

9 August 2012

Ref: 20689

Mr R Hewitt  
6 Lindyn Street  
CHARLESTOWN NSW 2290

## GEOTECHNICAL ENGINEERS REPORT

6 Lindyn Street, Charlestown

### 1. INTRODUCTION

At you requested we have carried out a limited geotechnical investigation of the above site and surrounding areas. The purpose of this investigation was to determine the slope stability risk category for the subject site in accordance with methodology set out in the " Australian Geomechanics Society of Landslide Risk Management: guidelines, AG Vol. 37. No. 2.

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## 2. SITE DESCRIPTION

The site was located on the eastern side of Lindyn St., Charlestown. An existing 2 storey residence is currently on the site. The current layout can be seen in the aerial photograph.

The site has been artificially terraced with rock & treated timber retaining walls. The original downslope did not exceed 15°.



## 3. FIELDWORK

Fieldwork was undertaken on 8th August 2012 consisting of a visual assessment of the site and surrounding area.

## 4. GEOLOGICAL SETTING AND SUBSURFACE CONDITIONS

The fieldwork indicated the site consists of clays.

An investigation of geological maps indicated that there are no coal workings at a depth to influence the site.

There is no evidence of subsidence or slip in the subject property or adjacent properties.

## 5. SLOPE STABILITY AND DEVELOPMENT GUIDELINES

### 5.1 STABILITY ASSESSMENT

The site was assessed as having an “unlikely” potential for soil slide/soil flow landslide within the natural insitu soils with a “minor” measure of consequence to property and therefore, a “low” risk level of instability as defined in “Landslide Risk Assessment – Example of Qualitative Terminology for Use in Assessing Risk to Property”.

## **5.2 DEVELOPMENT GUIDELINES**

### **5.2.1 EXCAVATIONS**

Excavations in soil in excess of 1.0metres depth must be supported by an engineers designed retaining wall

Unretained cuts in soil must be battered in accordance with the requirements of the Building Code of Australia, but in no case should be steeper than:

2H:1V in other than rock,

1H:4V in excavated rock, and

1H:8V in rock requiring excavation with a rock breaker.

All excavations must be protected from erosion.

### **5.2.2 FILLING**

Fill in excess of 1.0 metres must be retained by an engineer designed retaining wall.

Unretained fill less than 1.0 metres in depth should be battered in accordance with the requirements of the Building Code of Australia, but in no case should be steeper than 2H:1V and must be protected from erosion.

Fill should be placed in maximum 200mm deep layers and be compacted to 95% maximum dry relative density for cohesive material or 70% relative density for non- cohesive (sand) material.

Where placing fill over a rock surface, the rock must be battered to provide a backslope not less than 5°. Under no circumstance is fill to be placed over a downslope sloping rockface.

### **5.2.3 COUNCIL'S DEVELOPMENT GUIDELINES**

Council's development guidelines should be reviewed during site planning as development guidelines may impose height limitations on site cut and fills.

### **5.2.4 RETAINING WALLS**

Engineer designed retaining walls should be designed in accordance with the requirements of AS4678 "Earth-retaining Structures" to support, where appropriate, surcharge loading due to the upslope battered surface level above the retaining walls and the depth of cut or fill material. Retaining walls should be constructed with adequate surface and subsurface drainage to the Engineer's and Council requirements.

### **5.2.5 SITE DRAINAGE**

The effective drainage from the site of surface and subsurface water is important to ensure the stability of the surface soil and the long term performance of any footing system and retaining walls.

The property should be developed and maintained in accordance with the guidelines set out in Section 3 of the BCA and Appendix B of AS 2870.

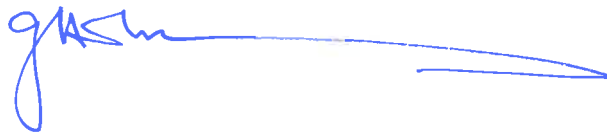
In particular the following measures are recommended:

- Catch/dish drains formed at the top of all batters
- Dish and rubble drains installed at the toe of all batters
- Subsoil drains installed behind new retaining walls
- Cut areas sloped to fall away from building and water not allowed to pond around buildings.
- The site graded to prevent water from ponding on any compacted fills.
- Surface stormwater and subsoil water collected and disposed of to Council's requirements.
- Erosion control measures to be undertaken during construction to Council requirements.

#### 5.2.6 FOOTINGS

If rock is exposed, all footings should be founded on or piered to rock.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Graeme Holmes', with a long horizontal flourish extending to the right.

Graeme Holmes M.I.E, CPEng