



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

23rd July 2014

Our Reference: 14127:JHF812

Winslow Constructors Pty Ltd
50 Barry Road
CAMPBELLFIELD VIC 3061

Dear Sirs,

**RE: LEVEL 1 EARTHWORKS INSPECTION AND TESTING
ARMSTRONG, MT DUNEED (STAGE 9) – MOUNT DUNEED**

Please find attached our Report Nos 14127/R001 to 14127/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 April 2014 and was completed in mid May 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 inspections 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', written in a cursive style.

Justin Fry



COMPACTION ASSESSMENT

Job No 14127
 Report No 14127/R001
 Date Issued 12/06/14

CIVIL GEOTECHNICAL SERVICES

6 - 8 Rose Avenue, Croydon 3136

Tested by DK
 Date tested 08/04/14
 Checked by JHF

Client WINSLOW CONSTRUCTORS PTY LTD (CAMPBELLFIELD)
 Project ARMSTRONG, MT DUNEED - STAGE 9
 Location MOUNT DUNEED

Feature	EARTHWORKS	<i>Layer thickness</i>	200 mm	<i>Time:</i> 08:30
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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 <i>mm</i>	175	175	175	-	-	-
Field wet density <i>t/m³</i>	1.94	1.86	1.89	-	-	-
Field moisture content %	17.3	17.8	22.2	-	-	-

Test procedure AS 1289.5.7.1

Test No	1	2	3	-	-	-
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>	1.89	1.92	1.92	-	-	-
Adjusted Peak Converted Wet Density <i>t/m³</i>	-	-	-	-	-	-
Optimum Moisture Content %	22.0	22.0	24.0	-	-	-

<i>Moisture Variation From Optimum Moisture Content</i>	5.0% dry	4.0% dry	1.5% dry	-	-	-
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Density Ratio (R_{HD})	%	102.5	97.5	98.5	-	-	-
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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 14127
 Report No 14127/R002
 Date Issued 17/07/14

CIVIL GEOTECHNICAL SERVICES

6 - 8 Rose Avenue, Croydon 3136

Client	WINSLOW CONSTRUCTORS PTY LTD (CAMPBELLFIELD)	Tested by	DK
Project	ARMSTRONG, MT DUNEED - STAGE 9	Date tested	14/04/14
Location	MOUNT DUNEED	Checked by	JHF

Feature	EARTHWORKS	Layer thickness	200 mm	Time:	11:00
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Test procedure AS 1289.2.1.1 & 5.8.1

Test No		4	5	6	7	-	-
Location		REFER TO FIGURE 1					
Approximate depth below FSL							
Measurement depth	mm	175	175	175	175	-	-
Field wet density	t/m ³	1.92	1.93	1.89	1.91	-	-
Field moisture content	%	29.8	27.9	32.0	29.0	-	-

Test procedure AS 1289.5.7.1

Test No		4	5	6	7	-	-
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	0	-	-
Peak Converted Wet Density	t/m ³	2.00	1.99	1.94	2.02	-	-
Adjusted Peak Converted Wet Density	t/m ³	-	-	-	-	-	-
Optimum Moisture Content	%	27.0	25.0	30.5	26.5	-	-

Moisture Variation From Optimum Moisture Content		2.5% wet	2.5% wet	1.5% wet	2.0% wet	-	-
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Density Ratio (R _{HD})	%	95.5	97.0	97.5	95.0	-	-
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Material description

No 4 - 7 Clay Fill



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Approved Signatory : Justin Fry



COMPACTION ASSESSMENT

Job No 14127
 Report No 14127/R003
 Date Issued 30/06/14

CIVIL GEOTECHNICAL SERVICES

6 - 8 Rose Avenue, Croydon 3136

Tested by DK
 Date tested 15/04/14
 Checked by JHF

Client WINSLOW CONSTRUCTORS PTY LTD (CAMPBELLFIELD)
 Project ARMSTRONG, MT DUNED - STAGE 9
 Location MOUNT DUNED

Feature	EARTHWORKS	Layer thickness	200 mm	Time: 09:20
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Test procedure AS 1289.2.1.1 & 5.8.1

Test No	8	9	10	-	-	-
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	1.88	1.93	1.98	-	-	-
Field moisture content %	23.0	20.9	21.5	-	-	-

Test procedure AS 1289.5.7.1

Test No	8	9	10	-	-	-
Compactive effort	Standard					
Oversize rock retained on sieve mm	19.0	19.0	19.0	-	-	-
Percent of oversize material wet	0	0	0	-	-	-
Peak Converted Wet Density t/m ³	1.98	1.96	1.96	-	-	-
Adjusted Peak Converted Wet Density t/m ³	-	-	-	-	-	-
Optimum Moisture Content %	23.5	22.5	23.0	-	-	-
Moisture Variation From Optimum Moisture Content	0.5% dry	1.5% dry	1.5% dry	-	-	-
Density Ratio (R_{HD}) %	95.0	98.5	101.0	-	-	-

Material description

No 8 - 10 Clay Fill



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Approved Signatory : Justin Fry



COMPACTION ASSESSMENT

Job No 14127
 Report No 14127/R004
 Date Issued 30/06/14

CIVIL GEOTECHNICAL SERVICES

6 - 8 Rose Avenue, Croydon 3136

Tested by DK
 Date tested 16/04/14
 Checked by JHF

Client WINSLOW CONSTRUCTORS PTY LTD (CAMPBELLFIELD)
 Project ARMSTRONG, MT DUNED - STAGE 9
 Location MOUNT DUNED

Feature	EARTHWORKS	<i>Layer thickness</i>	200 mm	<i>Time:</i> 08:00
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Test procedure AS 1289.2.1.1 & 5.8.1

Test No	11	12	13	-	-	-
<i>Location</i>	REFER TO FIGURE 1	REFER TO FIGURE 1	REFER TO FIGURE 1			
<i>Approximate depth below FSL</i>						
<i>Measurement depth</i> mm	175	175	175	-	-	-
<i>Field wet density</i> t/m ³	1.92	1.87	2.07	-	-	-
<i>Field moisture content</i> %	19.5	20.0	15.7	-	-	-

Test procedure AS 1289.5.7.1

Test No	11	12	13	-	-	-
<i>Compactive effort</i>	Standard					
<i>Oversize rock retained on sieve</i> mm	19.0	19.0	19.0	-	-	-
<i>Percent of oversize material</i> wet	0	0	0	-	-	-
<i>Peak Converted Wet Density</i> t/m ³	1.99	1.94	2.07	-	-	-
<i>Adjusted Peak Converted Wet Density</i> t/m ³	-	-	-	-	-	-
<i>Optimum Moisture Content</i> %	21.5	23.0	18.0	-	-	-

<i>Moisture Variation From Optimum Moisture Content</i>	2.0% dry	3.0% dry	2.5% dry	-	-	-
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Density Ratio (R_{HD}) %	96.5	96.0	100.0	-	-	-
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Material description

No 11 - 13 Clay Fill



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Approved Signatory : Justin Fry



COMPACTION ASSESSMENT

Job No 14127
 Report No 14127/R005
 Date Issued 17/07/14

CIVIL GEOTECHNICAL SERVICES

6 - 8 Rose Avenue, Croydon 3136

Client	WINSLOW CONSTRUCTORS PTY LTD (CAMPBELLFIELD)	Tested by	DK
Project	ARMSTRONG, MT DUNED - STAGE 9	Date tested	06/05/14
Location	MOUNT DUNED	Checked by	JHF

Feature	EARTHWORKS	Layer thickness	200 mm	Time:	09:20
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Test procedure AS 1289.2.1.1 & 5.8.1

Test No	14	15	16	17	18	19
Location	REFER TO FIGURE 1					
Approximate depth below FSL						
Measurement depth	mm	175	175	175	175	175
Field wet density	t/m ³	1.92	1.92	1.97	1.95	1.97
Field moisture content	%	20.2	19.2	18.7	20.4	20.0

Test procedure AS 1289.5.7.1

Test No	14	15	16	17	18	19
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	0	0
Peak Converted Wet Density	t/m ³	2.00	1.96	2.03	2.04	2.02
Adjusted Peak Converted Wet Density	t/m ³	2.00	-	-	-	-
Optimum Moisture Content	%	20.5	20.5	19.0	20.0	20.0

Moisture Variation From Optimum Moisture Content	0.0%	1.5% dry	0.0%	0.0%	0.0%	1.0% dry
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Density Ratio (R _{HD})	%	96.0	97.5	97.0	95.5	97.5	95.5
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Material description

No 14 - 19 Clay Fill



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Approved Signatory : Justin Fry



COMPACTION ASSESSMENT

Job No 14127
 Report No 14127/R006
 Date Issued 17/07/14

CIVIL GEOTECHNICAL SERVICES

6 - 8 Rose Avenue, Croydon 3136

Client	WINSLOW CONSTRUCTORS PTY LTD (CAMPBELLFIELD)	Tested by	DK
Project	ARMSTRONG, MT DUNED - STAGE 9	Date tested	06/05/14
Location	MOUNT DUNED	Checked by	JHF

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

Test No		20	21	22	23	-	-
Location		REFER TO FIGURE 1					
Approximate depth below FSL							
Measurement depth	mm	175	175	175	175	-	-
Field wet density	t/m ³	1.93	1.94	1.93	1.94	-	-
Field moisture content	%	19.1	20.6	21.0	17.9	-	-

Test procedure AS 1289.5.7.1

Test No		20	21	22	23	-	-
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	0	-	-
Peak Converted Wet Density	t/m ³	2.01	2.01	2.04	2.03	-	-
Adjusted Peak Converted Wet Density	t/m ³	-	-	-	-	-	-
Optimum Moisture Content	%	19.5	20.5	20.5	18.5	-	-

Moisture Variation From Optimum Moisture Content	0.0%	0.0%	0.0%	0.5% dry	-	-
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Density Ratio (R _{HD})	%	96.0	97.0	95.0	95.5	-	-
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Material description

No 20 - 23 Clay Fill



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Approved Signatory : Justin Fry



COMPACTION ASSESSMENT

Job No 14127
 Report No 14127/R007
 Date Issued 20/06/14

CIVIL GEOTECHNICAL SERVICES

6 - 8 Rose Avenue, Croydon 3136

Tested by DK
 Date tested 07/05/14
 Checked by JHF

Client WINSLOW CONSTRUCTORS PTY LTD (CAMPBELLFIELD)
 Project ARMSTRONG, MT DUNED - STAGE 9
 Location MOUNT DUNED

Feature	EARTHWORKS	<i>Layer thickness</i>	200 mm	<i>Time:</i> 08:15
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Test procedure AS 1289.2.1.1 & 5.8.1

Test No	24	25	26	27	28	29
<i>Location</i>	REFER TO FIGURE 1					
<i>Approximate depth below FSL</i>						
<i>Measurement depth</i> mm	175	175	175	175	175	175
<i>Field wet density</i> t/m ³	1.89	1.94	1.91	1.92	1.90	1.97
<i>Field moisture content</i> %	17.0	16.9	16.4	17.0	21.9	23.3

Test procedure AS 1289.5.7.1

Test No	24	25	26	27	28	29
<i>Compactive effort</i>	Standard					
<i>Oversize rock retained on sieve</i> mm	19.0	19.0	19.0	19.0	19.0	19.0
<i>Percent of oversize material</i> wet	0	3	0	0	0	0
<i>Peak Converted Wet Density</i> t/m ³	1.97	1.98	1.99	1.99	1.98	2.02
<i>Adjusted Peak Converted Wet Density</i> t/m ³	-	2.03	-	1.99	1.99	-
<i>Optimum Moisture Content</i> %	19.0	18.0	18.5	18.0	22.0	21.5

<i>Moisture Variation From Optimum Moisture Content</i>	1.5% dry	1.5% dry	2.0% dry	1.0% dry	0.0%	2.0% wet
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Density Ratio (R_{HD}) %	96.0	95.0	96.0	96.5	95.5	97.5
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Material description

No 24 - 29 Clay Fill



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Approved Signatory : Justin Fry



COMPACTION ASSESSMENT

Job No 14127
 Report No 14127/R008
 Date Issued 30/06/14

CIVIL GEOTECHNICAL SERVICES

6 - 8 Rose Avenue, Croydon 3136

Tested by DK
 Date tested 08/05/14
 Checked by JHF

Client WINSLOW CONSTRUCTORS PTY LTD (CAMPBELLFIELD)
 Project ARMSTRONG, MT DUNED - STAGE 9
 Location MOUNT DUNED

Feature EARTHWORKS *Layer thickness* 200 mm *Time:* 08:15

Test procedure AS 1289.2.1.1 & 5.8.1

Test No		30	31	32	-	-	-
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	1.91	1.89	-	-	-
Field moisture content	%	21.3	18.6	24.7	-	-	-

Test procedure AS 1289.5.7.1

Test No		30	31	32	-	-	-
Compactive effort		Standard					
Oversize rock retained on sieve	mm	19.0	19.0	19.0	-	-	-
Percent of oversize material	wet	0	0	0	-	-	-
Peak Converted Wet Density	t/m ³	1.93	1.97	1.98	-	-	-
Adjusted Peak Converted Wet Density	t/m ³	-	-	-	-	-	-
Optimum Moisture Content	%	22.5	19.5	22.0	-	-	-

Moisture Variation From Optimum Moisture Content		1.0% dry	1.0% dry	2.5% wet	-	-	-
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Density Ratio (R_{HD})	%	100.5	97.0	95.0	-	-	-
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Material description

No 30 - 32 Clay Fill



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Approved Signatory : Justin Fry



COMPACTION ASSESSMENT

Job No 14127
 Report No 14127/R009
 Date Issued 17/07/14

CIVIL GEOTECHNICAL SERVICES

6 - 8 Rose Avenue, Croydon 3136

Client	WINSLOW CONSTRUCTORS PTY LTD (CAMPBELLFIELD)	Tested by	DK
Project	ARMSTRONG, MT DUNED - STAGE 9	Date tested	12/05/14
Location	MOUNT DUNED	Checked by	JHF

Feature	EARTHWORKS	Layer thickness	200 mm	Time: 11:00
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Test procedure AS 1289.2.1.1 & 5.8.1

Test No	33	34	35	36	-	-
Location	REFER TO FIGURE 1					
Approximate depth below FSL						
Measurement depth <i>mm</i>	175	175	175	175	-	-
Field wet density <i>t/m³</i>	1.96	1.97	1.96	2.05	-	-
Field moisture content %	21.1	22.2	22.9	25.7	-	-

Test procedure AS 1289.5.7.1

Test No	33	34	35	36	-	-
Compactive effort	Standard					
Oversize rock retained on sieve <i>mm</i>	19.0	19.0	19.0	19.0	-	-
Percent of oversize material <i>wet</i>	1	1	1	0	-	-
Peak Converted Wet Density <i>t/m³</i>	2.06	2.07	2.02	2.08	-	-
Adjusted Peak Converted Wet Density <i>t/m³</i>	2.07	2.07	2.03	2.09	-	-
Optimum Moisture Content %	19.0	19.5	19.0	19.5	-	-

Moisture Variation From Optimum Moisture Content	2.0% wet	2.5% wet	3.5% wet	6.5% wet	-	-
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Density Ratio (R_{HD})	%	95.0	95.0	97.0	98.0	-	-
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Material description

No 33 - 36 Clay Fill



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Approved Signatory : Justin Fry