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Geotechnics • Environment • Groundwater

REPORT
on
PRELIMINARY GEOTECHNICAL ASSESSMENT

OATLEY BOWLING CLUB
RIVER STREET, OATLEY

Prepared for
HURSTVILLE CITY COUNCIL

Project 44456
December 2006

Douglas Partners Pty Ltd
ABN 75 053 980 117
96 Hermitage Road
West Ryde NSW 2114
Australia

PO Box 472
West Ryde NSW 1685
Phone (02) 9809 0666
Fax: (02) 9809 4095
sydney@douglaspartners.com.au

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GSY:aj
Project 44456
18 December 2006

REPORT ON PRELIMINARY GEOTECHNICAL ASSESSMENT
OATLEY BOWLING CLUB
RIVER STREET, OATLEY

1. INTRODUCTION

This report presents the findings of a preliminary geotechnical assessment conducted at the existing bowling club on River Street, Oatley. The assessment was commissioned by Mr Morris Rosenberg of NRP Architecture, on behalf of Hurstville City Council.

The assessment comprised a site visit and review of existing geotechnical information available from published data and geotechnical reports from Douglas Partners archives. The main aim of the assessment was to provide preliminary information on subsurface conditions for initial planning of re-development of the site.

Field work, environmental, planning and site contamination issues were beyond the scope of the present assessment but are likely to be required at a later stage. A Stage 1 (preliminary) contamination assessment was carried out concurrently with the geotechnical assessment and is reported separately.

2. SITE DESCRIPTION AND GEOLOGY

2.1 Site Description

The site, as shown on Drawing SK-01, dated 8 December 2006 produced by NPR Architecture which is given in Appendix A, is irregular in shape and situated at the end of River Street, Oatley. The site is approximately 100 m long and about 80 m across at its widest point. The site is bounded by residential properties to the north, the Illawarra Railway line to the east, unformed Myrtle Street to the south and unformed River Street to the west.

The site was once a bowling club comprising a single storey brick club building with a basement garage located on the eastern side of the site, two greens on the northern section, a timber and metal shed opposite the club on the western side and open flat ground, used for car parking on the remaining area. The club and bowling greens have not been used for some time and the building is boarded up and weeds growing on the greens.

There is currently bushland to the south and west of the site and the natural slope is generally to the south west. A creek runs approximately north south through the bushland to the west of the site. The site has been filled on the southern and western parts of the site resulting in open flat ground. At the edges of the filling, there are embankments up to about 6 m to 8 m high. Timber crib retaining walls, in various states of repair, have been used to support the embankments.

The bowling greens on the northern section of the site are elevated above the natural level and step down the slope with a difference in levels of approximately 3 m to 4 m between the greens. The greens are located on filling and are supported by sandstone block retaining walls.

2.2 Geology

Reference to the Sydney 1:100000 Geological Series Sheet indicates that the site is underlain by Hawkesbury Sandstone, which typically comprises medium to coarse grained quartz sandstone.

3. SITE OBSERVATIONS

Sandstone bedrock is exposed on the large flat area in front of the club house and under the shed on the western side of the site. Sandstone bedrock is also present behind the club house. See Photos 1, 2 and 3 in Appendix B.

The sandstone block retaining walls, up to about 4 m height, supporting the greens have many cracks in the mortar and show signs of minor movement. No bulging of the walls was obvious. See Photos 4 and 5.

The bowling greens have been built on filling and there is evidence of the filling settling, especially in the area between the actual greens and the retaining walls where the seats are located. Seats in the area have been adjusted by up to the order of 100 mm. See Photos 6 and 7.

The club house is in relatively good condition as it is probably founded on rock. See Photo 8.

In the southern western corner of the site, the timber crib walls supporting the embankments are in poor condition with many incidences of collapses, washing out of fines and rotting timber. See Photos 9 and 10. Also observed on the embankments was unsuitable material including pipes, large pieces of rock and concrete, steel pieces, plastic and rubbish.

4. GEOLOGICAL MODEL

Based on site observations only, it is expected that, after demolition of the club house and greens, sandstone bedrock will be close to the surface in the north-eastern half of the site. On the south-western part of the site, the level of sandstone is then expected to dip to the south-west with filling and possibly some residual soil overlying rock.

The exposed sandstone on site is generally medium strength or better. Where the sandstone is buried below residual soil, the rock strength at the surface may vary from extremely low to low, but would be expected to increase in strength with depth.

The filling, as observed in the embankments, is considered to be uncontrolled.

5. COMMENTS

5.1 Proposed Development

It is understood that Hurstville City Council propose to redevelop the site and various options are being considered for the site but planning is only at the conceptual stage. No details are available of any proposed buildings, layout or levels. One of the options being considered is an aged care facility.

It is assumed that the initial stage of redevelopment would be demolition of the club house and removal of the bowling greens.

The comments below are of a general nature only. They should be reviewed when detailed design is being formulated. At this stage, further investigation involving preferably bores are likely to be necessary. The extent of additional work will depend on development details.

5.2 Site Preparation

Following the demolition of the club building and the bowling greens, it is expected that rock will be close to the surface over much of the north-eastern half of the site. Excavation below the surface could involve the removal of medium strength or better sandstone requiring the use of medium size excavators, heavy hydraulic rock breakers and large dozers with rippers. Service trenches may have to be excavated into bedrock.

The sandstone bedrock would provide a suitable bench on which filling could be placed to construct level benches.

There appears to be a significant amount of filling, whose depth is unknown, in the south-western half of the site. Further investigation would be required to check thickness and condition. It is unlikely that the filling could be considered "controlled filling". In its present condition, the filling is considered to be unsuitable for the support of structural loads and ground slabs.

The variable compaction within the existing filling could give rise to differential settlements, even though the filling has been in place for some time, unless some form of treatment is adopted. It is very difficult to estimate the extent of settlement which may take place, nevertheless it is contrary to standard engineering practice to build on variable compacted uncontrolled filling.

The options for the support of structural loads, slabs and pavements therefore should include either support on reworked filling or on natural material below the filling. Further details can be provided on possible treatment of the filling following geotechnical investigation of the site.

5.3 Embankments

The embankments in the south-western corners of the site are in a poor condition. It is considered that the embankments and any retaining walls should be totally rebuilt as they cannot be relied upon to provide support for a development at the top of the embankments.

This would involve removal of any remaining retaining walls and the material for some distance behind the faces and could be undertaken in conjunction with the reworking of the uncontrolled filling on the site. There was plenty of unsuitable material exposed in the embankment which should not be reused in the reconstruction of the embankment.

Investigation would be required to assess the ground conditions for new retaining wall foundations. New filling should be placed in horizontal layers and compacted.

If batters are to be adopted instead of retaining walls, a stability assessment would be required to determine a suitable slope for the site conditions. It is expected that stable permanent slopes would probably be in the order of 2H:1V to 3H:1V.

5.4 Foundations

The foundation systems suitable for the site will depend on the type of development, the loadings and the layout of the site.

It is expected that rock would be close to the surface over the north-eastern half the site. In these cases, shallow footings on rock could be adopted.

In areas of controlled filling, shallow footings for relatively light loads may be suitable. Heavier loads should be taken to rock and would probably comprise bored piers, or similar.

5.5 Further Investigation

For detailed design purposes, further investigation involving test bores including coring of the underlying rock is recommended to better define the thickness and quality of filling over the site and also to establish allowable bearing pressures for foundations. In addition, sampling and laboratory testing of the subgrade should be carried out for pavement design.

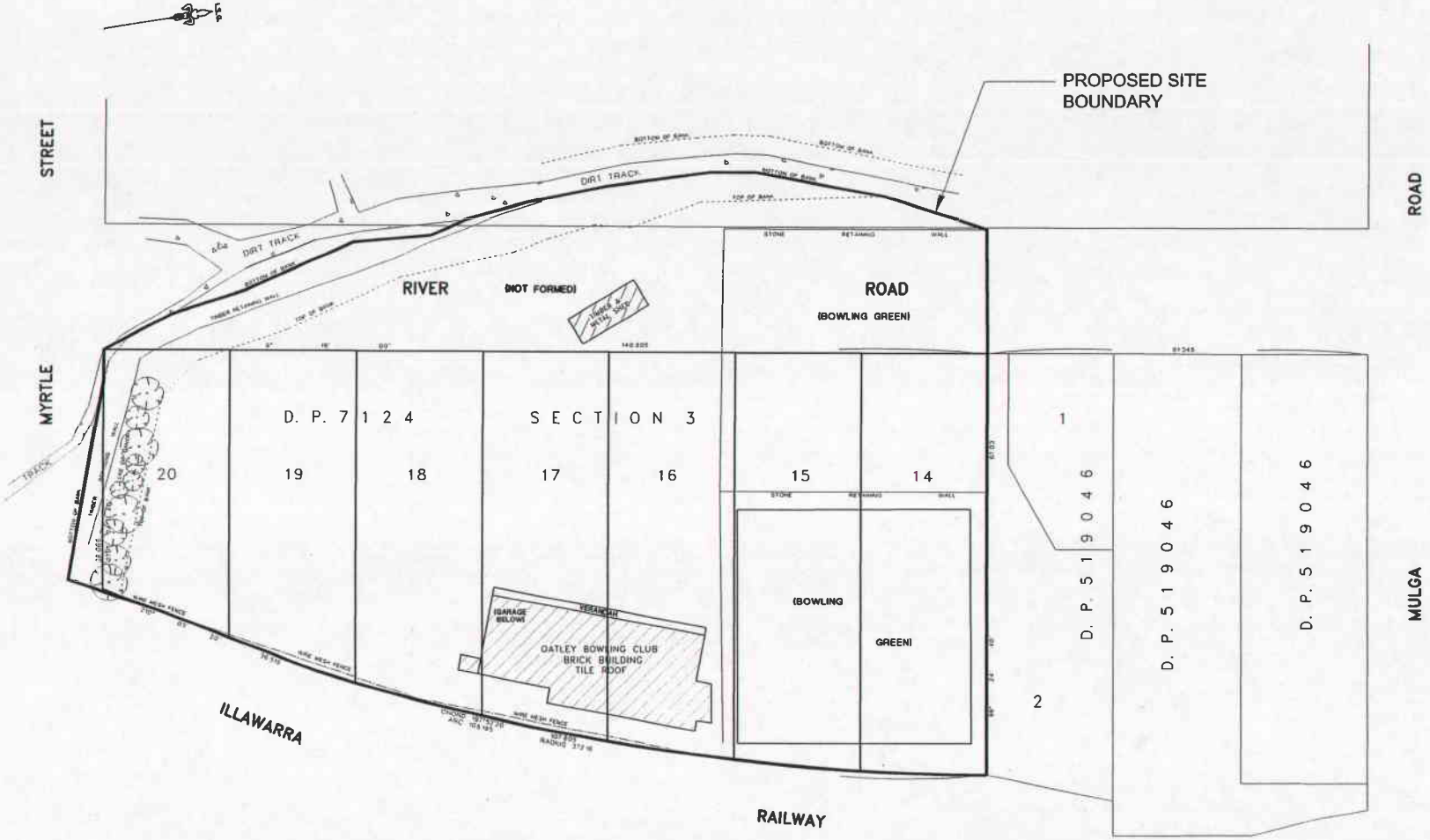
DOUGLAS PARTNERS PTY LTD

Reviewed by

Geoff Young
Principal

Dr Terry Wiesner
Principal

APPENDIX A
Notes Relating to this Report Drawing



ANGLICAN RETIREMENT VILLAGES

OATLEY BOWLING CLUB

PROPOSED SITE BOUNDARY

8th DEC 2006

SCALE 1:500 @A2

N R P ARCHITECTURE

DWG: SK-01

APPENDIX B
Photographic Plates

PHOTO 1: Exposed rock in front of club house

PHOTO 2: Exposed rock under shed

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PHOTO 3: Exposed rock behind club house

PHOTO 4: Retaining wall between greens

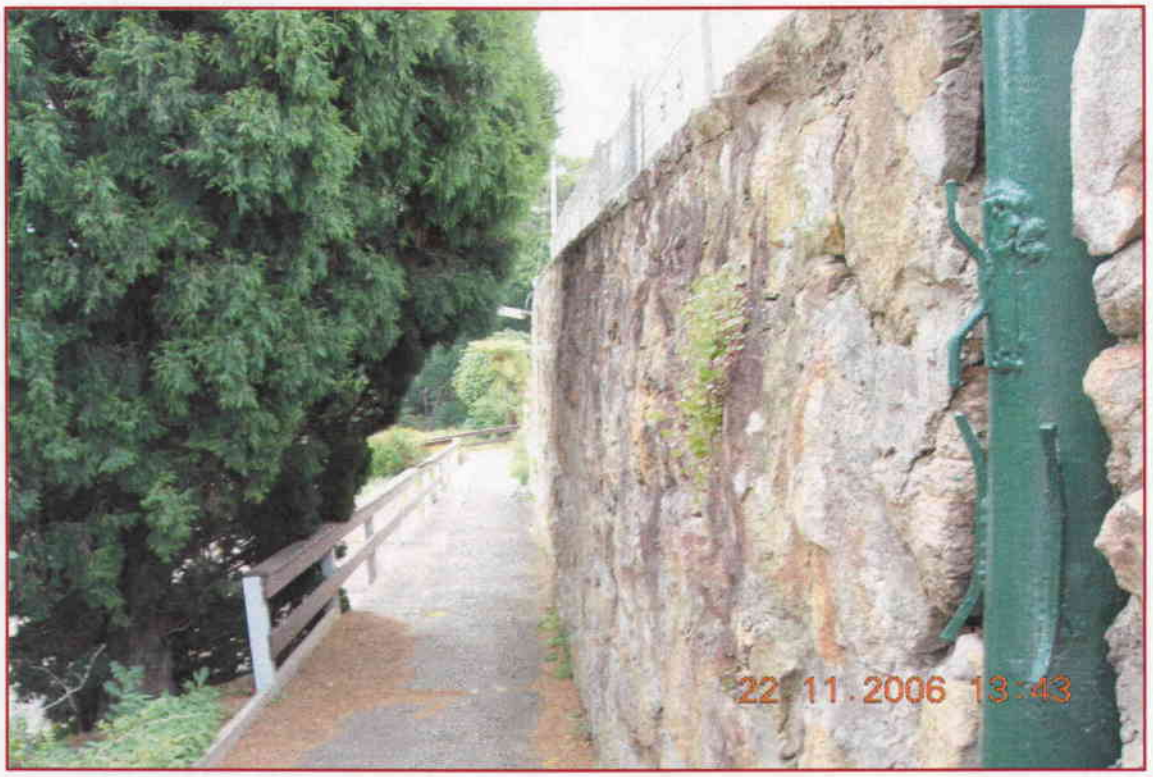

PHOTO 5: Retaining wall supporting lower green

PHOTO 6: Settlement of filling

PHOTO 7: Leaning seat indicating settlement

PHOTO 8: The Club House

PHOTO 9: Timber crib wall

PHOTO 10: Failed crib wall