98 water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Borehole No. **BH14**

Engineering Log - Borehole

Client: **BROWN CONSULTING (QLD) PTY LTD**

Principal:

Project: **BELLVISTA 2**

Borehole Location: **REFER TO SITE PLAN**

Sheet 1 of 1

Project No: **GEOTKPAR01560AA**Date started: **24.4.2009**Date completed: **24.4.2009**

Logged by: **DF**

Checked by:

drill model and mounting:				EDSON CPI				Easting: 509565.138				slope: -90°				R.L. Surface: 2.787														
hole diameter:				100 mm				Northing: 7035049.18				bearing:				datum: GDA94														
drilling information										material substance																				
method		penetration			support		water		notes samples, tests, etc		RL		depth metres		graphic log		classification symbol		material				moisture condition		consistency/ density index		pocket penetro- meter		structure and additional observations	
1 2 3																			soil type: plasticity or particle characteristics, colour, secondary and minor components.								100 200 300 400			
ADT					N														SILTY SAND: fine to medium grained, dark grey, trace of organics.				M		L					
																			SAND: fine to medium grained, grey.						L/MD					
																			SAND: fine to medium grained, grey, trace of silt.				D		VD					
																			SAND: fine to medium grained, dark brown, with silt.				M/W		MD					
																			CLAYEY SAND: fine to medium grained, brown, medium plasticity fines.				W							
																			SANDY CLAY: medium to high plasticity, pale grey, fine to medium grained sand.				M		St		X		DIST PP=160kPa	
																									VSt		X		DIST PP=250kPa	
																			...fine to coarse grained sand and trace of fine grained gravel.								X		DIST PP=300kPa	
																			SANDY SILTY CLAY: high plasticity, red and pale grey, fine to medium grained sand.								X		DIST PP=280kPa	
																			Borehole BH14 terminated at 6m										LIMIT OF INVESTIGATION	
</																														

Borehole No. **BH15**

Engineering Log - Borehole

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **26.4.2009**

Principal:

Date completed: **26.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509730.812 slope: -90° R.L. Surface: 2.543
hole diameter: 100 mm Northing 7035153.4 bearing: datum: GDA94

drilling information						material substance																	
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa			structure and additional observations						
	1	2	3											100	200	300		400					
ADT				N								M	L										
							2			SP	SAND: fine to medium grained, grey, trace of silt.		L/MD										
							1			SP	SAND: fine to medium grained, dark brown, trace of silt.		MD										
										CH	SANDY CLAY: high plasticity, pale grey and pale brown/orange, fine to medium grained sand.		VSt			X	DIST PP=210kPa						
							2																
																X	DIST PP=300kPa						
							0																
										CH	SANDY CLAY: medium to high plasticity, pale grey, fine to coarse grained sand.		St			X	DIST PP=150kPa						
							3																
							-1																
							4																
							-2									X	DIST PP=200kPa						
							5																
							-3			CH	SANDY CLAY: high plasticity, pale grey/orange and red, fine to coarse grained sand.					X	DIST PP=160kPa						
							6																
											Borehole BH15 terminated at 6m							LIMIT OF INVESTIGATION					
							-4																
							7																
							-5																
							8																
method AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool HA hand auger DT diatube B blank bit V V bit T TC bit *bit shown by suffix e.g. ADT						support M mud N nil C casing penetration 1 2 3 4  no resistance ranging to refusal water  10/1/98 water level on date shown  water inflow  water outflow						notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal						classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit			consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense		

Borehole No. **BH16**

Engineering Log - Borehole

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **1.5.2009**

Principal:

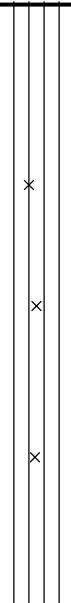
Date completed: **1.5.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI				Easting: 509152.052		slope: -90°		R.L. Surface: 3.124																					
hole diameter: 100 mm				Northing 7035206.822		bearing:		datum: GDA94																					
drilling information						material substance																							
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa	structure and additional observations														
	1	2	3																										
ADT			N	NONE OBSERVED		-3		SM	SILTY SAND: fine to medium grained, dark grey, trace of organics.	M/W	L																		
						SP		SAND: fine to medium grained, grey, trace of silt.	M/W	SEEPAGE																			
						CL		SANDY CLAY: medium plasticity, orange and pale grey, fine to medium grained sand.	M	St	DIST PP=200kPa																		
						CH		SANDY CLAY: high plasticity, orange and pale grey, fine to medium grained sand.																					
						CH		SANDY SILTY CLAY: high plasticity, pale grey, fine grained sand.																					
				D	-2	1				St/VSt	X	DIST PP=250kPa																	
				ASS	-1	2					X	DIST PP=240kPa																	
					0	3						X	DIST PP=240kPa																
					4	4								LIMIT OF INVESTIGATION															
					-1																								
					-2	5																							
					-3	6																							
					-4	7																							
						8																							
method AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool HA hand auger DT diatube B blank bit V V bit T TC bit *bit shown by suffix e.g. ADT						support M mud N nil C casing penetration 1 2 3 4  no resistance ranging to refusal water  10/1/98 water level on date shown  water inflow  water outflow						notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal						classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit						consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense					

Borehole No. **BH17**

Engineering Log - Borehole

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **18.4.2009**

Principal:

Date completed: **18.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI				Easting: 509321.925				slope: -90°				R.L. Surface: 6.130																	
hole diameter: 100 mm				Northing 7035385.16				bearing:				datum: GDA94																	
drilling information								material substance																					
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetrometer				structure and additional observations											
	1	2	3											100 kPa	200 kPa	300 kPa	400 kPa												
ADT				N			6			CH	SANDY CLAY: medium to high plasticity, pale brown/orange and red, fine to medium grained sand, trace of gravel.	M	St	X				FILL DIST PP=150kPa											
										SM	SILTY SAND: fine to medium grained, dark grey, trace of organics.		MD					NATURAL											
							5	1		SP	SAND: fine to medium grained, brown, trace of silt.																		
										SC	CLAYEY SAND: fine to medium grained, pale brown, low plasticity fines, trace of gravel.	M/W																	
							4	2		CH	SANDY CLAY: medium to high plasticity, orange/red and pale grey, fine to medium grained sand, trace of gravel.	M	St	X				DIST PP=140kPa											
														X				DIST PP=150kPa											
							3	3			...medium plasticity, colour changing to red and pale grey.		VSt	X				DIST PP=220kPa											
							4																						
							2				Borehole BH17 terminated at 4m							LIMIT OF INVESTIGATION											
								5																					
							1																						
								6																					
							0																						
								7																					
							-1																						
								8																					
method AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool HA hand auger DT diatube B blank bit V V bit T TC bit *bit shown by suffix e.g. ADT						support M mud N nil C casing penetration 1 2 3 4  no resistance ranging to refusal water  10/1/98 water level on date shown  water inflow  water outflow						notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal						classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit						consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense					

Borehole No. **BH18**

Engineering Log - Borehole

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **18.4.2009**

Principal:

Date completed: **18.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509520.833 slope: -90° R.L. Surface: 6.418
hole diameter: 100 mm Northing 7035613.057 bearing: datum: GDA94

drilling information						material substance									
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa	structure and additional observations
	1	2	3												
ADT				N								M	MD		
							6			SM	SILTY SAND: fine to medium grained, dark brown, trace of organics.				
										SP	SAND: fine to medium grained, grey/brown.		L		
										SP	SAND: fine to medium grained, pale brown, trace of clay fines.	W			
							1			SC	CLAYEY SAND: fine to medium grained, pale brown and orange, low plasticity fines.		L/MD		
							5			CH	SANDY CLAY: medium to high plasticity, orange/red and pale grey, fine to medium grained sand.	M	St	X	DIST PP=160kPa
					ASS		2			SC	CLAYEY SAND: fine to medium grained, pale grey and pale brown/orange, low plasticity fines.	M/W	MD		
							4			CH	SANDY CLAY: high plasticity, pale grey, fine to medium grained sand. ...medium to high plasticity.	M	VSt	X	DIST PP=220kPa
							3						St	X	DIST PP=140kPa
							3								
							4								
											Borehole BH18 terminated at 4m				LIMIT OF INVESTIGATION
							2								
							5								
							1								
							6								
							0								
							7								
							-1								
							8								

method AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool HA hand auger DT diatube B blank bit V V bit T TC bit *bit shown by suffix e.g. ADT	support M mud C casing penetration 1 2 3 4 no resistance ranging to refusal water 10/1/98 water level on date shown water inflow water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Borehole No. **BH19**

Engineering Log - Borehole

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **1.5.2009**

Principal:

Date completed: **1.5.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509311.852 slope: -90° R.L. Surface: 3.410
hole diameter: 100 mm Northing 7035155.992 bearing: datum: GDA94

drilling information					material substance										
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa	structure and additional observations
	1	2	3												
ADT				N								M	L		
										SM	SILTY SAND: fine to medium grained, dark grey, trace of organics.		MD		
										SP	SAND: fine to medium grained, grey.				
											...colour changing to pale grey.		D		
											...colour changing to dark grey.	W	VD		
											...colour changing to dark brown.		D		
					ASS										
										CH	SANDY CLAY: medium to high plasticity, pale grey, fine to medium grained sand.	M	St	X	PP=100kPa
														X	PP=150kPa
														X	PP=200kPa
											Borehole BH19 terminated at 4m				LIMIT OF INVESTIGATION
											</				

method AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool HA hand auger DT diatube B blank bit V V bit T TC bit *bit shown by suffix e.g. ADT	support M mud N nil C casing penetration 1 2 3 4  no resistance ranging to refusal water  10/1/98 water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Borehole No. **BH20**

Engineering Log - Borehole

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **21.4.2009**

Principal:

Date completed: **21.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509428.101 slope: -90° R.L. Surface: 4.580
hole diameter: 100 mm Northing 7035294.259 bearing: datum: GDA94

drilling information						material substance									
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa	structure and additional observations
	1	2	3												
ADT				N						SM	SILTY SAND: fine to medium grained, dark grey, with clay fines and trace of organics.	M	MD		
										SP	SAND: fine to medium grained, grey, trace of silt and clay.	W			
										SC	CLAYEY SAND: fine to medium grained, pale grey and brown, low plasticity fines, trace of gravel.				
										CH	SANDY CLAY: high plasticity, pale grey and orange, fine to medium grained sand.	M	VSt	x	DIST PP=300kPa
										SC	CLAYEY SAND: fine to medium grained, pale grey and pale brown, low plasticity fines.	W	MD		
										CL	SANDY CLAY: medium plasticity, pale brown/orange and red, fine to medium grained sand.	M	St	x	DIST PP=150kPa
										CH	SANDY CLAY: high plasticity, pale grey and red, fine grained sand.			x	DIST PP=190kPa
											Borehole BH20 terminated at 4m				LIMIT OF INVESTIGATION
						</									

method	support	notes, samples, tests	classification symbols and soil description	consistency/density index
AS AD RR W CT HA DT B V T *bit shown by suffix e.g. ADT	M mud C casing penetration 1 2 3 4  water 10/1/98 water level on date shown water inflow water outflow	U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal	based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

Borehole No. **BH21**

Engineering Log - Borehole

Client: **BROWN CONSULTING (QLD) PTY LTD**

Principal:

Project: **BELLVISTA 2**

Borehole Location: **REFER TO SITE PLAN**

Sheet 1 of 1

Project No: **GEOTKPAR01560AA**Date started: **17.4.2009**Date completed: **17.4.2009**

Logged by: **DF**

Checked by:

drill model and mounting:						EDSON CPI		Easting: 509521.978		slope: -90°		R.L. Surface: 4.879			
hole diameter:						100 mm		Northing 7035416.072		bearing:		datum: GDA94			
drilling information						material substance									
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa 100 200 300 400	structure and additional observations
	1	2	3												
ADT				N								M	MD		
												M/W			
													D		
													VD		
												M	MD		
													St	X	DIST PP=150
												W	MD		
												M	VSt	X	DIST PP=220kPa
													St	X	DIST PP=160kPa
													MD		
															LIMIT OF INVESTIGATION

Borehole No. **BH22**

Engineering Log - Borehole

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **1.5.2009**

Principal:

Date completed: **1.5.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509636.907 slope: -90° R.L. Surface: 5.440
hole diameter: 100 mm Northing 7035571.222 bearing: datum: GDA94

drilling information						material substance									
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa	structure and additional observations
ADT	1	2	3	N											
							5			SM	SILTY SAND: fine to medium grained, dark grey, trace of organics.	M	L		
										SP	SAND: fine to medium grained, dark grey, trace of silt.				
							1			SP	SAND: fine to medium grained, grey. ...colour changing to brown, with silt.	M/W			
											...colour changing to pale brown and grey, with silt and trace of clay.		MD		
					D		4						D		
						ASS	2			SC	CLAYEY SAND: fine to medium grained, pale grey, medium plasticity fines.	M	MD		
							3			CH	SANDY CLAY: high plasticity, pale grey and orange, fine to medium grained sand.		VSt	X	DIST PP=280kPa
							3							X	DIST PP=350kPa
							2			SC	CLAYEY SAND: fine to medium grained, pale grey, fine to coarse grained sand.	W	MD		
							4								
							1				Borehole BH22 terminated at 4m				LIMIT OF INVESTIGATION
							5								
							0								
							6								
							-1								
							7								
							-2								
							8								

method AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool HA hand auger DT diatube B blank bit V V bit T TC bit *bit shown by suffix e.g. ADT	support M mud N nil C casing penetration 1 2 3 4  no resistance ranging to refusal water  10/1/98 water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Borehole No. **BH23**

Engineering Log - Borehole

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **21.4.2009**

Principal:

Date completed: **21.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509330.049 slope: -90° R.L. Surface: 3.141
hole diameter: 100 mm Northing 7035075.585 bearing: datum: GDA94

drilling information							material substance									
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- kPa	meter	structure and additional observations
	1	2	3													
ADT				N			-3			SM	SILTY SAND: fine to medium grained, dark grey, trace of organics.	M	MD	100		DIST PP=160kPa

method	support	notes, samples, tests	classification symbols and soil description based on unified classification system	consistency/density index
AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool HA hand auger DT diatube B blank bit V V bit T TC bit *bit shown by suffix e.g. ADT	M mud C casing penetration 1 2 3 4  no resistance ranging to refusal water 10/1/98 water level on date shown water inflow water outflow	U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal	moisture D dry M moist W wet Wp plastic limit WL liquid limit	VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

Engineering Log - Borehole

Borehole No. **BH24**

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **21.4.2009**

Principal:

Date completed: **21.4.2009**Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

[illegible]

Borehole No. **BH25**

Engineering Log - Borehole

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **17.4.2009**

Principal:

Date completed: **17.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509566.743 slope: -90° R.L. Surface: 4.351
hole diameter: 100 mm Northing 7035287.423 bearing: datum: GDA94

drilling information						material substance																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa	structure and additional observations																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
	1	2	3																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
ADT				N								M	D																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																

method AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool HA hand auger DT diatube B blank bit V V bit T TC bit *bit shown by suffix e.g. ADT	support M mud N nil C casing penetration 1 2 3 4  no resistance ranging to refusal water  10/1/98 water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Borehole No. **BH26**

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Engineering Log - Borehole

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **26.4.2009**

Principal:

Date completed: **26.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI				Easting: 509688.974				slope: -90°				R.L. Surface: 3.873							
hole diameter: 100 mm				Northing: 7035386.053				bearing:				datum: GDA94							
drilling information								material substance											
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa	structure and additional observations				
	1	2	3																
ADT				N								M	L						
							-3	1		SM	SILTY SAND: fine to medium grained, dark grey, with organics present.								
										SP	SAND: fine to medium grained, dark grey, trace of silt.	W							
										SP	SAND: fine to medium grained, grey/brown, trace of silt.	M	D/VD						
										SP	SAND: fine to medium grained, pale grey, trace of clay.	W	MD						
							-2	2		SC	CLAYEY SAND: fine to medium grained, pale grey and pale brown/orange, medium plasticity fines.	M							
						ASS				CH	SANDY CLAY: medium to high plasticity, pale grey, fine to medium grained sand.		St	X	DIST PP=160kPa				
										CH	SANDY CLAY: high plasticity, pale grey, fine to medium grained sand.		VSt	X	DIST PP=280kPa				
							-1	3			...medium to high plasticity.		St	X	DIST PP=150kPa				
							-0	4						X	DIST PP=140kPa				
											Borehole BH26 terminated at 4m				LIMIT OF INVESTIGATION				
							-1	5											
							-2	6											
							-3	7											
							-4	8											
method				support				notes, samples, tests				classification symbols and soil description				consistency/density index			
AS auger screwing*				M mud N nil				U ₅₀ undisturbed sample 50mm diameter				VS very soft							
AD auger drilling*				C casing				U ₆₃ undisturbed sample 63mm diameter				S soft							
RR roller/tricone								D disturbed sample				F firm							
W washbore								N standard penetration test (SPT)				St stiff							
CT cable tool								N* SPT - sample recovered				VSt very stiff							
HA hand auger								Nc SPT with solid cone				H hard							
DT diatube								V vane shear (kPa)				Fb friable							
B blank bit								P pressuremeter				VL very loose							
V V bit								Bs bulk sample				L loose							
T TC bit								E environmental sample				MD medium dense							
*bit shown by suffix								R refusal				D dense							
e.g. ADT												VD very dense							

Borehole No. **BH28**

Engineering Log - Borehole

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **21.4.2009**

Principal:

Date completed: **21.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509427.641 slope: -90° R.L. Surface: 3.281
hole diameter: 100 mm Northing 7035083.781 bearing: datum: GDA94

drilling information					material substance									
method	penetration	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- kPa	meter	structure and additional observations
ADT	1 2 3	N			3			SM	SILTY SAND: fine to medium grained, dark grey, trace or organics.	M	MD			DIST PP=150kPa LIMIT OF INVESTIGATION
						1		SP	SAND: fine to medium grained, brown. ...colour changing to orange/brown, with silt and trace of gravel.	M/W				
					2				...colour changing to dark grey/brown, trace of silt.	M	D			
					2					W				
					1									
					3			SC	CLAYEY SAND: fine to coarse grained, pale grey, medium plasticity fines.		MD			DIST PP=150kPa LIMIT OF INVESTIGATION
					0			CL	SANDY CLAY: medium plasticity, pale grey, fine to coarse grained sand.	M	St	X		
					4									
					-1									
					5									
					-2									Borehole BH28 terminated at 6m
					6									
					-3									
					7									
					-4									
					8									

method AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool HA hand auger DT diatube B blank bit V V bit T TC bit *bit shown by suffix e.g. ADT	support M mud N nil C casing penetration 1 2 3 4  no resistance ranging to refusal water  10/1/98 water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Borehole

Borehole No. **BH29**

Sheet 1 of 1

Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **20.4.2009**

Principal:

Date completed: **20.4.2009**Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting:						EDSON CPI						Easting: 509559.217						slope: -90°						R.L. Surface: 3.531																																			
hole diameter:						100 mm						Northing 7035174.326						bearing:						datum: GDA94																																			
drilling information												material substance																																															
method		penetration			support		water		notes samples, tests, etc		RL		depth metres		graphic log		classification symbol		material						moisture condition		consistency/ density index		pocket penetro- meter kPa		structure and additional observations																												
1 2 3																			soil type: plasticity or particle characteristics, colour, secondary and minor components.										100 200 300 400																														
ADT					N				ASS		-3						SM SP		SILTY SAND: fine to medium grained, dark grey, trace of organics. SAND: fine to medium grained, grey/brown.						M M/W		MD																																
											1						SP SC		SAND: fine to medium grained, pale brown and pale grey, with clay fines and trace of silt and gravel. CLAYEY SAND: fine to medium grained, pale brown and grey, low plasticity fines.						M W		D MD																																
											2																																																
											2																																																
											1																																																
											3						CL		SANDY CLAY: medium plasticity, pale brown and pale grey, fine to coarse grained sand.						M		St		X		DIST PP=100kPa																												
											0																																																
											4																		X		DIST PP=140kPa																												
																			Borehole BH29 terminated at 4m												LIMIT OF INVESTIGATION																												
											-1																																																
											5																																																
											-2																																																
											6																																																
											-3																																																
											7																																																
											-4																																																
											8																																																
method AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool HA hand auger DT diatube B blank bit V V bit T TC bit *bit shown by suffix e.g. ADT												support M mud N nil C casing penetration 1 2 3 4 water 10/1/98 water level on date shown 												notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal												classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit												consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense											

Borehole No. **BH30**

Engineering Log - Borehole

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **26.4.2009**

Principal:

Date completed: **26.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509680.433 slope: -90° R.L. Surface: 3.168
hole diameter: 100 mm Northing 7035269.958 bearing: datum: GDA94

drilling information							material substance								
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa	structure and additional observations
ADT	1	2	3	N			3			SM	SILTY SAND: fine to medium grained, dark grey, with organics present.	M	L	100	DIST PP=150kPa DIST PP=230kPa DIST PP=220kPa DIST PP=130kPa
									SP	SAND: fine to medium grained, grey, trace of silt.			200		
							1		SP	SAND: fine to medium grained, dark brown, trace of silt. ...colour changing to brown. ...colour changing to pale brown.	W	D/V/D	300		
					ASS		2		CH	SILTY CLAY: medium to high plasticity, pale brown/orange and pale grey, fine to medium grained sand. ...colour changing to pale grey.	M	St	400		
							1					VSt		X	
							2							X	
							3							X	
							0					St		X	
							4								
							-1				Borehole BH30 terminated at 4m				LIMIT OF INVESTIGATION
							5								
							-2								
							6								
							-3								
							7								
							-4								
							8								

method	support	notes, samples, tests	classification symbols and soil description	consistency/density index
AS AD RR W CT HA DT B V T *bit shown by suffix e.g. ADT	M mud C casing penetration 1 2 3 4  no resistance ranging to refusal water 10/1/98 water level on date shown water inflow water outflow	U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal	based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

Borehole No. **BH31**

Engineering Log - Borehole

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **24.4.2009**

Principal:

Date completed: **24.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509404.583 slope: -90° R.L. Surface: 2.542
hole diameter: 100 mm Northing 7034963.245 bearing: datum: GDA94

drilling information							material substance									
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa	structure and additional observations	
	1	2	3													
ADT				N						SM	SILTY SAND: fine to medium grained, dark grey, trace of organics.	M	L			
									SP	SAND: fine to medium grained, grey.		M/W				
										SP	SAND: fine to medium grained, brown, trace of clay.	W	MD			
									CH	SANDY CLAY: medium to high plasticity, grey and brown, fine to medium grained sand.		M		VSt		
					D					CH	SANDY CLAY: high plasticity, pale grey and red, fine grained sand.					DIST PP=200kPa
																DIST PP=250kPa
					ASS											DIST PP=280kPa
											...fine to medium grained sand.					DIST PP=300kPa
											Borehole BH31 terminated at 4m					LIMIT OF INVESTIGATION

method AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool HA hand auger DT diatube B blank bit V V bit T TC bit *bit shown by suffix e.g. ADT	support M mud N nil C casing penetration 1 2 3 4 no resistance ranging to refusal water 10/1/98 water level on date shown water inflow water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Borehole No. **BH32**

Engineering Log - Borehole

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **24.4.2009**

Principal:

Date completed: **24.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509493.701 slope: -90° R.L. Surface: 2.600
hole diameter: 100 mm Northing 7035010.479 bearing: datum: GDA94

drilling information					material substance									
method	penetration	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- kPa	meter	structure and additional observations
ADT	1 2 3	N						SM	SILTY SAND: fine to medium grained, dark grey, trace of organics.	M	L			DIST PP=110kPa DIST PP=120kPa
					2	1		SP	SAND: fine to medium grained, grey, trace of silt. ...colour changing to dark brown.	W				
					1			SC	CLAYEY SAND: fine to medium grained, grey, low plasticity fines.		MD			
					1			SC	CLAYEY SAND: fine to medium grained, pale grey and pale brown/orange, medium plasticity fines.	M				
					2			CH	SANDY CLAY: medium to high plasticity, pale grey, fine to medium grained sand.		St	X		
					0			SC	CLAYEY SAND: fine to medium grained, pale grey, medium plasticity fines.	M/W	MD			
					3			CH	SANDY CLAY: medium to high plasticity, pale grey, fine to medium grained sand.	M	St	X		
					-1			SP	SAND: fine to medium grained, pale grey, with clay fines.	W	MD			
					4									
									Borehole BH32 terminated at 4m					LIMIT OF INVESTIGATION
					-2									
					5									
					-3									
					6									
					-4									
					7									
					-5									
					8									

method AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool HA hand auger DT diatube B blank bit V V bit T TC bit *bit shown by suffix e.g. ADT	support M mud N nil C casing penetration 1 2 3 4  no resistance ranging to refusal water  10/1/98 water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Borehole No. **BH33**

Engineering Log - Borehole

Client: **BROWN CONSULTING (QLD) PTY LTD**

Principal:

Project: **BELLVISTA 2**

Borehole Location: **REFER TO SITE PLAN**

Sheet 1 of 1

Project No: **GEOTKPAR01560AA**Date started: **24.4.2009**Date completed: **24.4.2009**

Logged by: **DF**

Checked by:

drill model and mounting:						EDSON CPI		Easting: 509617.391		slope: -90°		R.L. Surface: 2.728							
hole diameter:						100 mm		Northing: 7035092.444		bearing:		datum: GDA94							
drilling information						material substance													
method	penetration			support water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa 100 200 300 400	structure and additional observations					
	1	2	3																
ADT				N					SM SP	SILTY SAND: fine to medium grained, dark grey, trace of organics. SAND: fine to medium grained, grey, trace of silt.	M	L							
							-2				W								
							-1				MD								
					ASS		-2		CH	SANDY CLAY: medium to high plasticity, pale grey and orange, fine to medium grained sand.	M	St/VSt	X	DIST PP=200kPa					
							-1			...fine to coarse grained sand.			X	DIST PP=220kPa					
							-0												
							-2												
							-3		CL	SANDY CLAY: medium plasticity, pale grey, fine to medium grained sand, trace of fine to medium grained gravel.		VSt	X	DIST PP=260kPa					
							-1												
							-4						X	DIST PP=300kPa					
							-2			Borehole BH33 terminated at 4m				DIST PP=300kPa LIMIT OF INVESTIGATION					
							-5												
							-6												
							-7												
							-8												
method AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool HA hand auger DT diatube B blank bit V V bit T TC bit *bit shown by suffix e.g. ADT				support M mud N nil C casing penetration 1 2 3 4  no resistance ranging to refusal water  10/1/98 water level on date shown  water inflow  water outflow				notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal				classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit				consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense			

Borehole No. **BH34**

Engineering Log - Borehole

Client: **BROWN CONSULTING (QLD) PTY LTD**

Principal:

Project: **BELLVISTA 2**

Borehole Location: **REFER TO SITE PLAN**

Sheet 1 of 1

Project No: **GEOTKPAR01560AA**Date started: **24.4.2009**Date completed: **24.4.2009**

Logged by: **DF**

Checked by:

drill model and mounting:						EDSON CPI		Easting: 509680.634		slope: -90°		R.L. Surface: 2.649				
hole diameter:						100 mm		Northing: 7035131.239		bearing:		datum: GDA94				
drilling information						material substance										
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa 100 200 300 400	structure and additional observations	
	1	2	3													
ADT				N		ASS						M	L			
											SM	SILTY SAND: fine to medium grained, dark grey, trace of organics. SAND: fine to medium grained, grey. ...colour changing to grey/brown, trace of silt.				
										SP				MD		
											SP	SAND: fine to medium grained, grey and brown, with silt and a trace of clay.	W			
											CH	SANDY CLAY: high plasticity, pale brown/orange and pale grey, fine to medium grained sand.	M	St		
											CH	SILTY CLAY: high plasticity, pale grey and orange, with fine grained sand.		VSt		
											SC	CLAYEY SAND: fine to medium grained, pale grey, low plasticity fines.	W	MD		
											Borehole BH34 terminated at 4m					LIMIT OF INVESTIGATION

Borehole No. **BH35**

Engineering Log - Borehole

Client: **BROWN CONSULTING (QLD) PTY LTD**

Principal:

Project: **BELLVISTA 2**

Borehole Location: **REFER TO SITE PLAN**

Sheet 1 of 1

Project No: **GEOTKPAR01560AA**Date started: **24.4.2009**Date completed: **24.4.2009**

Logged by: **DF**

Checked by:

drill model and mounting:						EDSON CPI		Easting: 509769.144		slope: -90°		R.L. Surface: 2.471			
hole diameter:						100 mm		Northing: 7035180.815		bearing:		datum: GDA94			
drilling information						material substance									
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material	moisture condition	consistency/ density index	pocket penetro- meter kPa	structure and additional observations
	1	2	3												
ADT				N			-2			SM SP	SILTY SAND: fine to medium grained, dark grey, trace of organics. SAND: fine to medium grained, grey, trace of silt. ...fine to coarse grained.	M	L		
						ASS	-1			SC CH	CLAYEY SAND: fine to coarse grained, grey and brown, low plasticity fines. SANDY CLAY: medium to high plasticity, pale grey/brown, fine to medium grained sand. ...colour changing to pale grey.	W M	MD VSt	X	DIST PP=250kPa
							-2							X	DIST PP=240kPa
							-3							X	DIST PP=280kPa
							-4							X	DIST PP=300kPa
							-5				Borehole BH35 terminated at 4m				LIMIT OF INVESTIGATION
							-6								
							-7								
							-8								
method AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool HA hand auger DT diatube B blank bit V V bit T TC bit *bit shown by suffix e.g. ADT						support M mud N nil C casing penetration 1 2 3 4  no resistance ranging to refusal water  10/1/98 water level on date shown  water inflow  water outflow		notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal				classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit		consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense	

Borehole No. **BH36**

Engineering Log - Borehole

Client: **BROWN CONSULTING (QLD) PTY LTD**

Principal:

Project: **BELLVISTA 2**

Borehole Location: **REFER TO SITE PLAN**

Sheet 1 of 1

Project No: **GEOTKPAR01560AA**Date started: **1.5.2009**Date completed: **1.5.2009**

Logged by: **DF**

Checked by:

drill model and mounting: EDSON CPI				Easting: 509204.707				slope: -90°				R.L. Surface: 2.801					
hole diameter: 100 mm				Northing: 7035133.306				bearing:				datum: GDA94					
drilling information							material substance										
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa 100 200 300 400	structure and additional observations		
	1	2	3														
ADT		N		D ASS	2	1		SM	SILTY SAND: fine to medium grained, dark grey, trace of organics.	M	L	100	200	300	400	(BORDERLINE CLAYEY SAND) DIST PP=240kPa DIST PP=250kPa DIST PP=380kPa	
								SP	SAND: fine to medium grained, grey.								L/MD
								SP	SAND: fine to medium grained, brown, trace of silt.								D/VD
								SC	CLAYEY SAND: fine to medium grained, pale grey and brown, low plasticity fines.	W	MD						
								CL	SANDY CLAY: medium plasticity, pale grey and red, fine to coarse grained sand.	M	VSt	X					
								CH	SANDY CLAY: high plasticity, pale grey and red, fine to medium grained sand.								
					-1	4		Borehole BH36 terminated at 3m						LIMIT OF INVESTIGATION			
									-2	5	6	7	8				

method

AS
AD
RR
W
CT
HA
DT
B
V
T
*bit shown by suffix
e.g. ADT

auger screwing*
auger drilling*
roller/tricone
washbore
cable tool
hand auger
diatube
blank bit
V bit
TC bit

support

M mud
C casing

N nil

penetration

1 2 3 4

no resistance ranging to refusal

water

10/1/98 water level on date shown

water inflow

water outflow

notes, samples, tests

U₅₀
U₆₃
D
N
N*
Nc
V
P
Bs
E
R

undisturbed sample 50mm diameter
undisturbed sample 63mm diameter
disturbed sample
standard penetration test (SPT)
SPT - sample recovered
SPT with solid cone
vane shear (kPa)
pressuremeter
bulk sample
environmental sample
refusal

classification symbols and soil description

based on unified classification system

moisture

D dry
M moist
W wet
Wp plastic limit
WL liquid limit

consistency/density index

VS
S
F
St
VSt
H
Fb
VL
L
MD
D
VD

very soft
soft
firm
stiff
very stiff
hard
friable
very loose
loose
medium dense
dense
very dense

Borehole No. **BH37**

Engineering Log - Borehole

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **1.5.2009**

Principal:

Date completed: **1.5.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509273.373 slope: -90° R.L. Surface: 4.154
hole diameter: 100 mm Northing 7035220.329 bearing: datum: GDA94

drilling information				material substance									
method	penetration	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa	structure and additional observations
ADT	1 2 3	N			4			SM	SILTY SAND: fine to medium grained, dark grey, trace of organics.	M	L		
						1		SP	SAND: fine to medium grained, grey, trace of silt.		L/MD		
						3			...colour changing to dark grey.		VD		INDURATED SAND
						2		SP	SAND: fine to medium grained, dark brown, with silt.	M/W	MD		
						2		SP	SAND: fine to medium grained, pale grey and grey.	W			
						3			...colour changing to dark brown.				
					1				Borehole BH37 terminated at 3m				LIMIT OF INVESTIGATION
					4								
					0								
					5								
					-1								
					6								
					-2								
					7								
					-3								
					8								

method AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool HA hand auger DT diatube B blank bit V V bit T TC bit *bit shown by suffix e.g. ADT	support M mud N nil C casing penetration 1 2 3 4  no resistance ranging to refusal water  10/1/98 water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Borehole No. **BH38**

Engineering Log - Borehole

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **20.4.2009**

Principal:

Date completed: **20.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509348.703 slope: -90° R.L. Surface: 4.929
hole diameter: 100 mm Northing 7035309.243 bearing: datum: GDA94

drilling information				material substance									
method	penetration	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa	structure and additional observations
ADT	1 2 3	N						SM	SILTY SAND: fine to medium grained, grey, trace of organics.	M	MD		
								SP	SAND: fine to medium grained, pale brown.				
									...colour changing to brown.	D/M	D		CEMENTED
									...colour changing to dark brown.				
				ASS	4	1		CH	SANDY CLAY: medium to high plasticity, pale brown/orange, fine to medium grained sand, trace of gravel.	M/W	St	X	DIST PP=90kPa
					3	2			...colour changing to orange.			X	DIST PP=100kPa
									...colour changing to orange and pale grey.			X	DIST PP=150kPa
					2	3			...colour changing to orange/red and pale grey, fine to coarse grained sand.			X	DIST PP=160kPa
									Borehole BH38 terminated at 3m				LIMIT OF INVESTIGATION
					1	4							
					0	5							
					-1	6							
					-2	7							
					-3	8							

method AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool HA hand auger DT diatube B blank bit V V bit T TC bit *bit shown by suffix e.g. ADT	support M mud N nil C casing penetration 1 2 3 4  no resistance ranging to refusal water  10/1/98 water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Borehole No. **BH39**

Engineering Log - Borehole

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **17.4.2009**

Principal:

Date completed: **17.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509443.453 slope: -90° R.L. Surface: 5.250
hole diameter: 100 mm Northing 7035404.116 bearing: datum: GDA94

drilling information						material substance																							
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa	structure and additional observations														
	1	2	3																										
ADT				N			5			SC	SILTY CLAYEY SAND: fine to medium grained, dark grey/brown, low plasticity fines, trace of gravel.	M	VD		DIST PP=120kPa														
									SC	CLAYEY SAND: fine to medium grained, dark grey, medium plasticity fines.		MD																	
							1		CL	SANDY CLAY: medium plasticity, dark grey, fine to medium grained sand. ...colour changing to pale brown/orange and grey.		St	x																
				▶	ASS		4								DIST PP=180kPa														
							2		SP	SAND: fine to medium grained, pale grey, with clay fines. ...trace of clay fines.	W	MD																	
							3		SC	CLAYEY SAND: fine to medium grained, pale grey, medium plasticity fines.		St																	
							3			CL	SANDY CLAY: medium plasticity, pale grey, fine to coarse grained sand.	M	VSt	x															
							2				Borehole BH39 terminated at 3m				LIMIT OF INVESTIGATION														
							4																						
							1																						
							5																						
							0																						
							6																						
							-1																						
							7																						
							-2																						
							8																						
method AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool HA hand auger DT diatube B blank bit V V bit T TC bit *bit shown by suffix e.g. ADT						support M mud N nil C casing penetration 1 2 3 4 no resistance ranging to refusal water 10/1/98 water level on date shown water inflow water outflow						notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal						classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit						consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense					

Borehole No. **BH40**

Engineering Log - Borehole

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **21.4.2009**

Principal:

Date completed: **21.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509487.436 slope: -90° R.L. Surface: 5.401
hole diameter: 100 mm Northing 7035480.836 bearing: datum: GDA94

drilling information					material substance									
method	penetration	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material	moisture condition	consistency/ density index	pocket penetro- meter kPa	structure and additional observations	
ADT	1 2 3	N						SM	SILTY SAND: fine to medium grained, dark grey, trace of organics.	M	MD		DIST PP=150kPa DIST PP=310kPa DIST PP=250kPa LIMIT OF INVESTIGATION	
					5			SP	SAND: fine to medium grained, grey. ...colour changing to pale grey. ...colour changing ot dark brown.	W				
					1									
					4			SC	CLAYEY SAND: fine to medium grained, grey, low plasticity fines.		D			
					2			CL	SANDY CLAY: medium plasticity, pale grey, fine to coarse grained sand.	M	St			
					3			CH	SANDY CLAY: medium to high plasticity, pale grey/orange, fine to medium grained sand.		VSt			
					3				Borehole BH40 terminated at 3m					
					2									
					4									
					1									
					5									
					0									
					6									
					-1									
					7									
					-2									
					8									

method	support	notes, samples, tests	classification symbols and soil description	consistency/density index
AS AD RR W CT HA DT B V T *bit shown by suffix e.g. ADT	M mud C casing penetration 1 2 3 4  no resistance ranging to refusal water  10/1/98 water level on date shown  water inflow  water outflow	U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal	based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

Borehole No. **BH41**

Engineering Log - Borehole

Client: **BROWN CONSULTING (QLD) PTY LTD**

Principal:

Project: **BELLVISTA 2**

Borehole Location: **REFER TO SITE PLAN**

Sheet 1 of 1

Project No: **GEOTKPAR01560AA**Date started: **18.4.2009**Date completed: **18.7.2009**

Logged by: **DF**

Checked by:

drill model and mounting:					EDSON CPI		Easting: 509556.647		slope: -90°		R.L. Surface: 5.797								
hole diameter:					100 mm		Northing: 7035558.052		bearing:		datum: GDA94								
drilling information							material substance												
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa 100 200 300 400	structure and additional observations				
	1	2	3																
ADT				N		ASS	5	1		SM	SILTY SAND: fine to medium grained, grey, trace of organics.	M	MD						
										SP	SAND: fine to medium grained, brown. ...colour changing to pale grey. ...colour changing to dark brown, trace of silt.	W	D						
							4	2		SC	CLAYEY SAND: fine to medium grained, grey/brown, low plasticity fines.		VD						
							3	3		CH	SANDY CLAY: high plasticity, pale grey, fine to medium grained sand.	M	VSt	x	DIST PP=300kPa				
							2	4			Borehole BH41 terminated at 3m				LIMIT OF INVESTIGATION				
							1	5											
							0	6											
							-1	7											
							-2	8											
method AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool HA hand auger DT diatube B blank bit V V bit T TC bit *bit shown by suffix e.g. ADT					support M mud N nil C casing penetration 1 2 3 4 no resistance ranging to refusal water 10/1/98 water level on date shown water inflow water outflow					notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal					classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit			consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense	

Borehole No. **BH42**

Engineering Log - Borehole

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **18.4.2009**

Principal:

Date completed: **18.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509618.281 slope: -90° R.L. Surface: 6.407
hole diameter: 100 mm Northing 7035632.379 bearing: datum: GDA94

drilling information						material substance									
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa	structure and additional observations
ADT	1	2	3	N						CL	GRAVELLY SANDY CLAY: low plasticity, pale brown and grey, fine to coarse sand and gravel. SILTY SAND: fine to medium grained, dark grey, trace of clay fines.	M	St	100 200 300 400	FILL
							6		SM			D	NATURAL		
					▲			1		SP	SAND: fine to medium grained, dark brown/brown, trace of silt and clay fines. ...colour changing to pale brown.	M/W	MD		
						ASS	5			CH	SANDY CLAY: medium to high plasticity, pale brown/orange and pale grey, fine to medium grained sand.	M	St	X	DIST PP=130kPa
								2		SC	CLAYEY SAND: fine to medium grained, pale brown/orange and pale grey, low plasticity fines.	W	MD		
							4								
								3		CH	SANDY CLAY: medium to high plasticity, pale grey and orange, fine to medium grained sand.	M	St	X	DIST PP=150kPa
											Borehole BH42 terminated at 3m				LIMIT OF INVESTIGATION
							3								
							4								
							2								
							5								
							1								
							6								
							0								
							7								
							-1								
							8								

method AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool HA hand auger DT diatube B blank bit V V bit T TC bit *bit shown by suffix e.g. ADT	support M mud N nil C casing penetration 1 2 3 4  no resistance ranging to refusal water  10/1/98 water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Borehole No. **BH44**

Engineering Log - Borehole

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **21.4.2009**

Principal:

Date completed: **21.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509372.387 slope: -90° R.L. Surface: 3.591
hole diameter: 100 mm Northing 7035128.667 bearing: datum: GDA94

drilling information						material substance												
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa				structure and additional observations
	1	2	3											100	200	300	400	
ADT		1	2	3	N		3		SM	SILTY SAND: fine to medium grained, dark grey, trace of organics.	M	MD						
										SP	SAND: fine to medium grained, pale grey/brown, trace of silt.							M/W
										SC	CLAYEY SAND: fine to medium grained, dark brown, low plasticity fines.							M
										SP	SAND: fine to medium grained, grey/brown. ...colour changing to grey.							W
										SP	SAND: fine to coarse grained, pale grey, trace of clay fines.							
										SP	SAND: fine to coarse grained, pale grey, trace of clay fines.							

Borehole No. **BH45**

Sheet 1 of 1
Project No. **GEOTKPAR01560AA**

Engineering Log - Borehole

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **21.4.2009**

Principal:

Date completed: **21.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509494.887 slope: -90° R.L. Surface: 4.214
hole diameter: 100 mm Northing 7035236.499 bearing: datum: GDA94

drilling information						material substance									
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa	structure and additional observations
ADT	1	2	3	N			4			SM	SILTY SAND: fine to medium grained, grey, trace of organics. SAND: fine to medium grained, grey/brown. ...colour changing to pale brown/orange. ...colour changing to brown.	M	MD	100	
							1		SP			D	200		
							3			W		VD	300		
							2					MD	400		
						ASS	2			SC	CLAYEY SAND: fine to medium grained, pale grey and brown, low plasticity fines, trace of gravel.				
							3			CH	SANDY CLAY: medium to high plasticity, pale grey and orange, fine to medium grained sand.	M	St	x	DIST PP=180kPa
							1				Borehole BH45 terminated at 3m				LIMIT OF INVESTIGATION
							4								
							0								
							5								
							-1								
							6								
							-2								
							7								
							-3								
							8								

method	support	notes, samples, tests	classification symbols and soil description	consistency/density index
AS AD RR W CT HA DT B V T *bit shown by suffix e.g. ADT	M mud C casing penetration 1 2 3 4  no resistance ranging to refusal water  10/1/98 water level on date shown  water inflow  water outflow	U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal	based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

Borehole No. **BH46**

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Engineering Log - Borehole

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **20.4.2009**

Principal:

Date completed: **20.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI		Easting: 509595.979		slope: -90°		R.L. Surface: 4.045								
hole diameter: 100 mm		Northing: 7035365.144		bearing:		datum: GDA94								
drilling information				material substance										
method	penetration	support	notes samples, tests, etc	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa	structure and additional observations			
ADT	1 2 3	N		RL										
				3	1	SM	SILTY SAND: fine to medium grained, grey, trace of organics.	M	MD					
						SP	SAND: fine to medium grained, grey/brown, trace of silt.	W						
			ASS	2	2	CL	SANDY CLAY: medium plasticity, pale grey/orange and red, fine to medium grained sand.	M	St	X	DIST PP=100kPa			
						CH	SANDY CLAY: medium to high plasticity, pale grey and red, fine to medium grained sand. ...colour changing to pale grey.			X	DIST PP=100kPa			
				1	3					X	DIST PP=140kPa			
				0	4		Borehole BH46 terminated at 3m				LIMIT OF INVESTIGATION			
				-1	5									
				-2	6									
				-3	7									
					8									
method AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool HA hand auger DT diatube B blank bit V V bit T TC bit *bit shown by suffix e.g. ADT			support M mud C casing penetration 1 2 3 4  no resistance ranging to refusal water  10/1/98 water level on date shown  water inflow  water outflow			notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal			classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit			consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense		

Borehole No. **BH47**

Engineering Log - Borehole

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **26.4.2009**

Principal:

Date completed: **26.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509628.376 slope: -90° R.L. Surface: 4.395
hole diameter: 100 mm Northing 7035457.209 bearing: datum: GDA94

drilling information						material substance															
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetrometer				structure and additional observations			
	1	2	3											100 kPa	200 kPa	300 kPa	400 kPa				
ADT				N			4			SM	SILTY SAND: fine to medium grained, dark grey, trace of organics.	M	L								
										SP	SAND: fine to medium grained, grey, trace of silt.										
							1			SP	SAND: fine to medium grained, brown, trace of silt.	M/W	MD/D								
													VD								
							3			SP	SAND: fine to medium grained, dark brown, trace of silt.	D/M									
							2			SC	CLAYEY SAND: fine to coarse grained, grey, medium plasticity fines.	W	MD								
							2			CH	SANDY CLAY: medium to high plasticity, pale grey, fine to medium grained sand.	M	VSt			X			DIST PP=300kPa		
													St			X			DIST PP=150kPa		
							3														
							1				Borehole BH47 terminated at 3m								LIMIT OF INVESTIGATION		
							4														
							0														
							5														
							-1														
							6														
							-2														
							7														
							-3														
							8														
method AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool HA hand auger DT diatube B blank bit V V bit T TC bit *bit shown by suffix e.g. ADT						support M mud N nil C casing penetration 1 2 3 4  no resistance ranging to refusal water  10/1/98 water level on date shown  water inflow water outflow				notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal				classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit				consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense			

Borehole No. **BH49**

Engineering Log - Borehole

Sheet 1 of 1
Project No: **GEOTKPAR01560AA**

Client: **BROWN CONSULTING (QLD) PTY LTD**

Date started: **26.4.2009**

Principal:

Date completed: **26.4.2009**

Project: **BELLVISTA 2**

Logged by: **DF**

Borehole Location: **REFER TO SITE PLAN**

Checked by:

drill model and mounting: EDSON CPI Easting: 509700.242 slope: -90° R.L. Surface: 4.094
hole diameter: 100 mm Northing 7035440.237 bearing: datum: GDA94

drilling information						material substance									
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- meter kPa	structure and additional observations
	1	2	3												
ADT				N			4			SM	SILTY SAND: fine to medium grained, dark brown, trace of organics.	M	L		
										SP	SAND: fine to medium grained, grey, trace of silt.	M/W			
								1		SP	SAND: fine to medium grained, pale grey.	W	MD		
							3			CL	SANDY CLAY: medium plasticity, pale brown/orange and pale grey, fine to medium grained sand.	M	St	x	DIST PP=140kPa
					D ASS					CH	SANDY CLAY: medium to high plasticity, pale grey, fine to coarse grained sand.		St/VSt		
							2							x	DIST PP=200kPa
														x	DIST PP=240kPa
							3								
							1				Borehole BH49 terminated at 3m				LIMIT OF INVESTIGATION
								4							
							0								
														</	

method AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool HA hand auger DT diatube B blank bit V V bit T TC bit *bit shown by suffix e.g. ADT	support M mud C casing penetration 1 2 3 4  no resistance ranging to refusal water  10/1/98 water level on date shown  water inflow  water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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