

Project 73735  
8 November 2013  
RKL:pc

**Mr Stuart and Mrs Karen Backhouse**  
**10 Goondari Road**  
**Allambie NSW 2100**

Email stuback@tpg.com.au

Dear Mr and Mrs Backhouse

**10 Goondari Road Allambie**  
**Proposed Alterations and Additions**  
**Warringah DCP Clause E10 and Warringah LEP 2011**  
**Preliminary Assessment for Geotechnical Requirements**

As requested the above site has been inspected to assess the need for a full geotechnical report, as required by the Warringah Local Environment Plan 2011. The site is located in an area identified as Area B – Flanking Slopes 5° to 25° on the Warringah DCP Landslip Risk Map – sheet LSR 001\_012.

As part of the preliminary assessment the architectural plans for the works, Drawings JUL 6/13 Pages 1 to 4, prepared by W.P.O'Brien, Building Contractors, Design & Construction, were supplied and examined to review the nature and extent of proposed works. The plans indicate that the work will comprise;

- the addition of a double car port at the western end of the residence;
- a verandah along the southern, street façade with a new tiled skillion roof matching the existing roof;
- removal of a section of wall and replacement with a door and windows to create a new entry; and
- a new driveway and entry path.

To satisfy the "Checklist For Council's Assessment of Site Conditions ..." within Clause E10 of the Warringah Council DCP, the following information and observations are provided ;

- based upon inspection of the subject site and external inspection of the adjacent sites, there is no observed evidence or known history of slope instability;
- excavation or filling to greater than 2 m is not proposed,
- the site is currently developed and there is no filling to greater than 1 m depth observed; and
- there are no cuts/excavations greater than 2 m in height.

On the basis of the above information it is considered that a full geotechnical report with respect to Landslip Risk is not required. It is also considered that the proposed development can be successfully completed in a geotechnically stable condition, provided it is carried out in accordance with sound engineering practice (refer to attached Australian Geoguide 8).

This assessment does not and is not intended to provide geotechnical information for design or construction purposed and specific investigation should be carried as required/appropriate for the structural requirements for the proposed work.

Douglas Partners (DP) has prepared this report for this project at 10 Goondari Road Allambie under DP's Conditions of Engagement. It is provided for the exclusive use of Mr and Mrs Backhouse for the specific project and purpose 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. DP has necessarily relied upon information provided by the client and/or their agents.

This report must be read in conjunction with all the attached notes 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.

We trust that these comments are sufficient for your present requirements.

Yours faithfully

**Douglas Partners Pty Ltd**



**Richard Lloyd**

Senior Associate/Senior Engineering Geologist

Reviewed by



**John Braybrooke**

Principal

Encl.      Notes "About this Inspection Report"  
             Australian Geoguide LR8

# About this Inspection Report

## Douglas Partners



### Introduction

These notes are provided to amplify DP's inspection report in regard to the limitations of carrying out inspection work. Not all notes are necessarily relevant to this report.

### Standards

This inspection report has been prepared by qualified personnel to current engineering standards of interpretation and analysis.

### Copyright and Limits of Use

This inspection report is the property of DP and is provided for the exclusive use of the client for the specific project and purpose as described in the report. It should not be used by a third party for any purpose other than to confirm that the construction works addressed in the report have been inspected as described. Use of the inspection report is limited in accordance with the Conditions of Engagement for the commission.

DP does not undertake to guarantee the works of the contractors or relieve them of their responsibility to produce a completed product conforming to the design.

### Reports

This inspection report may include advice or opinion that is based on engineering and/or geological interpretation, information provided by the client or the client's agent, and information gained from:

- an investigation report for the project (if available to DP);
- inspection of the work, exposed ground conditions, excavation spoil and performance of excavating equipment while DP was on site;
- investigation and testing that was carried out during the site inspection;
- anecdotal information provided by authoritative site personnel; and

- DP's experience and knowledge of local geology.

Such information may be limited by the frequency of any inspection or testing that was able to be practically carried out, including possible site or cost constraints imposed by the client/contractor(s). For these reasons, the reliability of this inspection report is limited by the scope of information on which it relies.

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

- unexpected variations in subsurface conditions that are not evident from the inspection; and
- the actions of contractors responding to commercial pressures.

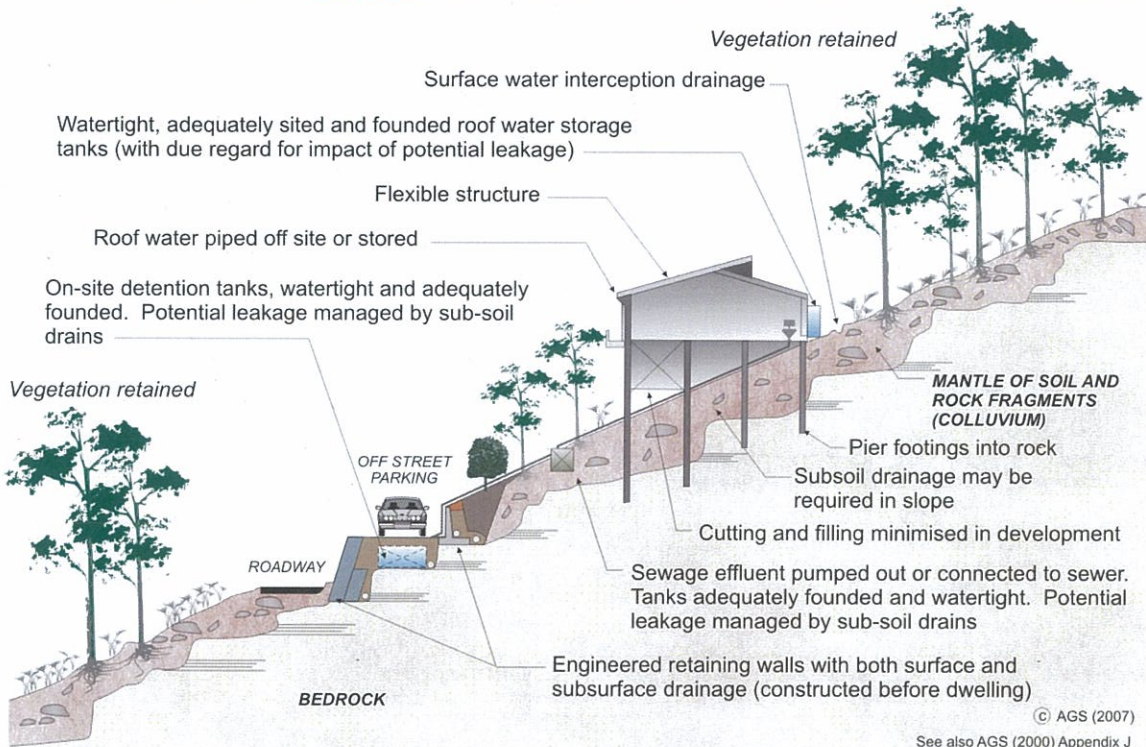
Should these issues occur, then additional advice should be sought from DP and, if required, amendments made.

This inspection report must be read in conjunction with any attached information. This inspection report should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions from review by others of this inspection report or test data, which are not otherwise supported by an expressed statement, interpretation, outcome or conclusion stated in this inspection report.

## HILLSIDE CONSTRUCTION PRACTICE

Sensible development practices are required when building on hillsides, particularly if the hillside has more than a low risk of instability (GeoGuide LR7). Only building techniques intended to maintain, or reduce, the overall level of landslide risk should be considered. Examples of good hillside construction practice are illustrated below.

### EXAMPLES OF GOOD HILLSIDE CONSTRUCTION PRACTICE



#### WHY ARE THESE PRACTICES GOOD?

**Roadways and parking areas** - are paved and incorporate kerbs which prevent water discharging straight into the hillside (GeoGuide LR5).

**Cuttings** - are supported by retaining walls (GeoGuide LR6).

**Retaining walls** - are engineer designed to withstand the lateral earth pressures and surcharges expected, and include drains to prevent water pressures developing in the backfill. Where the ground slopes steeply down towards the high side of a retaining wall, the disturbing force (see GeoGuide LR6) can be two or more times that in level ground. Retaining walls must be designed taking these forces into account.

**Sewage** - whether treated or not is either taken away in pipes or contained in properly founded tanks so it cannot soak into the ground.

**Surface water** - from roofs and other hard surfaces is piped away to a suitable discharge point rather than being allowed to infiltrate into the ground. Preferably, the discharge point will be in a natural creek where ground water exits, rather than enters, the ground. Shallow, lined, drains on the surface can fulfil the same purpose (GeoGuide LR5).

**Surface loads** - are minimised. No fill embankments have been built. The house is a lightweight structure. Foundation loads have been taken down below the level at which a landslide is likely to occur and, preferably, to rock. This sort of construction is probably not applicable to soil slopes (GeoGuide LR3). If you are uncertain whether your site has rock near the surface, or is essentially a soil slope, you should engage a geotechnical practitioner to find out.

**Flexible structures** - have been used because they can tolerate a certain amount of movement with minimal signs of distress and maintain their functionality.

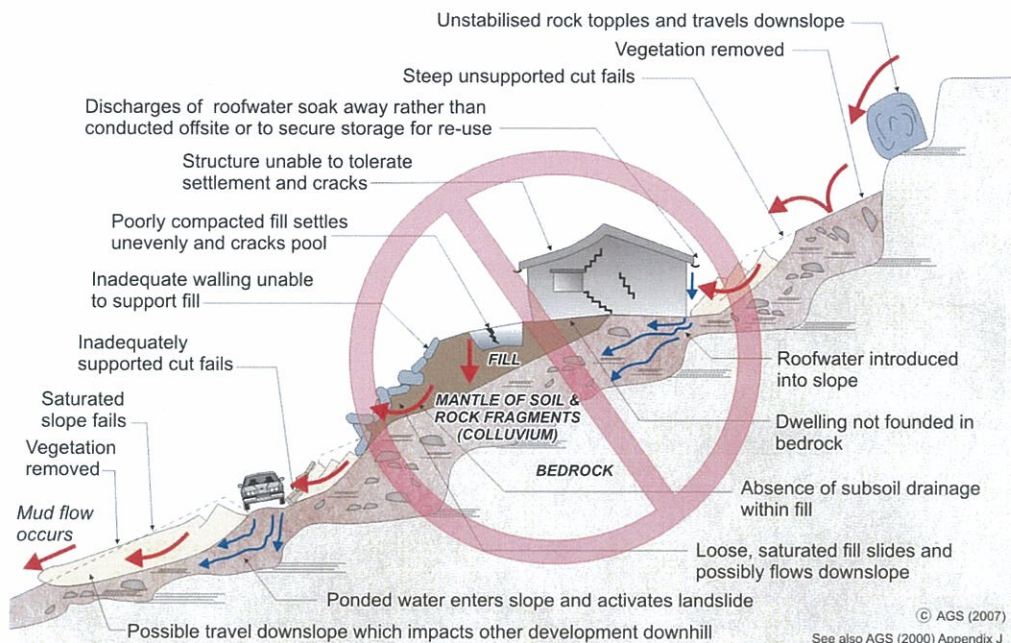
**Vegetation clearance** - on soil slopes has been kept to a reasonable minimum. Trees, and to a lesser extent smaller vegetation, take large quantities of water out of the ground every day. This lowers the ground water table, which in turn helps to maintain the stability of the slope. Large scale clearing can result in a rise in water table with a consequent increase in the likelihood of a landslide (GeoGuide LR5). An exception may have to be made to this rule on steep rock slopes where trees have little effect on the water table, but their roots pose a landslide hazard by dislodging boulders.

Possible effects of ignoring good construction practices are illustrated on page 2. Unfortunately, these poor construction practices are not as unusual as you might think and are often chosen because, on the face of it, they will save the developer, or owner, money. You should not lose sight of the fact that the cost and anguish associated with any one of the disasters illustrated, is likely to more than wipe out any apparent savings at the outset.

#### ADOPT GOOD PRACTICE ON HILLSIDE SITES

## AUSTRALIAN GEOGUIDE LR8 (CONSTRUCTION PRACTICE)

### EXAMPLES OF **POOR** HILLSIDE CONSTRUCTION PRACTICE



#### WHY ARE THESE PRACTICES POOR?

**Roadways and parking areas** - are unsurfaced and lack proper table drains (gutters) causing surface water to pond and soak into the ground.

**Cut and fill** - has been used to balance earthworks quantities and level the site leaving unstable cut faces and added large surface loads to the ground. Failure to compact the fill properly has led to settlement, which will probably continue for several years after completion. The house and pool have been built on the fill and have settled with it and cracked. Leakage from the cracked pool and the applied surface loads from the fill have combined to cause landslides.

**Retaining walls** - have been avoided, to minimise cost, and hand placed rock walls used instead. Without applying engineering design principles, the walls have failed to provide the required support to the ground and have failed, creating a very dangerous situation.

**A heavy, rigid, house** - has been built on shallow, conventional, footings. Not only has the brickwork cracked because of the resulting ground movements, but it has also become involved in a man-made landslide.

**Soak-away drainage** - has been used for sewage and surface water run-off from roofs and pavements. This water soaks into the ground and raises the water table (GeoGuide LR5). Subsoil drains that run along the contours should be avoided for the same reason. If felt necessary, subsoil drains should run steeply downhill in a chevron, or herring bone, pattern. This may conflict with the requirements for effluent and surface water disposal (GeoGuide LR9) and if so, you will need to seek professional advice.

**Rock debris** - from landslides higher up on the slope seems likely to pass through the site. Such locations are often referred to by geotechnical practitioners as "debris flow paths". Rock is normally even denser than ordinary fill, so even quite modest boulders are likely to weigh many tonnes and do a lot of damage once they start to roll. Boulders have been known to travel hundreds of metres downhill leaving behind a trail of destruction.

**Vegetation** - has been completely cleared, leading to a possible rise in the water table and increased landslide risk (GeoGuide LR5).

#### DON'T CUT CORNERS ON HILLSIDE SITES - OBTAIN ADVICE FROM A GEOTECHNICAL PRACTITIONER

More information relevant to your particular situation may be found in other Australian GeoGuides:

- |                                     |                                                    |
|-------------------------------------|----------------------------------------------------|
| • GeoGuide LR1 - Introduction       | • GeoGuide LR6 - Retaining Walls                   |
| • GeoGuide LR2 - Landslides         | • GeoGuide LR7 - Landslide Risk                    |
| • GeoGuide LR3 - Landslides in Soil | • GeoGuide LR9 - Effluent & Surface Water Disposal |
| • GeoGuide LR4 - Landslides in Rock | • GeoGuide LR10 - Coastal Landslides               |
| • GeoGuide LR5 - Water & Drainage   | • GeoGuide LR11 - Record Keeping                   |

The Australian GeoGuides (LR series) are a set of publications intended for property owners; local councils; planning authorities; developers; insurers; lawyers and, in fact, anyone who lives with, or has an interest in, a natural or engineered slope, a cutting, or an excavation. They are intended to help you understand why slopes and retaining structures can be a hazard and what can be done with appropriate professional advice and local council approval (if required) to remove, reduce, or minimise the risk they represent. The GeoGuides have been prepared by the Australian Geomechanics Society, a specialist technical society within Engineers Australia, the national peak body for all engineering disciplines in Australia, whose members are professional geotechnical engineers and engineering geologists with a particular interest in ground engineering. The GeoGuides have been funded under the Australian governments' National Disaster Mitigation Program.