MORRISON GEOTECHNIC

Brisbane | Gold Coast | Maroochydore
Unit 1, 35 Limestone Street (PO Box 3063), Darra Q 4076 **P** (07) 3282 0900 **F** (07) 3282 0955
ABN 51 009 878 899
www.morrisongeo.com.au

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.
- 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 282 are presented in Table 1 below.

Table 1: Summary of Testing

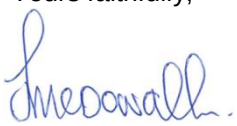
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
282	310	31st July 2018	103.0
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

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

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

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,
- 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

IIGER06085.0MRP

MORRISON GEOTECHNIC

Brisbane | Gold Coast | Maroochydore
Unit 1, 35 Limestone Street (PO Box 3063), Darra Q 4076 **P** (07) 3283 0900 **F** (07) 3283 0955
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

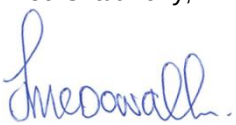
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
283	311	31st July 2018	98.0
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			

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

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

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,
- 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

IIGER06085.0MRP

MORRISON GEOTECHNIC

Brisbane | Gold Coast | Maroochydore
Unit 1, 35 Limestone Street (PO Box 3063), Darra Q 4076 **P** (07) 3284 0900 **F** (07) 3284 0955
ABN 51 009 878 899
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

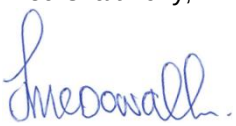
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
284	312	31st July 2018	100.0
284	313	31st July 2018	97.0
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

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

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

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,
- 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

IIGER06085.0MRP

MORRISON GEOTECHNIC

Brisbane | Gold Coast | Maroochydore
Unit 1, 35 Limestone Street (PO Box 3063), Darra Q 4076 **P** (07) 3285 0900 **F** (07) 3285 0955
ABN 51 009 878 899
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

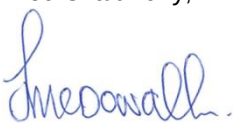
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
285	314	31st July 2018	98.0
285	315	31st July 2018	98.0
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

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

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

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 :	-			

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

IIGER06085.0MRP

MORRISON GEOTECHNIC

Brisbane | Gold Coast | Maroochydore
Unit 1, 35 Limestone Street (PO Box 3063), Darra Q 4076 **P** (07) 3286 0900 **F** (07) 3286 0955
ABN 51 009 878 899
www.morrisongeo.com.au

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

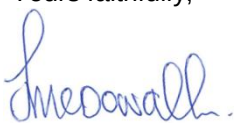
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
286	316	31st July 2018	99.5
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

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

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

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 :	-			

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

IIGER06085.0MRP

MORRISON GEOTECHNIC

Brisbane | Gold Coast | Maroochydore
Unit 1, 35 Limestone Street (PO Box 3063), Darra Q 4076 **P** (07) 3287 0900 **F** (07) 3287 0955
ABN 51 009 878 899
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

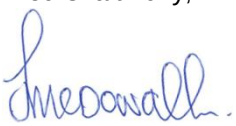
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
287	301	30th July 2018	96.5
287	317	31st July 2018	104.0
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

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
ABN: 51 009 878 899
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 :	-			

NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025.

APPROVED SIGNATORY

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

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

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 :	-			

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

IIGER06085.0MRP

MORRISON GEOTECHNIC

Brisbane | Gold Coast | Maroochydore
Unit 1, 35 Limestone Street (PO Box 3063), Darra Q 4076 **P** (07) 3289 0900 **F** (07) 3288 0955
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

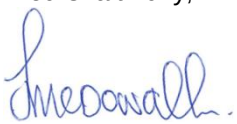
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
287	301	30th July 2018	96.5
287	317	31st July 2018	104.0
289	298	30th July 2018	96.0
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after 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

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

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 :	-			

NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025.

APPROVED SIGNATORY

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

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

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 :	-			

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

IIGER06085.0MRP

MORRISON GEOTECHNIC

Brisbane | Gold Coast | Maroochydore
Unit 1, 35 Limestone Street (PO Box 3063), Darra Q 4076 **P** (07) 3289 0900 **F** (07) 3289 0955
ABN 51 009 878 899
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 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

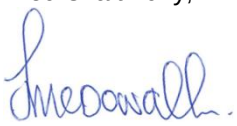
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
289	298	30th July 2018	96.0
Note: Laboratory Standard Test Methods Used: AS1289.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after completion of Bulk Earthworks.			

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

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

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 :	-			

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

IIGER06085.0MRP

MORRISON GEOTECHNIC

Brisbane | Gold Coast | Maroochydore
Unit 1, 35 Limestone Street (PO Box 3063), Darra Q 4076 **P** (07) 3290 0900 **F** (07) 3290 0955
ABN 51 009 878 899
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

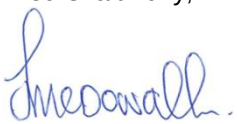
Lot Number	Test Number	Date Tested	Density Ratio Achieved %
289	298	30th July 2018	96.0
291	300	30th July 2018	97.5
291	309	31st July 2018	98.5
Note: Laboratory Standard Test Methods Used: AS1290.5.8.1, 5.7.1, 2.1.1.			
Note: Lot numbers on test certificates not accurate due to lot layout redesign after 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

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

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 :	-			

NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025.

APPROVED SIGNATORY

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

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

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

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

IIGER06085.0MRP