



CIVIL GEOTECHNICAL SERVICES
ABN 26 474 013 724
PO Box 678 Croydon Vic 3136
Telephone: 9723 0744 Facsimile: 9723 0799

25th September 2015

Our Reference: 14327:JHF908

Winslow Constructors Pty Ltd
50 Barry Road
CAMPBELLFIELD VIC 3061

Dear Sirs,

**RE: LEVEL 1 EARTHWORKS INSPECTION AND TESTING
ARMSTRONG, MT DUNEED – STAGE 17A, MOUNT DUNEED**

Please find attached our Report Nos 14327/R001 to 14327/R009 that relate to the field density testing that was conducted within the filled allotments at the above subdivision. The level 1 inspections and associated field density testing commenced in early September 2014 and was completed in mid November 2014.

The inspections and testing of the earthworks was undertaken in general accordance with the Level 1 requirements of AS 3798 - Guidelines on Earthworks for Commercial and Residential Developments.

The site inspection and testing was performed by experienced geotechnicians from this office. Any areas that were deemed unsatisfactory were reworked and retested under their supervision. The testing was performed to the relevant Australian Standards and the accompanying test reports carry NATA endorsement. The attached compaction results, which were located randomly throughout the fill profile, are considered to be representative of the bulk fill materials that were placed across the reported allotments by Winslow Constructors during the aforementioned period. The approximate locations of the field density tests can be seen on the attached plan (Figure 1).

We are of the view that the bulk fill materials that have been placed across the reported allotments by Winslow Constructors during the aforementioned period can be considered as having been placed in a controlled manner to a minimum density ratio of 95% (standard compactive effort).

Please contact the undersigned if you require any additional information.

Civil Geotechnical Services

A handwritten signature in black ink, appearing to read 'Justin Fry', is written over a white background.

Justin Fry



COMPACTION ASSESSMENT

Job No 14327
 Report No 14327/R001
 Date Issued 12/11/14

CIVIL GEOTECHNICAL SERVICES

6 - 8 Rose Avenue, Croydon 3136

Tested by DK
 Date tested 05/09/14
 Checked by JHF

Client WINSLOW CONSTRUCTORS PTY LTD (CAMPBELLFIELD)
 Project ARMSTRONG, MT DUNED - STAGE 17A
 Location MOUNT DUNED

Feature EARTHWORKS *Layer thickness* 200 mm *Time:* 12:07

Test procedure AS 1289.2.1.1 & 5.8.1

Test No		1	2	3	-	-	-
Location		REFER TO FIGURE 1	REFER TO FIGURE 1	REFER TO FIGURE 1			
Approximate depth below FSL							
Measurement depth	mm	175	175	175	-	-	-
Field wet density	t/m ³	1.94	2.05	2.00	-	-	-
Field moisture content	%	14.4	14.1	14.5	-	-	-

Test procedure AS 1289.5.7.1

Test No		1	2	3	-	-	-
Compactive effort		Standard					
Oversize rock retained on sieve	mm	19.0	19.0	19.0	-	-	-
Percent of oversize material	wet	0	2	3	-	-	-
Peak Converted Wet Density	t/m ³	1.97	2.02	2.03	-	-	-
Adjusted Peak Converted Wet Density	t/m ³	-	2.02	2.03	-	-	-
Optimum Moisture Content	%	17.0	16.5	17.0	-	-	-

Moisture Variation From Optimum Moisture Content		2.5% dry	2.5% dry	2.5% dry	-	-	-
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Density Ratio (R_{HD})	%	98.5	101.5	98.0	-	-	-
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Material description

No 1 - 3 Clay Fill



The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/National standards. Accredited for compliance to ISO/IEC 17025. Accreditation No 9909

Approved Signatory : Justin Fry



COMPACTION ASSESSMENT

Job No 14327
 Report No 14327/R002
 Date Issued 30/09/14

CIVIL GEOTECHNICAL SERVICES

6 - 8 Rose Avenue, Croydon 3136

Client	WINSLOW CONSTRUCTORS PTY LTD (CAMPBELLFIELD)	Tested by	DK
Project	ARMSTRONG, MT DUNED - STAGE 17A	Date tested	11/09/14
Location	MOUNT DUNED	Checked by	JHF

Feature	EARTHWORKS	Layer thickness	200 mm	Time:	09:45
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Test procedure AS 1289.2.1.1 & 5.8.1

Test No		4	5	6	-	-	-
Location		REFER TO FIGURE 1	REFER TO FIGURE 1	REFER TO FIGURE 1			
Approximate depth below FSL							
Measurement depth	mm	175	175	175	-	-	-
Field wet density	t/m ³	2.06	2.03	1.97	-	-	-
Field moisture content	%	19.4	20.7	14.5	-	-	-

Test procedure AS 1289.5.7.1

Test No		4	5	6	-	-	-
Compactive effort		Standard					
Oversize rock retained on sieve	mm	19.0	19.0	19.0	-	-	-
Percent of oversize material	wet	0	1	0	-	-	-
Peak Converted Wet Density	t/m ³	2.04	2.04	1.97	-	-	-
Adjusted Peak Converted Wet Density	t/m ³	-	2.05	-	-	-	-
Optimum Moisture Content	%	19.0	20.5	17.0	-	-	-

Moisture Variation From Optimum Moisture Content		0.0%	0.0%	2.5% dry	-	-	-
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Density Ratio (R _{HD})	%	101.0	99.0	100.0	-	-	-
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Material description

No 4 - 6 Clay Fill



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Approved Signatory : Justin Fry



COMPACTION ASSESSMENT

Job No 14327
 Report No 14327/R003
 Date Issued 24/11/14

CIVIL GEOTECHNICAL SERVICES

6 - 8 Rose Avenue, Croydon 3136

Tested by DK
 Date tested 15/09/14
 Checked by JHF

Client WINSLOW CONSTRUCTORS PTY LTD (CAMPBELLFIELD)
 Project ARMSTRONG, MT DUNED - STAGE 17A
 Location MOUNT DUNED

Feature EARTHWORKS *Layer thickness* 200 mm *Time:* 10:04

Test procedure AS 1289.2.1.1 & 5.8.1

Test No		7	8	9	-	-	-
Location		REFER TO FIGURE 1	REFER TO FIGURE 1	REFER TO FIGURE 1			
Approximate depth below FSL							
Measurement depth	mm	175	175	175	-	-	-
Field wet density	t/m ³	1.96	2.03	1.96	-	-	-
Field moisture content	%	14.4	15.5	16.5	-	-	-

Test procedure AS 1289.5.7.1

Test No		7	8	9	-	-	-
Compactive effort		Standard					
Oversize rock retained on sieve	mm	19.0	19.0	19.0	-	-	-
Percent of oversize material	wet	2	0	0	-	-	-
Peak Converted Wet Density	t/m ³	1.99	1.96	1.99	-	-	-
Adjusted Peak Converted Wet Density	t/m ³	1.99	-	-	-	-	-
Optimum Moisture Content	%	16.5	18.5	19.0	-	-	-

Moisture Variation From Optimum Moisture Content	2.5% dry	2.5% dry	2.5% dry	-	-	-
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Density Ratio (R_{HD})	%	98.5	103.5	98.5	-	-	-
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Material description

No 7 - 9 Clay Fill



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Approved Signatory : Justin Fry



COMPACTION ASSESSMENT

Job No 14327
 Report No 14327/R004
 Date Issued 11/12/14

CIVIL GEOTECHNICAL SERVICES

6 - 8 Rose Avenue, Croydon 3136

Tested by DK
 Date tested 16/09/14
 Checked by JHF

Client WINSLOW CONSTRUCTORS PTY LTD (CAMPBELLFIELD)
 Project ARMSTRONG, MT DUNED - STAGE 17A
 Location MOUNT DUNED

Feature EARTHWORKS *Layer thickness* 200 mm *Time:* 11:15

Test procedure AS 1289.2.1.1 & 5.8.1

Test No	10	11	12	-	-	-
Location	REFER TO FIGURE 1	REFER TO FIGURE 1	REFER TO FIGURE 1			
Approximate depth below FSL						
Measurement depth mm	175	175	175	-	-	-
Field wet density t/m ³	2.02	2.01	2.02	-	-	-
Field moisture content %	15.9	14.8	14.7	-	-	-

Test procedure AS 1289.5.7.1

Test No	10	11	12	-	-	-
Compactive effort	Standard					
Oversize rock retained on sieve mm	19.0	19.0	19.0	-	-	-
Percent of oversize material wet	1	0	0	-	-	-
Peak Converted Wet Density t/m ³	2.02	1.99	1.98	-	-	-
Adjusted Peak Converted Wet Density t/m ³	2.02	1.99	1.98	-	-	-
Optimum Moisture Content %	18.5	17.5	17.0	-	-	-

Moisture Variation From Optimum Moisture Content	2.5% dry	2.5% dry	2.5% dry	-	-	-
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Density Ratio (R_{HD}) %	100.0	101.0	102.5	-	-	-
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Material description

No 10 - 12 Clay Fill



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Approved Signatory : Justin Fry



COMPACTION ASSESSMENT

Job No 14327
 Report No 14327/R005
 Date Issued 27/11/14

CIVIL GEOTECHNICAL SERVICES

6 - 8 Rose Avenue, Croydon 3136

Client	WINSLOW CONSTRUCTORS PTY LTD (CAMPBELLFIELD)	Tested by	DK
Project	ARMSTRONG, MT DUNED - STAGE 17A	Date tested	05/11/14
Location	MOUNT DUNED	Checked by	JHF

Feature	EARTHWORKS	Layer thickness	200 mm	Time:	11:30
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Test procedure AS 1289.2.1.1 & 5.8.1

Test No	13	14	15	16	-	-
Location	REFER TO FIGURE 1					
Approximate depth below FSL						
Measurement depth	mm	175	175	175	175	-
Field wet density	t/m ³	1.97	1.99	1.93	1.95	-
Field moisture content	%	17.8	18.7	16.0	15.6	-

Test procedure AS 1289.5.7.1

Test No	13	14	15	16	-	-
Compactive effort	Standard					
Oversize rock retained on sieve	mm	19.0	19.0	19.0	19.0	-
Percent of oversize material	wet	0	0	0	2	-
Peak Converted Wet Density	t/m ³	2.00	2.03	1.97	1.98	-
Adjusted Peak Converted Wet Density	t/m ³	-	-	-	1.99	-
Optimum Moisture Content	%	18.0	18.0	18.0	18.0	-

Moisture Variation From Optimum Moisture Content	0.0%	0.5% wet	2.0% dry	2.5% dry	-	-
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Density Ratio (R _{HD})	%	99.0	98.0	98.0	98.0	-
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Material description

No 13 - 16 Clay Fill



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Approved Signatory : Justin Fry



COMPACTION ASSESSMENT

Job No 14327
 Report No 14327/R006
 Date Issued 27/11/14

CIVIL GEOTECHNICAL SERVICES

6 - 8 Rose Avenue, Croydon 3136

Client	WINSLOW CONSTRUCTORS PTY LTD (CAMPBELLFIELD)	Tested by	DK
Project	ARMSTRONG, MT DUNED - STAGE 17A	Date tested	06/11/14
Location	MOUNT DUNED	Checked by	JHF

Feature	EARTHWORKS	Layer thickness	200 mm	Time:	09:42
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Test procedure AS 1289.2.1.1 & 5.8.1

Test No		17	18	19	-	-	-
Location		REFER TO FIGURE 1	REFER TO FIGURE 1	REFER TO FIGURE 1			
Approximate depth below FSL							
Measurement depth	mm	175	175	175	-	-	-
Field wet density	t/m ³	1.98	1.99	2.03	-	-	-
Field moisture content	%	19.5	16.7	17.2	-	-	-

Test procedure AS 1289.5.7.1

Test No		17	18	19	-	-	-
Compactive effort		Standard					
Oversize rock retained on sieve	mm	19.0	19.0	19.0	-	-	-
Percent of oversize material	wet	0	1	0	-	-	-
Peak Converted Wet Density	t/m ³	2.02	2.00	2.04	-	-	-
Adjusted Peak Converted Wet Density	t/m ³	-	2.02	-	-	-	-
Optimum Moisture Content	%	20.0	19.0	18.0	-	-	-

Moisture Variation From Optimum Moisture Content		0.5% dry	2.0% dry	1.0% dry	-	-	-
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Density Ratio (R _{HD})	%	98.0	99.0	99.5	-	-	-
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Material description

No 17 - 19 Clay Fill



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Approved Signatory : Justin Fry



COMPACTION ASSESSMENT

Job No 14327
 Report No 14327/R007
 Date Issued 27/11/14

CIVIL GEOTECHNICAL SERVICES

6 - 8 Rose Avenue, Croydon 3136

Tested by SC
 Date tested 10/11/14
 Checked by JHF

Client WINSLOW CONSTRUCTORS PTY LTD (CAMPBELLFIELD)
 Project ARMSTRONG, MT DUNED - STAGE 17A
 Location MOUNT DUNED

Feature	EARTHWORKS	<i>Layer thickness</i>	200 mm	<i>Time:</i> 10:00
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Test procedure AS 1289.2.1.1 & 5.8.1

Test No	20	21	22	-	-	-
Location	REFER TO FIGURE 1	REFER TO FIGURE 1	REFER TO FIGURE 1			
Approximate depth below FSL						
Measurement depth <i>mm</i>	175	175	175	-	-	-
Field wet density <i>t/m³</i>	2.01	2.10	2.01	-	-	-
Field moisture content %	12.6	13.4	11.8	-	-	-

Test procedure AS 1289.5.7.1

Test No	20	21	22	-	-	-
Compactive effort	Standard					
Oversize rock retained on sieve <i>mm</i>	19.0	19.0	19.0	-	-	-
Percent of oversize material <i>wet</i>	0	0	0	-	-	-
Peak Converted Wet Density <i>t/m³</i>	2.00	2.08	2.02	-	-	-
Adjusted Peak Converted Wet Density <i>t/m³</i>	-	2.09	2.03	-	-	-
Optimum Moisture Content %	14.5	16.0	14.0	-	-	-

<i>Moisture Variation From Optimum Moisture Content</i>	2.0% dry	2.5% dry	2.5% dry	-	-	-
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Density Ratio (R_{HD}) %	100.5	100.5	99.5	-	-	-
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Material description

No 20 - 22 Clay Fill



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Approved Signatory : Justin Fry



COMPACTION ASSESSMENT

Job No 14327
 Report No 14327/R009
 Date Issued 27/11/14

CIVIL GEOTECHNICAL SERVICES

6 - 8 Rose Avenue, Croydon 3136

Client	WINSLOW CONSTRUCTORS PTY LTD (CAMPBELLFIELD)	Tested by	DK
Project	ARMSTRONG, MT DUNED - STAGE 17A	Date tested	14/11/14
Location	MOUNT DUNED	Checked by	JHF

Feature	EARTHWORKS	Layer thickness	200 mm	Time:	09:42
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Test procedure AS 1289.2.1.1 & 5.8.1

Test No	26	27	28	29	30	31	
Location	REFER TO FIGURE 1						
Approximate depth below FSL							
Measurement depth	mm	175	175	175	175	175	
Field wet density	t/m ³	1.95	1.83	1.84	1.83	1.95	1.92
Field moisture content	%	20.8	20.2	21.2	19.4	19.0	17.5

Test procedure AS 1289.5.7.1

Test No	26	27	28	29	30	31	
Compactive effort	Standard						
Oversize rock retained on sieve	mm	19.0	19.0	19.0	19.0	19.0	
Percent of oversize material	wet	0	0	0	1	0	1
Peak Converted Wet Density	t/m ³	1.96	1.87	1.93	1.86	1.98	1.93
Adjusted Peak Converted Wet Density	t/m ³	-	-	-	1.87	-	1.96
Optimum Moisture Content	%	22.5	22.5	23.5	22.0	20.0	20.0

Moisture Variation From Optimum Moisture Content	1.5% dry	2.5% dry	2.0% dry	2.5% dry	1.0% dry	2.5% dry
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Density Ratio (R _{HD})	%	99.5	98.0	95.5	98.0	98.5	98.0
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Material description

No 26 - 31 Clay Fill



The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/National standards. Accredited for compliance to ISO/IEC 17025. Accreditation No 9909

Approved Signatory : Justin Fry