

GEOTECHNICAL INVESTIGATION

BELLVISTA 2 - PRECINCT 1

BELLVISTA BOULEVARD, CALOUNDRA

Brown Consulting (Qld) Pty Ltd

GEOTKPAR01560AA/A (Rev3)

29 November 2010

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Brown Consulting (Qld) Pty Ltd
P.O. Box 997
Buddina Qld 4575

Attention: Mr Brent Thomas

Dear Sir,

**RE: Geotechnical Investigation
Bellvista 2 - Precinct 1
Bellvista Boulevard, Caloundra**

Coffey Geotechnics Pty Ltd (Coffey) was commissioned by Mr Brent Thomas of Brown Consulting (Qld) Pty Ltd on behalf of Stockland Caloundra Downs Pty Ltd to undertake geotechnical investigations and assessments for the proposed subdivision of Precinct 1 (Stages 1, 8, 9, 10, 11, 12, 13, 14 & 15) of the Bellvista 2 Estate at Bellvista Boulevard, Caloundra. The geotechnical investigations and assessments are set out in this report.

Should you wish to discuss any aspect of this report, please contact Ron McMahon in our Kunda Park office.

For and on behalf of Coffey Geotechnics Pty Ltd



Ron McMahon

Principal Engineer

1	INTRODUCTION	1
2	PROPOSED DEVELOPMENT	1
3	FIELDWORK	1
4	LABORATORY TESTING	1
5	SITE CONDITIONS	2
5.1	Topography and Site Description	2
5.2	Geology and Soils	2
6	GEOTECHNICAL CONDITIONS	3
6.1	Founding Conditions	3
6.2	Shrink Swell Movements	3
6.3	Earthworks	3
6.4	Stripping Depths	4
6.5	Allowable Bearing Capacity	4
6.6	Pavement Design	4
6.7	Excavations	5
6.8	Groundwater	5

Important Information about your Coffey Report

Figures

Subdivision Plans

Figure 1: Precinct 1, Stage 1, Plan with Borehole Locations

Figure 2: Precinct 1, Stages 8, 9, 10, 11, 12, 13, 14 & 15, Plan with Borehole Locations

Appendices

Appendix A: Borehole Logs and DCP Blow Counts

Appendix B: Laboratory Test Certificates

1 INTRODUCTION

Coffey Geotechnics Pty Ltd (Coffey) was commissioned by Mr Brent Thomas of Brown Consulting (Qld) Pty Ltd (Browns) on behalf of Stockland Caloundra Downs Pty Ltd to undertake geotechnical investigations and assessments for the proposed subdivision of Precinct 1 which is part of the Bellvista 2 residential development at Bellvista Boulevard, Caloundra.

2 PROPOSED DEVELOPMENT

Precinct 1 of the proposed development covers some 45.1 hectares. The development involves some 21.0 hectares of mixed use residential precinct and 14.4 hectares of open space. The works will include the placement of imported fill on the lots, the construction roads and the installation of services. Open drains between 2 and 4 metres deep will be constructed along the northern side of Precinct 1. The proposed layout is shown in the subdivision plans provided by Browns, a copy of which is attached.

3 FIELDWORK

Fieldwork was undertaken between 17 April and 5 May 2009 under the direction of a principal engineer from Coffey's Kunda Park office. A total of 18 boreholes were drilled to a depth of 6 metres, 18 boreholes to a depth of 4 metres and 20 boreholes to a depth of 3 metres on the site. In addition 18 boreholes were drilled on Lot 9989 immediately adjacent to Precinct 1 on the southern side. Dynamic cone penetrometers (DCP) testing to depths up to 1.5 metres was conducted adjacent to each borehole. Borehole logs and DCP blow counts are attached in **Appendix A** together with explanation sheets defining the terms and symbols used. Borehole locations are shown in **Figure 1**. Four samples of subgrade soils were collected for CBR testing. The samples are identified by depth and borehole number.

A walkover inspection was conducted by engineers and soil scientists from Coffey's Kunda Park office. The topography and surface features were noted.

4 LABORATORY TESTING

Laboratory testing for ASS and erosion characteristics was undertaken. The results are reported separately in reports on those aspects of the investigations.

Laboratory testing for CBR values was undertaken in Coffey's NATA registered Kunda park laboratory. Four samples from Precinct 1 were tested. Samples showed high CBR values in the range 26% to 47%. Test certificates are attached in **Appendix B**.

5 SITE CONDITIONS

5.1 Topography and Site Description

Precinct 1 is a more or less triangular area off the south eastern side of Bellvista Boulevard at Caloundra. It adjoins the Caloundra airport property in the northeast.

The lot is at an elevation of about RL 5 to 6 metres AHD along the Bellvista Boulevard frontage and slopes down to the southeast and southwest away from the boulevard frontage with an average gradient less than 1% to an elevation of about RL 2 metres in the southern parts of the site. A natural drainage line flows to the south around the southwestern end of the precinct.

Precinct 1 has been previously cleared of the endemic vegetation. A dense exotic grass cover is established over the site. Larger woody vegetation within Precinct 1 was generally in the form of regrowth and limited to areas along the existing drainage lines. Tree species identified included *Pinus radiata*, *Acacia melanoxylon*, *Lophostemon suaveolens*, *Melaleuca quinquenervia* and various Eucalyptus species.

5.2 Geology and Soils

According to the 1:100 000 Geological Series mapping, sheet 9444 and part 9544, prepared by the Department of Mines and Energy Queensland, the site is underlain by Quaternary alluvium (mapping unit Qa). This unit consists predominantly of sands and silty sands in this area. The alluvium is underlain at shallow depth by residual soils derived from the Late Triassic to Jurassic Landsborough Sandstones (mapping unit RJ1). This sequence is predominately sandstone in this area.

The subsurface profile was inferred the Coffey boreholes on the site. The soil profile generally consists of upper alluvial sand strata overlying stiff residual sandy clays. Sandy clay/clayey sand fill soils between 200 mm and 600 mm deep were noted in four boreholes. The compaction history of the fill is not known. Furthermore, borehole investigations indicate that the site was not stripped prior to the placement of the fill.

The upper sandy profile consists of a silty sand topsoil 200 mm to 300 mm thick overlying the subsoils. Organic matter was present in the topsoils but was a relatively small percentage of the soil mass at depths greater than 200 mm. The subsoils are medium dense to very dense sands and clayey sands. In some areas the subsoils are indurated. The depth of the upper sand strata varies from 0.6 metres deep to more than 3 metres deep overlying the residual soils.

The residual soils are sandy clays derived from the in situ weathering of the underlying Landsborough Sandstones and grade to sandstone with depth. The clays are stiff to very stiff in consistency. Laboratory testing was not undertaken but Coffey's experience with these clays and visual classification indicates that they have a high plasticity and are moderately reactive.

6 GEOTECHNICAL CONDITIONS

6.1 Founding Conditions

Founding conditions on the site will be suitable for high level footings providing fill on residential allotments is placed as controlled fill as per AS2870-1996. Settlements will be minimal and will not impact on footing design. No preloading or soft soil treatments are indicated to be required.

6.2 Shrink Swell Movements

Shrink swell movements for the natural soil profile will vary across the site depending on depth of the upper sandy strata. They will generally be less than 20 mm but in some isolated areas may be in the range 20 to 40 mm. These movements indicate that Class S or Class M footing systems as per AS2870-1996 are likely in the natural profile.

Where lots are filled, the likely classifications will be a function of the depth and nature of the fill soils. Where sandy fill soils are used, classifications are likely to be Class S providing that the fill is certified as controlled fill as per AS2870. The requirements for controlled fill are set out in Section 6.3 of this report. Where clay fill soils are used, the classification will depend of the reactivity of the clay fill. Allowable bearing capacities will be in excess of 100 kPa at depths greater than 0.3 metres.

6.3 Earthworks

The following are recommended for placement of the fill on the site:

1. Previous fill and topsoil shall be removed and stockpiled, and the subgrade rolled to a minimum dry density ratio of 95% based on Standard compactive effort. Voids remaining following removal of tree stumps, boulders and other obstructions shall be excavated and filled with suitable controlled fill.
2. Following subgrade preparation, the area shall be test rolled in accordance with AS3798-2007 to identify soft and/or wet areas. Soft and/or wet areas shall be excavated and replaced by suitable controlled fill.
3. Controlled fill shall consist of suitable materials from the site or imported material and shall be placed in layers maximum 250 mm loose thickness for sand and clayey sand soils with up to 40% fines (less than 75µm) and 200 mm loose thickness for clay fill. The fill shall be uniformly compacted to a minimum dry density ratio of 95% based on Standard compactive effort under residential lots and 98% Standard under roadways or in areas proposed for commercial or industrial development. Placement moisture contents are to be within a range $\pm 2\%$ of optimum moisture content. The maximum dry density shall be corrected for rock greater than 37.5mm in accordance with AS1289 *'Methods of Testing Soils for Engineering Purposes'*.
4. Fill derived from the weathered sandstone shall be broken down during excavation, treatment and compaction to produce a material with sufficient fines to fill the voids between coarse fragments, and preferably with less than 20% larger than 37.5mm. Cobbles and boulders larger than 150mm in diameter shall be excluded.
5. Alternative compaction specifications based on a method specification will be required for material with more than 20% larger than 37.5mm (see AS3798-2007 Section 5.4).
6. Unsuitable materials (including organic material, tree trunks, roots, organic soils, rubbish and other deleterious materials) shall be excluded.

7. All earthworks including subgrade preparation, fill placement and compaction shall be performed under Level 1 supervision (as defined in AS3798-2007), with sampling and testing to at least the frequency required in AS3798-2007. It should be noted that AS3798 states that unless fill is placed under a Level 1 Overview, the geotechnical testing authority will not be in a position to provide an opinion on the fill. This implies that the geotechnical testing authority may only certify fill as controlled fill (as required by AS2870) if a Level 1 Overview has been undertaken.
8. As far as is practical, the fill level across the site shall be raised uniformly, with each layer being completed and tested prior to placement of the following layer.

Unless otherwise determined by a geotechnical engineer, the fill should be mixed as well as practical to produce a material with relatively uniform grading. The fill is to be placed so that stability is derived from adequate compaction of the finer material embedding the larger particles, rather than mechanical interlock of rock fragments.

It is noted that proper moisture conditioning of the fill material is required to reduce the likelihood that future wetting of the fill will result in significant settlement.

6.4 Stripping Depths

Based on borehole investigations, the stripping depth required varies from 0.2 metres to 0.5 metres. The deeper stripping depths are generally in isolated locations and an average stripping depth of some 250 mm may be anticipated. These stripping depths do not include the stripping of pre-existing fill which is present in some areas.

It should be noted that stripping is required to remove soils with significant organic matter or other soils which have poor structural integrity and will not provide a suitable base for the placement of future fill. It is not necessary to remove all topsoil or soils with any organic matter providing the above requirements are met. Close control on stripping depths should be maintained to ensure that excess stripping is not undertaken.

6.5 Allowable Bearing Capacity

The allowable bearing capacity of the natural soils on the site at the normal footing depth of 0.4 metres is generally in excess of 100 kPa. Weaker soils were noted at depth in some isolated areas but these areas are likely to be rectified by proof rolling and replacement as set out in Section 6.3.

The bearing capacity of the fill soils if compacted as set out in Section 6.3 can be expected to be in excess of 100 kPa.

6.6 Pavement Design

Laboratory testing for CBR values on three samples of the subgrade soils was undertaken. CBR values of 26% to 47% were measured. Preliminary design based on a CBR of 20% is recommended. CBR testing will be required by Council prior to design once the subgrade fill is in place. In order to achieve an economical pavement design, the use of sandy soils under roadways is recommended.

6.7 Excavations

Excavations on the site may be undertaken using conventional earthmoving equipment. Temporary excavations up to 3 metres deep may be battered back at an angle of 1.5H:1V above the water table and 2.5H:1V below the water table. Permanent excavations up to 4 metres deep should be battered back at 2.5H:1 V above the water table and 3H:1V for excavations below the water table.

For deeper excavations, Coffey should be consulted to provide a site specific design. Similarly, where surcharge loadings at the top of excavations are proposed, Coffey should be consulted for a specific batter design.

6.8 Groundwater

Groundwater was recorded at depths generally between 0.5 and 1 metre in boreholes on the site. The groundwater appeared to be a perched water table in the upper sand profile which is underlain by the residual clay soils.

Investigations were undertaken during periods of higher than average rainfall and it may be that during drier periods, the groundwater trapped in the upper sands is transpired out of the profile or seeps vertically or laterally off the site. During periods of prolonged dry weather, it is expected that the groundwater in the upper parts of the site will not be present.

However, the site is relatively flat with slow surface drainage and the profile consists of sandy soil overlying low permeability clays. It should be anticipated that, during periods of prolonged heavy rainfall, the water table may be higher than that recorded in boreholes during these investigations. All structure and drain design and construction planning should anticipate the possibility of high groundwater levels.

For and on behalf of Coffey Geotechnics Pty Ltd



Ron McMahon

Principal Engineer

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

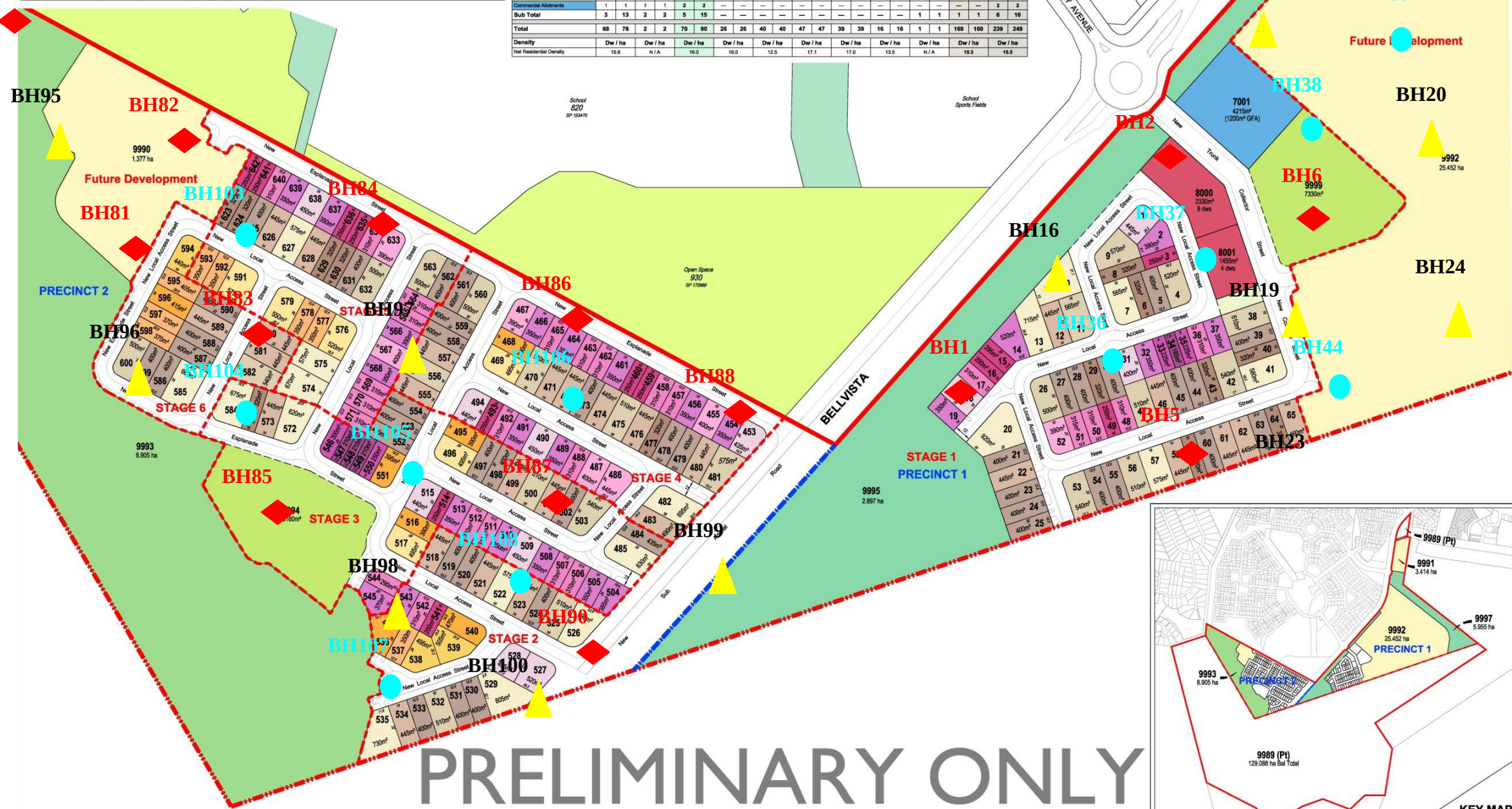
Reporting relies on interpretation of factual information based on judgement and opinion and has a level of uncertainty attached to it, which is far less exact than the design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. To help prevent this problem, 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.

LAND USE BUDGET - APPLICATION 1											
Land Use	Stage 1	Balance Precinct 1	Sub Total Precinct 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Balance Precinct 2	Sub Total Precinct 2	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	19.675	2.807	3.191	2.743	2.295	1.194	33.832	45.852	65.527
Sealable Area	9.393	10.282	19.675	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	1.890	1.908	0.719	—	6.899	9.606
Medium Density Allotments	0.379	—	0.379	—	—	—	—	—	—	0.379	0.379
Commercial Site	0.422	—	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	1.890	1.908	0.719	27.876	34.768	39.660
Road	—	—	—	0.987	—	—	—	—	0.987	0.987	0.987
Sub Arterial Road	—	—	—	0.987	—	—	—	—	0.987	0.987	0.987
Collector Street	0.489	—	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	4.449
Pedestrian Connections-Thresholds	0.038	—	0.038	—	—	—	—	—	—	0.038	0.038
Total Area of New Road	1.649	—	1.649	1.395	0.806	0.803	0.786	0.474	—	4.314	5.303
Open Space	—	—	—	—	—	—	—	—	—	—	—
Active Park	0.733	—	0.733	—	0.816	—	—	—	0.816	1.549	1.549
Passive Open Space	—	8.905	8.905	—	—	—	—	—	—	8.905	8.905
Stormwater Conveyance	3.498	—	3.498	—	—	—	—	—	5.956	5.956	9.454
Total Open Space	4.231	8.905	13.136	—	0.816	—	—	—	5.956	6.772	19.908
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	263
Esplanade Street	188	—	188	252	212	212	—	—	—	862	862
Local Access Street	630	—	630	226	291	292	198	—	—	1298	1988
Collector Street	73	—	73	—	—	—	—	—	—	73	73
Trunk Collector Street	187	—	187	—	—	—	—	—	—	187	187
Sub Arterial Road	—	—	—	247	—	—	—	—	—	247	247
Total Length of New Road	952	—	952	503	533	569	504	319	—	2428	3380

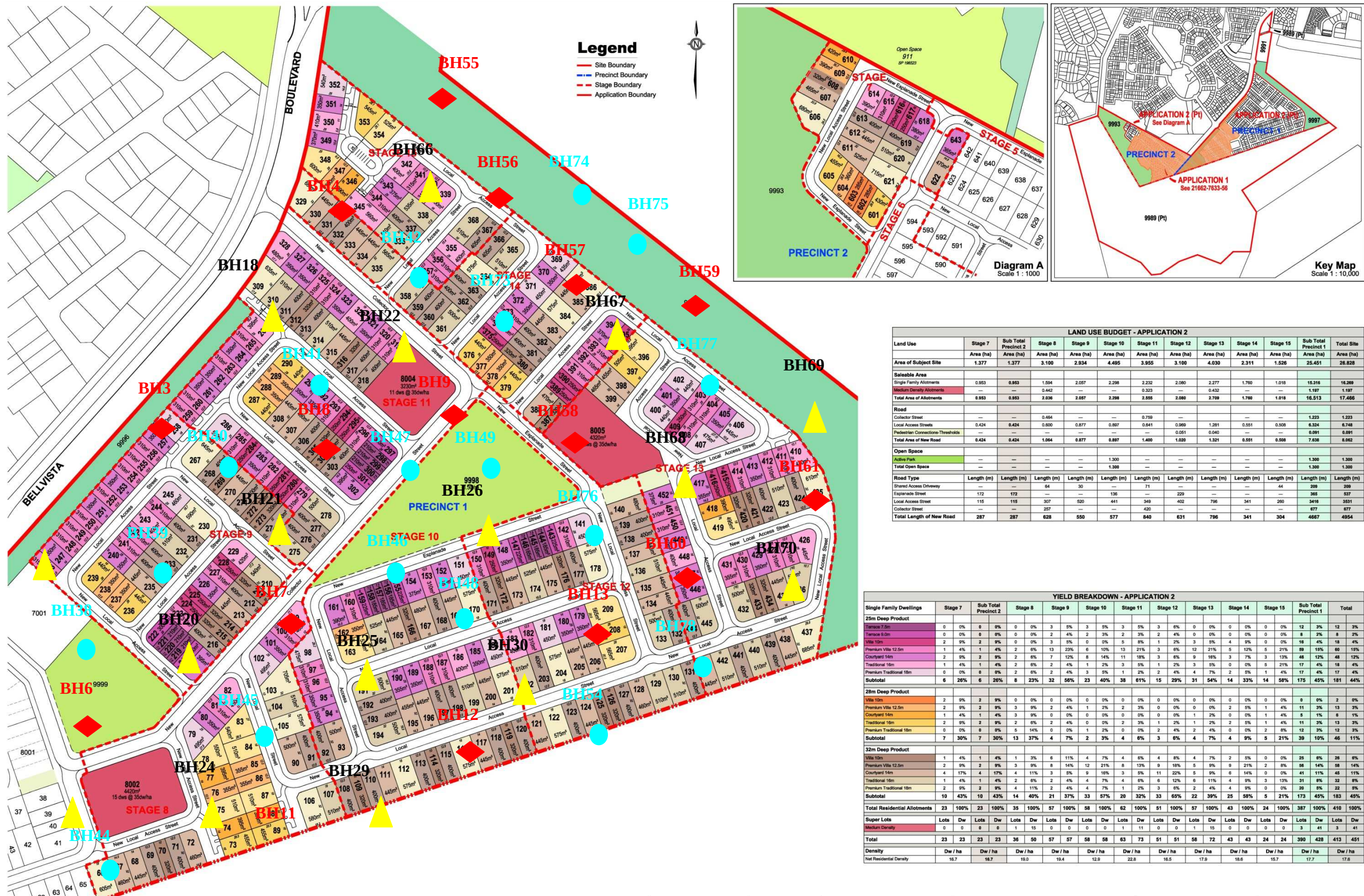
YIELD BREAKDOWN - APPLICATION 1																					
Single Family Dwellings	Stage 1	Balance Precinct 1	Sub Total Precinct 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Balance Precinct 2	Sub Total Precinct 2	Total										
25m Deep Product																					
Terrace 7.5m	1	2%	—	1	3%	—	0%	—	0%	—	3	2%	4	2%							
Terrace 8.0m	2	3%	—	2	3%	—	0%	—	0%	—	2	1%	4	2%							
Villa 10m	4	6%	—	4	6%	1	3%	3	6%	4	10%	—	9	5%	13	6%					
Premium Villa 12.5m	5	8%	—	5	8%	1	4%	5	13%	7	18%	—	10	12%	25	11%					
Courtyard 14m	8	8%	—	5	9%	1	4%	6	15%	7	15%	4	10%	—	18	11%	23	10%			
Traditional 18m	1	2%	—	1	2%	—	0%	—	0%	4	9%	2	5%	—	6	4%	7	3%			
Premium Traditional 18m	3	3%	—	3	3%	2	8%	2	5%	3	8%	1	3%	—	8	5%	11	6%			
Subtotal	21	32%	—	21	32%	5	19%	10	46%	24	51%	18	46%	—	66	39%	87	37%			
28m Deep Product																					
Villa 10m	—	0%	—	—	0%	—	0%	—	0%	—	—	—	0%	—	—	—	—	0%			
Premium Villa 12.5m	—	0%	—	—	0%	1	4%	—	0%	4	10%	3	18%	—	8	5%	8	3%			
Courtyard 14m	—	0%	—	—	0%	2	8%	3	8%	1	2%	—	0%	1	6%	—	7	4%	7	3%	
Traditional 18m	—	0%	—	—	0%	2	8%	—	0%	—	0%	1	6%	—	3	2%	3	1%			
Premium Traditional 18m	—	0%	—	—	0%	—	0%	2	5%	1	2%	3	8%	—	6	4%	6	3%			
Subtotal	—	0%	—	—	0%	5	19%	5	13%	2	4%	7	18%	5	31%	24	14%	24	10%		
32m Deep Product																					
Villa 10m	7	11%	—	7	11%	—	0%	1	3%	1	2%	4	10%	—	—	6	4%	13	6%		
Premium Villa 12.5m	15	23%	—	15	23%	6	23%	8	13%	3	8%	5	31%	—	27	16%	42	18%			
Courtyard 14m	7	11%	—	7	11%	4	15%	3	8%	8	17%	2	5%	3	18%	20	12%	27	12%		
Traditional 18m	9	14%	—	9	14%	2	8%	2	5%	5	11%	2	5%	2	13%	13	8%	22	9%		
Premium Traditional 18m	6	9%	—	6	9%	4	15%	3	8%	1	2%	3	8%	1	6%	12	7%	18	8%		
Subtotal	44	68%	—	44	68%	18	62%	18	40%	21	49%	14	36%	11	89%	78	48%	122	52%		
Total Residential Allotments	65	100%	—	65	100%	26	100%	40	100%	47	100%	39	100%	16	100%	—	168	100%	233	100%	
Super Lots	Lots	Dw	Lots	Dw	Lots	Dw	Lots	Dw	Lots	Dw	Lots	Dw	Lots	Dw	Lots	Dw	Lots	Dw	Lots	Dw	
Medium Density	2	12	—	—	2	12	—	—	—	—	—	—	—	—	—	—	—	—	2	12	
Balance Super Allotment	—	—	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Commercial Allotments	1	1	1	1	2	2	—	—	—	—	—	—	—	—	—	—	—	2	2	2	
Sub Total	3	13	2	2	5	15	—	—	—	—	—	—	—	—	1	1	1	1	6	16	
Total	68	78	2	2	70	80	26	26	40	40	47	47	39	39	16	1	1	169	169	239	249
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	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/D	figure no: FIGURE 1
	4 soil samples (1kg) at varying depths up to 2m					original size	A3				



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/A	figure no: FIGURE 1
	4 soil samples (1kg) at varying depths up to 2m					original size	A3				