

JANUARY, 2019

**JOB NO. GE19/010
CCA WINSLOW PTY LTD
CERTIFICATION OF COMPLETED
EARTHWORKS FOR STAGE 6
MONTEGO HILLS DEVELOPMENT
KINGSHOLME**



MORRISON
GEOTECHNIC



Job No. GE19/010
Ref: 18900
Author: Ben Elsmore

21st January, 2019

CCA Winslow
1587 Ipswich Road
Rocklea QLD 4106

ATTENTION MR JAMES MARTIN
Email: JamesM@ccawinslow.com.au

Dear Sir,

RE: CERTIFICATION OF COMPLETED EARTHWORKS FOR STAGE 6, MONTEGO HILLS DEVELOPMENT, KINGSHOLME

Morrison Geotechnic has been commissioned by Mr. James Martin of CCA Winslow Pty Ltd, to provide a certification of the completed earthworks including all cut/fill batters associated with the bulk earthworks, access roads, bio-retention basin and building pads development within Stage 6 of the Montego Hills Development, Kingsholme. The certification is required to satisfy Geotechnical Condition 12b of the City of Gold Coast Council Development Conditions, application number PN118080/12/DA1, dated the 31st January, 2017, which form part of the Planning and Environment Court judgement dated the 20th April, 2017. This Council condition is as follows:-

12 Certification of Retaining Structures/Batters Long-Term Factor of Safety

- b) *Prior to the earlier endorsement of survey plans, certification from a Registered Professional Engineer Queensland (RPEQ) specialised in Geotechnical Engineering confirming that "all constructed cut/fill batters and retaining structures (if any) on site have achieved adequate stability with a long-term factor of safety greater than 1.5 against geotechnical instabilities".*

A certification of the proposed bulk earthworks drawings was carried out prior to earthworks by Douglas Partners (82750.06.R.001 dated June, 2017) confirming that the proposed earthworks structures including all cut and fill batters could achieve a long-term factor of safety of at least 1.5 against geotechnical instabilities.

Morrison Geotechnic also undertook 'Level One' earthworks observation and testing on site and provided a Level One Compliance Report for the stage (Job Number: GL17/195 dated 3rd October, 2018). The earthworks involved a geotechnical assessment of an existing drainage feature and recommendations were provided to the contractor for filling of this area. Filling of this drainage feature was undertaken under 'Level One' observation.

This report assesses whether the completed earthworks are in all respects consistent with the Mortons Urban Solutions design drawings and the advice and recommendations of the Douglas Partners report: "*Report on Landslip Hazard Risk Assessment & Bulk Earthworks Global Stability Assessment, Montego Hills Stages 5 and 6, 97 Upper Ormeau Road, Kingsholme*", Job Number 82750.06, dated June, 2017.

A desk study of the supplied earthworks plans was initially carried out. The following Mortons Urban Solutions drawings were reviewed as part of the desk study:

- 19610-06-010-A – Sediment & Erosion Control Plan;
- 19610-06-030-A – Bulk Earthworks Cut Fill Plan;
- 19610-06-050-A – Bulk Earthworks Section Key Plan;
- 19610-05-051-A – Bulk Earthworks Sections Sheet 01;
- 19610-05-052-A – Bulk Earthworks Sections Sheet 02; and
- 19610-05-053-A – Bulk Earthworks Sections Sheet 03.

Based on the earthworks drawings provided by Mortons Urban Solutions for Stage 6, the bulk earthworks comprise cuts ranging up to approximately up to 7.5m in depth and fills ranging up to 7.0m in thickness to form batter heights not exceeding 2.5m. Batters exceeding 2.5m in height incorporate a 1.0m wide horizontal cut bench for each 2.5m vertical height interval and a 2.5m wide horizontal cut bench for each 5.0m vertical height interval. No retaining structures have been constructed within Stage 6 of the Montego Hills development.

At the completion of the earthworks, a walkover survey of all constructed cut and fill batters was carried out on the 21st January, 2019 by a Senior Geotechnical Engineer from our Gold Coast office. The walkover survey indicated that all completed earthworks, including all constructed cut/fill batters associated with the development within Stage 6 have been constructed in general accordance with the attached Mortons Urban Solutions bulk earthworks drawings listed above and the advice and recommendations of the Douglas Partners report (Ref: 82750.06).

All cut and fill batters typically have been battered to safe angles of no steeper than 2(H):1(V) or 26° which is usually considered to be the minimum design target for similar developments to achieve a factor of safety in excess of 1.5.

All completed earthworks, including all cut and fill batters within Stage 6 of the Montego Hills development, Kingsholme, are considered to be satisfactory and will achieve a long-term factor of safety in excess of 1.5 providing the following recommendations are or have been implemented:

- The fill used in the construction of batters has been placed and compacted to at least 95% Standard Maximum Dry Density and is "Controlled Fill" in accordance with A.S. 2870 (Clause 6.4.2 (a)) – "Residential Slabs and Footings" and A.S. 3798.
- The fill slopes have been over-constructed and trimmed back to the design geometry to ensure compaction in the outer zones.
- Where the ground surface slopes at 8° or more, the foundation has been benched prior to filling.
- In areas where drainage gullies have been filled, all surface water is diverted into dedicated drainage easements and transported off site.
- Upslope surficial water flows must be directed away from all sloping batters to limit the ingress of water into the fill which can create stability problems. In some areas the road drainage system should minimise surface water flow onto the batters.
- Batters are to be stabilised using techniques such as vegetation and mulching or similar to minimise erosion. Properly maintained vegetation should reduce the occurrence of surface erosion by impingent rainfall.

- No dwellings or structures are permitted within 1m of the crest of any batters on site as per the recommendations of the Douglas Partners Certification (82750.06). If dwellings or structures are to be constructed within 1m of the crest of any batter slopes or retaining structures, further analyses will be required or foundations must extend below the toe of the batter or retaining wall footings.
- No additional earthworks including cuts, fills or retaining walls that are not shown on the approved Mortons Urban Solutions design drawings are permitted without approval from a suitably qualified geotechnical engineer or engineering geologist.

It should be noted that the exposed fill material and batters must be constantly maintained and repaired during the early stages of mulching and vegetation, as erosion may be expected until vegetation is fully established.

If the recommendations described above have or will be followed, all completed earthworks, including all cut and fill batters and retaining structures, should achieve long term factors of safety of greater than 1.5 against slope instability.

Bulk earthworks plans showing the location of the cut and fill batters are attached to this report. The standard pro-forma for geotechnical certification has been completed and is presented in Appendix A to this report.

Please do not hesitate to contact this office if you require any further information.

Yours faithfully



B M Elsmore
21/01/2019

B M ELSMORE (RPEQ 19656)

for and on behalf of

MORRISON GEOTECHNIC PTY LIMITED

Encl. Bulk Earthworks Plans
Appendix A - Standard Pro-forma for Geotechnical Certification
Important Information About Your Geotechnical Engineering Report

PROJECT NAME
MONTEGO Hills

STAGE 06

R.P. DESCRIPTION
LOT 2 RP29994, LOT 2
RP107328 & LOT1 RP243312
UPPER ORMEAU ROAD,
KINGSHOLME, QLD

CLIENT
VILLOWOOD properties
COMMUNITIES DESIGNED FOR LIVING

ISSUES
TENDER 09-08-17
COUNCIL 31-05-17
CONSTRUCTION 10-10-17

PRE DATE
A 31-05-17 COUNCIL ISSUE

AMENDMENT
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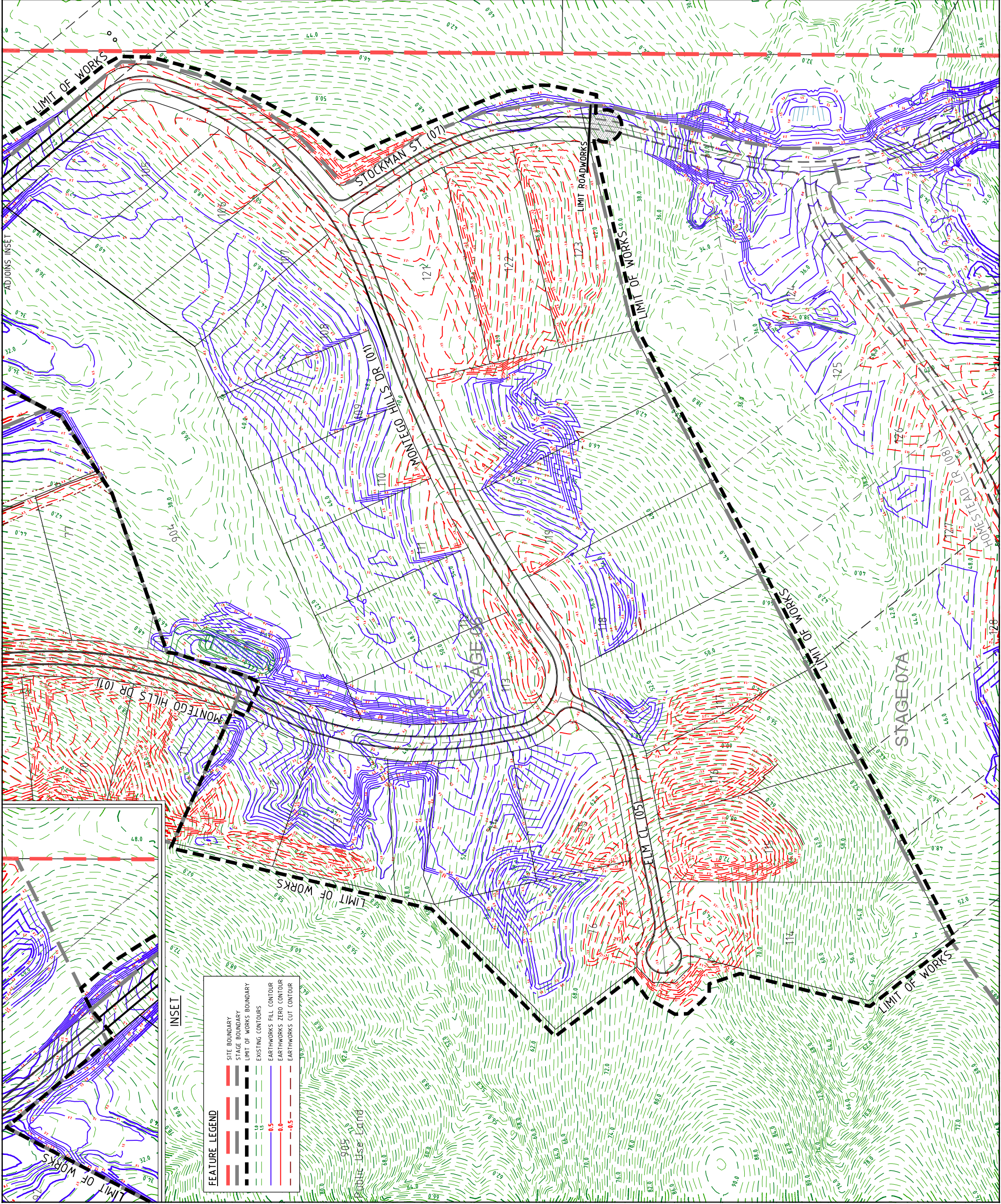
ALL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH 001-NOTES AND 002-LEGEND

ASSOCIATED CONSULTANTS
gassman surveys
development perspectives planners designers

DRAWING TITLE
**BULK EARTHWORKS
CUT FILL PLAN**

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Urban & Regional Planning
Civil Engineering
Project Coordination
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DESIGNED RB
DRAWN RV
APPROVED BY [Signature]
DATE 09-12-16
DRAWING NUMBER
19610-06-030
AMEND. A



APPENDIX 'A'

STANDARD PROFORMA FOR GEOTECHNICAL CERTIFICATION



**Standard Pro-forma for
Geotechnical Certification**

City of Gold Coast Council file reference: **PN118080/12/DA1**

**PROPOSED WORKS AT (LOCATION): STAGE 6, MONTEGO HILLS DEVELOPMENT,
KINGSHOLME**

for (proposed development): **Development of Lots, Access Roads and Bio-Retention
Basins**

**I, Ben Matthew ELSMORE, RPEQ No. 19656, of Morrison Geotechnic Pty Limited
(Consulting Engineers), being duly authorised on this behalf, do certify that:-**

All constructed cut and fill batters associated with Stage 6 of the Montego Hills development, Kingsholme, are in all respects consistent with the advice and recommendations of the Douglas Partners Report " Report on Landslip Hazard Risk Assessment & Bulk Earthworks Global Stability Assessment, Montego Hills Stages 5 and 6, 97 Upper Ormeau Road, Kingsholme", Job Number 82750.06, dated June, 2017, have achieved adequate stability with a long term factor of safety (at least 70 years) of greater than 1.5 against geotechnical instability and will therefore not cause any adverse effects on the stability and integrity of the neighbouring buildings, properties, utility services and infrastructures providing the construction recommendations made in the report "Certification of Completed Earthworks For Stage 5 – Montego Hills Development, Kingsholme," Job No. GE19/010, Dated the 21st of January, 2019, have been or will be implemented.

I am aware that the City of Gold Coast Council will rely upon this certificate and any associated geotechnical reports, maps, graphs, tables, attachments etc. produced as a consequence of commissioning this development proposal.


21/01/2019

Signed: _____ **B M ELSMORE**

Designation: **Senior Geotechnical Engineer**

Certified this: **Twenty-First Day of January, 2019.**

File: *GE19/010*

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 Geotechnical Engineer for Additional Assistance

Membership in ASFE/THE BEST PEOPLE ON EARTH exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.



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