MORRISON GEOTECHNIC

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Gold Coast Office
Job: GL16/077
Ref: 14903
Author: Ian Masman

21st October 2016

Golding Contractors Pty Ltd
Po Box 1643
Milton Qld, 4064

ATTENTION: **MR CAMERON MCCLURE**
Email: Cameron.mcclure@golding.com.au

Dear Sir

RE: **LEVEL ONE COMPLIANCE REPORT FOR EARTHWORKS FILLING OPERATIONS GAINSBOROUGH GREENS – PRECINCT 1.1 – STAGES 1 & 2 YAWALPAH ROAD, PIMPAMA**

Table of Contents

1.0 INTRODUCTION

1.1 General

This report presents results of Level One earthworks inspections, field testing and associated Compaction Compliance testing carried out on earthworks fill placed and compacted to form residential allotments and embankments below subgrade at Gainsborough Greens, Precinct 1.1, Stages 1 and 2 development at Yawalpah Road, Pimpama (The Site).

The work was commissioned by Mr. Cameron McClure representing Golding Contractors (The Client) using Purchase Order 4500203391.

The earthworks were carried out by The Client.

Earthworks operations were carried out intermittently between 5th May 2016 and 28th July 2016.

1.2 Previous Earthworks

As far as can be determined onsite, there were no previous earthworks at The Site with the exception of localized filled bunds for detention basins.

1.3 The Project

The proposed development at The Site includes residential allotments, new pavements and associated underground service networks.

Earthworks filling is required to form building platforms supporting proposed residential buildings and embankments below subgrade to support future pavements. Earthworks at The Site included stripping vegetation, organics and topsoil, proof roll testing of the natural ground surface, and then filling The Site to the project design level.

The Site is bounded by undeveloped land to the North and West, Yawalpah Road to the South, and Kerkin Road North to the East.

Picture 1: Aerial View of the Site (Image Source: Nearmap.com, showing 1st October 2016).

2.0 THE BRIEF

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials between the existing ground level and the design earthworks level in accordance with AS3798 2007 – "Guidelines on Earthworks for Commercial and Residential Developments";
- Relative Density Control Testing in accordance with AS1289 – Testing of Soils for Engineering Purposes and at frequencies required in AS3798 Table 8.1.
- City of Gold Coast Council Requirements.
- Notes on KN Group project drawings.

All other design requirements such as CBR and Quality of Materials, site classifications, material assessments, foundation assessments and slope / global stability appraisals were not included in the Brief and are therefore excluded from this Report.

KN Group Earthworks Contour Plans 08-131-05C to 08-131-06C indicate the extents of fill to be constructed at The Site. The plans are considered to be a reasonable indication of the actual fill constructed during our involvement.

The actual thickness of fill on an individual lot id presented as a lot disclosure plan which can be requested from the developer

2.1 Additional Requirements

Morrison Geotechnic was not engaged to carry out additional works other than what was outlined in the Brief.

3.0 METHODOLOGY

Earthworks Inspections and Testing was carried out on the stripped and exposed ground surfaces and during the placement and compaction of fill materials forming residential allotments and embankments below subgrade.

Field and laboratory testing included walk over assessments of the existing ground conditions, proof roll testing of the stripped surface including the natural surface observation of filling and compaction activities and field density testing using a soil moisture density gauge and Hilf Density compactions.

3.1 Stripped Surface Assessment

The Site had been cleared of all debris, trees and topsoil. Visible organic matter, un-compacted or loose soil, unsuitable materials and any over wet areas were removed to expose a natural foundation.

Existing detention basins were dewatered with wet soils and sediments removed to expose a suitable natural surface.

Natural materials exposed after stripping and clearing the site which formed the fill foundation can be broadly summarized as:

- Sandy Clay (CI - CH), very stiff, medium to high plasticity, fine to medium sand, yellow / brown and moist.
- Rock (XW), extremely weathered, very low to low strength and yellow grey brown.

The stripped surface was proof rolled by The Client in the presence of our Geotechnicians using a large pad foot roller carrying out multiple passes. Areas where movements were observed beneath the wheels of the plant were removed to a suitable base or tyned, air dried to approximate optimum moisture content and re-compacted. After the above treatments were carried out, the proof rolling process was repeated.

When no visible movement or vertical deflection was observed during proof roll testing, the stripped surface was assessed to be suitable as a foundation for the placement of fill.

Picture 2: View of the Stripped Surface Prior to the Placement of Fill

3.2 Filling Operations

Fill materials were sourced from cut areas at The Site. Materials used as fill at The Site can be broadly summarized as: -

> Sandy Clay – (CI – CH), medium to high plasticity, fine to medium sand, yellow/brown, moist.

Placement and compaction of the fill materials was carried out using the following plant:

- Dozer
- Water Truck
- Excavator
- Cat 815 Compactor
- Body trucks
- Pad Foot Roller
- Articulated Dump Trucks

The fill was placed in layers appropriate for the above plant, moisture conditioned at the fill source and during placement and thoroughly mixed to achieve moisture contents suitable for compaction.

To the extent that was reasonably practicable, fill materials visibly containing excessive amounts of silts or deleterious materials such as sticks, oversize particles or construction debris were sorted to remove the contaminants prior to placement, or rejected for use. Some cobble sized particles may remain in the body of the fill, however are unlikely to be in sufficient quantities to adversely affect the performance of the new fill. Sloping areas requiring filling were benched and continually keyed into the slope prior to and during fill placement. Compaction of the fill was carried out using multiple passes of the above compaction plant.

Field density tests and laboratory compactions were carried out on the fill materials in accordance with Table 5.1 and 8.1 of AS3798 2007 (Guidelines on Earthworks for Commercial and Residential Developments) and tested to AS1289 test methods (Testing of Soils for Engineering Purposes). Testing under this Job Number for the recent works achieved the required compaction specification of 95% standard Hilf compaction.

Picture 3: Site Earthworks Filling Operations

The location of the field density tests are shown on the Site Plan contained in Appendix A. The results of the field density and laboratory compaction tests are contained in Appendix B. These test locations and levels were not obtained by survey and are therefore should only be considered as approximate.

4.0 STATEMENT OF COMPLIANCE

Our representatives observed the relevant earthworks operations during our engagement including the stripped surface, fill placement and compaction operations and carried out field density tests and laboratory compaction tests in accordance with The Brief.

The fill at The Site has been observed to be placed and compacted in a controlled manner and can be termed "Controlled" as defined in AS2870 (Residential Slabs and Footings).

5.0 EXCLUSIONS

The compliance statement excludes any top soil, which may be placed for use as Lot dressing or any other subsequent earthworks after 28th July 2016. All trench backfill, landscaping fill and other fill placed without our knowledge is also excluded.

Assessments of batter stability, global stability, and material quality such as soaked CBR and site classifications are excluded from this commission. The stability of any fill batters in the long term must take account of the variable materials used for the construction of the fill platforms and all surface loads including traffic loads near the crest of all batters.

Our on-site attendance specifically excludes assessments of fill material quality and engineering properties that are outside the requirements of AS.3798 - 2007, including soil or fill reactivity and soaked CBR values. We note that the fill materials comprise clay soils, which may result in unfavorable site classifications for individual lots and low subgrade design strengths for pavements.

Footings and ground slabs for any structures constructed over natural soils or controlled fill should be designed to accommodate the characteristic ground surface movements and settlement potential. Assessments of these design parameters are beyond the scope of this Report.

Controlled fill (Level 1 Fill) provides an overview that the Earthwork Specification has been met. There are instances where significant long term settlements of controlled fill can occur. Large total and differential settlements can be expected where fill has been placed over soft and compressible soils and where the thickness of controlled fill varies significantly across a lot.

In some cases, fill materials with high silt content can deteriorate in wet weather conditions resulting in allowable bearing pressures less than 100 kPa

6.0 LIMITATIONS

This Report has been prepared by Morrison Geotechnic Pty Ltd (Morrison Geotechnic), and may include contributions from Morrison Geotechnic's officers and employees, sub-contractors, sub-consultants or agents (Contributors).

This Report is for the sole benefit and use of Golding Contractors Pty Ltd (Client), its designers, clients and relevant statutory authorities for the sole purpose of providing geotechnical advice and recommendations in respect of Gainsborough Greens, Precinct 1.1, Stages 1 & 2, Yawalpah Road, Pimpama Development (Project). The Report is only intended to address those issues expressly described in the Brief/ Work Instructions in this Report. This report should not be relied upon for assessing fill extents and thicknesses.

This Report should not be used or relied upon for any other purpose without Morrison Geotechnic's prior written consent. Morrison Geotechnic and the Contributors do not accept any responsibility or liability in any way whatsoever for the use or reliance of this Report by anyone other than the Client, its designers, its clients and relevant statutory authorities or by anyone else for any purpose other than that for which it has been prepared.

Except with Morrison Geotechnic's prior written consent, this Report may not be:

(a) released to any other party, whether in whole or in part (other than to the Client's officers, employees, advisers, designers, clients and relevant statutory authorities);

(b) Used or relied upon by any other party.

Morrison Geotechnic and the Contributors, do not accept any liability or responsibility whatsoever for, or in respect of, any use or reliance upon this Report by any other party. Morrison Geotechnic is not obliged to enter into discussions with any third party in respect of this Report.

The information (including technical information and information obtained through discussions) on which this report is based has been provided by the Client and third parties. Morrison Geotechnic and the Contributors:

(a) have relied upon and presumed the accuracy of this information;

(b) have not verified the accuracy or reliability of this information (other than as expressly stated in this Report);

(c) have not made any independent investigations or enquiries in respect of those matters of which it has no actual knowledge at the time of giving this Report to the Client; and

(d) Make no warranty or guarantee, expressed or implied, as to the accuracy or reliability of this information.

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(a) is not an environmental, contamination or hazardous materials assessment; may be invalid, incomplete or inaccurate (including errors in the scope of work, investigation methodology, observations, opinions and advice) where the information provided to Morrison Geotechnic was invalid, incomplete or inaccurate;

(b) Is limited to observations of those parts of the site described in Section 1.0.

No warranty or guarantee, whether express or implied, is made in respect of the geotechnical data, information, advice, opinions and recommendations present in this Report.

If further information becomes available, or additional assumptions need to be made, Morrison Geotechnic reserves its right to amend this Report.

If you have any queries regarding the above, please contact Mr Ian Masman at our Gold Coast office.

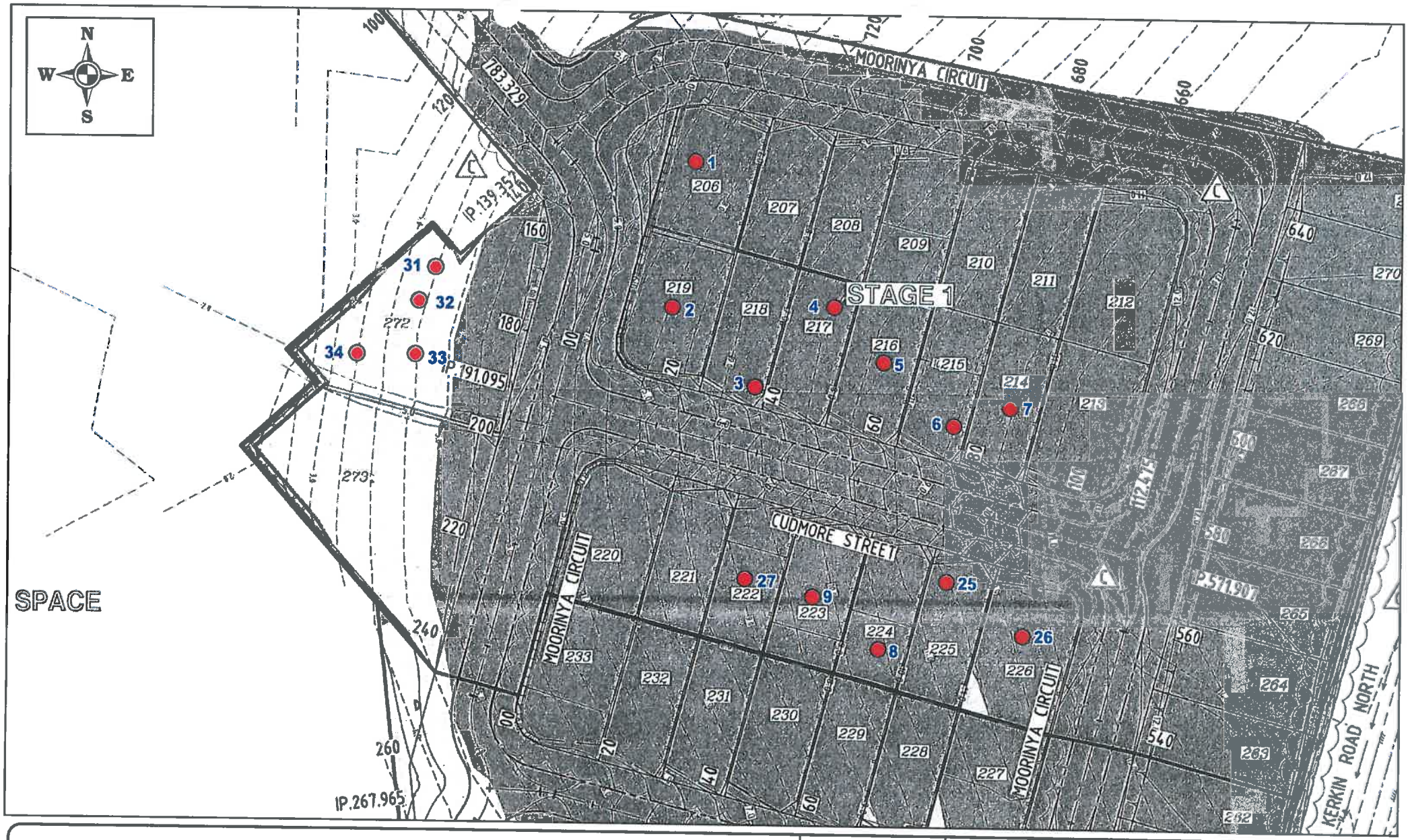
Ian Masman
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

M. D. RILEY (RPEQ 5641)

ATTACHMENTS:
Appendix A – Site Plan Showing Test Locations
Appendix B – Test Reports
Appendix C – Photo Gallery

APPENDIX 'A'

(Site Plan showing Test Locations)



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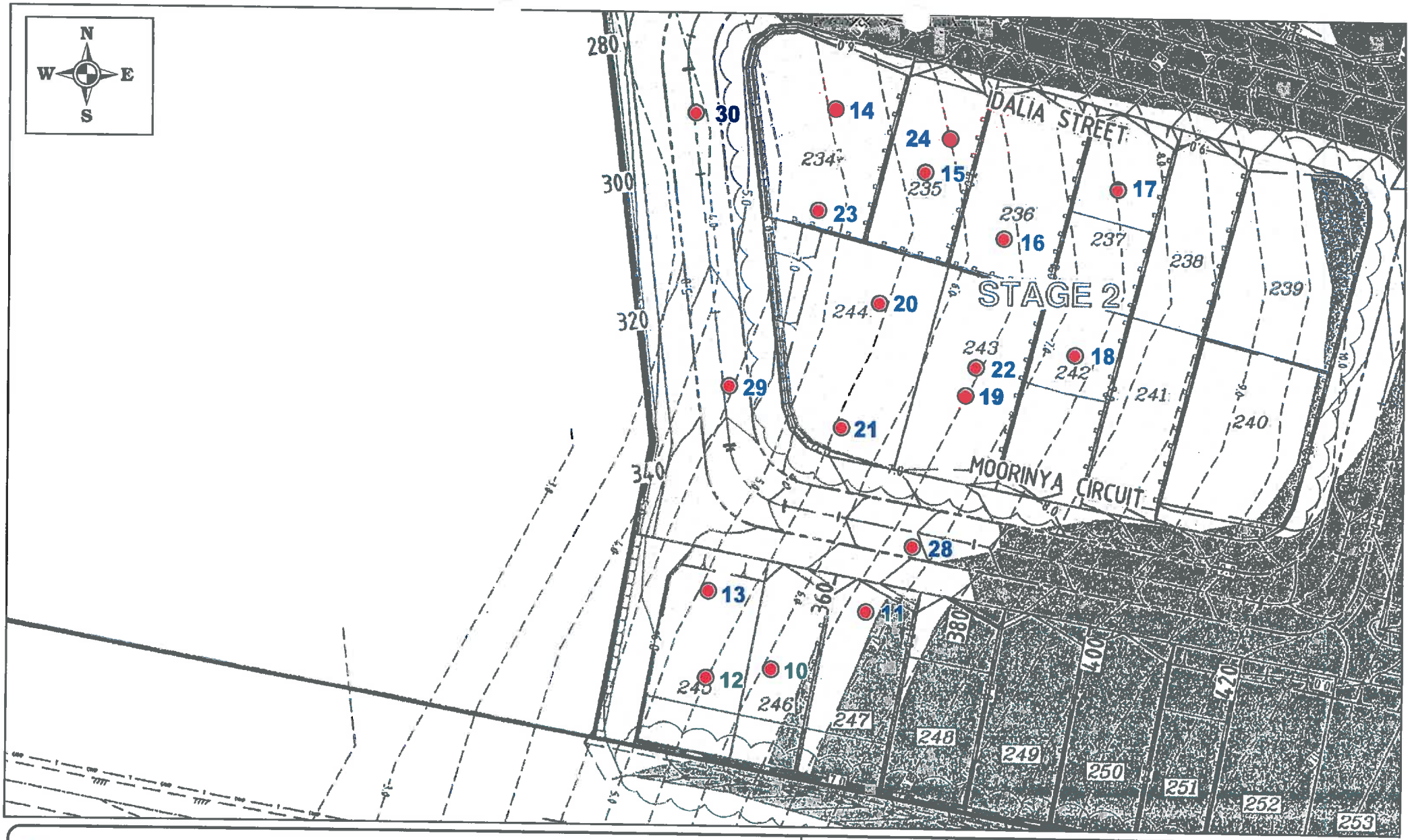
Engineers: D.Riley, J.Daly, S.Wynne, D.Dragun, C.Moratti
D.Vanderhor & B.Elsmore
Geologists: L.Bexley & R.Howchin

Map Description :	**Field Density Test Locations (Sheet 1 of 2)**		
Client :	**Golding Contractors Pty Ltd**		
Project :	**Precinct 1.1 - Stages 1 & 2, Gainsborough Greens Development, Yawalpah Road, Pimpama**		
Project No :	**GL16/077**	Date: **26/10/16**	Scale : Not to Scale



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Map Description :	**Field Density Test Locations (Sheet 2 of 2)**		
Client :	**Golding Contractors Pty Ltd**		
Project :	**Precinct 1.1 - Stages 1 & 2, Gainsborough Greens Development, Yawalpah Road, Pimpama**		
Project No :	**GL16/077**	Date: **26/10/16**	Scale : Not to Scale

APPENDIX 'B'

(Laboratory Test Results)

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Hilf Density Ratio Report

Client :	**GOLDING CONTRACTORS**	Report Number:	**GL16-077.2/1**
Address :	**Po Box 65, Arundel BC, QLD, 4214**	Report Date :	**13/05/2016**
Project Name :	**GAINSBOROUGH GREENS - PRECINCT 1.1 - STAGES 1 & 2**	Order Number :	
Project Number :	**GL16/077**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**YAWALPAH ROAD , PIMPAMA**		**Page 1 of 1**

Sample Number :	218740	218741	218742	218743
Test Number :	1	2	3	4
Sampling Method :	AS1289.1.2.1 CL. 6.4	AS1289.1.2.1 CL. 6.4	AS1289.1.2.1 CL. 6.4	AS1289.1.2.1 CL. 6.4
Date Sampled :	6/05/2016	6/05/2016	6/05/2016	6/05/2016
Date Tested :	6/05/2016	6/05/2016	6/05/2016	6/05/2016
'aterial Type :	ALLOTMENT FILL	ALLOTMENT FILL	ALLOTMENT FILL	ALLOTMENT FILL
Material Source :	ONSITE	ONSITE	ONSITE	ONSITE
Lot Number :				
Sample Location :	REFER TO SITE PLAN FINISHED LEVEL	REFER TO SITE PLAN FINISHED LEVEL	REFER TO SITE PLAN FINISHED LEVEL	REFER TO SITE PLAN FINISHED LEVEL
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	-	-	-	-
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	4	4	16
Oversize Dry (%) :				
Oversize Density (t/m³) :		2.425	2.457	2.496
Field Moisture Content (%) :	16.7	17.9	20.8	10.2
Hilf MDR Number :	218740	218741	218742	218743
Hilf MDR Method :				
Compactive Effort :	Standard	Standard	Standard	Standard
rield Density Method :	AS1289.5.8.1 & 5.7.1	AS1289.5.8.1 & 5.7.1	AS1289.5.8.1 & 5.7.1	AS1289.5.8.1 & 5.7.1
Moisture Method :	AS 1289.2.1.1	AS 1289.2.1.1	AS 1289.2.1.1	AS 1289.2.1.1
Moisture Ratio (%) :	95.5	105.5	92.5	88.5
Field Wet Density (t/m³) :	1.990	1.990	1.980	2.060
Optimum Moisture Content (%) :	17.4	17.0	22.5	11.5
Moisture Variation :	0.7	-0.9	1.6	1.3
Peak Converted Wet Density (t/m³) :	1.970	2.07*	1.97*	2.17*
Hilf Density Ratio (%) :	**101.0**	**96.0**	**100.5**	**95.0**
Minimum Specification :	95	95	95	95
Moisture Specification :				
Site Selection :				
Soil Description :				
Remarks :	-			

* - denotes adjusted for oversize

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APPROVED SIGNATORY

S Taylor

GARY TAYLOR (Gold Coast) - WORKS SUPERVISOR
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Hilf Density Ratio Report

Client :	GOLDING CONTRACTORS	Report Number:	GL16-077.3/1
Address :	Po Box 65, Arundel BC, QLD, 4214	Report Date :	13/05/2016
Project Name :	GAINSBOROUGH GREENS - PRECINCT 1.1 - STAGES 1 & 2	Order Number :	
Project Number :	GL16/077	Test Method :	AS1289.5.8.1 & 5.7.1
Location:	YAWALPAH ROAD , PIMPAMA		Page 1 of 1

Sample Number :	218744	218745		
Test Number :	5	6		
Sampling Method :	AS1289.1.2.1 CL. 6.4	AS1289.1.2.1 CL. 6.4		
Date Sampled :	6/05/2016	6/05/2016		
Date Tested :	6/05/2016	6/05/2016		
laterial Type :	ALLOTMENT FILL	ALLOTMENT FILL		
Material Source :	ONSITE	ONSITE		
Lot Number :				
Sample Location :	REFER TO SITE PLAN FINISHED LEVEL	REFER TO SITE PLAN FINISHED LEVEL		
Test Depth (mm) :	150	150		
Layer Depth (mm) :	-	-		
Maximum Size (mm) :	19	19		
Oversize Wet (%) :	10	-		
Oversize Dry (%) :				
Oversize Density (t/m³) :	2.492			
Field Moisture Content (%) :	13.7	21.2		
Hilf MDR Number :	218744	218745		
Hilf MDR Method :	AS1289.5.7.1			
Compactive Effort :	Standard	Standard		
Field Density Method :	AS1289.5.8.1 & 5.7.1	AS1289.5.8.1 & 5.7.1		
Moisture Method :	AS 1289.2.1.1	AS 1289.2.1.1		
Moisture Ratio (%) :	108	101		
Field Wet Density (t/m³) :	2.090	1.980		
Optimum Moisture Content (%) :	12.7	21.0		
Moisture Variation :	-1.0	-0.2		
Peak Converted Wet Density (t/m³) :	2.19*	1.970		
Hilf Density Ratio (%) :	**95.5**	**100.5**		
Minimum Specification :	95	95		
Moisture Specification :				
Site Selection :				
Soil Description :				
Remarks :	-			

* - denotes adjusted for oversize

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Hilf Density Ratio Report

Client :	**GOLDING CONTRACTORS**	Report Number:	**GL16-077.1/1**
Address :	**Po Box 65, Arundel BC, QLD, 4214**	Report Date :	**13/05/2016**
Project Name :	**GAINSBOROUGH GREENS - PRECINCT 1.1 - STAGES 1 & 2**	Order Number :	
Project Number :	**GL16/077**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**YAWALPAH ROAD , PIMPAMA**	**Page 1 of 1**	

Sample Number :	218777	218778	218779	
Test Number :	7	8	9	
Sampling Method :	AS1289.1.2.1 CL. 6.4	AS1289.1.2.1 CL. 6.4	AS1289.1.2.1 CL. 6.4	
Date Sampled :	7/05/2016	7/05/2016	7/05/2016	
Date Tested :	7/05/2016	7/05/2016	7/05/2016	
Material Type :	ALLOTMENT FILL	ALLOTMENT FILL	ALLOTMENT FILL	
Material Source :	ONSITE	ONSITE	ONSITE	
Lot Number :				
Sample Location :	REFER TO SITE PLAN FINSIHED LEVEL	REFER TO SITE PLAN FINSIHED LEVEL	REFER TO SITE PLAN FINSIHED LEVEL	
Test Depth (mm) :	150	150	150	
Layer Depth (mm) :	-	-	-	
Maximum Size (mm) :	19	19	19	
Oversize Wet (%) :	-	-	-	
Oversize Dry (%) :				
Oversize Density (t/m³) :				
Field Moisture Content (%) :	12.0	19.4	20.0	
Hilf MDR Number :	218777	218778	218779	
Hilf MDR Method :	AS1289.5.7.1	AS1289.5.7.1	AS1289.5.7.1	
Compactive Effort :	Standard	Standard	Standard	
Field Density Method :	AS1289.5.8.1 & 5.7.1	AS1289.5.8.1 & 5.7.1	AS1289.5.8.1 & 5.7.1	
Moisture Method :	AS 1289.2.1.1	AS 1289.2.1.1	AS 1289.2.1.1	
Moisture Ratio (%) :	89	88	90.5	
Field Wet Density (t/m³) :	2.020	1.920	1.940	
Optimum Moisture Content (%) :	13.5	22.1	22.1	
Moisture Variation :	1.5	2.5	2.0	
Peak Converted Wet Density (t/m³) :	2.090	1.950	1.940	
Hilf Density Ratio (%) :	**96.5**	**98.5**	**100.0**	
Minimum Specification :	95	95	95	
Moisture Specification :				
Site Selection :				
Soil Description :				
Remarks :	-			

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Document Code RFO89-10

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Hilf Density Ratio Report

Client :	**GOLDING CONTRACTORS**	Report Number:	**GL16-077.4/1**
Address :	**Po Box 65, Arundel BC, QLD, 4214**	Report Date :	**16/05/2016**
Project Name :	**GAINSBOROUGH GREENS - PRECINCT 1.1 - STAGES 1 & 2**	Order Number :	
Project Number :	**GL16/077**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**YAWALPAH ROAD , PIMPAMA**		**Page 1 of 1**

Sample Number :	218799	218800		
Test Number :	10	11		
Sampling Method :	AS1289.1.2.1 CL. 6.4	AS1289.1.2.1 CL. 6.4		
Date Sampled :	9/05/2016	9/05/2016		
Date Tested :	9/05/2016	9/05/2016		
Material Type :	LOT FILL	LOT FILL		
Material Source :	ONSITE	ONSITE		
Lot Number :				
Sample Location :	REFER TO SITE PLAN FINISHED LEVEL	REFER TO SITE PLAN FINISHED LEVEL		
Test Depth (mm) :	150	150		
Layer Depth (mm) :	-	-		
Maximum Size (mm) :	19	19		
Oversize Wet (%) :	-	-		
Oversize Dry (%) :				
Oversize Density (t/m³) :				
Field Moisture Content (%) :	21.1	21.0		
Hilf MDR Number :	218799	218800		
Hilf MDR Method :	AS1289.5.7.1	AS1289.5.7.1		
Compactive Effort :	Standard	Standard		
Field Density Method :	AS1289.5.8.1 & 5.7.1	AS1289.5.8.1 & 5.7.1		
Moisture Method :	AS 1289.2.1.1	AS 1289.2.1.1		
Moisture Ratio (%) :	97	93		
Field Wet Density (t/m³) :	1.920	1.910		
Optimum Moisture Content (%) :	21.7	22.6		
Moisture Variation :	0.6	1.5		
Peak Converted Wet Density (t/m³) :	1.890	1.900		
Hilf Density Ratio (%) :	**101.5**	**100.5**		
Minimum Specification :	95	95		
Moisture Specification :				
Site Selection :				
Soil Description :				
Remarks :	-			

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Hilf Density Ratio Report

Client :	**GOLDING CONTRACTORS**	Report Number:	**GL16-077.5/1**
Address :	**Po Box 65, Arundel BC, QLD, 4214**	Report Date :	**17/05/2016**
Project Name :	**GAINSBOROUGH GREENS - PRECINCT 1.1 - STAGES 1 & 2**	Order Number :	
Project Number :	**GL16/077**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**YAWALPAH ROAD , PIMPAMA**		**Page 1 of 1**

Sample Number :	218858	218859		
Test Number :	12	13		
Sampling Method :	AS1289.1.2.1 CL. 6.4	AS1289.1.2.1 CL. 6.4		
Date Sampled :	11/05/2016	11/05/2016		
Date Tested :	11/05/2016	11/05/2016		
Material Type :	LOT FILL	LOT FILL		
Material Source :	ONSITE	ONSITE		
Lot Number :				
Sample Location :	REFER TO SITE PLAN 0.5m BELOW FL	REFER TO SITE PLAN FINISHED LEVEL		
Test Depth (mm) :	150	150		
Layer Depth (mm) :	-	-		
Maximum Size (mm) :	19	19		
Oversize Wet (%) :	-	-		
Oversize Dry (%) :				
Oversize Density (t/m³) :				
Field Moisture Content (%) :	20.7	19.0		
Hilf MDR Number :	218858	218859		
Hilf MDR Method :	AS1289.5.7.1	AS1289.5.7.1		
Compactive Effort :	Standard	Standard		
Field Density Method :	AS1289.5.8.1 & 5.7.1	AS1289.5.8.1 & 5.7.1		
Moisture Method :	AS 1289.2.1.1	AS 1289.2.1.1		
Moisture Ratio (%) :	91.5	100		
Field Wet Density (t/m³) :	2.020	2.010		
Optimum Moisture Content (%) :	22.6	19.0		
Moisture Variation :	1.9	0.0		
Peak Converted Wet Density (t/m³) :	1.900	1.960		
Hilf Density Ratio (%) :	**106.5**	**102.0**		
Minimum Specification :	95	95		
Moisture Specification :				
Site Selection :				
Soil Description :				
Remarks :	-			

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Hilf Density Ratio Report

Client :	**GOLDING CONTRACTORS**	Report Number:	**GL16-077.6/1**
Address :	**Po Box 65, Arundel BC, QLD, 4214**	Report Date :	**19/05/2016**
Project Name :	**GAINSBOROUGH GREENS - PRECINCT 1.1 - STAGES 1 & 2**	Order Number :	
Project Number :	**GL16/077**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**YAWALPAH ROAD , PIMPAMA**	**Page 1 of 1**	

Sample Number :	218933	218934	218935	
Test Number :	14	15	16	
Sampling Method :	AS1289.1.2.1 CL. 6.4	AS1289.1.2.1 CL. 6.4	AS1289.1.2.1 CL. 6.4	
Date Sampled :	13/05/2016	13/05/2016	13/05/2016	
Date Tested :	13/05/2016	13/05/2016	13/05/2016	
Material Type :	LOT FILL	LOT FILL	LOT FILL	
Material Source :	ONSITE	ONSITE	ONSITE	
Lot Number :				
Sample Location :	REFER TO SITE PLAN FINISHED LEVEL	REFER TO SITE PLAN 0.8m BELOW FL	REFER TO SITE PLAN 0.8m BELOW FL	
Test Depth (mm) :	150	150	150	
Layer Depth (mm) :	-	-	-	
Maximum Size (mm) :	19	19	19	
Oversize Wet (%) :	-	-	-	
Oversize Dry (%) :				
Oversize Density (t/m³) :				
Field Moisture Content (%) :	19.5	20.9	19.1	
Hilf MDR Number :	218933	218934	218935	
Hilf MDR Method :	AS1289.5.7.1	AS1289.5.7.1	AS1289.5.7.1	
Compactive Effort :	Standard	Standard	Standard	
Field Density Method :	AS1289.5.8.1 & 5.7.1	AS1289.5.8.1 & 5.7.1	AS1289.5.8.1 & 5.7.1	
Moisture Method :	AS 1289.2.1.1	AS 1289.2.1.1	AS 1289.2.1.1	
Moisture Ratio (%) :	98	106	105	
Field Wet Density (t/m³) :	1.980	1.970	1.980	
Optimum Moisture Content (%) :	19.9	19.7	18.2	
Moisture Variation :	0.3	-1.2	-0.9	
Peak Converted Wet Density (t/m³) :	2.060	2.070	2.070	
Hilf Density Ratio (%) :	**96.0**	**95.5**	**95.5**	
Minimum Specification :	95	95	95	
Moisture Specification :				
Site Selection :				
Soil Description :				
Remarks :	-			

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Hilf Density Ratio Report

Client :	**GOLDING CONTRACTORS**	Report Number:	**GL16-077.7/1**
Address :	**Po Box 65, Arundel BC, QLD, 4214**	Report Date :	**19/05/2016**
Project Name :	**GAINSBOROUGH GREENS - PRECINCT 1.1 - STAGES 1 & 2**	Order Number :	
Project Number :	**GL16/077**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**YAWALPAH ROAD , PIMPAMA**		**Page 1 of 1**

Sample Number :	218954	218955	218956	218957
Test Number :	17	18	19	20
Sampling Method :	AS1289.1.2.1 CL. 6.4	AS1289.1.2.1 CL. 6.4	AS1289.1.2.1 CL. 6.4	AS1289.1.2.1 CL. 6.4
Date Sampled :	16/05/2016	16/05/2016	16/05/2016	16/05/2016
Date Tested :	16/05/2016	16/05/2016	16/05/2016	16/05/2016
Material Type :	LOT FILL	LOT FILL	LOT FILL	LOT FILL
Material Source :	ONSITE	ONSITE	ONSITE	ONSITE
Lot Number :				
Sample Location :	REFER TO SITE PLAN 0.2m BELOW FL	REFER TO SITE PLAN 0.5m BELOW FL	REFER TO SITE PLAN 0.5m BELOW FL	REFER TO SITE PLAN 0.5m BELOW FL
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	-	-	-	-
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :				
Oversize Density (t/m³) :				
Field Moisture Content (%) :	14.7	17.9	14.5	17.5
Hilf MDR Number :	218954	218955	218956	218957
Hilf MDR Method :	AS1289.5.7.1	AS1289.5.7.1	AS1289.5.7.1	AS1289.5.7.1
Compactive Effort :	Standard	Standard	Standard	Standard
Field Density Method :	AS1289.5.8.1 & 5.7.1	AS1289.5.8.1 & 5.7.1	AS1289.5.8.1 & 5.7.1	AS1289.5.8.1 & 5.7.1
Moisture Method :	AS 1289.2.1.1	AS 1289.2.1.1	AS 1289.2.1.1	AS 1289.2.1.1
Moisture Ratio (%) :	79.5	91.5	77.5	90
Field Wet Density (t/m³) :	1.940	1.960	1.930	1.980
Optimum Moisture Content (%) :	18.5	19.6	18.7	19.5
Moisture Variation :	3.8	1.6	4.2	2.0
Peak Converted Wet Density (t/m³) :	1.910	1.950	1.900	1.940
Hilf Density Ratio (%) :	**101.5**	**100.5**	**101.5**	**102.5**
Minimum Specification :	95	95	95	95
Moisture Specification :				
Site Selection :				
Soil Description :				
Remarks :	-			

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Hilf Density Ratio Report

Client :	**GOLDING CONTRACTORS**	Report Number:	**GL16-077.8/1**
Address :	**Po Box 65, Arundel BC, QLD, 4214**	Report Date :	**23/05/2016**
Project Name :	**GAINSBOROUGH GREENS - PRECINCT 1.1 - STAGES 1 & 2**	Order Number :	
Project Number :	**GL16/077**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**YAWALPAH ROAD , PIMPAMA**		**Page 1 of 1**

Sample Number :	218996	218997	218998	218999
Test Number :	21	22	23	24
Sampling Method :	AS1289.1.2.1 CL. 6.4	AS1289.1.2.1 CL. 6.4	AS1289.1.2.1 CL. 6.4	AS1289.1.2.1 CL. 6.4
Date Sampled :	17/05/2016	17/05/2016	17/05/2016	17/05/2016
Date Tested :	17/05/2016	17/05/2016	17/05/2016	17/05/2016
Material Type :	LOT FILL	LOT FILL	LOT FILL	LOT FILL
Material Source :	ONSITE	ONSITE	ONSITE	ONSITE
Lot Number :				
Sample Location :	REFER TO SITE PLAN FINISHED LEVEL	REFER TO SITE PLAN FINISHED LEVEL	REFER TO SITE PLAN 0.4m BELOW FL	REFER TO SITE PLAN 0.4m BELOW FL
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	-	-	-	-
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	3
Oversize Dry (%) :				
Oversize Density (t/m³) :				2.422
Field Moisture Content (%) :	14.8	14.5	16.5	13.2
Hilf MDR Number :	218996	218997	218998	218999
Hilf MDR Method :	AS1289.5.7.1	AS1289.5.7.1	AS1289.5.7.1	AS1289.5.7.1
Compactive Effort :	Standard	Standard	Standard	Standard
Field Density Method :	AS1289.5.8.1 & 5.7.1	AS1289.5.8.1 & 5.7.1	AS1289.5.8.1 & 5.7.1	AS1289.5.8.1 & 5.7.1
Moisture Method :	AS 1289.2.1.1	AS 1289.2.1.1	AS 1289.2.1.1	AS 1289.2.1.1
Moisture Ratio (%) :	90.5	91	90	85.5
Field Wet Density (t/m³) :	1.910	1.910	1.950	1.950
Optimum Moisture Content (%) :	16.3	15.9	18.4	15.4
Moisture Variation :	1.5	1.4	1.8	2.3
Peak Converted Wet Density (t/m³) :	1.960	1.960	1.990	1.96*
Hilf Density Ratio (%) :	**97.5**	**97.0**	**98.0**	**99.0**
Minimum Specification :	95	95	95	95
Moisture Specification :				
Site Selection :				
Soil Description :				
Remarks :	-			

* - denotes adjusted for oversize

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Hilf Density Ratio Report

Client :	**GOLDING CONTRACTORS**	Report Number:	**GL16-077.9/1**
Address :	**Po Box 65, Arundel BC, QLD, 4214**	Report Date :	**24/05/2016**
Project Name :	**GAINSBOROUGH GREENS - PRECINCT 1.1 - STAGES 1 & 2**	Order Number :	
Project Number :	**GL16/077**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**YAWALPAH ROAD , PIMPAMA**		**Page 1 of 1**

Sample Number :	219050	219051	219052	
Test Number :	25	26	27	
Sampling Method :	AS1289.1.2.1 CL. 6.4	AS1289.1.2.1 CL. 6.4	AS1289.1.2.1 CL. 6.4	
Date Sampled :	18/05/2016	18/05/2016	18/05/2016	
Date Tested :	18/05/2016	18/05/2016	18/05/2016	
Material Type :	LOT FILL	LOT FILL	LOT FILL	
Material Source :	ONSITE	ONSITE	ONSITE	
Lot Number :				
Sample Location :	REFER TO SITE PLAN FINISHED LEVEL	REFER TO SITE PLAN FINISHED LEVEL	REFER TO SITE PLAN FINISHED LEVEL	
Test Depth (mm) :	150	150	150	
Layer Depth (mm) :	-	-	-	
Maximum Size (mm) :	19	19	19	
Oversize Wet (%) :	-	-	-	
Oversize Dry (%) :				
Oversize Density (t/m³) :				
Field Moisture Content (%) :	9.6	11.7	11.6	
Hilf MDR Number :	219050	219051	219052	
Hilf MDR Method :	AS1289.5.7.1	AS1289.5.7.1	AS1289.5.7.1	
Compactive Effort :	Standard	Standard	Standard	
Field Density Method :	AS1289.5.8.1 & 5.7.1	AS1289.5.8.1 & 5.7.1	AS1289.5.8.1 & 5.7.1	
Moisture Method :	AS 1289.2.1.1	AS 1289.2.1.1	AS 1289.2.1.1	
Moisture Ratio (%) :	80	72.5	77	
Field Wet Density (t/m³) :	1.900	1.950	1.920	
Optimum Moisture Content (%) :	12.0	16.1	15.0	
Moisture Variation :	2.6	4.6	3.6	
Peak Converted Wet Density (t/m³) :	1.870	1.860	1.850	
Hilf Density Ratio (%) :	**101.5**	**104.5**	**103.5**	
Minimum Specification :	95	95	95	
Moisture Specification :				
Site Selection :				
Soil Description :				
Remarks :	-			

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Hilf Density Ratio Report

Client :	**GOLDING CONTRACTORS**	Report Number:	**GL16-077.10/1**
Address :	**Po Box 65, Arundel BC, QLD, 4214**	Report Date :	**31/05/2016**
Project Name :	**GAINSBOROUGH GREENS - PRECINCT 1.1 - STAGES 1 & 2**	Order Number :	
Project Number :	**GL16/077**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**YAWALPAH ROAD , PIMPAMA**	**Page 1 of 1**	

Sample Number :	219118	219119	219120	
Test Number :	28	29	30	
Sampling Method :	AS1289.1.2.1 CL. 6.4	AS1289.1.2.1 CL. 6.4	AS1289.1.2.1 CL. 6.4	
Date Sampled :	19/05/2016	19/05/2016	19/05/2016	
Date Tested :	19/05/2016	19/05/2016	19/05/2016	
Material Type :	LOT FILL	LOT FILL	LOT FILL	
Material Source :	ONSITE	ONSITE	ONSITE	
Lot Number :				
Sample Location :	REFER TO SITE PLAN FINISHED LEVEL	REFER TO SITE PLAN 0.4m BELOW FL	REFER TO SITE PLAN FINISHED LEVEL	
Test Depth (mm) :	150	150	150	
Layer Depth (mm) :	-	-	-	
Maximum Size (mm) :	19	19	19	
Oversize Wet (%) :	-	-	-	
Oversize Dry (%) :				
Oversize Density (t/m³) :				
Field Moisture Content (%) :	14.9	16.2	13.0	
Hilf MDR Number :	219118	219119	219120	
Hilf MDR Method :	AS1289.5.7.1	AS1289.5.7.1	AS1289.5.7.1	
Compactive Effort :	Standard	Standard	Standard	
Field Density Method :	AS1289.5.8.1 & 5.7.1	AS1289.5.8.1 & 5.7.1	AS1289.5.8.1 & 5.7.1	
Moisture Method :	AS 1289.2.1.1	AS 1289.2.1.1	AS 1289.2.1.1	
Moisture Ratio (%) :	105	94	82.5	
Field Wet Density (t/m³) :	2.030	2.010	1.930	
Optimum Moisture Content (%) :	14.2	17.2	15.8	
Moisture Variation :	-0.7	1.0	2.7	
Peak Converted Wet Density (t/m³) :	1.990	2.000	1.980	
Hilf Density Ratio (%) :	**102.0**	**100.5**	**97.5**	
Minimum Specification :	95	95	95	
Moisture Specification :				
Site Selection :				
Soil Description :				
Remarks :	-			

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Hilf Density Ratio Report

Client :	**GOLDING CONTRACTORS**	Report Number:	**GL16-077.11/1**
Address :	**Po Box 65, Arundel BC, QLD, 4214**	Report Date :	**1/07/2016**
Project Name :	**GAINSBOROUGH GREENS - PRECINCT 1.1 - STAGES 1 & 2**	Order Number :	
Project Number :	**GL16/077**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**YAWALPAH ROAD , PIMPAMA**		**Page 1 of 1**

Sample Number :	220097	220098	220099	220100
Test Number :	31	32	33	34
Sampling Method :	AS1289.1.2.1 CL. 6.4	AS1289.1.2.1 CL. 6.4	AS1289.1.2.1 CL. 6.4	AS1289.1.2.1 CL. 6.4
Date Sampled :	27/06/2016	27/06/2016	27/06/2016	27/06/2016
Date Tested :	27/06/2016	27/06/2016	27/06/2016	27/06/2016
Material Type :	GENERAL FILL	GENERAL FILL	GENERAL FILL	GENERAL FILL
Material Source :	ONSITE	ONSITE	ONSITE	ONSITE
Lot Number :				
Sample Location :	REFER TO SITE PLAN 2m BELOW FL	REFER TO SITE PLAN 1.5m BELOW FL	REFER TO SITE PLAN 1m BELOW FL	REFER TO SITE PLAN 0.5m BELOW FL
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	-	-	-	-
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :				
Oversize Density (t/m³) :				
Field Moisture Content (%) :	18.6	17.5	14.7	14.2
Hilf MDR Number :	220097	220098	220099	220100
Hilf MDR Method :				AS1289.5.7.1
Compactive Effort :	Standard	Standard	Standard	Standard
Field Density Method :	AS1289.5.8.1 & 5.7.1	AS1289.5.8.1 & 5.7.1	AS1289.5.8.1 & 5.7.1	AS1289.5.8.1 & 5.7.1
Moisture Method :	AS 1289.2.1.1	AS 1289.2.1.1	AS 1289.2.1.1	AS 1289.2.1.1
Moisture Ratio (%) :	93.5	103	88.5	91
Field Wet Density (t/m³) :	1.940	1.930	2.030	2.040
Optimum Moisture Content (%) :	19.9	17.0	16.6	15.6
Moisture Variation :	1.3	-0.5	1.9	1.4
Peak Converted Wet Density (t/m³) :	1.990	2.040	1.980	2.040
Hilf Density Ratio (%) :	**97.5**	**95.0**	**102.5**	**100.0**
Minimum Specification :	95	95	95	95
Moisture Specification :				
Site Selection :				
Soil Description :				
Remarks :	-			

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Hilf Density Ratio Report

Client :	**GOLDING CONTRACTORS**	Report Number:	**GL16-077.12/1**
Address :	**Po Box 65, Arundel BC, QLD, 4214**	Report Date :	**26/07/2016**
Project Name :	**GAINSBOROUGH GREENS - PRECINCT 1.1 - STAGES 1 & 2**	Order Number :	
Project Number :	**GL16/077**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**YAWALPAH ROAD , PIMPAMA**		**Page 1 of 1**

Sample Number :	220728			
Test Number :	35			
Sampling Method :	AS1289.1.2.1 CL. 6.4			
Date Sampled :	15/07/2016			
Date Tested :	15/07/2016			
Material Type :	GENERAL FILL			
Material Source :	ONSITE			
Lot Number :	273			
Sample Location :	REFER TO SITE PLAN 1.5m BELOW FL			
Test Depth (mm) :	150			
Layer Depth (mm) :	-			
Maximum Size (mm) :	19			
Oversize Wet (%) :	-			
Oversize Dry (%) :				
Oversize Density (t/m³) :				
Field Moisture Content (%) :	18.0			
Hilf MDR Number :	220728			
Hilf MDR Method :	AS1289.5.1.1 & 5.7.1			
Compactive Effort :	Standard			
Field Density Method :	AS1289.5.8.1 & 5.7.1			
Moisture Method :	AS 1289.2.1.1			
Moisture Ratio (%) :	92			
Field Wet Density (t/m³) :	1.970			
Optimum Moisture Content (%) :	19.5			
Moisture Variation :	1.5			
Peak Converted Wet Density (t/m³) :	2.020			
Hilf Density Ratio (%) :	**97.5**			
Minimum Specification :	95			
Moisture Specification :				
Site Selection :				
Soil Description :				
Remarks :	-			

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APPENDIX 'C'

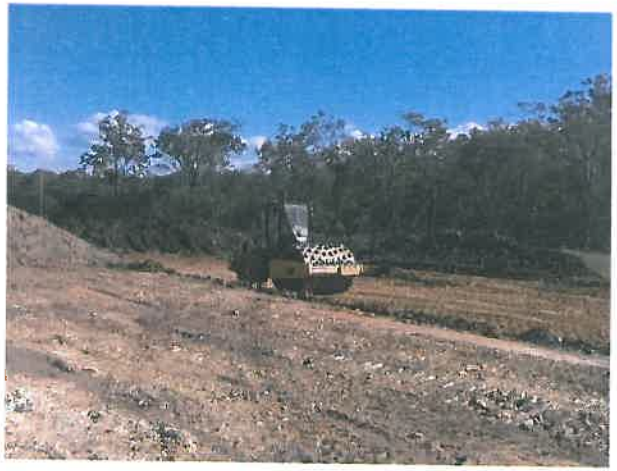
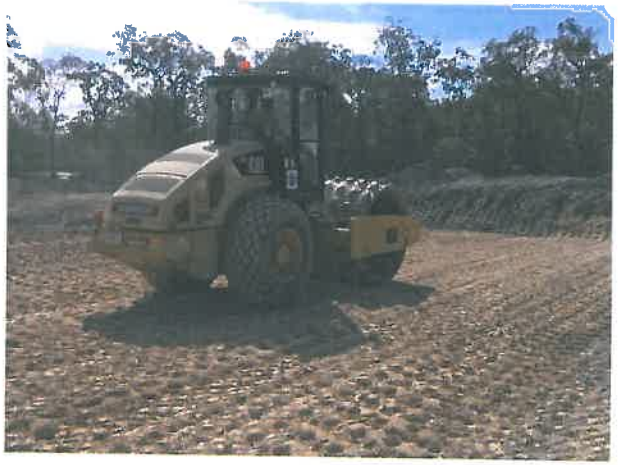
(Photo Gallery)



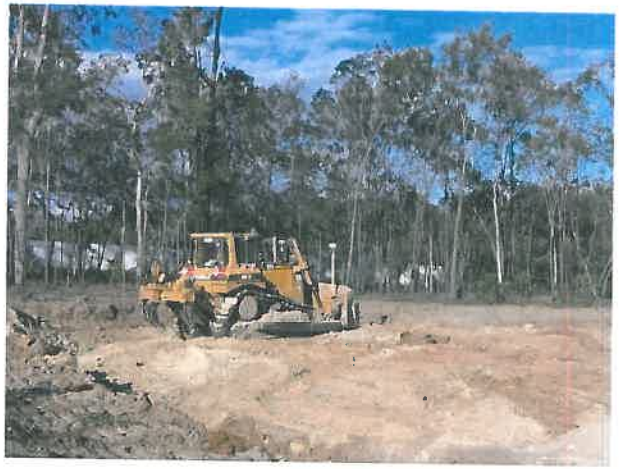


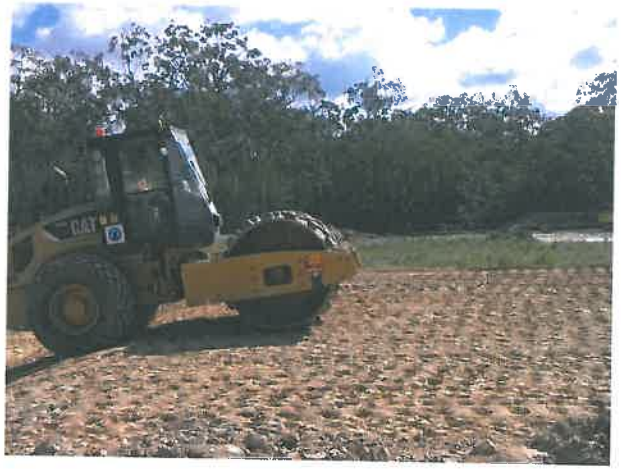
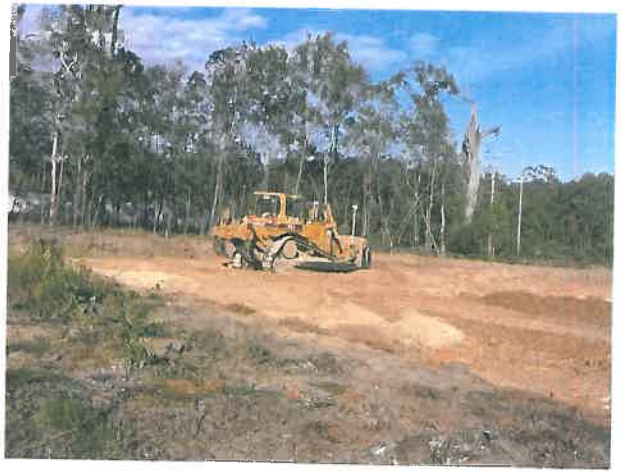






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