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Project 39870.03
12 October 2012
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Empowered Living Support Services
PO Box 3310
GLENDALE NSW 2285

Attention: Ms Angela Bill

Dear Madam

Response to LMCC Comments regarding Extent of Earthworks
Proposed Aged Care Development
Lot 1, DP377679, Marmong Street, Marmong Point

1. Introduction

We refer to your recent email correspondence regarding comments received from Lake Macquarie City Council (LMCC) in relation to proposed earthworks for the proposed development at Marmong Point. Douglas Partners Pty Ltd (DP) prepared a preliminary geotechnical assessment report for the project (Ref 1).

Based on the information provided LMCC's comments pertinent to geotechnical matters may be summarised as follows:

- The 'level' (depths) of cut and fill is considered excessive; LMCC note fill of 'over 8 m' and cut of 'over 7 m'. LMCC do not support the proposed extent of earthworks;
- It is proposed to reclaim part of the existing maturation pond – further details are required on how this would be done and 'measures to ensure that there are no geotechnical land stability issues'; and
- The risk of slope instability adjacent to fill batters in the reclaimed pond is 'medium' and further investigation is required to reduce the level of risk.

We acknowledge receipt of a the following drawings prepared by ADW Johnson:

- Concept Engineering Plans, Drawings 001 to 017; all Revision D dated 26 April 2012, except Drawings 013 and 014 Revision E dated 22 May 2012 (Ref 2); and
- Cut/fill earthworks drawing, Reference "cut fill 5Oct2012.dwg' (Ref 3).

These drawings and report have been considered in preparing this response. The current design involves a proposed total volume of approximately 51,000 m^3 of cut and 91,000 m^3 of fill.

2. Proposed Earthworks

The supplied drawings indicate that the majority of the earthworks will involve cut and fill of less than 2 m depth.

The areas of deep cut or fill are localised, with the following maxima:

- Cut of approximately 5 m depth adjacent to Road 1 at the southern corner of the proposed development; and
- Fill of approximately 8.9 m depth beneath Road 1 at Ch 320.

The geotechnical risks associated with cuts and fills (stability and settlement) can be suitably managed by applying sound engineering principles in design and construction.

For excavations these principles would include identification of adverse jointing or bedding in rock, adherence to maximum permissible batter slopes, protection of batter slopes from erosion and provision of adequate drainage.

In the case of fills these principles would include foundation preparation, appropriate material quality, adequate compaction, adherence to maximum permissible batter slopes, protection of batter slopes from erosion and adequate drainage.

These matters can be readily included in construction documentation and could form a condition of consent before issuing a construction certificate. Detailed geotechnical investigations are proposed to assist the design and documentation process prior to construction; and these investigations would in particular target the areas of deepest cut and fill.

3. Reclamation of the Maturation Pond

It is proposed to reclaim a portion of the existing maturation pond. The concept plans indicate fill depths of up to about 2 m. LMCC have requested further information on how the filling would be undertaken.

The most appropriate construction technique will depend upon the depth and strength of soft sediments within the pond. Detailed geotechnical investigation of the pond area are proposed to assist the design and documentation process prior to construction. Potential construction methods would include:

- Push out fill from the edges to displace the sediments (‘mud wave’ approach), provided the sediments are soft enough to be displaced;
- Removal of soft soils ahead of fill advance using a long-reach excavator;
- Construction of a coffer dam to enable dewatering of the fill area and conventional removal of unsuitable soils; or
- If little or no soft sediment is present, fill may be pushed out in a conventional manner.

The most appropriate method (or combination of methods) will depend on the findings of the detailed geotechnical investigation. Particular attention would be given to material type and compaction if placed under water. These matters can be readily included in construction documentation and could form a condition of consent before issuing a construction certificate.

4. Stability of the Fill Batters in Maturation Pond

As noted in the preliminary geotechnical report (Ref 1) the risk of instability adjacent to the maturation pond fill batters is assessed to be Medium, mainly because detailed geotechnical investigation and design has not yet been undertaken. The report further noted that the risk is expected to be reduced following assessment, once the depth and strength of pond base material is known, the fill and batter slopes can be engineered to suit the conditions.

The engineering requirements to construct stable batters can be readily included in construction documentation and could form a condition of consent before issuing a construction certificate.

5. References

1. Douglas Partners Pty Ltd, "Report on Preliminary Geotechnical and Acid Sulphate Soil Assessment, Proposed Residential/Retirement Development, Lot 1, DP 377679, off Marmong Street, Marmong Point, prepared for Empowered Living Support Services", Project 39870.03-01, 13 April 2012.
2. ADW Johnson Pty Limited, "Stormwater Management Report and Concept Engineering Plans for Proposed Aged Care Facility, Lot DP 377679 & Lot 784 DP 533494, Marmong Street, Marmong Point", Ref 238111 Rev C, May 2012.
3. ADW Johnson Pty Limited, Cut/Fill Earthworks (AutoCAD drawing file), 5 October 2012.

6. Limitations

Douglas Partners Pty Ltd (DP) has prepared this report for this project at Lot 1, DP 377679, 135a Marmong Street Marmong Point in accordance with instructions received from Empowered Living Support Services Ltd dated 2 April 2012. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Empowered Living Support Services Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and testing locations in previous assessments, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during previous investigations. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

Yours faithfully
Douglas Partners Pty Ltd

Reviewed by

Stephen Jones
Principal

Scott McFarlane
Senior Associate

Attachments: About This Report

About this Report

Douglas Partners

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.