MORRISON GEOTECHNIC

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Brisbane Office
Job No: DL17/122
Ref No: 12980
Author: L. McDowall

5th March 2018

Allroads
PO Box 318
Browns Plains Qld 4118

ATTENTION: MR DARREN GILLESPIE

Email: Darren.gillespie@allroads.com.au
Cc: Sam.petersen@allroads.com.au

Dear Sirs,

RE: LEVEL ONE COMPLIANCE REPORT FOR BULK EARTHWORKS FILLING OPERATIONS FLAGSTONE CITY STAGE 1I, FLAGSTONE

Table of Contents

1.0 INTRODUCTION

1.1 General

This report presents results of Level One Earthworks Inspections and associated Compaction Compliance testing carried out on Earthworks Fill constructed to form residential building platforms at the Flagstone City Stage 1I Development, Flagstone (The Site).

The work was commissioned by Mr. D. Gillespie representing Allroads Ltd Pty (The Client), using Purchase Order AR2210-SCA-001.

Earthworks were carried out by The Client.

Earthworks filling operations were carried out intermittently between 26th April 2017 and 23rd November 2017.

Picture 1: Aerial View of the Site (Image Source: Nearmap.com- dated 16th September 2017)

1.2 Previous Earthworks

As far as could be determined; no previous earthworks have been carried out at The Site.

1.3 The Project

The Purpose for filling at The Site is to construct a Residential Subdivision which included new pavements, residential building platforms and associated underground services.

Bradlees Pty Ltd Earthworks Cut/Fill Plan, Project Number 15-843, Drawing number C1-S1G-CIL-110, Revision A dated 19.05.2017, indicates the extents and thickness of fill to be constructed at The Site. This plan is considered to be a reasonable indication of the actual fill constructed at The Site.

The actual thickness of fill on an individual Lot can be obtained from the Developer as a Lot Disclosure Plan.
The Site is bounded by future residential developments to the East and South and undeveloped land to the North and West.

2.0 THE BRIEF

The Brief from the Client was limited to:

- Level One Inspection and Testing of the placement and compaction of fill materials in accordance with AS3798 2007 – "Guidelines on Earthworks for Commercial and Residential Developments",
- Logan City Council Project Specifications.
- Relative Density Control Testing in accordance with AS1289 – Testing of Soils for Engineering Purposes and at frequencies required in AS3798 Table 8.1.
- Notes on Bradlees Earthworks Drawings.

All other design requirements such as CBR and Quality of Materials, site classification, material, settlement assessments and existing filling were not included in the Brief and are therefore excluded from this Report.

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.

Field and laboratory testing included a walk over assessments of the existing ground conditions, observation of filling and compaction activities, field density testing using a nuclear soil moisture density gauge and Hilf compactions. All work was carried out in accordance with AS 3798 and AS 1289.

3.1 Stripped Surface Assessment

The areas to be filled at The Site were observed to be stripped and cleared of all visible organic matter, deleterious, loose and unsuitable materials to depths exposing a competent natural foundation.

The materials forming the natural fill foundation, exposed after the stripping and clearing can be broadly summarised as:

- Sandstone (SW) – slightly weathered, medium and medium to high strength, fine to medium grained, orange grey with grey/brown streaks.
- Clayey Sand (SC) – at least dense, fine to course grained sand, low to medium plasticity fines, light orange – grey, moist.

Following the stripped surface assessment of the fill areas, the natural fill foundation was approved for filling using the following process:

- Walk over assessments confirming that the competent ground was exposed.
- Proof roll testing using large sized and loaded truck confirming no movement of the foundation.
- Sloping areas to be filled were either benched prior to filling or fill was keyed into the slope during filling operations.

On this basis, the compliant assessments in accordance with above indicate that the exposed ground forming the fill foundation is capable of supporting new fill materials.

Picture 2: View of the Stripping Operations Prior to Fill Placement

3.2 Filling Operations

Fill material was sourced from onsite cuts areas, onsite stockpiles and trench excavations.

Fill materials can be broadly summarised as:

- Sandy Clay (CI) – medium plasticity, fine to coarse grained sand, traces of fine to course gravel, orange – grey - brown, moist.
- Clayey Sand (SC) – fine to course grained sand, low to medium plasticity, traces of fine to course gravel, light orange – grey, moist

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

- 825 Compactor
- Dozer
- Scraper
- Articulated Dump Truck
- Water Truck
- Excavator

The fill materials were moisture conditioned at the source and during placement to moisture contents suitable for compaction. Deleterious materials such as organics, sticks, roots and over size particles were sorted and removed during placement or were rejected for use. Occasional cobble sized particles may remain in the fill however are not considered to affect the fill as a mass.

Placement of the fill materials was carried layers appropriate for the above plant and compacted using the above plant carrying out multiple passes.

Our representative observed the filling process as described above and it was assessed to be consistent for the entire thickness of fill.

Field density tests and laboratory compactions were carried out on the compacted 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 achieved the required specification of 95% of the Hilf Density.

Fill placed and compacted at measured density ratios less than 95% were tyned, moisture conditioned and re-compacted until the required specification was achieved. Retesting was carried out using Random Stratified Location methods.

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

Picture 3: View of the Site During Construction

Picture 4: View of the Site During Construction

4.0 STATEMENT OF COMPLIANCE

Our representative observed all the relevant earthworks operations including the stripped surface, filling operations and carried out field density tests in accordance with the required standards (AS3798, AS1289) and specifications.

It is confirmed that Level One Inspection and Testing has been carried out on the earthworks fill to form the residential Lots and embankments below subgrade. Based on the observations made by our Geotechnicians and the results of the field and laboratory tests, the placed and compacted fill at the above project has, as far as we have been able to assess, been constructed in general accordance with the intent of AS3798 and the Specification.

The fill can be deemed as “controlled” as defined in AS2870 (Residential Slabs and Footings).

5.0 EXCLUSIONS

This statement does not include trench backfill or any top soil which may be placed for use as dressing or any other subsequent earthworks after 23rd November 2017.

Assessments of material quality such as soaked CBR and site classifications are excluded from this commission.

Our on-site attendance specifically excludes assessments of fill material quality and engineering properties that are outside the requirements of AS3798 - 2007, including soil or fill reactivity and soaked CBR values. We note that the fill materials used may result in unfavourable site classifications and low subgrade design strengths.

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.

This report is not to be relied upon for settlement analysis engineering advice. This is beyond the scope of this report and outside our engagement.

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 Allroads Pty Ltd (**Client**), its designers, clients and relevant statutory authorities for the sole purpose of providing geotechnical advice and recommendations in respect of the Flagstone City Stage 1I Development, Flagstone **(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 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.

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

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(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.

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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 our Brisbane office.

Yours faithfully

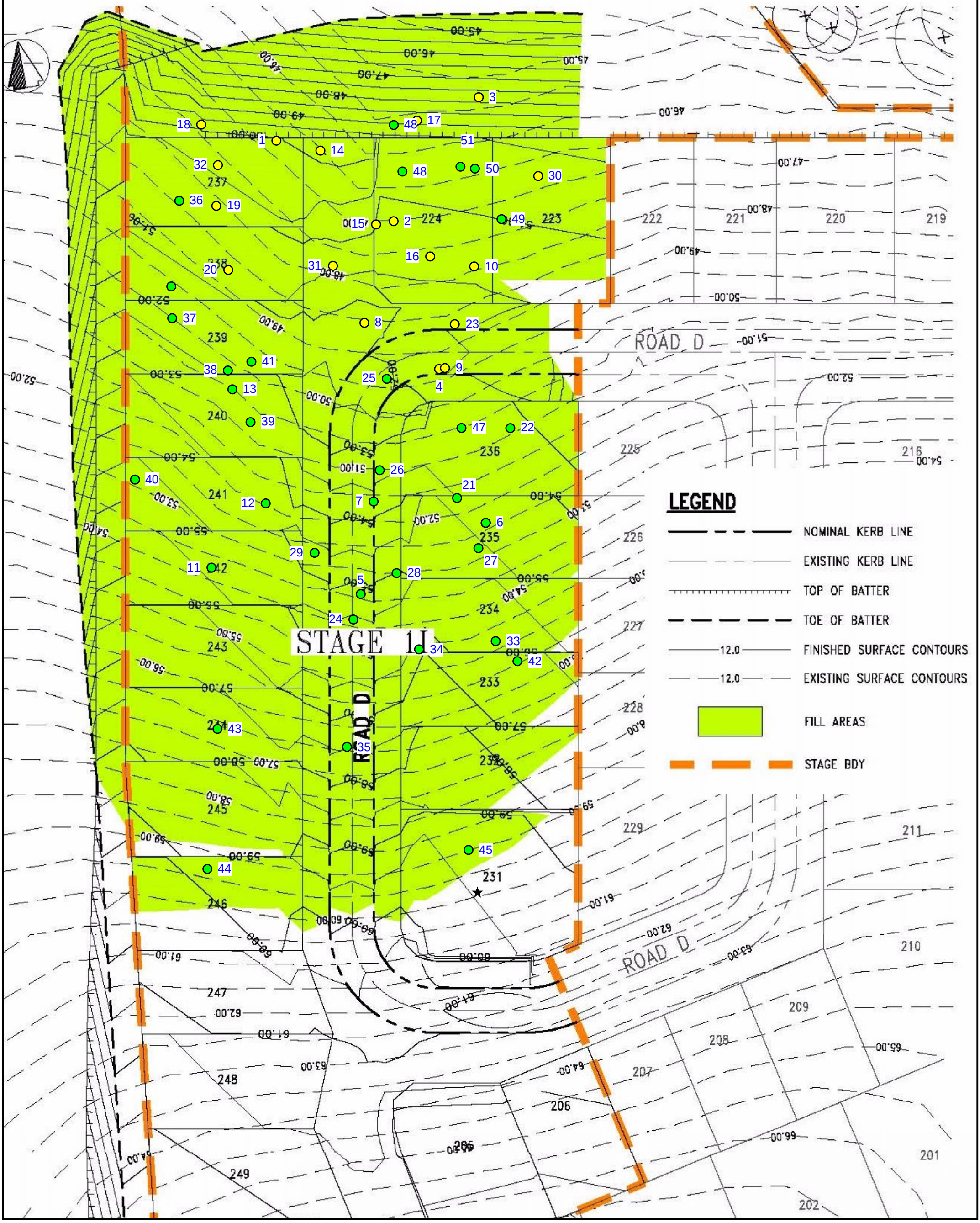
LIAM McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

ATTACHMENTS:
Appendix A – Site Plan Showing Test Locations
Appendix B – Laboratory Test Results Reports
Brochure – 'Important Information About Your Geotechnical Report'

APPENDIX A

Site Plan

Test Locations



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Engineers: D.Riley & J.Daly
Geologists: L.Bexley & R.Howchin
Laboratory: M.Morrison

Map Description :	**EARTHWORKS FIELD DENSITY TESTING - Level 1 Inspection**
Client :	ALLROADS PTY LTD
Project :	**FLAGSTONE CITY, STAGE 1I**
LEGEND :	RL 40.00 - 44.99 · RL 45.00 - 49.99 · RL 50.00 - 54.99 · RL ---------- · RL ---------- · Final Level

Project No :	DL17/122	Drawing No :	DL17/122 - 01	Scale :	Not to Scale

APPENDIX B

Test Certificates

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Hilf Density Ratio Report

Client :	ALLROADS PTY LTD	Report Number:	DL17/122 - 1
Address :	P O BOX 4698, LOGANHOLME, QLD, 4129	Report Date :	05/05/2017
Project Name :	EARTHWORKS SUPERVISION	Order Number :	AR2087/SCA001
Project Number :	DL17/122	Test Method :	AS1289.5.8.1 & 5.7.1
Location:	FLAGSTONE CITY , STAGE 1I	Page 1 of 1	

Sample Number :	228003	228004	228005	228006
Test Number :	1	2	3	4
Sampling Method :	-	-	-	-
Date Sampled :	28/04/2017	28/04/2017	28/04/2017	28/04/2017
Date Tested :	28/04/2017	28/04/2017	28/04/2017	28/04/2017
Material Type :	General Fill	General Fill	General Fill	General Fill
Material Source :	On Site	On Site	On Site	On Site
Lot Number :	-	-	-	-
Sample Location :	E 33887 N 73619 RL 46.82	E 33904 N 73602 RL 46.96	E 33922 N 73620 RL 45.53	E 33907 N 73576 RL 49.22
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 (%) :	7.3	6.6	8.8	7.2
Hilf MDR Number :	228003	228004	228005	228006
Hilf MDR Method :	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 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 :	AS1289.2.1.1	AS1289.2.1.1	AS1289.2.1.1	AS1289.2.1.1
Moisture Ratio (%) :	76.5	68.5	101	77
Field Wet Density (t/m³) :	2.117	2.121	2.103	2.102
Optimum Moisture Content (%) :	9.6	9.6	8.7	9.4
Moisture Variation :	2.3	3.2	-0.1	2.2
Peak Converted Wet Density (t/m³) :	2.137	2.111	2.191	2.141
Hilf Density Ratio (%) :	99.0	100.5	96.0	98.0
Minimum Specification :	95	95	95	95
Moisture Specification :	-	-	-	-
Site Selection :	-	-	-	-
Soil Description :	-	-	-	-
Remarks :	-			

NATA ACCREDITATION

Accredited for compliance with ISO/IEC 17025.

APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
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Hilf Density Ratio Report

Client :	ALLROADS PTY LTD	Report Number:	DL17/122 - 2
Address :	P O BOX 4698, LOGANHOLME, QLD, 4129	Report Date :	09/05/2017
Project Name :	EARTHWORKS SUPERVISION	Order Number :	AR2087/SCA001
Project Number :	DL17/122	Test Method :	AS1289.5.8.1 & 5.7.1
Location:	FLAGSTONE CITY , STAGE 1I	Page 1 of 1	

Sample Number :	228206	228207	228208	
Test Number :	5	6	7	
Sampling Method :	-	-	-	
Date Sampled :	02/05/2017	02/05/2017	02/05/2017	
Date Tested :	02/05/2017	02/05/2017	02/05/2017	
Material Type :	General Fill	General Fill	General Fill	
Material Source :	On Site	On Site	On Site	
Lot Number :	-	-	-	
Sample Location :	E 33887 N 73541 RL 53.10	E 33910 N 73549 RL 52.38	E 33892 N 73556 RL 51.74	
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 (%) :	8.1	7.2	9.3	
Hilf MDR Number :	228206	228207	228208	
Hilf MDR Method :	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 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 :	AS1289.2.1.1	AS1289.2.1.1	AS1289.2.1.1	
Moisture Ratio (%) :	71.5	68	82.5	
Field Wet Density (t/m³) :	2.106	2.120	2.224	
Optimum Moisture Content (%) :	11.3	10.6	11.3	
Moisture Variation :	3.3	3.5	2.0	
Peak Converted Wet Density (t/m³) :	2.152	2.157	2.136	
Hilf Density Ratio (%) :	98.0	98.5	104.0	
Minimum Specification :	95	95	95	
Moisture Specification :	-	-	-	
Site Selection :	-	-	-	
Soil Description :	-	-	-	
Remarks :	-			

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Liam Mcdowall (Brisbane) - Branch Manager
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Hilf Density Ratio Report

Client :	ALLROADS PTY LTD	Report Number:	DL17/122 - 3
Address :	P O BOX 4698, LOGANHOLME, QLD, 4129	Report Date :	10/05/2017
Project Name :	EARTHWORKS SUPERVISION	Order Number :	AR2087/SCA001
Project Number :	DL17/122	Test Method :	AS1289.5.8.1 & 5.7.1
Location:	FLAGSTONE CITY , STAGE 1I	Page 1 of 1	

Sample Number :	228301	228302	228303	
Test Number :	8	9	10	
Sampling Method :	-	-	-	
Date Sampled :	03/05/2017	03/05/2017	03/05/2017	
Date Tested :	03/05/2017	03/05/2017	03/05/2017	
Material Type :	General Fill	General Fill	General Fill	
Material Source :	On Site	On Site	On Site	
Lot Number :	-	-	-	
Sample Location :	E 33896 N 73586 RL 48.89	E 33908 N 73576 RL 49.56	E 33916 N 73592 RL 48.51	
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 (%) :	9.5	12.0	10.1	
Hilf MDR Number :	228301	228302	228303	
Hilf MDR Method :	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 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 :	AS1289.2.1.1	AS1289.2.1.1	AS1289.2.1.1	
Moisture Ratio (%) :	83.5	105	91.5	
Field Wet Density (t/m³) :	2.198	2.158	2.124	
Optimum Moisture Content (%) :	11.4	11.4	11.0	
Moisture Variation :	1.9	-0.6	0.9	
Peak Converted Wet Density (t/m³) :	2.212	2.222	2.211	
Hilf Density Ratio (%) :	99.5	97.0	96.0	
Minimum Specification :	95	95	95	
Moisture Specification :	-	-	-	
Site Selection :	-	-	-	
Soil Description :	-	-	-	
Remarks :	-			

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Hilf Density Ratio Report

Client :	ALLROADS PTY LTD	Report Number:	DL17/122 - 4
Address :	P O BOX 4698, LOGANHOLME, QLD, 4129	Report Date :	10/05/2017
Project Name :	EARTHWORKS SUPERVISION	Order Number :	AR2087/SCA001
Project Number :	DL17/122	Test Method :	AS1289.5.8.1 & 5.7.1
Location:	FLAGSTONE CITY , STAGE 1I	Page 1 of 1	

Sample Number :	228477	228478	228479	
Test Number :	11	12	13	
Sampling Method :	-	-	-	
Date Sampled :	05/05/2017	05/05/2017	05/05/2017	
Date Tested :	05/05/2017	05/05/2017	05/05/2017	
Material Type :	General Fill	General Fill	General Fill	
Material Source :	On Site	On Site	On Site	
Lot Number :	-	-	-	
Sample Location :	E 33863 N 73550 RL 53.790	E 33874 N 73559 RL 52.230	E 33872 N 73579 RL 50.650	
Test Depth (mm) :	150	150	150	
Layer Depth (mm) :	-	-	-	
Maximum Size (mm) :	19	19	19	
Oversize Wet (%) :	15	11	9	
Oversize Dry (%) :	-	-	-	
Oversize Density (t/m³) :	2.608	2.494	2.384	
Field Moisture Content (%) :	8.3	7.6	11.9	
Hilf MDR Number :	228477	228478	228479	
Hilf MDR Method :	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 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 :	AS1289.2.1.1	AS1289.2.1.1	AS1289.2.1.1	
Moisture Ratio (%) :	76	68	106	
Field Wet Density (t/m³) :	2.089	2.189	2.149	
Optimum Moisture Content (%) :	10.9	11.2	11.2	
Moisture Variation :	2.6	3.6	-0.7	
Peak Converted Wet Density (t/m³) :	2.201*	2.191*	2.237*	
Hilf Density Ratio (%) :	95.0	100.0	96.0	
Minimum Specification :	95	95	95	
Moisture Specification :	-	-	-	
Site Selection :	-	-	-	
Soil Description :	-	-	-	
Remarks :	-			

* - denotes adjusted for oversize

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Hilf Density Ratio Report

Client :	ALLROADS PTY LTD	Report Number:	DL17/122 - 5
Address :	P O BOX 4698, LOGANHOLME, QLD, 4129	Report Date :	17/05/2017
Project Name :	EARTHWORKS SUPERVISION	Order Number :	AR2087/SCA001
Project Number :	DL17/122	Test Method :	AS1289.5.8.1 & 5.7.1
Location:	FLAGSTONE CITY , STAGE 1I	Page 1 of 1	

Sample Number :	228592	228593	228594	228595
Test Number :	14	15	16	17
Sampling Method :	-	-	-	-
Date Sampled :	08/05/2017	08/05/2017	08/05/2017	08/05/2017
Date Tested :	08/05/2017	08/05/2017	08/05/2017	08/05/2017
Material Type :	General Fill	General Fill	General Fill	General Fill
Material Source :	On Site	On Site	On Site	On Site
Lot Number :	-	-	-	-
Sample Location :	E 33894 N 73616 RL 47.42	E 33901 N 73602 RL 48.04	E 33909 N 73595 RL 48.43	E 33911 N 73618 RL 46.79
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 (%) :	7.8	8.1	11.2	8.9
Hilf MDR Number :	228592	228593	228594	228595
Hilf MDR Method :	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 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 :	AS1289.2.1.1	AS1289.2.1.1	AS1289.2.1.1	AS1289.2.1.1
Moisture Ratio (%) :	73.5	79.5	95	81
Field Wet Density (t/m³) :	2.110	2.119	2.151	2.160
Optimum Moisture Content (%) :	10.6	10.2	11.8	11.0
Moisture Variation :	2.8	2.1	0.6	2.1
Peak Converted Wet Density (t/m³) :	2.155	2.156	2.116	2.181
Hilf Density Ratio (%) :	98.0	98.5	101.5	99.0
Minimum Specification :	95	95	95	95
Moisture Specification :	-	-	-	-
Site Selection :	-	-	-	-
Soil Description :	-	-	-	-
Remarks :	-			

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Hilf Density Ratio Report

Client :	ALLROADS PTY LTD	Report Number:	DL17/122 - 6
Address :	P O BOX 4698, LOGANHOLME, QLD, 4129	Report Date :	17/05/2017
Project Name :	EARTHWORKS SUPERVISION	Order Number :	AR2087/SCA001
Project Number :	DL17/122	Test Method :	AS1289.5.8.1 & 5.7.1
Location:	FLAGSTONE CITY , STAGE 1I	Page 1 of 1	

Sample Number :	228634	228635	228636	
Test Number :	18	19	20	
Sampling Method :	-	-	-	
Date Sampled :	09/05/2017	09/05/2017	09/05/2017	
Date Tested :	09/05/2017	09/05/2017	09/05/2017	
Material Type :	General Fill	General Fill	General Fill	
Material Source :	On Site	On Site	On Site	
Lot Number :	-	-	-	
Sample Location :	E 33875 N 73624 RL 48.20	E 33875 N 73610 RL 48.97	E 33875 N 73599 RL 49.45	
Test Depth (mm) :	150	150	150	
Layer Depth (mm) :	-	-	-	
Maximum Size (mm) :	19	19	19	
Oversize Wet (%) :	9	15	18	
Oversize Dry (%) :	-	-	-	
Oversize Density (t/m³) :	2.447	2.440	2.483	
Field Moisture Content (%) :	9.2	13.1	12.5	
Hilf MDR Number :	228634	228635	228636	
Hilf MDR Method :	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 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 :	AS1289.2.1.1	AS1289.2.1.1	AS1289.2.1.1	
Moisture Ratio (%) :	88	129	103	
Field Wet Density (t/m³) :	2.129	2.271	2.185	
Optimum Moisture Content (%) :	10.5	10.2	12.1	
Moisture Variation :	1.3	-3.0	-0.3	
Peak Converted Wet Density (t/m³) :	2.219*	2.293*	2.256*	
Hilf Density Ratio (%) :	96.0	99.0	97.0	
Minimum Specification :	95	95	95	
Moisture Specification :	-	-	-	
Site Selection :	-	-	-	
Soil Description :	-	-	-	
Remarks :	-			

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Hilf Density Ratio Report

Client :	ALLROADS PTY LTD	Report Number:	DL17/122 - 7
Address :	P O BOX 4698, LOGANHOLME, QLD, 4129	Report Date :	26/05/2017
Project Name :	EARTHWORKS SUPERVISION	Order Number :	AR2087/SCA001
Project Number :	DL17/122	Test Method :	AS1289.5.8.1 & 5.7.1
Location:	FLAGSTONE CITY , STAGE 1I	Page 1 of 1	

Sample Number :	228705	228706	228707	
Test Number :	21	22	23	
Sampling Method :	-	-	-	
Date Sampled :	11/05/2017	11/05/2017	11/05/2017	
Date Tested :	11/05/2017	11/05/2017	11/05/2017	
Material Type :	General Fill	General Fill	General Fill	
Material Source :	On Site	On Site	On Site	
Lot Number :	-	-	-	
Sample Location :	E 33906 N 73554 RL 51.97	E 33917 N 73564 RL 51.07	E 33911 N 73583 RL 49.67	
Test Depth (mm) :	150	150	150	
Layer Depth (mm) :	150	150	150	
Maximum Size (mm) :	19	19	19	
Oversize Wet (%) :	19	17	19	
Oversize Dry (%) :	-	-	-	
Oversize Density (t/m³) :	2.351	2.407	2.352	
Field Moisture Content (%) :	8.9	9.7	11.3	
Hilf MDR Number :	228705	228706	228707	
Hilf MDR Method :	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 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 :	AS1289.2.1.1	AS1289.2.1.1	AS1289.2.1.1	
Moisture Ratio (%) :	82	100	98	
Field Wet Density (t/m³) :	2.164	2.206	2.098	
Optimum Moisture Content (%) :	10.8	9.7	11.5	
Moisture Variation :	2.0	0.0	0.2	
Peak Converted Wet Density (t/m³) :	2.215*	2.259*	2.212*	
Hilf Density Ratio (%) :	97.5	97.5	95.0	
Minimum Specification :	95	95	95	
Moisture Specification :	-	-	-	
Site Selection :	-	-	-	
Soil Description :	-	-	-	
Remarks :	-			

* - denotes adjusted for oversize

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Hilf Density Ratio Report

Client :	ALLROADS PTY LTD	Report Number:	DL17/122 - 8
Address :	P O BOX 4698, LOGANHOLME, QLD, 4129	Report Date :	26/05/2017
Project Name :	EARTHWORKS SUPERVISION	Order Number :	AR2087/SCA001
Project Number :	DL17/122	Test Method :	AS1289.5.8.1 & 5.7.1
Location:	FLAGSTONE CITY , STAGE 1I	Page 1 of 1	

Sample Number :	228795	228796	228797	
Test Number :	24	25	26	
Sampling Method :	-	-	-	
Date Sampled :	15/05/2017	15/05/2017	15/05/2017	
Date Tested :	15/05/2017	15/05/2017	15/05/2017	
Material Type :	General Fill	General Fill	General Fill	
Material Source :	On Site	On Site	On Site	
Lot Number :	-	-	-	
Sample Location :	E 33885 N 73537 RL 54.11	E 33898 N 73576 RL 50.34	E 33894 N 73561 RL 51.53	
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 (%) :	9.3	9.8	9.6	
Hilf MDR Number :	228795	228796	228797	
Hilf MDR Method :	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 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 :	AS1289.2.1.1	AS1289.2.1.1	AS1289.2.1.1	
Moisture Ratio (%) :	81	81	79.5	
Field Wet Density (t/m³) :	2.132	2.107	2.205	
Optimum Moisture Content (%) :	11.5	12.1	12.1	
Moisture Variation :	2.2	2.3	2.5	
Peak Converted Wet Density (t/m³) :	2.166	2.184	2.216	
Hilf Density Ratio (%) :	98.5	96.5	99.5	
Minimum Specification :	95	95	95	
Moisture Specification :	-	-	-	
Site Selection :	-	-	-	
Soil Description :	-	-	-	
Remarks :	-			

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Hilf Density Ratio Report

Client :	ALLROADS PTY LTD	Report Number:	DL17/122 - 9
Address :	P O BOX 4698, LOGANHOLME, QLD, 4129	Report Date :	29/05/2017
Project Name :	EARTHWORKS SUPERVISION	Order Number :	AR2087/SCA001
Project Number :	DL17/122	Test Method :	AS1289.5.8.1 & 5.7.1
Location:	FLAGSTONE CITY , STAGE 1I	Page 1 of 1	

Sample Number :	229189	229190	229191	
Test Number :	27	28	29	
Sampling Method :	-	-	-	
Date Sampled :	22/05/2017	22/05/2017	22/05/2017	
Date Tested :	22/05/2017	22/05/2017	22/05/2017	
Material Type :	General Fill	General Fill	General Fill	
Material Source :	On Site	On Site	On Site	
Lot Number :	-	-	-	
Sample Location :	E 33908.000 N 73545.000 RL 53.38	E 33893.61 N 73543.370 RL 53.82	E 33880.600 N 73549.280 RL 53.33	
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 (%) :	11.0	11.6	11.8	
Hilf MDR Number :	229189	229190	229191	
Hilf MDR Method :	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 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 :	AS1289.2.1.1	AS1289.2.1.1	AS1289.2.1.1	
Moisture Ratio (%) :	98	100	100.5	
Field Wet Density (t/m³) :	2.048	2.128	2.134	
Optimum Moisture Content (%) :	11.2	11.6	11.7	
Moisture Variation :	0.2	0.0	-0.1	
Peak Converted Wet Density (t/m³) :	2.124	2.205	2.196	
Hilf Density Ratio (%) :	96.5	96.5	97.0	
Minimum Specification :	95	95	95	
Moisture Specification :	-	-	-	
Site Selection :	-	-	-	
Soil Description :	-	-	-	
Remarks :	-			

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Hilf Density Ratio Report

Client :	ALLROADS PTY LTD	Report Number:	DL17/122 - 10
Address :	P O BOX 4698, LOGANHOLME, QLD, 4129	Report Date :	12/06/2017
Project Name :	EARTHWORKS SUPERVISION	Order Number :	AR2087/SCA001
Project Number :	DL17/122	Test Method :	AS1289.5.8.1 & 5.7.1
Location:	FLAGSTONE CITY , STAGE 1I	Page 1 of 1	

Sample Number :	229784	229785	229786	
Test Number :	30	31	32	
Sampling Method :	-	-	-	
Date Sampled :	30/05/2017	30/05/2017	30/05/2017	
Date Tested :	30/05/2017	30/05/2017	30/05/2017	
Material Type :	General Fill	General Fill	General Fill	
Material Source :	On Site	On Site	On Site	
Lot Number :	-	-	-	
Sample Location :	E 33929.442 N 73605.065 RL 48.116	E 33892.533 N 73596.435 RL 49.360	E 33876.514 N 73616.759 RL 48.922	
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 (%) :	8.8	7.9	8.2	
Hilf MDR Number :	229784	229785	229786	
Hilf MDR Method :	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 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 :	AS1289.2.1.4	AS1289.2.1.4	AS1289.2.1.4	
Moisture Ratio (%) :	79	75	77.5	
Field Wet Density (t/m³) :	2.101	2.255	2.104	
Optimum Moisture Content (%) :	11.2	10.5	10.6	
Moisture Variation :	2.4	2.6	2.4	
Peak Converted Wet Density (t/m³) :	2.154	2.169	2.151	
Hilf Density Ratio (%) :	97.5	104.0	98.0	
Minimum Specification :	95	95	95	
Moisture Specification :	-	-	-	
Site Selection :	-	-	-	
Soil Description :	-	-	-	
Remarks :	-			

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Hilf Density Ratio Report

Client :	ALLROADS PTY LTD	Report Number:	DL17/122 - 11
Address :	P O BOX 4698, LOGANHOLME, QLD, 4129	Report Date :	17/07/2017
Project Name :	EARTHWORKS SUPERVISION	Order Number :	AR2087/SCA001
Project Number :	DL17/122	Test Method :	AS1289.5.8.1 & 5.7.1
Location:	FLAGSTONE CITY , STAGE 1I	Page 1 of 1	

Sample Number :	231440	231441	231442	
Test Number :	33	34	35	
Sampling Method :	-	-	-	
Date Sampled :	06/07/2017	06/07/2017	06/07/2017	
Date Tested :	06/07/2017	06/07/2017	06/07/2017	
Material Type :	General Fill	General Fill	General Fill	
Material Source :	On Site	On Site	On Site	
Lot Number :	-	-	-	
Sample Location :	E 33908.439 N 73529.720 RL 55.474	E 33895.872 N 73530.623 RL 55.887	E 33880.014 N 73516.595 RL 56.989	
Test Depth (mm) :	150	150	150	
Layer Depth (mm) :	-	-	-	
Maximum Size (mm) :	19	19	19	
Oversize Wet (%) :	10	14	15	
Oversize Dry (%) :	-	-	-	
Oversize Density (t/m³) :	2.087	2.126	2.059	
Field Moisture Content (%) :	7.2	7.4	8.6	
Hilf MDR Number :	231440	231441	231442	
Hilf MDR Method :	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 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 :	AS1289.2.1.1	AS1289.2.1.1	AS1289.2.1.1	
Moisture Ratio (%) :	67.5	68	79.5	
Field Wet Density (t/m³) :	2.151	2.117	2.120	
Optimum Moisture Content (%) :	10.7	10.9	10.8	
Moisture Variation :	3.5	3.6	2.2	
Peak Converted Wet Density (t/m³) :	2.145*	2.131*	2.159*	
Hilf Density Ratio (%) :	100.5	99.5	98.0	
Minimum Specification :	95	95	95	
Moisture Specification :	-	-	-	
Site Selection :	-	-	-	
Soil Description :	-	-	-	
Remarks :	-			

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Hilf Density Ratio Report

Client :	ALLROADS PTY LTD	Report Number:	DL17/122 - 12
Address :	P O BOX 4698, LOGANHOLME, QLD, 4129	Report Date :	20/09/2017
Project Name :	EARTHWORKS SUPERVISION	Order Number :	AR2087/SCA001
Project Number :	DL17/122	Test Method :	AS1289.5.8.1 & 5.7.1
Location:	FLAGSTONE CITY , STAGE 1I	Page 1 of 1	

Sample Number :	235451	235452	235453	
Test Number :	36	37	38	
Sampling Method :	-	-	-	
Date Sampled :	12/09/2017	12/09/2017	12/09/2017	
Date Tested :	12/09/2017	12/09/2017	12/09/2017	
Material Type :	General Fill	General Fill	General Fill	
Material Source :	On Site	On Site	On Site	
Lot Number :	-	-	-	
Sample Location :	E 33869.000 N 73612.000 RL 50.600	E 33865.000 N 73598.500 RL 51.040	E 33873.000 N 73579.120 RL 51.900	
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 (%) :	8.1	8.3	8.3	
Hilf MDR Number :	235451	235452	235453	
Hilf MDR Method :	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 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 :	AS1289.2.1.1	AS1289.2.1.1	AS1289.2.1.1	
Moisture Ratio (%) :	77.5	81	76	
Field Wet Density (t/m³) :	2.060	2.050	2.062	
Optimum Moisture Content (%) :	10.4	10.2	10.9	
Moisture Variation :	2.4	2.0	2.7	
Peak Converted Wet Density (t/m³) :	2.117	2.159	2.048	
Hilf Density Ratio (%) :	97.5	95.0	100.5	
Minimum Specification :	95	95	95	
Moisture Specification :	-	-	-	
Site Selection :	-	-	-	
Soil Description :	-	-	-	
Remarks :	-			

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Hilf Density Ratio Report

Client :	ALLROADS PTY LTD	Report Number:	DL17/122 - 13
Address :	P O BOX 4698, LOGANHOLME, QLD, 4129	Report Date :	03/10/2017
Project Name :	EARTHWORKS SUPERVISION	Order Number :	AR2087/SCA001
Project Number :	DL17/122	Test Method :	AS1289.5.8.1 & 5.7.1
Location:	FLAGSTONE CITY , STAGE 1I	Page 1 of 1	

Sample Number :	235989	235990	235991	
Test Number :	39	40	41	
Sampling Method :	-	-	-	
Date Sampled :	22/09/2017	22/09/2017	22/09/2017	
Date Tested :	22/09/2017	22/09/2017	22/09/2017	
Material Type :	General Fill	General Fill	General Fill	
Material Source :	On Site	On Site	On Site	
Lot Number :	-	-	-	
Sample Location :	E 33853.000 N 73567.000 RL 53.500	E 33874.000 N 73573.600 RL 52.700	E 33876.600 N 73583.000 RL 52.200	
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 (%) :	9.3	9.7	8.9	
Hilf MDR Number :	235989	235990	235991	
Hilf MDR Method :	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 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 :	AS1289.2.1.1	AS1289.2.1.1	AS1289.2.1.1	
Moisture Ratio (%) :	81	86	80.5	
Field Wet Density (t/m³) :	2.159	2.191	2.121	
Optimum Moisture Content (%) :	11.5	11.3	11.0	
Moisture Variation :	2.2	1.7	2.2	
Peak Converted Wet Density (t/m³) :	2.154	2.150	2.156	
Hilf Density Ratio (%) :	100.0	102.0	98.5	
Minimum Specification :	95	95	95	
Moisture Specification :	-	-	-	
Site Selection :	-	-	-	
Soil Description :	-	-	-	
Remarks :	-			

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Hilf Density Ratio Report

Client :	ALLROADS PTY LTD	Report Number:	DL17/122 - 14
Address :	P O BOX 4698, LOGANHOLME, QLD, 4129	Report Date :	31/10/2017
Project Name :	EARTHWORKS SUPERVISION	Order Number :	AR2087/SCA001
Project Number :	DL17/122	Test Method :	AS1289.5.8.1 & 5.7.1
Location:	FLAGSTONE CITY , STAGE 1I	Page 1 of 1	

Sample Number :	237025	237026	237027	
Test Number :	42	43	44	
Sampling Method :	-	-	-	
Date Sampled :	26/10/2017	26/10/2017	26/10/2017	
Date Tested :	26/10/2017	26/10/2017	26/10/2017	
Material Type :	General Fill	General Fill	General Fill	
Material Source :	On Site	On Site	On Site	
Lot Number :	-	-	-	
Sample Location :	E 33911.310 N 73525.060 RL 55.980	E 33859.830 N 73523.850 RL 57.820	E 33853.55 N 73500.040 RL 59.690	
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 (%) :	9.0	7.2	7.3	
Hilf MDR Number :	237025	237026	237027	
Hilf MDR Method :	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 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 :	AS1289.2.1.1	AS1289.2.1.1	AS1289.2.1.1	
Moisture Ratio (%) :	79.5	75	100.5	
Field Wet Density (t/m³) :	2.158	2.104	2.090	
Optimum Moisture Content (%) :	11.3	9.6	7.2	
Moisture Variation :	2.3	2.5	0.0	
Peak Converted Wet Density (t/m³) :	2.202	2.127	2.094	
Hilf Density Ratio (%) :	98.0	99.0	100.0	
Minimum Specification :	95	95	95	
Moisture Specification :	-	-	-	
Site Selection :	-	-	-	
Soil Description :	-	-	-	
Remarks :	-			

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Hilf Density Ratio Report

Client :	**ALLROADS PTY LTD**	Report Number:	**DL17/122 - 15**
Address :	**P O BOX 318, BROWNS PLAINS, QLD, 4118**	Report Date :	**04/12/2017**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**AR2210/SCA001**
Project Number :	**DL17/122**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**FLAGSTONE CITY , STAGE 1I**	**Page 1 of 1**	

Sample Number :	238337			
Test Number :	45			
Sampling Method :	-			
Date Sampled :	23/11/2017			
Date Tested :	23/11/2017			
Material Type :	**Allotment Fill**			
Material Source :	**On Site**			
Lot Number :	**231**			
Sample Location :	Lot 231 3m From North Boundary 5m From West Boundary Final Level			
Test Depth (mm) :	150			
Layer Depth (mm) :	-			
Maximum Size (mm) :	19			
Oversize Wet (%) :	-			
Oversize Dry (%) :	-			
Oversize Density (t/m³) :	-			
Field Moisture Content (%) :	7.4			
Hilf MDR Number :	238337			
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 :	AS1289.2.1.1			
Moisture Ratio (%) :	63			
Field Wet Density (t/m³) :	2.083			
Optimum Moisture Content (%) :	11.7			
Moisture Variation :	4.3			
Peak Converted Wet Density (t/m³) :	2.169			
Hilf Density Ratio (%) :	**96.0**			
Minimum Specification :	95			
Moisture Specification :	-			
Site Selection :	-			
Soil Description :	-			
Remarks :	-			

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Hilf Density Ratio Report

Client :	**ALLROADS PTY LTD**	Report Number:	**DL17/122 - 16**
Address :	**P O BOX 318, BROWNS PLAINS, QLD, 4118**	Report Date :	**06/12/2017**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**AR2210/SCA001**
Project Number :	**DL17/122**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**FLAGSTONE CITY , STAGE 1I**	**Page 1 of 1**	

Sample Number :	232881			
Test Number :	46			
Sampling Method :	-			
Date Sampled :	03/08/2017			
Date Tested :	03/08/2017			
Material Type :	**General Fill**			
Material Source :	**On Site**			
Lot Number :	-			
Sample Location :	E 33907.000 N 73618.700 RL 48.300			
Test Depth (mm) :	150			
Layer Depth (mm) :	-			
Maximum Size (mm) :	19			
Oversize Wet (%) :	-			
Oversize Dry (%) :	-			
Oversize Density (t/m³) :	-			
Field Moisture Content (%) :	23.7			
Hilf MDR Number :	232881			
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 :	AS1289.2.1.1			
Moisture Ratio (%) :	93.5			
Field Wet Density (t/m³) :	2.106			
Optimum Moisture Content (%) :	25.3			
Moisture Variation :	1.4			
Peak Converted Wet Density (t/m³) :	2.166			
Hilf Density Ratio (%) :	**97.0**			
Minimum Specification :	95			
Moisture Specification :	-			
Site Selection :	-			
Soil Description :	-			
Remarks :	**This test report replaces DL17/343-2 dated 18/08/2017.**			

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Hilf Density Ratio Report

Client :	**ALLROADS PTY LTD**	Report Number:	**DL17/122 - 17**
Address :	**P O BOX 318, BROWNS PLAINS, QLD, 4118**	Report Date :	**06/12/2017**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**AR2210/SCA001**
Project Number :	**DL17/122**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**FLAGSTONE CITY , STAGE 1I**	**Page 1 of 1**	

Sample Number :	232925	232927		
Test Number :	47	48		
Sampling Method :	-	-		
Date Sampled :	04/08/2017	04/08/2017		
Date Tested :	04/08/2017	04/08/2017		
Material Type :	**General Fill**	**General Fill**		
Material Source :	**On Site**	**On Site**		
Lot Number :	-	-		
Sample Location :	E 33912.000 N 73561.000 RL 53.100	E 33907.500 N 73610.400 RL 48.600		
Test Depth (mm) :	150	150		
Layer Depth (mm) :	-	-		
Maximum Size (mm) :	19	19		
Oversize Wet (%) :	-	-		
Oversize Dry (%) :	-	-		
Oversize Density (t/m³) :	-	-		
Field Moisture Content (%) :	6.5	10.8		
Hilf MDR Number :	232925	232927		
Hilf MDR Method :	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 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 :	AS1289.2.1.1	AS1289.2.1.1		
Moisture Ratio (%) :	61.5	102		
Field Wet Density (t/m³) :	2.158	2.144		
Optimum Moisture Content (%) :	10.6	10.6		
Moisture Variation :	4.1	-0.2		
Peak Converted Wet Density (t/m³) :	2.133	2.233		
Hilf Density Ratio (%) :	**101.0**	**96.0**		
Minimum Specification :	95	95		
Moisture Specification :	-	-		
Site Selection :	-	-		
Soil Description :	-	-		
Remarks :	**This test report replaces DL17/343-3 dated 18/08/2017.**			

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Hilf Density Ratio Report

Client :	**ALLROADS PTY LTD**	Report Number:	**DL17/122 - 18**
Address :	**P O BOX 318, BROWNS PLAINS, QLD, 4118**	Report Date :	**06/12/2017**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**AR2210/SCA001**
Project Number :	**DL17/122**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**FLAGSTONE CITY , STAGE 1I**	**Page 1 of 1**	

Sample Number :	233016	233018		
Test Number :	49	50		
Sampling Method :	-	-		
Date Sampled :	07/08/2017	07/08/2017		
Date Tested :	07/08/2017	07/08/2017		
Material Type :	**General Fill**	**General Fill**		
Material Source :	**On Site**	**On Site**		
Lot Number :	-	-		
Sample Location :	E 33922.000 N 73599.100 RL 49.500	E 33914.000 N 73608.900 RL 49.200		
Test Depth (mm) :	150	150		
Layer Depth (mm) :	-	-		
Maximum Size (mm) :	19	19		
Oversize Wet (%) :	-	-		
Oversize Dry (%) :	-	-		
Oversize Density (t/m³) :	-	-		
Field Moisture Content (%) :	9.0	6.9		
Hilf MDR Number :	233016	233018		
Hilf MDR Method :	AS1289.5.1.1 & 5.7.1	AS1289.5.1.1 & 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 :	AS1289.2.1.1	AS1289.2.1.1		
Moisture Ratio (%) :	83	57.5		
Field Wet Density (t/m³) :	2.036	2.068		
Optimum Moisture Content (%) :	10.8	12.0		
Moisture Variation :	1.9	5.0		
Peak Converted Wet Density (t/m³) :	2.140	2.132		
Hilf Density Ratio (%) :	**95.0**	**97.0**		
Minimum Specification :	95	95		
Moisture Specification :	-	-		
Site Selection :	-	-		
Soil Description :	-	-		
Remarks :	**This test report replaces DL17/343-4 dated 21/08/2017.**			

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Hilf Density Ratio Report

Client :	**ALLROADS PTY LTD**	Report Number:	**DL17/122 - 19**
Address :	**P O BOX 318, BROWNS PLAINS, QLD, 4118**	Report Date :	**06/12/2017**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**AR2210/SCA001**
Project Number :	**DL17/122**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**FLAGSTONE CITY , STAGE 1I**	**Page 1 of 1**	

Sample Number :	233244			
Test Number :	51			
Sampling Method :	-			
Date Sampled :	09/08/2017			
Date Tested :	09/08/2017			
Material Type :	**General Fill**			
Material Source :	**On Site**			
Lot Number :	-			
Sample Location :	E 33916.800 N 73609.000 RL 50.600			
Test Depth (mm) :	150			
Layer Depth (mm) :	-			
Maximum Size (mm) :	19			
Oversize Wet (%) :	-			
Oversize Dry (%) :	-			
Oversize Density (t/m³) :	-			
Field Moisture Content (%) :	9.4			
Hilf MDR Number :	233244			
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 :	AS1289.2.1.1			
Moisture Ratio (%) :	85			
Field Wet Density (t/m³) :	2.129			
Optimum Moisture Content (%) :	11.0			
Moisture Variation :	1.7			
Peak Converted Wet Density (t/m³) :	2.128			
Hilf Density Ratio (%) :	**100.0**			
Minimum Specification :	95			
Moisture Specification :	-			
Site Selection :	-			
Soil Description :	-			
Remarks :	**This test report replaces DL17/343-5 dated 26/08/2017.**			

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