

Our Ref: NA80813347 L001 Sandrick Project Directions Planning Report:KL

Miscellaneous Reference:KL

Contact Kevin Leedow

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Cardno (NSW/ACT) Pty Ltd
ABN 95 001 145 035

St Catherine's School Waverley
c/- Sandrick Project Directions
Suite 412 Nexus Norwest
4 Columbia Court,
Norwest Business Park
Baulkham Hills NSW 2153

Level 9
The Forum
203 Pacific Highway
St Leonards NSW 2065
Australia

Phone: 61 2 9496 7700
Fax: 61 2 9499 3902

www.cardno.com.au

Dear Sir,

ST CATHERINE'S SCHOOL
26 ALBION STREET WAVERLEY
RESEARCH PERFORMING ARTS AQUATIC CENTRE (RPAC) PROJECT
DIRECTOR GENERAL'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS

The Director General's Environmental Assessment Requirements nominates a structural report for the development.

Site topography and other site considerations

The site slopes from north to south over about 120 metres in length with a fall of about 16 metres to the Macpherson Street level to the south. The school site is elevated about 3 metres above the street level at the south and rises in a series of terraces to the north.

The eastern side of the development area of the site has a residential development (No. 4 Macpherson Street) with the lowest floor level matching with or less than 1.5 metres below the existing ground level. The lowest level of the residential development to the east adjacent to Leichhardt Lane is 3.5 metres below the lane.

There is a substation (sub no. 184) located to the eastern end of the development area which is at the street level of Leichhardt Lane.

Proposed Development

The development issues affecting the structural considerations of the development are as follows:

1. The basement level is 2 to 3.2 metres below street level. This will require excavation from 5 to 12 metres.
2. The pool level will require 8 metres of excavation for the northern section of the development. The pool level abuts the existing Jo Karaolis Sports Centre (JKSC) and will be about 4.5 metres below the sports centre.

3. The Research Centre will be partly located over the JKSC and will require loads to be transferred to the footings adjacent to the JKSC.

Geotechnical Considerations

A geotechnical investigation and report was carried out by JK Geotechnics in November 2013 (Report 26904ZRppt). Previous investigations have been carried out by the same firm since 1990.

The existing site consists of:

1. Poorly compacted sandy fill from 0.3 metres to 1.1 metres.
2. Loose to medium dense (at 2 metres depth) natural sands.
3. Weathered sandstone bedrock at depths between 2.4 and 5.2 metres below existing ground. The sandstone was extremely weathered and very low strength Class V increasing to weathered and medium strength Class III sandstone at depths of 7 to 9 metres.
4. An igneous dyke intrusion exists within the sandstone bedrock. The dyke runs west north west almost at the south east corner of the site and traverses the subject development site in the south west corner at Macpherson Street. The dyke consists of residual silty clay derived from weathering of dolerite/basalt bedrock which forms the dyke. The dyke ranges between 1 and 5 metres wide.
5. Ground water was encountered and is associated with seepage within the sands or the weathered dyke material.

The geotechnical conditions will require:

- Basement excavation in sands and then 1 to 8 metres of excavation in rock.
- Pool hall excavation in sands and then 3.5 to 8 metres in rock.
- The JKSC is excavated into rock to a depth of 4 metres. The proposed excavation adjacent to the JKSC will be in rock well below the lowest JKSC level.
- Continuous shoring in the deep upper level sands
- Bridging of footings over the dyke.
- Dewatering and measures to address the ground water drainage.

The temporary and permanent shoring is the major issue for this site and a variety of methods can be used to enable support for the residential development to the east, Leichhardt Lane and the substation to the east and adjacent school buildings and the magnolia tree. These measures are described in the geotechnical report and are standard shoring systems for a site of this type.

Support of the exposed rock face is a minor issue for the site and is again addressed in the geotechnical report. Lateral restraint can be provided to the rock mass with starters bars drilled and grouted 0.5 metres into the rock.

Structural Considerations

The design of the structural elements for the above project shall conform to the relevant SAA Codes, in particular the following:

AS 1170	Structural Design Actions
	Part 1 Permanent, Imposed and other Actions
	Part 2 Wind Actions
	Part 4 Earthquake Loads
AS 1720	Timber Structures
AS 2159	Piling Code
AS 2870	Residential Slabs and Footings
AS 3600	Concrete Structures
AS 3700	Masonry Structures
AS 4100	Steel Structures
DMR FORM 76	Pavement Thickness Design
Building Code of Australia	- Section B - Structure

The building structure will have the Fire Resistance Level as noted in the Building Code of Australia.

The geotechnical considerations require all footings to be founded in the underlying Class III or IV sandstone. This will be accommodated by either pad footings on rock or piers drilled to rock particularly around the existing developments where excavation is not required.

Yours faithfully



Kevin Leedow BE, MEngSc, FIE(Aust), NPER
Senior Principal NSW Building Structures
for **Cardno**