

# Jeffery and Katauskas Pty Ltd

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29 July 2011  
Ref: 24990SPlet2rev1

Bluestone Capital Ventures No.1 Pty Ltd  
C/- Parkview Group  
PO Box R1779R  
ROYAL EXCHANGE NSW 1225

ATTENTION: Mr Matt Crews

Dear Sirs

**GEOTECHNICAL SUMMARY REPORT**  
**CRONULLA SHARKS REDEVELOPMENT**  
**461 CAPTAIN COOK DRIVE, WOOLLOOWARE, NSW**

This letter presents a summary of our previous geotechnical report Reference 17119SPrpt dated 27 September 2002 which compiled the subsurface information from many previous investigations within the site spanning from the Western car park and field area (to the west of the existing Toyota Stadium) to the eastern side of the carpark to the east of the existing Rugby League Club. The original report is attached, together with a later report for the new southern grandstand (Reference 20345SPrpt2 dated 14 November 2006).

We understand that the proposed re-development is likely to include a high density residential development, perhaps of 14 levels to the west of Toyota Stadium, and a new neighbourhood retail centre, medical and leisure facilities to the east of the Cronulla Sutherland Leagues Club building. Further, we have been advised that the current plan is to avoid any significant excavation such that the lowest developments levels will be close to the existing surface levels.



**Principals:** L J Speechley BE(Hons) MEngSc; P Stubbs BSc(Eng) MICE FGS; D Trewick DipTech; B F Walker BE DIC MSc. **Senior Associates:** D J Bliss BE(Hons) MEngSc; A L Jackaman BE MEngSc; A J Kingswell BSc(Hons) MSc; P D Roberts BSc MSc; F A Vega BSc(Eng) GDE; P C Wright BE(Hons) MEngSc; A Zenon BSc(Eng) GDE. **Associates:** A J Hulskamp BE(Hons) MEngSc; W Theunissen BE MEngSc; A B Walker BE(Hons) MEngSc. **Principal Consultant:** R P Jeffery BE DIC MSc.





### **Site Descriptions**

The site is located to the north of Captain Cook Drive, Woollooware and is generally flat with a slight slope (less than 1°) down to the north. The regional topography falls gently toward the bay to the north apart from the golf course to the south of Captain Cook Drive that is generally at a lower level than the site.

The existing multi-storey Cronulla Sutherland Leagues Club, main field and grandstands are located within the central section of the site, with the western lands playing fields to the west and the club carpark to the east.

A drainage channel crosses the site from south to north at the western side of the existing stadium.

There are vacant land and mangrove swamps to the east of the site. Captain Cook Drive and then Woollooware Golf Course are to the south. Solander Playing Fields lie to the west, beyond which is industrial land. An easement for transmission lines lies to the north adjoining Woollooware Bay.

### **Subsurface Conditions**

In general terms, the previous investigations at the site have disclosed poorly compacted fill over soft and very soft bay deposits of organic silty clays over stiff to very stiff clayey soils and medium dense to very dense sandy soils. Sandstone or inferred sandstone bedrock was encountered at depths ranging from 7.7m to 20.6m.

Groundwater was encountered at depths between 0.4m and 3.8m during previous investigations. No long term groundwater monitoring has been undertaken during any of the investigations.



### **Comments and Recommendations**

There are several difficulties associated with the development at this site. These include:

- The deep poorly compacted fill and organic clays which will result in the need for deep piled footings to extend to the sandstone bedrock which is at considerable depth;
- The presence of obstructions and voids in the fill resulting in difficult piling conditions and the use of excess grout in auger grout injected piles;
- The very soft and soft organic clay layer will undergo additional consolidation settlements if additional load is placed above this layer;
- The deep, poorly compacted fill offers poor trafficability and is a poor pavement subgrade, and may result in reduced long term performance of pavements;
- The high groundwater which will make earthworks such as replacement of fill, proof rolling and additional fill compaction difficult;
- Methane has been encountered during previous investigations and this will require the adoption of a methane drainage blanket and extraction system below proposed structures and pavements. Other gases often found with methane are corrosive and hence copper pipes would not be recommended for underground services; and
- The organic clays were found during the recent investigation by EIS to have an acid sulphate generation potential.

Although the above are potential problems for the construction of the proposed development at the site, the construction nevertheless appears quite feasible. These difficulties on the site can be overcome if good planning, design and construction techniques are used.

### **Further Geotechnical Input**

It will be necessary for there to be significant additional geotechnical input at later stages in this development. When further details of the building locations and proposed column loads are available, it will be necessary to drill additional cored boreholes to obtain better information on the depth to, and the quality of, the bedrock. Following the completion of



these additional investigations, it will be necessary for detailed geotechnical reports to be prepared with recommendations to address the issues raised above. The scope of such works will be dependant upon the size and location of proposed buildings, as well as the degree of economic risk the parties are willing to accept during the construction period.

### **General Comments**

This report has been prepared for the particular project described and no responsibility is accepted for the use of any part of this report in any other context or for any other purpose. Copyright in this report is the property of Jeffery and Katauskas Pty Ltd. We have used a degree of care, skill and diligence normally exercised by consulting engineers in similar circumstances and locality. No other warranty expressed or implied is made or intended.

Should you require any further information regarding the above please do not hesitate to contact the undersigned.

Yours faithfully  
For and on behalf of  
JEFFERY AND KATAUSKAS PTY LTD

P Wright  
Senior Associate

Reviewed by:

P Stubbs  
Principal.