MORRISON GEOTECHNIC

Brisbane | Gold Coast | Maroochydore
Unit 1, 35 Limestone Street (PO Box 3063), Darra Q 4076 **P** (07) 3279 0900 **F** (07) 3279 0955
ABN 51 009 878 899
www.morrisongeo.com.au

Brisbane Office
Job Number: DL18/196
Ref No: 13862
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 226
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 226 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 226 are presented in Table 1 below.

Table 1: Summary of Testing

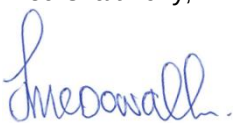
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
226	265	25th July 2018	97.0
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			

Fill constructed on Lot 225 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 225 can be termed as "Controlled Fill" in accordance with AS 2870-2011 "Residential Slabs and Footings".

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 72
Brochure: Important Information About Your Geotechnical Engineering Report

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 72**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**14/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250032	250033	250034	250035
Test Number :	262	263	264	265
Sampling Method :	-	-	-	-
Date Sampled :	25/07/2018	25/07/2018	25/07/2018	25/07/2018
Date Tested :	25/07/2018	25/07/2018	25/07/2018	25/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	293	-	291	-
Sample Location :	Lot 293 E 465921 N 6946679 RL 42.130	E 465914 N 6946674 RL 42.148	Lot 291 E 465899 N 6946689 RL 42.091	E 465887 N 6946691 RL 42.119
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	19.5	26.6	22.9	24.7
Hilf MDR Number :	250032	250033	250034	250035
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 (%) :	108.5	99.5	99.5	100.5
Field Wet Density (t/m³) :	1.898	1.907	1.910	1.918
Optimum Moisture Content (%) :	18.0	26.8	23.0	24.6
Moisture Variation :	-1.6	0.1	0.1	-0.1
Peak Converted Wet Density (t/m³) :	1.933	1.949	1.986	1.975
Hilf Density Ratio (%) :	**98.0**	**98.0**	**96.0**	**97.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	-			

NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025.

APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

Important Information about Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

ASFE
THE BEST PEOPLE ON EARTH

8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@asfe.org www.asfe.org

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Brisbane Office
Job Number: DL18/196
Ref No: 13863
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 227
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 227 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
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- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 227 are presented in Table 1 below.

Table 1: Summary of Testing

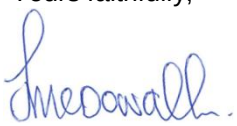
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
227	264	25th July 2018	96.0
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 227 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 227 can be termed as "Controlled Fill" in accordance with AS 2870-2011 "Residential Slabs and Footings".

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 72
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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 72**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**14/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250032	250033	250034	250035
Test Number :	262	263	264	265
Sampling Method :	-	-	-	-
Date Sampled :	25/07/2018	25/07/2018	25/07/2018	25/07/2018
Date Tested :	25/07/2018	25/07/2018	25/07/2018	25/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	293	-	291	-
Sample Location :	Lot 293 E 465921 N 6946679 RL 42.130	E 465914 N 6946674 RL 42.148	Lot 291 E 465899 N 6946689 RL 42.091	E 465887 N 6946691 RL 42.119
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
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Moisture Variation :	-1.6	0.1	0.1	-0.1
Peak Converted Wet Density (t/m³) :	1.933	1.949	1.986	1.975
Hilf Density Ratio (%) :	**98.0**	**98.0**	**96.0**	**97.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	-			

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Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

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e-mail: info@asfe.org www.asfe.org

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subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

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Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

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Obtain Professional Assistance To Deal with Mold

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Brisbane Office
Job Number: DL18/196
Ref No: 13864
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 228
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 228 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 228 are presented in Table 1 below.

Table 1: Summary of Testing

Lot Number	Test Number	Date Tested	Density Ratio Achieved %
228	263	25th July 2018	98.0
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			

Fill constructed on Lot 228 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 228 can be termed as "Controlled Fill" in accordance with AS 2870-2011 "Residential Slabs and Footings".

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,

L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 72
Brochure: Important Information About Your Geotechnical Engineering Report

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 72**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**14/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250032	250033	250034	250035
Test Number :	262	263	264	265
Sampling Method :	-	-	-	-
Date Sampled :	25/07/2018	25/07/2018	25/07/2018	25/07/2018
Date Tested :	25/07/2018	25/07/2018	25/07/2018	25/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	293	-	291	-
Sample Location :	Lot 293 E 465921 N 6946679 RL 42.130	E 465914 N 6946674 RL 42.148	Lot 291 E 465899 N 6946689 RL 42.091	E 465887 N 6946691 RL 42.119
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	19.5	26.6	22.9	24.7
Hilf MDR Number :	250032	250033	250034	250035
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 (%) :	108.5	99.5	99.5	100.5
Field Wet Density (t/m³) :	1.898	1.907	1.910	1.918
Optimum Moisture Content (%) :	18.0	26.8	23.0	24.6
Moisture Variation :	-1.6	0.1	0.1	-0.1
Peak Converted Wet Density (t/m³) :	1.933	1.949	1.986	1.975
Hilf Density Ratio (%) :	**98.0**	**98.0**	**96.0**	**97.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	-			

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WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025.

APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

Important Information about Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

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Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

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Brisbane Office
Job Number: DL18/196
Ref No: 13865
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 229
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 229 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
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- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 229 are presented in Table 1 below.

Table 1: Summary of Testing

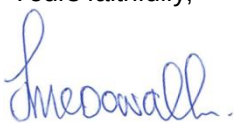
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
229	262	25th July 2018	98.0
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 229 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 229 can be termed as "Controlled Fill" in accordance with AS 2870-2011 "Residential Slabs and Footings".

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 72
Brochure: Important Information About Your Geotechnical Engineering Report

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 72**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**14/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250032	250033	250034	250035
Test Number :	262	263	264	265
Sampling Method :	-	-	-	-
Date Sampled :	25/07/2018	25/07/2018	25/07/2018	25/07/2018
Date Tested :	25/07/2018	25/07/2018	25/07/2018	25/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	293	-	291	-
Sample Location :	Lot 293 E 465921 N 6946679 RL 42.130	E 465914 N 6946674 RL 42.148	Lot 291 E 465899 N 6946689 RL 42.091	E 465887 N 6946691 RL 42.119
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	19.5	26.6	22.9	24.7
Hilf MDR Number :	250032	250033	250034	250035
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
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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 (%) :	108.5	99.5	99.5	100.5
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Optimum Moisture Content (%) :	18.0	26.8	23.0	24.6
Moisture Variation :	-1.6	0.1	0.1	-0.1
Peak Converted Wet Density (t/m³) :	1.933	1.949	1.986	1.975
Hilf Density Ratio (%) :	**98.0**	**98.0**	**96.0**	**97.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	-			

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WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025.

APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
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Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

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- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

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Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

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Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

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Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

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Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

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ABN 51 009 878 899
www.morrisongeo.com.au

Brisbane Office
Job Number: DL18/196
Ref No: 13889
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 253
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 253 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 253 are presented in Table 1 below.

Table 1: Summary of Testing

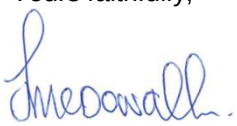
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
253	210	20th July 2018	99.5
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 253 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 253 can be termed as "Controlled Fill" in accordance with AS 2870-2011 "Residential Slabs and Footings".

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 59
Brochure: Important Information About Your Geotechnical Engineering Report

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 59**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**08/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	249705	249706	249707	249708
Test Number :	210	211	212	213
Sampling Method :	-	-	-	-
Date Sampled :	20/07/2018	20/07/2018	20/07/2018	20/07/2018
Date Tested :	20/07/2018	20/07/2018	20/07/2018	20/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**255**	**-**	**256**	**-**
Sample Location :	Lot 255 E 465892 N 6946516 RL 41.460	E 465887 N 6946507 RL 41.483	Lot 256 E 465897 N 6946500 RL 41.5	E 465896 N 6946495 RL 41.480
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	23.7	23.1	23.4	21.4
Hilf MDR Number :	249705	249706	249707	249708
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	AS1289.2.1.4	AS1289.2.1.1
Moisture Ratio (%) :	97.5	101	100.5	101
Field Wet Density (t/m³) :	1.914	1.935	1.927	1.937
Optimum Moisture Content (%) :	24.3	22.9	23.2	21.2
Moisture Variation :	0.6	-0.2	-0.1	-0.2
Peak Converted Wet Density (t/m³) :	1.919	1.990	1.969	2.013
Hilf Density Ratio (%) :	**99.5**	**97.0**	**98.0**	**96.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	**MDR performed by Gold Coast Laboratory. Corporate Site No. 1900.**			

NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.

APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

Important Information about Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

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www.morrisongeo.com.au

Brisbane Office
Job Number: DL18/196
Ref No: 13890
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 254
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 254 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 254 are presented in Table 1 below.

Table 1: Summary of Testing

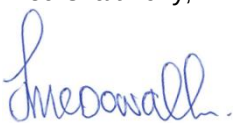
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
254	212	20th July 2018	98.0
254	213	20th July 2018	96.0
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 254 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 254 can be termed as “Controlled Fill” in accordance with AS 2870-2011 “Residential Slabs and Footings”.

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 59**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**08/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	249705	249706	249707	249708
Test Number :	210	211	212	213
Sampling Method :	-	-	-	-
Date Sampled :	20/07/2018	20/07/2018	20/07/2018	20/07/2018
Date Tested :	20/07/2018	20/07/2018	20/07/2018	20/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**255**	**-**	**256**	**-**
Sample Location :	Lot 255 E 465892 N 6946516 RL 41.460	E 465887 N 6946507 RL 41.483	Lot 256 E 465897 N 6946500 RL 41.5	E 465896 N 6946495 RL 41.480
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	23.7	23.1	23.4	21.4
Hilf MDR Number :	249705	249706	249707	249708
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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	AS1289.2.1.4	AS1289.2.1.1
Moisture Ratio (%) :	97.5	101	100.5	101
Field Wet Density (t/m³) :	1.914	1.935	1.927	1.937
Optimum Moisture Content (%) :	24.3	22.9	23.2	21.2
Moisture Variation :	0.6	-0.2	-0.1	-0.2
Peak Converted Wet Density (t/m³) :	1.919	1.990	1.969	2.013
Hilf Density Ratio (%) :	**99.5**	**97.0**	**98.0**	**96.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	**MDR performed by Gold Coast Laboratory. Corporate Site No. 1900.**			

NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.

APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

Important Information about Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

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Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

ASFE
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e-mail: info@asfe.org www.asfe.org

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ABN 51 009 878 899
www.morrisongeo.com.au

Brisbane Office
Job Number: DL18/196
Ref No: 13891
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 255
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 255 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

Tests performed on filling operations near Lot 255 are representative of the fill constructed on Lot 255. The closest tests to Lot 255 were performed on Lot 254. A summary of tests representative of the fill constructed on Lot 255 are presented in Table 1 below.

Table 1: Summary of Testing

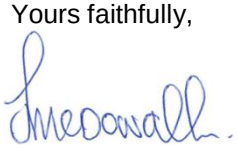
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
254	212	20th July 2018	98.0
254	213	20th July 2018	96.0
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 255 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 255 can be termed as “Controlled Fill” in accordance with AS 2870-2011 “Residential Slabs and Footings”.

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 59
Brochure: Important Information About Your Geotechnical Engineering Report

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 59**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**08/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	249705	249706	249707	249708
Test Number :	210	211	212	213
Sampling Method :	-	-	-	-
Date Sampled :	20/07/2018	20/07/2018	20/07/2018	20/07/2018
Date Tested :	20/07/2018	20/07/2018	20/07/2018	20/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**255**	**-**	**256**	**-**
Sample Location :	Lot 255 E 465892 N 6946516 RL 41.460	E 465887 N 6946507 RL 41.483	Lot 256 E 465897 N 6946500 RL 41.5	E 465896 N 6946495 RL 41.480
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	23.7	23.1	23.4	21.4
Hilf MDR Number :	249705	249706	249707	249708
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	AS1289.2.1.4	AS1289.2.1.1
Moisture Ratio (%) :	97.5	101	100.5	101
Field Wet Density (t/m³) :	1.914	1.935	1.927	1.937
Optimum Moisture Content (%) :	24.3	22.9	23.2	21.2
Moisture Variation :	0.6	-0.2	-0.1	-0.2
Peak Converted Wet Density (t/m³) :	1.919	1.990	1.969	2.013
Hilf Density Ratio (%) :	**99.5**	**97.0**	**98.0**	**96.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	**MDR performed by Gold Coast Laboratory. Corporate Site No. 1900.**			

NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.

APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

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Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

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Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

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Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

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Brisbane Office
Job Number: DL18/196
Ref No: 13892
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 256
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 256 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

Tests performed on filling operations near Lot 256 are representative of the fill constructed on Lot 256. The closest tests to Lot 256 were performed on Lot 254. A summary of tests representative of the fill constructed on Lot 256 are presented in Table 1 below.

Table 1: Summary of Testing

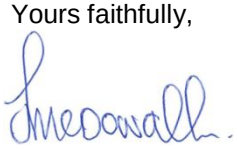
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
254	212	20th July 2018	98.0
254	213	20th July 2018	96.0
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 256 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 256 can be termed as “Controlled Fill” in accordance with AS 2870-2011 “Residential Slabs and Footings”.

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 59
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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 59**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**08/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	249705	249706	249707	249708
Test Number :	210	211	212	213
Sampling Method :	-	-	-	-
Date Sampled :	20/07/2018	20/07/2018	20/07/2018	20/07/2018
Date Tested :	20/07/2018	20/07/2018	20/07/2018	20/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**255**	**-**	**256**	**-**
Sample Location :	Lot 255 E 465892 N 6946516 RL 41.460	E 465887 N 6946507 RL 41.483	Lot 256 E 465897 N 6946500 RL 41.5	E 465896 N 6946495 RL 41.480
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	23.7	23.1	23.4	21.4
Hilf MDR Number :	249705	249706	249707	249708
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	AS1289.2.1.4	AS1289.2.1.1
Moisture Ratio (%) :	97.5	101	100.5	101
Field Wet Density (t/m³) :	1.914	1.935	1.927	1.937
Optimum Moisture Content (%) :	24.3	22.9	23.2	21.2
Moisture Variation :	0.6	-0.2	-0.1	-0.2
Peak Converted Wet Density (t/m³) :	1.919	1.990	1.969	2.013
Hilf Density Ratio (%) :	**99.5**	**97.0**	**98.0**	**96.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	**MDR performed by Gold Coast Laboratory. Corporate Site No. 1900.**			

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APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
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Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

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- not prepared for your project,
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- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

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Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

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Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

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Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

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www.morrisongeo.com.au

Brisbane Office
Job Number: DL18/196
Ref No: 13893
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 257
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 257 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

Tests performed on filling operations near Lot 257 are representative of the fill constructed on Lot 257. The closest tests to Lot 257 were performed on Lot 258. A summary of tests representative of the fill constructed on Lot 257 are presented in Table 1 below.

Table 1: Summary of Testing

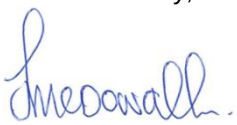
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
258	222	23rd July 2018	96.5
258	223	23rd July 2018	95.5
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			

Fill constructed on Lot 257 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 257 can be termed as “Controlled Fill” in accordance with AS 2870-2011 “Residential Slabs and Footings”.

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 62
Brochure: Important Information About Your Geotechnical Engineering Report

MORRISON GEOTECHNIC

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www.morrisongeo.com.au

Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 62**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**10/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	249789	249790	249791	249792
Test Number :	222	223	224	225
Sampling Method :	-	-	-	-
Date Sampled :	23/07/2018	23/07/2018	23/07/2018	23/07/2018
Date Tested :	23/07/2018	23/07/2018	23/07/2018	23/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**258**	**-**	**259**	**-**
Sample Location :	Lot 258 E 465928 N 6946480 RL 41.268	E 465925 N 6946475 RL 41.281	Lot 259 E 465932 N 6946514 RL 41.600	E 465941 N 6946515 RL 41.588
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 (%) :	24.4	24.0	21.3	21.8
Hilf MDR Number :	249789	249790	249791	249792
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 (%) :	103.5	99.5	94	99.5
Field Wet Density (t/m³) :	1.872	1.887	1.867	1.864
Optimum Moisture Content (%) :	23.6	24.1	22.7	21.9
Moisture Variation :	-0.7	0.1	1.4	0.1
Peak Converted Wet Density (t/m³) :	1.941	1.972	1.925	1.951
Hilf Density Ratio (%) :	**96.5**	**95.5**	**97.0**	**95.5**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	CLAY (CH)	CLAY (CH)	CLAY (CH)	CLAY (CH)
Remarks :	-			

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www.morrisongeo.com.au

Brisbane Office
Job Number: DL18/196
Ref No: 13894
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 258
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 258 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 258 are presented in Table 1 below.

Table 1: Summary of Testing

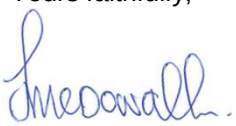
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
258	222	23rd July 2018	96.5
258	223	23rd July 2018	95.5
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			

Fill constructed on Lot 258 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 258 can be termed as "Controlled Fill" in accordance with AS 2870-2011 "Residential Slabs and Footings".

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 62
Brochure: Important Information About Your Geotechnical Engineering Report

MORRISON GEOTECHNIC

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ABN: 51 009 878 899
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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 62**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**10/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	249789	249790	249791	249792
Test Number :	222	223	224	225
Sampling Method :	-	-	-	-
Date Sampled :	23/07/2018	23/07/2018	23/07/2018	23/07/2018
Date Tested :	23/07/2018	23/07/2018	23/07/2018	23/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**258**	**-**	**259**	**-**
Sample Location :	Lot 258 E 465928 N 6946480 RL 41.268	E 465925 N 6946475 RL 41.281	Lot 259 E 465932 N 6946514 RL 41.600	E 465941 N 6946515 RL 41.588
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 (%) :	24.4	24.0	21.3	21.8
Hilf MDR Number :	249789	249790	249791	249792
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 (%) :	103.5	99.5	94	99.5
Field Wet Density (t/m³) :	1.872	1.887	1.867	1.864
Optimum Moisture Content (%) :	23.6	24.1	22.7	21.9
Moisture Variation :	-0.7	0.1	1.4	0.1
Peak Converted Wet Density (t/m³) :	1.941	1.972	1.925	1.951
Hilf Density Ratio (%) :	**96.5**	**95.5**	**97.0**	**95.5**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	CLAY (CH)	CLAY (CH)	CLAY (CH)	CLAY (CH)
Remarks :	-			

NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.

APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

Important Information about Your

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Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

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Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

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- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

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THE BEST PEOPLE ON EARTH

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www.morrisongeo.com.au

Brisbane Office
Job Number: DL18/196
Ref No: 13897
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 261
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 261 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 261 are presented in Table 1 below.

Table 1: Summary of Testing

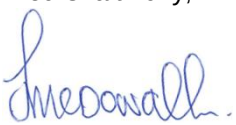
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
261	289	30th July 2018	99.5
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			

Fill constructed on Lot 261 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 261 can be termed as "Controlled Fill" in accordance with AS 2870-2011 "Residential Slabs and Footings".

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 79
Brochure: Important Information About Your Geotechnical Engineering Report

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ABN: 51 009 878 899
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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 79**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250420	250421	250422	250423
Test Number :	286	287	288	289
Sampling Method :	-	-	-	-
Date Sampled :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Date Tested :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**282**	**-**	**281**	**-**
Sample Location :	Lot 282 E 465864 N 6946607 RL 42.038	E 465874 N 6946620 RL 42.088	Lot 281 E 465862 N 6946581 RL 42.350	E 465852 N 6946586 RL 42.391
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	19.7	18.9	20.0	21.0
Hilf MDR Number :	250420	250421	250422	250423
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
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Moisture Method :	AS1289.2.1.1	AS1289.2.1.1	AS1289.2.1.1	AS1289.2.1.1
Moisture Ratio (%) :	99	91	99	97.5
Field Wet Density (t/m³) :	2.021	1.776	2.042	2.022
Optimum Moisture Content (%) :	19.9	20.8	20.2	21.5
Moisture Variation :	0.2	1.9	0.1	0.5
Peak Converted Wet Density (t/m³) :	2.048	1.849	2.011	2.034
Hilf Density Ratio (%) :	**98.5**	**96.0**	**101.5**	**99.5**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	-			

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APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
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ASFE
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IIGER06085.0MRP

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Brisbane Office
Job Number: DL18/196
Ref No: 13898
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 262
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 262 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 262 are presented in Table 1 below.

Table 1: Summary of Testing

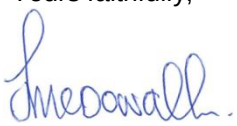
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
262	286	30th July 2018	98.5
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 262 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 262 can be termed as "Controlled Fill" in accordance with AS 2870-2011 "Residential Slabs and Footings".

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 79
Brochure: Important Information About Your Geotechnical Engineering Report

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ABN: 51 009 878 899
www.morrisongeo.com.au

Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 79**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250420	250421	250422	250423
Test Number :	286	287	288	289
Sampling Method :	-	-	-	-
Date Sampled :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Date Tested :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**282**	**-**	**281**	**-**
Sample Location :	Lot 282 E 465864 N 6946607 RL 42.038	E 465874 N 6946620 RL 42.088	Lot 281 E 465862 N 6946581 RL 42.350	E 465852 N 6946586 RL 42.391
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	19.7	18.9	20.0	21.0
Hilf MDR Number :	250420	250421	250422	250423
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 (%) :	99	91	99	97.5
Field Wet Density (t/m³) :	2.021	1.776	2.042	2.022
Optimum Moisture Content (%) :	19.9	20.8	20.2	21.5
Moisture Variation :	0.2	1.9	0.1	0.5
Peak Converted Wet Density (t/m³) :	2.048	1.849	2.011	2.034
Hilf Density Ratio (%) :	**98.5**	**96.0**	**101.5**	**99.5**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	-			

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Accredited for compliance with ISO/IEC 17025.

APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

Important Information about Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

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A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

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Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

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Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

ASFE
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Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@asfe.org www.asfe.org

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Brisbane Office
Job Number: DL18/196
Ref No: 13899
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 263
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 263 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
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Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 263 are presented in Table 1 below.

Table 1: Summary of Testing

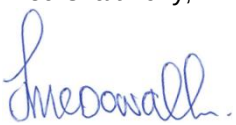
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
263	303	31st July 2018	99.0
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			

Fill constructed on Lot 263 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 263 can be termed as "Controlled Fill" in accordance with AS 2870-2011 "Residential Slabs and Footings".

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 83
Brochure: Important Information About Your Geotechnical Engineering Report

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 83**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250500	250501	250502	250503
Test Number :	302	303	304	305
Sampling Method :	-	-	-	-
Date Sampled :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Date Tested :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**277**	**-**	**278**	**-**
Sample Location :	Lot 277 E 465848 N 6946634 RL 42.646	E 465848 N 6946615 RL 42.668	Lot 278 E 465831 N 6946641 RL 42.690	E 465825 N 6946632 RL 42.711
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 (%) :	22.2	23.0	24.5	23.9
Hilf MDR Number :	250500	250501	250502	250503
Hilf MDR 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
Compactive Effort :	Standard	Standard	Standard	Standard
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Moisture Method :	AS1289.2.1.1	AS1289.2.1.1	AS1289.2.1.1	AS1289.2.1.1
Moisture Ratio (%) :	101.5	91	100	91
Field Wet Density (t/m³) :	1.913	1.870	1.890	1.858
Optimum Moisture Content (%) :	21.9	25.2	24.5	26.3
Moisture Variation :	-0.4	2.1	0.0	2.2
Peak Converted Wet Density (t/m³) :	1.827	1.888	1.856	1.891
Hilf Density Ratio (%) :	**104.5**	**99.0**	**102.0**	**98.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	CLAY (CH)	CLAY (CH)	CLAY (CH)	CLAY (CH)
Remarks :	Reported moisture variation does not accurately reflect placement moisture.			

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MORRISON GEOTECHNIC

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ABN 51 009 878 899
www.morrisongeo.com.au

Brisbane Office
Job Number: DL18/196
Ref No: 13900
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 264
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 264 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 264 are presented in Table 1 below.

Table 1: Summary of Testing

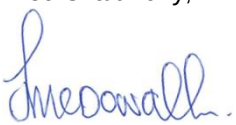
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
264	287	30th July 2018	96.0
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			

Fill constructed on Lot 264 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 264 can be termed as "Controlled Fill" in accordance with AS 2870-2011 "Residential Slabs and Footings".

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 79
Brochure: Important Information About Your Geotechnical Engineering Report

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 79**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250420	250421	250422	250423
Test Number :	286	287	288	289
Sampling Method :	-	-	-	-
Date Sampled :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Date Tested :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**282**	**-**	**281**	**-**
Sample Location :	Lot 282 E 465864 N 6946607 RL 42.038	E 465874 N 6946620 RL 42.088	Lot 281 E 465862 N 6946581 RL 42.350	E 465852 N 6946586 RL 42.391
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	19.7	18.9	20.0	21.0
Hilf MDR Number :	250420	250421	250422	250423
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 (%) :	99	91	99	97.5
Field Wet Density (t/m³) :	2.021	1.776	2.042	2.022
Optimum Moisture Content (%) :	19.9	20.8	20.2	21.5
Moisture Variation :	0.2	1.9	0.1	0.5
Peak Converted Wet Density (t/m³) :	2.048	1.849	2.011	2.034
Hilf Density Ratio (%) :	**98.5**	**96.0**	**101.5**	**99.5**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	-			

NATA
WORLD RECOGNISED ACCREDITATION

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APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

Important Information about Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

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Brisbane Office
Job Number: DL18/196
Ref No: 13901
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 265
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 265 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 265 are presented in Table 1 below.

Table 1: Summary of Testing

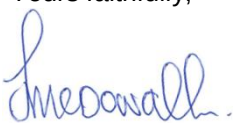
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
265	241	24th July 2018	100.5
265	285	26th July 2018	100.0
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			

Fill constructed on Lot 265 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 265 can be termed as "Controlled Fill" in accordance with AS 2870-2011 "Residential Slabs and Footings".

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 66 and 78
Brochure: Important Information About Your Geotechnical Engineering Report

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 66**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**10/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	249912	249913	249914	249915
Test Number :	238	239	240	241
Sampling Method :	-	-	-	-
Date Sampled :	24/07/2018	24/07/2018	24/07/2018	24/07/2018
Date Tested :	24/07/2018	24/07/2018	24/07/2018	24/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**270**	**-**	**271**	**-**
Sample Location :	Lot 270 E 465943 N 6946628 RL 42.279	E 465939 N 6946617 RL 42.290	Lot 271 E 465916 N 6946628 RL 42.130	E 465909 N 6946624 RL 42.189
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	21.7	23.7	17.7	16.6
Hilf MDR Number :	249912	249913	249914	249915
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 (%) :	104	98	100	90.5
Field Wet Density (t/m³) :	1.888	1.870	1.860	1.925
Optimum Moisture Content (%) :	20.9	24.2	17.7	18.3
Moisture Variation :	-0.8	0.5	0.0	1.8
Peak Converted Wet Density (t/m³) :	1.977	1.918	1.923	1.912
Hilf Density Ratio (%) :	**95.5**	**97.5**	**96.5**	**100.5**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	-			

NATA
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Accredited for compliance with ISO/IEC 17025 - Testing.

APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 78**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**14/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250200	250201		
Test Number :	284	285		
Sampling Method :	-	-		
Date Sampled :	26/07/2018	26/07/2018		
Date Tested :	26/07/2018	26/07/2018		
Material Type :	**Bulk Fill**	**Bulk Fill**		
Material Source :	**On Site (Cut)**	**On Site (Cut)**		
Lot Number :	-	-		
Sample Location :	Road 13 N: 6946653 E: 465895 RL: 42.368	N: 6946634 E: 465912 RL: 42.383		
Test Depth (mm) :	150	150		
Layer Depth (mm) :	-	-		
Maximum Size (mm) :	19	19		
Oversize Wet (%) :	-	-		
Oversize Dry (%) :	-	-		
Oversize Density (t/m³) :	-	-		
Field Moisture Content (%) :	19.0	17.3		
Hilf MDR Number :	250200	250201		
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 (%) :	114.5	90.5		
Field Wet Density (t/m³) :	1.883	1.969		
Optimum Moisture Content (%) :	16.6	19.1		
Moisture Variation :	-2.4	1.7		
Peak Converted Wet Density (t/m³) :	1.987	1.967		
Hilf Density Ratio (%) :	**95.0**	**100.0**		
Minimum Specification :	95	95		
Moisture Specification :	+ or - 2%	+ or - 2%		
Site Selection :	-	-		
Soil Description :	CLAY (CH)	CLAY (CH)		
Remarks :	-			

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APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
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As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

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Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

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Brisbane Office
Job Number: DL18/196
Ref No: 13902
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 266
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 266 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 266 are presented in Table 1 below.

Table 1: Summary of Testing

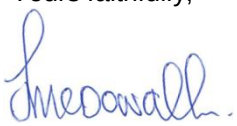
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
266	240	24th July 2018	96.5
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 266 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 266 can be termed as "Controlled Fill" in accordance with AS 2870-2011 "Residential Slabs and Footings".

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 66
Brochure: Important Information About Your Geotechnical Engineering Report

MORRISON GEOTECHNIC

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 66**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**10/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	249912	249913	249914	249915
Test Number :	238	239	240	241
Sampling Method :	-	-	-	-
Date Sampled :	24/07/2018	24/07/2018	24/07/2018	24/07/2018
Date Tested :	24/07/2018	24/07/2018	24/07/2018	24/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**270**	**-**	**271**	**-**
Sample Location :	Lot 270 E 465943 N 6946628 RL 42.279	E 465939 N 6946617 RL 42.290	Lot 271 E 465916 N 6946628 RL 42.130	E 465909 N 6946624 RL 42.189
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	21.7	23.7	17.7	16.6
Hilf MDR Number :	249912	249913	249914	249915
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 (%) :	104	98	100	90.5
Field Wet Density (t/m³) :	1.888	1.870	1.860	1.925
Optimum Moisture Content (%) :	20.9	24.2	17.7	18.3
Moisture Variation :	-0.8	0.5	0.0	1.8
Peak Converted Wet Density (t/m³) :	1.977	1.918	1.923	1.912
Hilf Density Ratio (%) :	**95.5**	**97.5**	**96.5**	**100.5**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	-			

NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.

APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

Important Information about Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

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Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

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Brisbane Office
Job Number: DL18/196
Ref No: 13903
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 267
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 267 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 267 are presented in Table 1 below.

Table 1: Summary of Testing

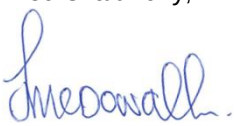
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
267	242	24th July 2018	102.5
267	243	24th July 2018	100.5
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 267 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 267 can be termed as “Controlled Fill” in accordance with AS 2870-2011 “Residential Slabs and Footings”.

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 67
Brochure: Important Information About Your Geotechnical Engineering Report

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 67**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**10/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	249916	249917	249918	249919
Test Number :	242	243	244	245
Sampling Method :	-	-	-	-
Date Sampled :	24/07/2018	24/07/2018	24/07/2018	24/07/2018
Date Tested :	24/07/2018	24/07/2018	24/07/2018	24/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**272**	**-**	**273**	**-**
Sample Location :	Lot 272 E 465911 N 6946602 RL 42.545	E 465917 N 6946597 RL 42.589	Lot 273 E 465911 N 6946584 RL 42.527	E 465900 N 6946578 RL 42.539
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	16.8	18.3	15.8	22.0
Hilf MDR Number :	249916	249917	249918	249919
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 (%) :	92	92.5	91	96
Field Wet Density (t/m³) :	2.032	1.836	1.947	1.895
Optimum Moisture Content (%) :	18.2	19.8	17.4	22.9
Moisture Variation :	1.4	1.6	1.6	0.8
Peak Converted Wet Density (t/m³) :	1.978	1.826	1.953	1.948
Hilf Density Ratio (%) :	**102.5**	**100.5**	**99.5**	**97.5**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	-			

NATA
WORLD RECOGNISED ACCREDITATION

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APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
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1162 / 1169

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Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

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- not prepared for your project,
- not prepared for the specific site explored, or
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Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

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Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

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subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

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Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

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Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

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Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

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ABN 51 009 878 899
www.morrisongeo.com.au

Brisbane Office
Job Number: DL18/196
Ref No: 13904
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 268
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 268 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 268 are presented in Table 1 below.

Table 1: Summary of Testing

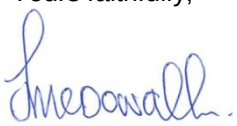
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
268	244	24th July 2018	99.5
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 268 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 268 can be termed as "Controlled Fill" in accordance with AS 2870-2011 "Residential Slabs and Footings".

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 67
Brochure: Important Information About Your Geotechnical Engineering Report

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 67**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**10/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	249916	249917	249918	249919
Test Number :	242	243	244	245
Sampling Method :	-	-	-	-
Date Sampled :	24/07/2018	24/07/2018	24/07/2018	24/07/2018
Date Tested :	24/07/2018	24/07/2018	24/07/2018	24/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**272**	**-**	**273**	**-**
Sample Location :	Lot 272 E 465911 N 6946602 RL 42.545	E 465917 N 6946597 RL 42.589	Lot 273 E 465911 N 6946584 RL 42.527	E 465900 N 6946578 RL 42.539
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	16.8	18.3	15.8	22.0
Hilf MDR Number :	249916	249917	249918	249919
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 (%) :	92	92.5	91	96
Field Wet Density (t/m³) :	2.032	1.836	1.947	1.895
Optimum Moisture Content (%) :	18.2	19.8	17.4	22.9
Moisture Variation :	1.4	1.6	1.6	0.8
Peak Converted Wet Density (t/m³) :	1.978	1.826	1.953	1.948
Hilf Density Ratio (%) :	**102.5**	**100.5**	**99.5**	**97.5**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	-			

NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.

APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

Important Information about Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

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Brisbane Office
Job Number: DL18/196
Ref No: 13905
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 269
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 269 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials in accordance with AS3798 2007 – "Guidelines on Earthworks for Commercial and Residential Developments";
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- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 269 are presented in Table 1 below.

Table 1: Summary of Testing

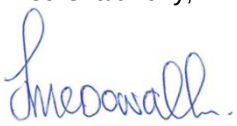
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
269	206	20th July 2018	96.0
269	207	20th July 2018	96.5
269	245	24th July 2018	97.5
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 269 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 269 can be termed as "Controlled Fill" in accordance with AS 2870-2011 "Residential Slabs and Footings".

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 58 and 67
Brochure: Important Information About Your Geotechnical Engineering Report

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 58**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**08/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	249701	249702	249703	249704
Test Number :	206	207	208	209
Sampling Method :	-	-	-	-
Date Sampled :	20/07/2018	20/07/2018	20/07/2018	20/07/2018
Date Tested :	20/07/2018	20/07/2018	20/07/2018	20/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**253**	**-**	**254**	**-**
Sample Location :	Lot 253 E 465900 N 6946572 RL 41.723	E 465892 N 6946574 RL 41.74	Lot 254 E 465891 N 69436538 RL 41.693	E 465893 N 6946550 RL 41.681
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	26.1	9.2	25.5	23.5
Hilf MDR Number :	249701	249702	249703	249704
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 (%) :	104.5	103	103	103
Field Wet Density (t/m³) :	1.902	1.902	1.803	1.873
Optimum Moisture Content (%) :	25.0	8.9	24.8	22.8
Moisture Variation :	-1.1	-0.2	-0.7	-0.7
Peak Converted Wet Density (t/m³) :	1.985	1.971	1.879	1.884
Hilf Density Ratio (%) :	**96.0**	**96.5**	**96.0**	**99.5**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	**MDR performed by Gold Coast Laboratory. Corporate Site No. 1900.**			

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WORLD RECOGNISED ACCREDITATION

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APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 67**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**10/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	249916	249917	249918	249919
Test Number :	242	243	244	245
Sampling Method :	-	-	-	-
Date Sampled :	24/07/2018	24/07/2018	24/07/2018	24/07/2018
Date Tested :	24/07/2018	24/07/2018	24/07/2018	24/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**272**	**-**	**273**	**-**
Sample Location :	Lot 272 E 465911 N 6946602 RL 42.545	E 465917 N 6946597 RL 42.589	Lot 273 E 465911 N 6946584 RL 42.527	E 465900 N 6946578 RL 42.539
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	16.8	18.3	15.8	22.0
Hilf MDR Number :	249916	249917	249918	249919
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
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Moisture Method :	AS1289.2.1.1	AS1289.2.1.1	AS1289.2.1.1	AS1289.2.1.1
Moisture Ratio (%) :	92	92.5	91	96
Field Wet Density (t/m³) :	2.032	1.836	1.947	1.895
Optimum Moisture Content (%) :	18.2	19.8	17.4	22.9
Moisture Variation :	1.4	1.6	1.6	0.8
Peak Converted Wet Density (t/m³) :	1.978	1.826	1.953	1.948
Hilf Density Ratio (%) :	**102.5**	**100.5**	**99.5**	**97.5**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	-			

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Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

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Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

ASFE
THE BEST PEOPLE ON EARTH

8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@asfe.org www.asfe.org

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Brisbane Office
Job Number: DL18/196
Ref No: 13907
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 271
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 271 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

Tests performed on filling operations near Lot 271 are representative of the fill constructed on Lot 271. The closest tests to Lot 271 were performed on Lot 269 and 272. A summary of tests representative of the fill constructed on Lot 271 are presented in Table 1 below.

Table 1: Summary of Testing

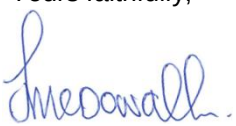
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
269	206	20th July 2018	96.0
269	207	20th July 2018	96.5
269	245	24th July 2018	97.5
272	208	20th July 2018	96.0
272	209	20th July 2018	99.5
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 271 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 271 can be termed as “Controlled Fill” in accordance with AS 2870-2011 “Residential Slabs and Footings”.

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 58 and 67
Brochure: Important Information About Your Geotechnical Engineering Report

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 58**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**08/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	249701	249702	249703	249704
Test Number :	206	207	208	209
Sampling Method :	-	-	-	-
Date Sampled :	20/07/2018	20/07/2018	20/07/2018	20/07/2018
Date Tested :	20/07/2018	20/07/2018	20/07/2018	20/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**253**	**-**	**254**	**-**
Sample Location :	Lot 253 E 465900 N 6946572 RL 41.723	E 465892 N 6946574 RL 41.74	Lot 254 E 465891 N 69436538 RL 41.693	E 465893 N 6946550 RL 41.681
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	26.1	9.2	25.5	23.5
Hilf MDR Number :	249701	249702	249703	249704
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 (%) :	104.5	103	103	103
Field Wet Density (t/m³) :	1.902	1.902	1.803	1.873
Optimum Moisture Content (%) :	25.0	8.9	24.8	22.8
Moisture Variation :	-1.1	-0.2	-0.7	-0.7
Peak Converted Wet Density (t/m³) :	1.985	1.971	1.879	1.884
Hilf Density Ratio (%) :	**96.0**	**96.5**	**96.0**	**99.5**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	**MDR performed by Gold Coast Laboratory. Corporate Site No. 1900.**			

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Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	249916	249917	249918	249919
Test Number :	242	243	244	245
Sampling Method :	-	-	-	-
Date Sampled :	24/07/2018	24/07/2018	24/07/2018	24/07/2018
Date Tested :	24/07/2018	24/07/2018	24/07/2018	24/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**272**	**-**	**273**	**-**
Sample Location :	Lot 272 E 465911 N 6946602 RL 42.545	E 465917 N 6946597 RL 42.589	Lot 273 E 465911 N 6946584 RL 42.527	E 465900 N 6946578 RL 42.539
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
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Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

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Brisbane Office
Job Number: DL18/196
Ref No: 13908
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 272
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 272 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 272 are presented in Table 1 below.

Table 1: Summary of Testing

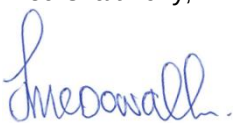
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
272	208	20th July 2018	96.0
272	209	20th July 2018	99.5
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 272 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 272 can be termed as “Controlled Fill” in accordance with AS 2870-2011 “Residential Slabs and Footings”.

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 58
Brochure: Important Information About Your Geotechnical Engineering Report

MORRISON GEOTECHNIC

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 58**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**08/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	249701	249702	249703	249704
Test Number :	206	207	208	209
Sampling Method :	-	-	-	-
Date Sampled :	20/07/2018	20/07/2018	20/07/2018	20/07/2018
Date Tested :	20/07/2018	20/07/2018	20/07/2018	20/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**253**	**-**	**254**	**-**
Sample Location :	Lot 253 E 465900 N 6946572 RL 41.723	E 465892 N 6946574 RL 41.74	Lot 254 E 465891 N 69436538 RL 41.693	E 465893 N 6946550 RL 41.681
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	26.1	9.2	25.5	23.5
Hilf MDR Number :	249701	249702	249703	249704
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 (%) :	104.5	103	103	103
Field Wet Density (t/m³) :	1.902	1.902	1.803	1.873
Optimum Moisture Content (%) :	25.0	8.9	24.8	22.8
Moisture Variation :	-1.1	-0.2	-0.7	-0.7
Peak Converted Wet Density (t/m³) :	1.985	1.971	1.879	1.884
Hilf Density Ratio (%) :	**96.0**	**96.5**	**96.0**	**99.5**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	**MDR performed by Gold Coast Laboratory. Corporate Site No. 1900.**			

NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.

APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

Important Information about Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

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Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

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www.morrisongeo.com.au

Brisbane Office
Job Number: DL18/196
Ref No: 13909
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 273
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 273 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

Tests performed on filling operations near Lot 273 are representative of the fill constructed on Lot 273. The closest tests to Lot 273 were performed on Lot 253 and 272. A summary of tests representative of the fill constructed on Lot 273 are presented in Table 1 below.

Table 1: Summary of Testing

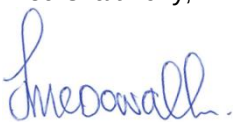
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
253	210	20th July 2018	99.5
272	208	20th July 2018	96.0
272	209	20th July 2018	99.5
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 273 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 273 can be termed as “Controlled Fill” in accordance with AS 2870-2011 “Residential Slabs and Footings”.

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 58 and 59
Brochure: Important Information About Your Geotechnical Engineering Report

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 58**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**08/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	249701	249702	249703	249704
Test Number :	206	207	208	209
Sampling Method :	-	-	-	-
Date Sampled :	20/07/2018	20/07/2018	20/07/2018	20/07/2018
Date Tested :	20/07/2018	20/07/2018	20/07/2018	20/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**253**	**-**	**254**	**-**
Sample Location :	Lot 253 E 465900 N 6946572 RL 41.723	E 465892 N 6946574 RL 41.74	Lot 254 E 465891 N 69436538 RL 41.693	E 465893 N 6946550 RL 41.681
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	26.1	9.2	25.5	23.5
Hilf MDR Number :	249701	249702	249703	249704
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 (%) :	104.5	103	103	103
Field Wet Density (t/m³) :	1.902	1.902	1.803	1.873
Optimum Moisture Content (%) :	25.0	8.9	24.8	22.8
Moisture Variation :	-1.1	-0.2	-0.7	-0.7
Peak Converted Wet Density (t/m³) :	1.985	1.971	1.879	1.884
Hilf Density Ratio (%) :	**96.0**	**96.5**	**96.0**	**99.5**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	**MDR performed by Gold Coast Laboratory. Corporate Site No. 1900.**			

NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.

APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

MORRISON GEOTECHNIC

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 59**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**08/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	249705	249706	249707	249708
Test Number :	210	211	212	213
Sampling Method :	-	-	-	-
Date Sampled :	20/07/2018	20/07/2018	20/07/2018	20/07/2018
Date Tested :	20/07/2018	20/07/2018	20/07/2018	20/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**255**	**-**	**256**	**-**
Sample Location :	Lot 255 E 465892 N 6946516 RL 41.460	E 465887 N 6946507 RL 41.483	Lot 256 E 465897 N 6946500 RL 41.5	E 465896 N 6946495 RL 41.480
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	23.7	23.1	23.4	21.4
Hilf MDR Number :	249705	249706	249707	249708
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	AS1289.2.1.4	AS1289.2.1.1
Moisture Ratio (%) :	97.5	101	100.5	101
Field Wet Density (t/m³) :	1.914	1.935	1.927	1.937
Optimum Moisture Content (%) :	24.3	22.9	23.2	21.2
Moisture Variation :	0.6	-0.2	-0.1	-0.2
Peak Converted Wet Density (t/m³) :	1.919	1.990	1.969	2.013
Hilf Density Ratio (%) :	**99.5**	**97.0**	**98.0**	**96.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	**MDR performed by Gold Coast Laboratory. Corporate Site No. 1900.**			

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WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.

APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
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As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

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Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

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Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

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Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

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Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

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www.morrisongeo.com.au

Brisbane Office
Job Number: DL18/196
Ref No: 13912
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 276
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 276 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 276 are presented in Table 1 below.

Table 1: Summary of Testing

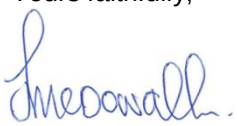
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
276	288	30th July 2018	101.5
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 276 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 276 can be termed as "Controlled Fill" in accordance with AS 2870-2011 "Residential Slabs and Footings".

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 79
Brochure: Important Information About Your Geotechnical Engineering Report

MORRISON GEOTECHNIC

Brisbane | Gold Coast | Maroochydore
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ABN: 51 009 878 899
www.morrisongeo.com.au

Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 79**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250420	250421	250422	250423
Test Number :	286	287	288	289
Sampling Method :	-	-	-	-
Date Sampled :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Date Tested :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**282**	**-**	**281**	**-**
Sample Location :	Lot 282 E 465864 N 6946607 RL 42.038	E 465874 N 6946620 RL 42.088	Lot 281 E 465862 N 6946581 RL 42.350	E 465852 N 6946586 RL 42.391
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	19.7	18.9	20.0	21.0
Hilf MDR Number :	250420	250421	250422	250423
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 (%) :	99	91	99	97.5
Field Wet Density (t/m³) :	2.021	1.776	2.042	2.022
Optimum Moisture Content (%) :	19.9	20.8	20.2	21.5
Moisture Variation :	0.2	1.9	0.1	0.5
Peak Converted Wet Density (t/m³) :	2.048	1.849	2.011	2.034
Hilf Density Ratio (%) :	**98.5**	**96.0**	**101.5**	**99.5**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	-			

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APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
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Brisbane Office
Job Number: DL18/196
Ref No: 13913
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 277
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 277 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

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Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

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A summary of tests representative of the fill constructed on Lot 277 are presented in Table 1 below.

Table 1: Summary of Testing

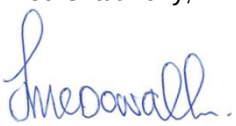
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
277	290	30th July 2018	99.0
277	291	30th July 2018	98.5
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 277 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 277 can be termed as “Controlled Fill” in accordance with AS 2870-2011 “Residential Slabs and Footings”.

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 80
Brochure: Important Information About Your Geotechnical Engineering Report

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ABN: 51 009 878 899
www.morrisongeo.com.au

Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 80**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250424	250425	250426	250427
Test Number :	290	291	292	293
Sampling Method :	-	-	-	-
Date Sampled :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Date Tested :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**261**	**-**	**269**	**-**
Sample Location :	Lot 261 E 465862 N 6946555 RL 42.250	E 465846 N 6946562 RL 42.218	Lot 269 E 465852 N 6946531 RL 41.881	E 465843 N 6946521 RL 42.001
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	18.7	19.6	23.6	21.0
Hilf MDR Number :	250424	250425	250426	250427
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 (%) :	99	90.5	99	98.5
Field Wet Density (t/m³) :	2.012	1.953	1.966	1.927
Optimum Moisture Content (%) :	18.9	21.6	23.9	21.3
Moisture Variation :	0.2	1.9	0.2	0.2
Peak Converted Wet Density (t/m³) :	2.032	1.984	1.971	1.987
Hilf Density Ratio (%) :	**99.0**	**98.5**	**100.0**	**97.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	-			

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APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
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While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

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- not prepared for your project,
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- composition of the design team, or
- project ownership.

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Subsurface Conditions Can Change

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Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

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Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

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Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

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Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

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Brisbane Office
Job Number: DL18/196
Ref No: 13914
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 278
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 278 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

Tests performed on filling operations near Lot 278 are representative of the fill constructed on Lot 278. The closest tests to Lot 278 were performed on Lot 277 and 279. A summary of tests representative of the fill constructed on Lot 278 are presented in Table 1 below.

Table 1: Summary of Testing

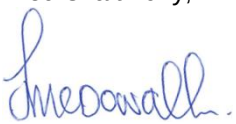
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
277	290	30th July 2018	99.0
277	291	30th July 2018	98.5
279	292	30th July 2018	100.0
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 278 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 278 can be termed as “Controlled Fill” in accordance with AS 2870-2011 “Residential Slabs and Footings”.

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 80
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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 80**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250424	250425	250426	250427
Test Number :	290	291	292	293
Sampling Method :	-	-	-	-
Date Sampled :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Date Tested :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**261**	**-**	**269**	**-**
Sample Location :	Lot 261 E 465862 N 6946555 RL 42.250	E 465846 N 6946562 RL 42.218	Lot 269 E 465852 N 6946531 RL 41.881	E 465843 N 6946521 RL 42.001
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	18.7	19.6	23.6	21.0
Hilf MDR Number :	250424	250425	250426	250427
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
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Moisture Ratio (%) :	99	90.5	99	98.5
Field Wet Density (t/m³) :	2.012	1.953	1.966	1.927
Optimum Moisture Content (%) :	18.9	21.6	23.9	21.3
Moisture Variation :	0.2	1.9	0.2	0.2
Peak Converted Wet Density (t/m³) :	2.032	1.984	1.971	1.987
Hilf Density Ratio (%) :	**99.0**	**98.5**	**100.0**	**97.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	-			

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APPROVED SIGNATORY

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Brisbane Office
Job Number: DL18/196
Ref No: 13915
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 279
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 279 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
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Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 279 are presented in Table 1 below.

Table 1: Summary of Testing

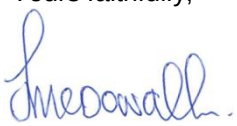
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
279	292	30th July 2018	100.0
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 279 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 279 can be termed as "Controlled Fill" in accordance with AS 2870-2011 "Residential Slabs and Footings".

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 80
Brochure: Important Information About Your Geotechnical Engineering Report

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ABN: 51 009 878 899
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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 80**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250424	250425	250426	250427
Test Number :	290	291	292	293
Sampling Method :	-	-	-	-
Date Sampled :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Date Tested :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**261**	**-**	**269**	**-**
Sample Location :	Lot 261 E 465862 N 6946555 RL 42.250	E 465846 N 6946562 RL 42.218	Lot 269 E 465852 N 6946531 RL 41.881	E 465843 N 6946521 RL 42.001
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	18.7	19.6	23.6	21.0
Hilf MDR Number :	250424	250425	250426	250427
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 (%) :	99	90.5	99	98.5
Field Wet Density (t/m³) :	2.012	1.953	1.966	1.927
Optimum Moisture Content (%) :	18.9	21.6	23.9	21.3
Moisture Variation :	0.2	1.9	0.2	0.2
Peak Converted Wet Density (t/m³) :	2.032	1.984	1.971	1.987
Hilf Density Ratio (%) :	**99.0**	**98.5**	**100.0**	**97.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	-			

NATA
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Accredited for compliance with ISO/IEC 17025.

APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

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Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

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Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

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- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

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Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

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Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

ASFE
THE BEST PEOPLE ON EARTH

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Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@asfe.org www.asfe.org

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www.morrisongeo.com.au

Brisbane Office
Job Number: DL18/196
Ref No: 13916
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 280
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 280 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 280 are presented in Table 1 below.

Table 1: Summary of Testing

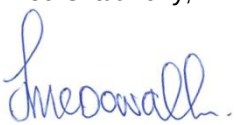
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
280	293	30th July 2018	97.0
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			

Fill constructed on Lot 280 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 280 can be termed as "Controlled Fill" in accordance with AS 2870-2011 "Residential Slabs and Footings".

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 80**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250424	250425	250426	250427
Test Number :	290	291	292	293
Sampling Method :	-	-	-	-
Date Sampled :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Date Tested :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**261**	**-**	**269**	**-**
Sample Location :	Lot 261 E 465862 N 6946555 RL 42.250	E 465846 N 6946562 RL 42.218	Lot 269 E 465852 N 6946531 RL 41.881	E 465843 N 6946521 RL 42.001
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
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Moisture Variation :	0.2	1.9	0.2	0.2
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Hilf Density Ratio (%) :	**99.0**	**98.5**	**100.0**	**97.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	-			

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MORRISON GEOTECHNIC

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Unit 1, 35 Limestone Street (PO Box 3063), Darra Q 4076 **P** (07) 3281 0900 **F** (07) 3281 0955
ABN 51 009 878 899
www.morrisongeo.com.au

Brisbane Office
Job Number: DL18/196
Ref No: 13917
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 281
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 281 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

Tests performed on filling operations near Lot 281 are representative of the fill constructed on Lot 281. The closest tests to Lot 281 were performed on Lot 280, 282 and 283. A summary of tests representative of the fill constructed on Lot 281 are presented in Table 1 below.

Table 1: Summary of Testing

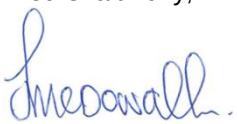
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
280	293	30th July 2018	97.0
282	310	31st July 2018	103.0
283	311	31st July 2018	98.0
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 281 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 281 can be termed as "Controlled Fill" in accordance with AS 2870-2011 "Residential Slabs and Footings".

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 80 and 85
Brochure: Important Information About Your Geotechnical Engineering Report

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 80**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250424	250425	250426	250427
Test Number :	290	291	292	293
Sampling Method :	-	-	-	-
Date Sampled :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Date Tested :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**261**	**-**	**269**	**-**
Sample Location :	Lot 261 E 465862 N 6946555 RL 42.250	E 465846 N 6946562 RL 42.218	Lot 269 E 465852 N 6946531 RL 41.881	E 465843 N 6946521 RL 42.001
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	18.7	19.6	23.6	21.0
Hilf MDR Number :	250424	250425	250426	250427
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 (%) :	99	90.5	99	98.5
Field Wet Density (t/m³) :	2.012	1.953	1.966	1.927
Optimum Moisture Content (%) :	18.9	21.6	23.9	21.3
Moisture Variation :	0.2	1.9	0.2	0.2
Peak Converted Wet Density (t/m³) :	2.032	1.984	1.971	1.987
Hilf Density Ratio (%) :	**99.0**	**98.5**	**100.0**	**97.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	-			

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APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 85**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250508	250509	250510	250511
Test Number :	310	311	312	313
Sampling Method :	-	-	-	-
Date Sampled :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Date Tested :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**267**	**-**	**266**	**-**
Sample Location :	Lot 267 E 465846 N 6946489 RL 42.320 (Final Level)	E 465839 N 6946484 RL 42.328 Final Level	Lot 266 E 465830 N 6946489 RL 42.550	E 465828 N 6946490 RL 42.580
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 (%) :	20.9	18.9	18.7	19.4
Hilf MDR Number :	250508	250509	250510	250511
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 (%) :	102.5	99.5	99.5	100.5
Field Wet Density (t/m³) :	1.992	1.957	1.955	1.935
Optimum Moisture Content (%) :	20.4	19.0	18.8	19.3
Moisture Variation :	-0.5	0.1	0.1	-0.1
Peak Converted Wet Density (t/m³) :	1.937	2.001	1.956	1.992
Hilf Density Ratio (%) :	**103.0**	**98.0**	**100.0**	**97.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	CLAY (CH)	CLAY (CH)	CLAY (CH)	CLAY (CH)
Remarks :	-			

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Important Information about Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

ASFE
THE BEST PEOPLE ON EARTH

8811 Colesville Road/Suite G106, Silver Spring, MD 20910
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Brisbane Office
Job Number: DL18/196
Ref No: 13918
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 282
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 282 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
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Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 282 are presented in Table 1 below.

Table 1: Summary of Testing

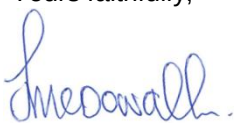
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
282	310	31st July 2018	103.0
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 282 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 282 can be termed as "Controlled Fill" in accordance with AS 2870-2011 "Residential Slabs and Footings".

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 85
Brochure: Important Information About Your Geotechnical Engineering Report

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 85**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250508	250509	250510	250511
Test Number :	310	311	312	313
Sampling Method :	-	-	-	-
Date Sampled :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Date Tested :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**267**	**-**	**266**	**-**
Sample Location :	Lot 267 E 465846 N 6946489 RL 42.320 (Final Level)	E 465839 N 6946484 RL 42.328 Final Level	Lot 266 E 465830 N 6946489 RL 42.550	E 465828 N 6946490 RL 42.580
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 (%) :	20.9	18.9	18.7	19.4
Hilf MDR Number :	250508	250509	250510	250511
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
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Moisture Method :	AS1289.2.1.1	AS1289.2.1.1	AS1289.2.1.1	AS1289.2.1.1
Moisture Ratio (%) :	102.5	99.5	99.5	100.5
Field Wet Density (t/m³) :	1.992	1.957	1.955	1.935
Optimum Moisture Content (%) :	20.4	19.0	18.8	19.3
Moisture Variation :	-0.5	0.1	0.1	-0.1
Peak Converted Wet Density (t/m³) :	1.937	2.001	1.956	1.992
Hilf Density Ratio (%) :	**103.0**	**98.0**	**100.0**	**97.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	CLAY (CH)	CLAY (CH)	CLAY (CH)	CLAY (CH)
Remarks :	-			

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Liam Mcdowall (Brisbane) - Branch Manager
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Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

ASFE
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e-mail: info@asfe.org www.asfe.org

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ABN 51 009 878 899
www.morrisongeo.com.au

Brisbane Office
Job Number: DL18/196
Ref No: 13919
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 283
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 283 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 283 are presented in Table 1 below.

Table 1: Summary of Testing

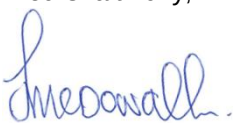
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
283	311	31st July 2018	98.0
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			

Fill constructed on Lot 283 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 283 can be termed as "Controlled Fill" in accordance with AS 2870-2011 "Residential Slabs and Footings".

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 85
Brochure: Important Information About Your Geotechnical Engineering Report

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 85**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250508	250509	250510	250511
Test Number :	310	311	312	313
Sampling Method :	-	-	-	-
Date Sampled :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Date Tested :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**267**	**-**	**266**	**-**
Sample Location :	Lot 267 E 465846 N 6946489 RL 42.320 (Final Level)	E 465839 N 6946484 RL 42.328 Final Level	Lot 266 E 465830 N 6946489 RL 42.550	E 465828 N 6946490 RL 42.580
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 (%) :	20.9	18.9	18.7	19.4
Hilf MDR Number :	250508	250509	250510	250511
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 (%) :	102.5	99.5	99.5	100.5
Field Wet Density (t/m³) :	1.992	1.957	1.955	1.935
Optimum Moisture Content (%) :	20.4	19.0	18.8	19.3
Moisture Variation :	-0.5	0.1	0.1	-0.1
Peak Converted Wet Density (t/m³) :	1.937	2.001	1.956	1.992
Hilf Density Ratio (%) :	**103.0**	**98.0**	**100.0**	**97.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	CLAY (CH)	CLAY (CH)	CLAY (CH)	CLAY (CH)
Remarks :	-			

NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025.

APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

Important Information about Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
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- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
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www.morrisongeo.com.au

Brisbane Office
Job Number: DL18/196
Ref No: 13920
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 284
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 284 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 284 are presented in Table 1 below.

Table 1: Summary of Testing

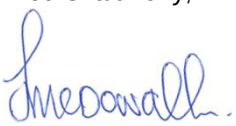
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
284	312	31st July 2018	100.0
284	313	31st July 2018	97.0
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 284 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 284 can be termed as “Controlled Fill” in accordance with AS 2870-2011 “Residential Slabs and Footings”.

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 85
Brochure: Important Information About Your Geotechnical Engineering Report

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 85**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250508	250509	250510	250511
Test Number :	310	311	312	313
Sampling Method :	-	-	-	-
Date Sampled :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Date Tested :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**267**	**-**	**266**	**-**
Sample Location :	Lot 267 E 465846 N 6946489 RL 42.320 (Final Level)	E 465839 N 6946484 RL 42.328 Final Level	Lot 266 E 465830 N 6946489 RL 42.550	E 465828 N 6946490 RL 42.580
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 (%) :	20.9	18.9	18.7	19.4
Hilf MDR Number :	250508	250509	250510	250511
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 (%) :	102.5	99.5	99.5	100.5
Field Wet Density (t/m³) :	1.992	1.957	1.955	1.935
Optimum Moisture Content (%) :	20.4	19.0	18.8	19.3
Moisture Variation :	-0.5	0.1	0.1	-0.1
Peak Converted Wet Density (t/m³) :	1.937	2.001	1.956	1.992
Hilf Density Ratio (%) :	**103.0**	**98.0**	**100.0**	**97.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	CLAY (CH)	CLAY (CH)	CLAY (CH)	CLAY (CH)
Remarks :	-			

NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025.

APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

Important Information about Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

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Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

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THE BEST PEOPLE ON EARTH

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e-mail: info@asfe.org www.asfe.org

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www.morrisongeo.com.au

Brisbane Office
Job Number: DL18/196
Ref No: 13921
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 285
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 285 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 285 are presented in Table 1 below.

Table 1: Summary of Testing

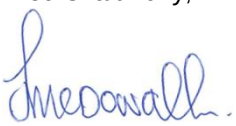
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
285	314	31st July 2018	98.0
285	315	31st July 2018	98.0
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 285 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 285 can be termed as “Controlled Fill” in accordance with AS 2870-2011 “Residential Slabs and Footings”.

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 86
Brochure: Important Information About Your Geotechnical Engineering Report

MORRISON GEOTECHNIC

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www.morrisongeo.com.au

Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 86**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250512	250513	250514	250515
Test Number :	314	315	316	317
Sampling Method :	-	-	-	-
Date Sampled :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Date Tested :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**265**	**-**	**264**	**-**
Sample Location :	Lot 265 E 465807 N 6946492 RL 42.391	E 465803 N 6946494 RL 42.381	Lot 264 E 465815 N 6946517 RL 43.007	E 465818 N 6946520 RL 43.066
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 (%) :	21.6	21.9	23.4	22.1
Hilf MDR Number :	250512	250513	250514	250515
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 (%) :	100.5	101	101	100.5
Field Wet Density (t/m³) :	1.921	1.907	1.939	2.037
Optimum Moisture Content (%) :	21.5	21.7	23.2	22.0
Moisture Variation :	-0.1	-0.2	-0.2	-0.1
Peak Converted Wet Density (t/m³) :	1.961	1.942	1.946	1.955
Hilf Density Ratio (%) :	**98.0**	**98.0**	**99.5**	**104.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	CLAY (CH)	CLAY (CH)	CLAY (CH)	CLAY (CH)
Remarks :	-			

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APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

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Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

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Brisbane Office
Job Number: DL18/196
Ref No: 13922
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 286
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 286 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 286 are presented in Table 1 below.

Table 1: Summary of Testing

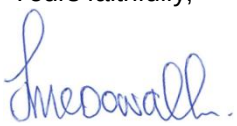
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
286	316	31st July 2018	99.5
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 286 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 286 can be termed as "Controlled Fill" in accordance with AS 2870-2011 "Residential Slabs and Footings".

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 86
Brochure: Important Information About Your Geotechnical Engineering Report

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ABN: 51 009 878 899
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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 86**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250512	250513	250514	250515
Test Number :	314	315	316	317
Sampling Method :	-	-	-	-
Date Sampled :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Date Tested :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**265**	**-**	**264**	**-**
Sample Location :	Lot 265 E 465807 N 6946492 RL 42.391	E 465803 N 6946494 RL 42.381	Lot 264 E 465815 N 6946517 RL 43.007	E 465818 N 6946520 RL 43.066
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 (%) :	21.6	21.9	23.4	22.1
Hilf MDR Number :	250512	250513	250514	250515
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 (%) :	100.5	101	101	100.5
Field Wet Density (t/m³) :	1.921	1.907	1.939	2.037
Optimum Moisture Content (%) :	21.5	21.7	23.2	22.0
Moisture Variation :	-0.1	-0.2	-0.2	-0.1
Peak Converted Wet Density (t/m³) :	1.961	1.942	1.946	1.955
Hilf Density Ratio (%) :	**98.0**	**98.0**	**99.5**	**104.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	CLAY (CH)	CLAY (CH)	CLAY (CH)	CLAY (CH)
Remarks :	-			

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Important Information about Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

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Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
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Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

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Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

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Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

ASFE
THE BEST PEOPLE ON EARTH

8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@asfe.org www.asfe.org

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www.morrisongeo.com.au

Brisbane Office
Job Number: DL18/196
Ref No: 13923
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 287
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 287 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 287 are presented in Table 1 below.

Table 1: Summary of Testing

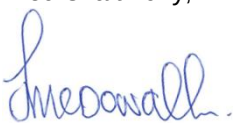
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
287	301	30th July 2018	96.5
287	317	31st July 2018	104.0
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 287 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 287 can be termed as "Controlled Fill" in accordance with AS 2870-2011 "Residential Slabs and Footings".

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 82 and 86
Brochure: Important Information About Your Geotechnical Engineering Report

MORRISON GEOTECHNIC

Brisbane | Gold Coast | Maroochydore
Unit 1, 35 Limestone Street (PO Box 3063), Darra Q 4076 P (07) 3279 0900 F (07) 3279 0955
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www.morrisongeo.com.au

Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 82**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250432	250433	250434	250435
Test Number :	298	299	300	301
Sampling Method :	-	-	-	-
Date Sampled :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Date Tested :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**263**	**-**	**262**	**264**
Sample Location :	Lot 263 E 465828 N 6946552 RL 42.250	E 465819 N 6946591 RL 42.299	Lot 262 E 465825 N 6946576 RL 42.474	Lot 264 E 465820 N 6946522 RL 42.301
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	18.9	19.3	19.6	20.3
Hilf MDR Number :	250432	250433	250434	250435
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 (%) :	99	99.5	91.5	98.5
Field Wet Density (t/m³) :	1.975	1.934	1.918	1.938
Optimum Moisture Content (%) :	19.0	19.4	21.4	20.6
Moisture Variation :	0.1	0.1	1.7	0.3
Peak Converted Wet Density (t/m³) :	2.056	1.994	1.964	2.005
Hilf Density Ratio (%) :	**96.0**	**97.0**	**97.5**	**96.5**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	-			

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APPROVED SIGNATORY

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Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250512	250513	250514	250515
Test Number :	314	315	316	317
Sampling Method :	-	-	-	-
Date Sampled :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Date Tested :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
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Layer Depth (mm) :	-	-	-	-
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
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Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

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e-mail: info@asfe.org www.asfe.org

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ABN 51 009 878 899
www.morrisongeo.com.au

Brisbane Office
Job Number: DL18/196
Ref No: 13924
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 288
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 288 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

Tests performed on filling operations near Lot 288 are representative of the fill constructed on Lot 288. The closest tests to Lot 288 were performed on Lot 287 and 289. A summary of tests representative of the fill constructed on Lot 288 are presented in Table 1 below.

Table 1: Summary of Testing

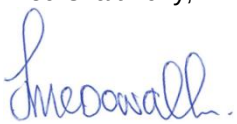
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
287	301	30th July 2018	96.5
287	317	31st July 2018	104.0
289	298	30th July 2018	96.0
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 288 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 288 can be termed as “Controlled Fill” in accordance with AS 2880-2011 “Residential Slabs and Footings”.

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 82 and 86
Brochure: Important Information About Your Geotechnical Engineering Report

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 82**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250432	250433	250434	250435
Test Number :	298	299	300	301
Sampling Method :	-	-	-	-
Date Sampled :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Date Tested :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**263**	**-**	**262**	**264**
Sample Location :	Lot 263 E 465828 N 6946552 RL 42.250	E 465819 N 6946591 RL 42.299	Lot 262 E 465825 N 6946576 RL 42.474	Lot 264 E 465820 N 6946522 RL 42.301
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	18.9	19.3	19.6	20.3
Hilf MDR Number :	250432	250433	250434	250435
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 (%) :	99	99.5	91.5	98.5
Field Wet Density (t/m³) :	1.975	1.934	1.918	1.938
Optimum Moisture Content (%) :	19.0	19.4	21.4	20.6
Moisture Variation :	0.1	0.1	1.7	0.3
Peak Converted Wet Density (t/m³) :	2.056	1.994	1.964	2.005
Hilf Density Ratio (%) :	**96.0**	**97.0**	**97.5**	**96.5**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	-			

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WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025.

APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 86**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250512	250513	250514	250515
Test Number :	314	315	316	317
Sampling Method :	-	-	-	-
Date Sampled :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Date Tested :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**265**	**-**	**264**	**-**
Sample Location :	Lot 265 E 465807 N 6946492 RL 42.391	E 465803 N 6946494 RL 42.381	Lot 264 E 465815 N 6946517 RL 43.007	E 465818 N 6946520 RL 43.066
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 (%) :	21.6	21.9	23.4	22.1
Hilf MDR Number :	250512	250513	250514	250515
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 (%) :	100.5	101	101	100.5
Field Wet Density (t/m³) :	1.921	1.907	1.939	2.037
Optimum Moisture Content (%) :	21.5	21.7	23.2	22.0
Moisture Variation :	-0.1	-0.2	-0.2	-0.1
Peak Converted Wet Density (t/m³) :	1.961	1.942	1.946	1.955
Hilf Density Ratio (%) :	**98.0**	**98.0**	**99.5**	**104.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	CLAY (CH)	CLAY (CH)	CLAY (CH)	CLAY (CH)
Remarks :	-			

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Important Information about Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

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Brisbane Office
Job Number: DL18/196
Ref No: 13926
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 289
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 289 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

Tests performed on filling operations near Lot 289 are representative of the fill constructed on Lot 289. The closest tests to Lot 289 were performed on Lot 527. A summary of tests representative of the fill constructed on Lot 289 are presented in Table 1 below.

Table 1: Summary of Testing

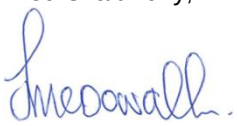
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
289	298	30th July 2018	96.0
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 289 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 289 can be termed as “Controlled Fill” in accordance with AS 2870-2011 “Residential Slabs and Footings”.

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 82
Brochure: Important Information About Your Geotechnical Engineering Report

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 82**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250432	250433	250434	250435
Test Number :	298	299	300	301
Sampling Method :	-	-	-	-
Date Sampled :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Date Tested :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**263**	**-**	**262**	**264**
Sample Location :	Lot 263 E 465828 N 6946552 RL 42.250	E 465819 N 6946591 RL 42.299	Lot 262 E 465825 N 6946576 RL 42.474	Lot 264 E 465820 N 6946522 RL 42.301
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	18.9	19.3	19.6	20.3
Hilf MDR Number :	250432	250433	250434	250435
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 (%) :	99	99.5	91.5	98.5
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Optimum Moisture Content (%) :	19.0	19.4	21.4	20.6
Moisture Variation :	0.1	0.1	1.7	0.3
Peak Converted Wet Density (t/m³) :	2.056	1.994	1.964	2.005
Hilf Density Ratio (%) :	**96.0**	**97.0**	**97.5**	**96.5**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	-			

NATA
WORLD RECOGNISED ACCREDITATION

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APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

Important Information about Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

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- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
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As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

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Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

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ASFE
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Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@asfe.org www.asfe.org

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www.morrisongeo.com.au

Brisbane Office
Job Number: DL18/196
Ref No: 13926
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 290
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 290 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

Tests performed on filling operations near Lot 290 are representative of the fill constructed on Lot 290. The closest tests to Lot 290 were performed on Lot 289 and 291. A summary of tests representative of the fill constructed on Lot 290 are presented in Table 1 below.

Table 1: Summary of Testing

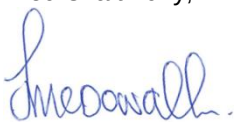
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
289	298	30th July 2018	96.0
291	300	30th July 2018	97.5
291	309	31st July 2018	98.5
Note: Laboratory Standard Test Methods Used: AS1290.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 290 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 290 can be termed as "Controlled Fill" in accordance with AS 2870-2011 "Residential Slabs and Footings".

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 82 and 84
Brochure: Important Information About Your Geotechnical Engineering Report

MORRISON GEOTECHNIC

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 82**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250432	250433	250434	250435
Test Number :	298	299	300	301
Sampling Method :	-	-	-	-
Date Sampled :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Date Tested :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**263**	**-**	**262**	**264**
Sample Location :	Lot 263 E 465828 N 6946552 RL 42.250	E 465819 N 6946591 RL 42.299	Lot 262 E 465825 N 6946576 RL 42.474	Lot 264 E 465820 N 6946522 RL 42.301
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	18.9	19.3	19.6	20.3
Hilf MDR Number :	250432	250433	250434	250435
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 (%) :	99	99.5	91.5	98.5
Field Wet Density (t/m³) :	1.975	1.934	1.918	1.938
Optimum Moisture Content (%) :	19.0	19.4	21.4	20.6
Moisture Variation :	0.1	0.1	1.7	0.3
Peak Converted Wet Density (t/m³) :	2.056	1.994	1.964	2.005
Hilf Density Ratio (%) :	**96.0**	**97.0**	**97.5**	**96.5**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	-			

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 84**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250504	250505	250506	250507
Test Number :	306	307	308	309
Sampling Method :	-	-	-	-
Date Sampled :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Date Tested :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**279**	**-**	**280**	**-**
Sample Location :	Lot 279 E 465826 N 6946614 RL 42.803	E 465837 N 6946608 RL 42.827	Lot 280 E 465825 N 6946592 RL 42.812	E 465830 N 6946582 RL 42.818
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 (%) :	21.1	22.7	21.5	20.0
Hilf MDR Number :	250504	250505	250506	250507
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
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Moisture Ratio (%) :	99.5	101	102	101
Field Wet Density (t/m³) :	1.964	1.950	1.973	1.972
Optimum Moisture Content (%) :	21.2	22.5	21.1	19.8
Moisture Variation :	0.1	-0.1	-0.4	-0.2
Peak Converted Wet Density (t/m³) :	1.971	1.840	1.973	2.002
Hilf Density Ratio (%) :	**99.5**	**106.0**	**100.0**	**98.5**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :				
Soil Description :	CLAY (CH)	CLAY (CH)	CLAY (CH)	CLAY (CH)
Remarks :	-			

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Brisbane Office
Job Number: DL18/196
Ref No: 13927
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

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WALLOON

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- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 291 are presented in Table 1 below.

Table 1: Summary of Testing

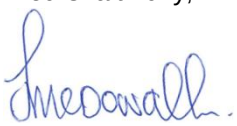
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
291	300	30th July 2018	97.5
291	309	31st July 2018	98.5
Note: Laboratory Standard Test Methods Used: AS1291.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 291 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 291 can be termed as “Controlled Fill” in accordance with AS 2870-2011 “Residential Slabs and Footings”.

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 82 and 84
Brochure: Important Information About Your Geotechnical Engineering Report

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Brisbane | Gold Coast | Maroochydore
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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 82**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250432	250433	250434	250435
Test Number :	298	299	300	301
Sampling Method :	-	-	-	-
Date Sampled :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Date Tested :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**263**	**-**	**262**	**264**
Sample Location :	Lot 263 E 465828 N 6946552 RL 42.250	E 465819 N 6946591 RL 42.299	Lot 262 E 465825 N 6946576 RL 42.474	Lot 264 E 465820 N 6946522 RL 42.301
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	18.9	19.3	19.6	20.3
Hilf MDR Number :	250432	250433	250434	250435
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 (%) :	99	99.5	91.5	98.5
Field Wet Density (t/m³) :	1.975	1.934	1.918	1.938
Optimum Moisture Content (%) :	19.0	19.4	21.4	20.6
Moisture Variation :	0.1	0.1	1.7	0.3
Peak Converted Wet Density (t/m³) :	2.056	1.994	1.964	2.005
Hilf Density Ratio (%) :	**96.0**	**97.0**	**97.5**	**96.5**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	-			

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APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 84**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250504	250505	250506	250507
Test Number :	306	307	308	309
Sampling Method :	-	-	-	-
Date Sampled :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Date Tested :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**279**	**-**	**280**	**-**
Sample Location :	Lot 279 E 465826 N 6946614 RL 42.803	E 465837 N 6946608 RL 42.827	Lot 280 E 465825 N 6946592 RL 42.812	E 465830 N 6946582 RL 42.818
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 (%) :	21.1	22.7	21.5	20.0
Hilf MDR Number :	250504	250505	250506	250507
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 (%) :	99.5	101	102	101
Field Wet Density (t/m³) :	1.964	1.950	1.973	1.972
Optimum Moisture Content (%) :	21.2	22.5	21.1	19.8
Moisture Variation :	0.1	-0.1	-0.4	-0.2
Peak Converted Wet Density (t/m³) :	1.971	1.840	1.973	2.002
Hilf Density Ratio (%) :	**99.5**	**106.0**	**100.0**	**98.5**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :				
Soil Description :	CLAY (CH)	CLAY (CH)	CLAY (CH)	CLAY (CH)
Remarks :	-			

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Important Information about Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

ASFE
THE BEST PEOPLE ON EARTH

8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@asfe.org www.asfe.org

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www.morrisongeo.com.au

Brisbane Office
Job Number: DL18/196
Ref No: 13928
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 292
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 292 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 292 are presented in Table 1 below.

Table 1: Summary of Testing

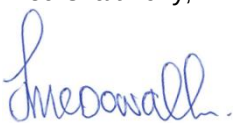
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
292	299	30th July 2018	97.0
292	308	31st July 2018	100.0
Note: Laboratory Standard Test Methods Used: AS1292.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 292 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 292 can be termed as “Controlled Fill” in accordance with AS 2870-2011 “Residential Slabs and Footings”.

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 82 and 84
Brochure: Important Information About Your Geotechnical Engineering Report

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 82**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250432	250433	250434	250435
Test Number :	298	299	300	301
Sampling Method :	-	-	-	-
Date Sampled :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Date Tested :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**263**	**-**	**262**	**264**
Sample Location :	Lot 263 E 465828 N 6946552 RL 42.250	E 465819 N 6946591 RL 42.299	Lot 262 E 465825 N 6946576 RL 42.474	Lot 264 E 465820 N 6946522 RL 42.301
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	18.9	19.3	19.6	20.3
Hilf MDR Number :	250432	250433	250434	250435
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 (%) :	99	99.5	91.5	98.5
Field Wet Density (t/m³) :	1.975	1.934	1.918	1.938
Optimum Moisture Content (%) :	19.0	19.4	21.4	20.6
Moisture Variation :	0.1	0.1	1.7	0.3
Peak Converted Wet Density (t/m³) :	2.056	1.994	1.964	2.005
Hilf Density Ratio (%) :	**96.0**	**97.0**	**97.5**	**96.5**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	-			

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APPROVED SIGNATORY

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

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 84**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250504	250505	250506	250507
Test Number :	306	307	308	309
Sampling Method :	-	-	-	-
Date Sampled :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Date Tested :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**279**	**-**	**280**	**-**
Sample Location :	Lot 279 E 465826 N 6946614 RL 42.803	E 465837 N 6946608 RL 42.827	Lot 280 E 465825 N 6946592 RL 42.812	E 465830 N 6946582 RL 42.818
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 (%) :	21.1	22.7	21.5	20.0
Hilf MDR Number :	250504	250505	250506	250507
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 (%) :	99.5	101	102	101
Field Wet Density (t/m³) :	1.964	1.950	1.973	1.972
Optimum Moisture Content (%) :	21.2	22.5	21.1	19.8
Moisture Variation :	0.1	-0.1	-0.4	-0.2
Peak Converted Wet Density (t/m³) :	1.971	1.840	1.973	2.002
Hilf Density Ratio (%) :	**99.5**	**106.0**	**100.0**	**98.5**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :				
Soil Description :	CLAY (CH)	CLAY (CH)	CLAY (CH)	CLAY (CH)
Remarks :	-			

NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025.

APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

Important Information about Your

Geotechnical Engineering Report

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While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

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Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

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e-mail: info@asfe.org www.asfe.org

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www.morrisongeo.com.au

Brisbane Office
Job Number: DL18/196
Ref No: 13929
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 293
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 293 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 293 are presented in Table 1 below.

Table 1: Summary of Testing

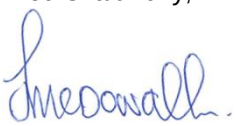
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
293	306	31st July 2018	99.5
293	307	31st July 2018	106.0
Note: Laboratory Standard Test Methods Used: AS1293.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 293 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 293 can be termed as “Controlled Fill” in accordance with AS 2870-2011 “Residential Slabs and Footings”.

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 84
Brochure: Important Information About Your Geotechnical Engineering Report

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 84**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250504	250505	250506	250507
Test Number :	306	307	308	309
Sampling Method :	-	-	-	-
Date Sampled :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Date Tested :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**279**	**-**	**280**	**-**
Sample Location :	Lot 279 E 465826 N 6946614 RL 42.803	E 465837 N 6946608 RL 42.827	Lot 280 E 465825 N 6946592 RL 42.812	E 465830 N 6946582 RL 42.818
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 (%) :	21.1	22.7	21.5	20.0
Hilf MDR Number :	250504	250505	250506	250507
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 (%) :	99.5	101	102	101
Field Wet Density (t/m³) :	1.964	1.950	1.973	1.972
Optimum Moisture Content (%) :	21.2	22.5	21.1	19.8
Moisture Variation :	0.1	-0.1	-0.4	-0.2
Peak Converted Wet Density (t/m³) :	1.971	1.840	1.973	2.002
Hilf Density Ratio (%) :	**99.5**	**106.0**	**100.0**	**98.5**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :				
Soil Description :	CLAY (CH)	CLAY (CH)	CLAY (CH)	CLAY (CH)
Remarks :	-			

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APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

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www.morrisongeo.com.au

Brisbane Office
Job Number: DL18/196
Ref No: 13936
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 300
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 300 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 300 are presented in Table 1 below.

Table 1: Summary of Testing

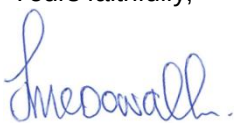
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
300	302	31st July 2018	104.5
Note: Laboratory Standard Test Methods Used: AS1300.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 300 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 300 can be termed as "Controlled Fill" in accordance with AS 2870-2011 "Residential Slabs and Footings".

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 83
Brochure: Important Information About Your Geotechnical Engineering Report

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 83**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250500	250501	250502	250503
Test Number :	302	303	304	305
Sampling Method :	-	-	-	-
Date Sampled :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Date Tested :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**277**	**-**	**278**	**-**
Sample Location :	Lot 277 E 465848 N 6946634 RL 42.646	E 465848 N 6946615 RL 42.668	Lot 278 E 465831 N 6946641 RL 42.690	E 465825 N 6946632 RL 42.711
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 (%) :	22.2	23.0	24.5	23.9
Hilf MDR Number :	250500	250501	250502	250503
Hilf MDR 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
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 (%) :	101.5	91	100	91
Field Wet Density (t/m³) :	1.913	1.870	1.890	1.858
Optimum Moisture Content (%) :	21.9	25.2	24.5	26.3
Moisture Variation :	-0.4	2.1	0.0	2.2
Peak Converted Wet Density (t/m³) :	1.827	1.888	1.856	1.891
Hilf Density Ratio (%) :	**104.5**	**99.0**	**102.0**	**98.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	CLAY (CH)	CLAY (CH)	CLAY (CH)	CLAY (CH)
Remarks :	Reported moisture variation does not accurately reflect placement moisture.			

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WORLD RECOGNISED ACCREDITATION

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APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

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Geotechnical Engineering Report

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Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

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- not prepared for your project,
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- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
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As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

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Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

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www.morrisongeo.com.au

Brisbane Office
Job Number: DL18/196
Ref No: 13937
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 301
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 301 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 301 are presented in Table 1 below.

Table 1: Summary of Testing

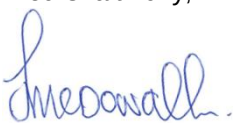
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
301	304	31st July 2018	102.0
301	305	31st July 2018	98.0
Note: Laboratory Standard Test Methods Used: AS1301.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 301 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 301 can be termed as “Controlled Fill” in accordance with AS 2870-2011 “Residential Slabs and Footings”.

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 83
Brochure: Important Information About Your Geotechnical Engineering Report

MORRISON GEOTECHNIC

Brisbane | Gold Coast | Maroochydore
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www.morrisongeo.com.au

Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 83**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250500	250501	250502	250503
Test Number :	302	303	304	305
Sampling Method :	-	-	-	-
Date Sampled :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Date Tested :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**277**	**-**	**278**	**-**
Sample Location :	Lot 277 E 465848 N 6946634 RL 42.646	E 465848 N 6946615 RL 42.668	Lot 278 E 465831 N 6946641 RL 42.690	E 465825 N 6946632 RL 42.711
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 (%) :	22.2	23.0	24.5	23.9
Hilf MDR Number :	250500	250501	250502	250503
Hilf MDR 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
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
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Optimum Moisture Content (%) :	21.9	25.2	24.5	26.3
Moisture Variation :	-0.4	2.1	0.0	2.2
Peak Converted Wet Density (t/m³) :	1.827	1.888	1.856	1.891
Hilf Density Ratio (%) :	**104.5**	**99.0**	**102.0**	**98.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	CLAY (CH)	CLAY (CH)	CLAY (CH)	CLAY (CH)
Remarks :	Reported moisture variation does not accurately reflect placement moisture.			

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APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
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www.morrisongeo.com.au

Brisbane Office
Job Number: DL18/196
Ref No: 13938
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 302
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 302 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

Tests performed on filling operations near Lot 302 are representative of the fill constructed on Lot 302. The closest tests to Lot 302 were performed on Lot 293. A summary of tests representative of the fill constructed on Lot 302 are presented in Table 1 below.

Table 1: Summary of Testing

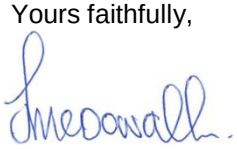
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
293	306	31st July 2018	99.5
293	307	31st July 2018	106.0
Note: Laboratory Standard Test Methods Used: AS1302.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 302 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 302 can be termed as “Controlled Fill” in accordance with AS 2870-2011 “Residential Slabs and Footings”.

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 84
Brochure: Important Information About Your Geotechnical Engineering Report

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 84**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250504	250505	250506	250507
Test Number :	306	307	308	309
Sampling Method :	-	-	-	-
Date Sampled :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Date Tested :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**279**	**-**	**280**	**-**
Sample Location :	Lot 279 E 465826 N 6946614 RL 42.803	E 465837 N 6946608 RL 42.827	Lot 280 E 465825 N 6946592 RL 42.812	E 465830 N 6946582 RL 42.818
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 (%) :	21.1	22.7	21.5	20.0
Hilf MDR Number :	250504	250505	250506	250507
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 (%) :	99.5	101	102	101
Field Wet Density (t/m³) :	1.964	1.950	1.973	1.972
Optimum Moisture Content (%) :	21.2	22.5	21.1	19.8
Moisture Variation :	0.1	-0.1	-0.4	-0.2
Peak Converted Wet Density (t/m³) :	1.971	1.840	1.973	2.002
Hilf Density Ratio (%) :	**99.5**	**106.0**	**100.0**	**98.5**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :				
Soil Description :	CLAY (CH)	CLAY (CH)	CLAY (CH)	CLAY (CH)
Remarks :	-			

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APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
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While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

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Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

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Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
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Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

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Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

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A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

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Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

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Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

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www.morrisongeo.com.au

Brisbane Office
Job Number: DL18/196
Ref No: 13939
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 303
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 303 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

Tests performed on filling operations near Lot 303 are representative of the fill constructed on Lot 303. The closest tests to Lot 303 were performed on Lot 301. A summary of tests representative of the fill constructed on Lot 303 are presented in Table 1 below.

Table 1: Summary of Testing

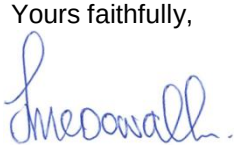
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
301	304	31st July 2018	102.0
301	305	31st July 2018	98.0
Note: Laboratory Standard Test Methods Used: AS1303.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 303 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 303 can be termed as “Controlled Fill” in accordance with AS 2870-2011 “Residential Slabs and Footings”.

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 83
Brochure: Important Information About Your Geotechnical Engineering Report

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 83**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250500	250501	250502	250503
Test Number :	302	303	304	305
Sampling Method :	-	-	-	-
Date Sampled :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Date Tested :	31/07/2018	31/07/2018	31/07/2018	31/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**277**	**-**	**278**	**-**
Sample Location :	Lot 277 E 465848 N 6946634 RL 42.646	E 465848 N 6946615 RL 42.668	Lot 278 E 465831 N 6946641 RL 42.690	E 465825 N 6946632 RL 42.711
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 (%) :	22.2	23.0	24.5	23.9
Hilf MDR Number :	250500	250501	250502	250503
Hilf MDR 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
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 (%) :	101.5	91	100	91
Field Wet Density (t/m³) :	1.913	1.870	1.890	1.858
Optimum Moisture Content (%) :	21.9	25.2	24.5	26.3
Moisture Variation :	-0.4	2.1	0.0	2.2
Peak Converted Wet Density (t/m³) :	1.827	1.888	1.856	1.891
Hilf Density Ratio (%) :	**104.5**	**99.0**	**102.0**	**98.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	CLAY (CH)	CLAY (CH)	CLAY (CH)	CLAY (CH)
Remarks :	Reported moisture variation does not accurately reflect placement moisture.			

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APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
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Brisbane Office
Job Number: DL18/196
Ref No: 13940
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 304
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 304 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

Tests performed on filling operations near Lot 304 are representative of the fill constructed on Lot 304. The closest tests to Lot 304 were performed on Lot 306. A summary of tests representative of the fill constructed on Lot 304 are presented in Table 1 below.

Table 1: Summary of Testing

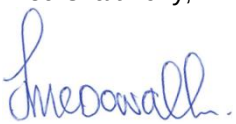
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
306	281	26th July 2018	101.5
Note: Laboratory Standard Test Methods Used: AS1304.5.8.1, 5.7.1, 2.1.1.			

Fill constructed on Lot 304 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 304 can be termed as “Controlled Fill” in accordance with AS 2870-2011 “Residential Slabs and Footings”.

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 77
Brochure: Important Information About Your Geotechnical Engineering Report

MORRISON GEOTECHNIC

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ABN: 51 009 878 899
www.morrisongeo.com.au

Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 77**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**14/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250196	250197	250198	250199
Test Number :	280	281	282	283
Sampling Method :	-	-	-	-
Date Sampled :	26/07/2018	26/07/2018	26/07/2018	26/07/2018
Date Tested :	26/07/2018	26/07/2018	26/07/2018	26/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	286	-	-	-
Sample Location :	Lot 286 N: 6946689 E: 465809 RL: 43.149	N: 6946693 E: 465789 RL: 43.117	Road 13 N: 6946661 E: 465847 RL: 42.450	N: 6946664 E: 465829 RL: 42.481
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 (%) :	27.0	24.8	18.1	18.6
Hilf MDR Number :	250196	250197	250198	250199
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 (%) :	100	93	90.5	101
Field Wet Density (t/m³) :	1.875	1.895	1.870	1.987
Optimum Moisture Content (%) :	27.0	26.7	20.0	18.4
Moisture Variation :	0.0	1.8	1.8	-0.2
Peak Converted Wet Density (t/m³) :	1.914	1.864	1.962	2.050
Hilf Density Ratio (%) :	**98.0**	**101.5**	**95.5**	**97.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	CLAY (CH)	CLAY (CH)	CLAY (CH)	CLAY (CH)
Remarks :	-			

NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025.

APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

Important Information about Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

ASFE
THE BEST PEOPLE ON EARTH

8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@asfe.org www.asfe.org

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www.morrisongeo.com.au

Brisbane Office
Job Number: DL18/196
Ref No: 13941
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 305
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 305 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

Tests performed on filling operations near Lot 305 are representative of the fill constructed on Lot 305. The closest tests to Lot 305 were performed on Lot 306. A summary of tests representative of the fill constructed on Lot 305 are presented in Table 1 below.

Table 1: Summary of Testing

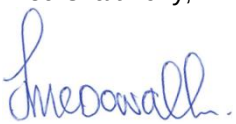
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
306	281	26th July 2018	101.5
Note: Laboratory Standard Test Methods Used: AS1305.5.8.1, 5.7.1, 2.1.1.			

Fill constructed on Lot 305 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 305 can be termed as “Controlled Fill” in accordance with AS 2870-2011 “Residential Slabs and Footings”.

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 77
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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 77**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**14/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250196	250197	250198	250199
Test Number :	280	281	282	283
Sampling Method :	-	-	-	-
Date Sampled :	26/07/2018	26/07/2018	26/07/2018	26/07/2018
Date Tested :	26/07/2018	26/07/2018	26/07/2018	26/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	286	-	-	-
Sample Location :	Lot 286 N: 6946689 E: 465809 RL: 43.149	N: 6946693 E: 465789 RL: 43.117	Road 13 N: 6946661 E: 465847 RL: 42.450	N: 6946664 E: 465829 RL: 42.481
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 (%) :	27.0	24.8	18.1	18.6
Hilf MDR Number :	250196	250197	250198	250199
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
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Moisture Variation :	0.0	1.8	1.8	-0.2
Peak Converted Wet Density (t/m³) :	1.914	1.864	1.962	2.050
Hilf Density Ratio (%) :	**98.0**	**101.5**	**95.5**	**97.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	CLAY (CH)	CLAY (CH)	CLAY (CH)	CLAY (CH)
Remarks :	-			

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WORLD RECOGNISED ACCREDITATION

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APPROVED SIGNATORY

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The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

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www.morrisongeo.com.au

Brisbane Office
Job Number: DL18/196
Ref No: 13942
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 306
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 306 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 306 are presented in Table 1 below.

Table 1: Summary of Testing

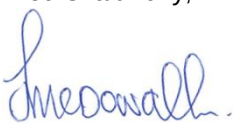
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
306	281	26th July 2018	101.5
Note: Laboratory Standard Test Methods Used: AS1306.5.8.1, 5.7.1, 2.1.1.			

Fill constructed on Lot 306 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 306 can be termed as "Controlled Fill" in accordance with AS 2870-2011 "Residential Slabs and Footings".

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 77
Brochure: Important Information About Your Geotechnical Engineering Report

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 77**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**14/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250196	250197	250198	250199
Test Number :	280	281	282	283
Sampling Method :	-	-	-	-
Date Sampled :	26/07/2018	26/07/2018	26/07/2018	26/07/2018
Date Tested :	26/07/2018	26/07/2018	26/07/2018	26/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	286	-	-	-
Sample Location :	Lot 286 N: 6946689 E: 465809 RL: 43.149	N: 6946693 E: 465789 RL: 43.117	Road 13 N: 6946661 E: 465847 RL: 42.450	N: 6946664 E: 465829 RL: 42.481
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 (%) :	27.0	24.8	18.1	18.6
Hilf MDR Number :	250196	250197	250198	250199
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 (%) :	100	93	90.5	101
Field Wet Density (t/m³) :	1.875	1.895	1.870	1.987
Optimum Moisture Content (%) :	27.0	26.7	20.0	18.4
Moisture Variation :	0.0	1.8	1.8	-0.2
Peak Converted Wet Density (t/m³) :	1.914	1.864	1.962	2.050
Hilf Density Ratio (%) :	**98.0**	**101.5**	**95.5**	**97.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	CLAY (CH)	CLAY (CH)	CLAY (CH)	CLAY (CH)
Remarks :	-			

NATA
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APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

Important Information about Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

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Brisbane Office
Job Number: DL18/196
Ref No: 13933
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 297
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 297 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 297 are presented in Table 1 below.

Table 1: Summary of Testing

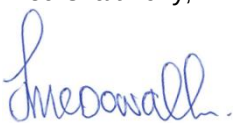
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
297	297	30th July 2018	98.0
Note: Laboratory Standard Test Methods Used: AS1297.5.8.1, 5.7.1, 2.1.1.			

Fill constructed on Lot 297 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 297 can be termed as "Controlled Fill" in accordance with AS 2870-2011 "Residential Slabs and Footings".

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 81
Brochure: Important Information About Your Geotechnical Engineering Report

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 81**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**21/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250428	250429	250430	250431
Test Number :	294	295	296	297
Sampling Method :	-	-	-	-
Date Sampled :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Date Tested :	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	**295**	**-**	**296**	**297**
Sample Location :	Lot 295 E 465952 N 6946700 RL 43.880 (Final Level)	E 465957 N 6946704 RL 43.862 (Final Level)	Lot 296 E 465935 N 6946700 RL 44.035 (Final Level)	Lot 297 E 465910 N 6946709 RL 44.004 (Final Level)
Test Depth (mm) :	150	150	150	150
Layer Depth (mm) :	150	150	150	150
Maximum Size (mm) :	19	19	19	19
Oversize Wet (%) :	-	-	-	-
Oversize Dry (%) :	-	-	-	-
Oversize Density (t/m³) :	-	-	-	-
Field Moisture Content (%) :	20.7	20.8	21.1	20.4
Hilf MDR Number :	250428	250429	250430	250431
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 (%) :	93	92	91.5	92.5
Field Wet Density (t/m³) :	1.835	1.869	1.757	1.864
Optimum Moisture Content (%) :	22.2	22.6	23.0	22.1
Moisture Variation :	1.5	1.8	1.9	1.7
Peak Converted Wet Density (t/m³) :	1.923	1.910	1.846	1.905
Hilf Density Ratio (%) :	**95.5**	**98.0**	**95.0**	**98.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	Silty Clay	Silty Clay	Silty Clay	Silty Clay
Remarks :	-			

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Accredited for compliance with ISO/IEC 17025.

APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

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Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

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Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

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Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

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Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

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ABN 51 009 878 899
www.morrisongeo.com.au

Brisbane Office
Job Number: DL18/196
Ref No: 13944
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 308
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 308 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 308 are presented in Table 1 below.

Table 1: Summary of Testing

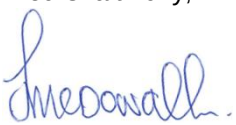
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
308	277	26th July 2018	98.5
Note: Laboratory Standard Test Methods Used: AS1308.5.8.1, 5.7.1, 2.1.1.			

Fill constructed on Lot 308 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 308 can be termed as "Controlled Fill" in accordance with AS 2870-2011 "Residential Slabs and Footings".

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 76
Brochure: Important Information About Your Geotechnical Engineering Report

MORRISON GEOTECHNIC

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ABN: 51 009 878 899
www.morrisongeo.com.au

Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 76**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**14/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250192	250193	250194	250195
Test Number :	276	277	278	279
Sampling Method :	-	-	-	-
Date Sampled :	26/07/2018	26/07/2018	26/07/2018	26/07/2018
Date Tested :	26/07/2018	26/07/2018	26/07/2018	26/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	288	-	287	-
Sample Location :	Lot 288 N: 6946700 E: 465838 RL: 42.946	N: 6946693 E: 465826 RL: 42.971	Lot 287 N: 6946684 E: 465831 RL: 43.354	N: 6946696 E: 465833 RL: 43.308
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 (%) :	24.0	20.5	27.0	27.0
Hilf MDR Number :	250192	250193	250194	250195
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 (%) :	101.5	99.5	95	112
Field Wet Density (t/m³) :	1.909	1.928	1.902	1.900
Optimum Moisture Content (%) :	23.6	20.6	28.4	24.1
Moisture Variation :	-0.4	0.1	1.3	-2.9
Peak Converted Wet Density (t/m³) :	1.962	1.960	1.859	1.946
Hilf Density Ratio (%) :	**97.5**	**98.5**	**102.5**	**97.5**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	CLAY (CH)	CLAY (CH)	CLAY (CH)	CLAY (CH)
Remarks :	-			

NATA WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025.

APPROVED SIGNATORY

Liam A McDowall

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

Important Information about Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

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www.morrisongeo.com.au

Brisbane Office
Job Number: DL18/196
Ref No: 13945
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 309
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 309 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 309 are presented in Table 1 below.

Table 1: Summary of Testing

Lot Number	Test Number	Date Tested	Density Ratio Achieved %
309	278	26th July 2018	102.5
309	279	26th July 2018	97.5
309	280	26th July 2018	98.0
Note: Laboratory Standard Test Methods Used: AS1309.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 309 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 309 can be termed as “Controlled Fill” in accordance with AS 2870-2011 “Residential Slabs and Footings”.

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,

L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 76 and 77
Brochure: Important Information About Your Geotechnical Engineering Report

MORRISON GEOTECHNIC

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 76**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**14/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250192	250193	250194	250195
Test Number :	276	277	278	279
Sampling Method :	-	-	-	-
Date Sampled :	26/07/2018	26/07/2018	26/07/2018	26/07/2018
Date Tested :	26/07/2018	26/07/2018	26/07/2018	26/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	288	-	287	-
Sample Location :	Lot 288 N: 6946700 E: 465838 RL: 42.946	N: 6946693 E: 465826 RL: 42.971	Lot 287 N: 6946684 E: 465831 RL: 43.354	N: 6946696 E: 465833 RL: 43.308
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 (%) :	24.0	20.5	27.0	27.0
Hilf MDR Number :	250192	250193	250194	250195
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 (%) :	101.5	99.5	95	112
Field Wet Density (t/m³) :	1.909	1.928	1.902	1.900
Optimum Moisture Content (%) :	23.6	20.6	28.4	24.1
Moisture Variation :	-0.4	0.1	1.3	-2.9
Peak Converted Wet Density (t/m³) :	1.962	1.960	1.859	1.946
Hilf Density Ratio (%) :	**97.5**	**98.5**	**102.5**	**97.5**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	CLAY (CH)	CLAY (CH)	CLAY (CH)	CLAY (CH)
Remarks :	-			

NATA WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025.

APPROVED SIGNATORY

Liam A McDowall

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

MORRISON GEOTECHNIC

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 77**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**14/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250196	250197	250198	250199
Test Number :	280	281	282	283
Sampling Method :	-	-	-	-
Date Sampled :	26/07/2018	26/07/2018	26/07/2018	26/07/2018
Date Tested :	26/07/2018	26/07/2018	26/07/2018	26/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	286	-	-	-
Sample Location :	Lot 286 N: 6946689 E: 465809 RL: 43.149	N: 6946693 E: 465789 RL: 43.117	Road 13 N: 6946661 E: 465847 RL: 42.450	N: 6946664 E: 465829 RL: 42.481
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 (%) :	27.0	24.8	18.1	18.6
Hilf MDR Number :	250196	250197	250198	250199
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 (%) :	100	93	90.5	101
Field Wet Density (t/m³) :	1.875	1.895	1.870	1.987
Optimum Moisture Content (%) :	27.0	26.7	20.0	18.4
Moisture Variation :	0.0	1.8	1.8	-0.2
Peak Converted Wet Density (t/m³) :	1.914	1.864	1.962	2.050
Hilf Density Ratio (%) :	**98.0**	**101.5**	**95.5**	**97.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	CLAY (CH)	CLAY (CH)	CLAY (CH)	CLAY (CH)
Remarks :	-			

NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025.

APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

Important Information about Your

Geotechnical Engineering Report

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While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

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Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

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Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

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Brisbane Office
Job Number: DL18/196
Ref No: 13946
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 310
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 310 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 310 are presented in Table 1 below.

Table 1: Summary of Testing

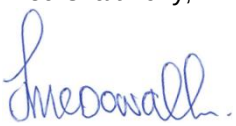
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
310	274	26th July 2018	100.0
310	275	26th July 2018	99.0
Note: Laboratory Standard Test Methods Used: AS1310.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 310 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 310 can be termed as “Controlled Fill” in accordance with AS 2870-2011 “Residential Slabs and Footings”.

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 75
Brochure: Important Information About Your Geotechnical Engineering Report

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www.morrisongeo.com.au

Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 75**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**14/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250187	250188	250190	250191
Test Number :	272	273	274	275
Sampling Method :	-	-	-	-
Date Sampled :	26/07/2018	26/07/2018	26/07/2018	26/07/2018
Date Tested :	26/07/2018	26/07/2018	26/07/2018	26/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	-	290	289	-
Sample Location :	N: 6946699 E: 465892 RL: 42.802	Lot 290 N: 6946692 E: 465874 RL: 42.921	Lot 289 N: 6946692 E: 465856 RL: 42.792	N: 6946681 E: 465853 RL: 42.818
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 (%) :	28.7	23.6	29.3	27.8
Hilf MDR Number :	250187	250188	250190	250191
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 (%) :	106.5	119	100	103.5
Field Wet Density (t/m³) :	1.826	1.863	1.875	1.897
Optimum Moisture Content (%) :	27.0	19.9	29.3	26.9
Moisture Variation :	-1.7	-3.9	0.0	-0.9
Peak Converted Wet Density (t/m³) :	1.855	1.900	1.874	1.915
Hilf Density Ratio (%) :	**98.5**	**98.0**	**100.0**	**99.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	CLAY (CH)	CLAY (CH)	CLAY (CH)	CLAY (CH)
Remarks :	-			

NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025.

APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

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www.morrisongeo.com.au

Brisbane Office
Job Number: DL18/196
Ref No: 13947
Author: L. McDowall

24th October 2018

CCA Winslow Pty Ltd
1587 Ipswich Road
Rocklea, QLD 4106

ATTENTION: MR GLEN RITCHIE
MR KIERAN HOY
Email: glenr@ccawinslow.com.au
kieranh@ccawinslow.com.au

Dear Sir,

RE: LOT 311
LEVEL ONE COMPLIANCE REPORT FOR
BULK EARTHWORKS FILLING OPERATIONS
WATERLEA ESTATE, STAGE 3,
WALLOON

Earthworks filling operations were carried out on Lot 311 at the above Development to form a working platform to support a future residential building.

Earthworks were constructed by CCA Winslow (The Client) between 05th July 2017 and 18th September 2018.

This report should be read in conjunction with Morrison Geotechnic Report "13791 – DL18/196 – CCA Winslow – Waterlea Estate, Stage 3 – Level One Report" Dated 12th October 2018.

The Brief from the Client was limited to:

- Level One Inspection of the placement and compaction of fill materials 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.
- Ipswich City Council Specifications.
- ETS Engineering Stage 3A and 3B Bulk Earthworks Layout Plans, Job Code: 17BNE-0083, Sheet Numbers: C200 – C203, Revision G, dated, 30th August 2018, and Interim Solution for Fish Barrier 17BNR-0083 – SK31 Rev P4

Level One Inspections and Testing was carried out on the stripped ground surface and during the placement and compaction of fill materials. Field and laboratory testing included proof roll testing of the stripped surface, field density testing using the nuclear soil moisture density gauge and standard Compactions.

Compaction testing at the Waterlea Estate, Stage 3 Development was carried out at a frequency of 1 test per 500m^3 of placed and compacted fill as defined in AS3798 Table 8.1. Test locations were selected using Random Stratified methods. Compaction testing was carried out at frequencies representative of the fill volume as a mass. On this basis, compaction testing was not required on each individual Lot.

A summary of tests representative of the fill constructed on Lot 311 are presented in Table 1 below.

Table 1: Summary of Testing

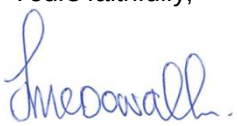
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
311	273	26th July 2018	98.0
Note: Laboratory Standard Test Methods Used: AS1311.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

Fill constructed on Lot 311 has been observed to be placed and compacted in accordance with the Brief. The fill on Lot 311 can be termed as "Controlled Fill" in accordance with AS 2870-2011 "Residential Slabs and Footings".

This statement does not include any top soil, which may have been placed for use as Lot dressing or any other subsequent earthworks after 18th September 2018

If there are any queries concerning the above please do not hesitate to contact this office, or alternatively send to my email at: lmcdowall@morrisongeo.com.au

Yours faithfully,



L. McDOWALL
For and on behalf of
MORRISON GEOTECHNIC PTY LIMITED

Encl: Laboratory Test Reports DL18/196 – 75
Brochure: Important Information About Your Geotechnical Engineering Report

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Hilf Density Ratio Report

Client :	**CCA WINSLOW**	Report Number:	**DL18/196 - 75**
Address :	**1587 IPSWICH ROAD, ROCKLEA, QLD, 4106**	Report Date :	**14/08/2018**
Project Name :	**EARTHWORKS SUPERVISION**	Order Number :	**PO40420**
Project Number :	**DL18/196**	Test Method :	**AS1289.5.8.1 & 5.7.1**
Location:	**WATERLEA ESTATE, STAGE 3 , WALLOON**	**Page 1 of 1**	

Sample Number :	250187	250188	250190	250191
Test Number :	272	273	274	275
Sampling Method :	-	-	-	-
Date Sampled :	26/07/2018	26/07/2018	26/07/2018	26/07/2018
Date Tested :	26/07/2018	26/07/2018	26/07/2018	26/07/2018
Material Type :	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**	**Bulk Fill**
Material Source :	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**	**On Site (Cut)**
Lot Number :	-	290	289	-
Sample Location :	N: 6946699 E: 465892 RL: 42.802	Lot 290 N: 6946692 E: 465874 RL: 42.921	Lot 289 N: 6946692 E: 465856 RL: 42.792	N: 6946681 E: 465853 RL: 42.818
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 (%) :	28.7	23.6	29.3	27.8
Hilf MDR Number :	250187	250188	250190	250191
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 (%) :	106.5	119	100	103.5
Field Wet Density (t/m³) :	1.826	1.863	1.875	1.897
Optimum Moisture Content (%) :	27.0	19.9	29.3	26.9
Moisture Variation :	-1.7	-3.9	0.0	-0.9
Peak Converted Wet Density (t/m³) :	1.855	1.900	1.874	1.915
Hilf Density Ratio (%) :	**98.5**	**98.0**	**100.0**	**99.0**
Minimum Specification :	95	95	95	95
Moisture Specification :	+ or - 2%	+ or - 2%	+ or - 2%	+ or - 2%
Site Selection :	-	-	-	-
Soil Description :	CLAY (CH)	CLAY (CH)	CLAY (CH)	CLAY (CH)
Remarks :	-			

NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025.

APPROVED SIGNATORY

Liam Mcdowall (Brisbane) - Branch Manager
NATA Accreditation Number
1162 / 1169

Important Information about Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

ASFE
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