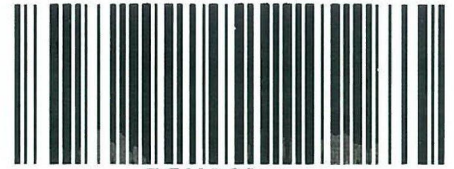


**WOOLF**  
**ASSOCIATES**  
**SOLICITORS**



Our ref: BSW:5508/11  
Your ref:

15 February 2012

Ms Natasha Harras  
Planner  
Department of Planning  
GPO Box 39  
SYDNEY NSW 2001  
*By email: natasha.harras@planning.nsw.gov.au*



Dear Ms Harras

RYDE MEDICAL CENTRE  
SUBMISSION TO DEPARTMENT OF PLANNING  
GRAYTHWAITE PROJECT PART 3A ENVIRONMENTAL ASSESSMENT  
APPLICATION NO. MP10\_0179

We act for Ryde Medical Centre. We refer to our earlier correspondence regarding the above. We note our arrangement that you would provide us with ten days notice before finalising your consideration of the above project. Mr Arthur from Health Infrastructure NSW has requested that we lodge any submission by Wednesday 15 February 2012. The following is submitted on behalf of Ryde Medical Centre( RMC).

RMC is immediately adjacent the project site to the west. The key issues for the RMC are:

1. Continued access both during construction and permanently while the RMC operates as a medical centre for egress over the hospital land from RMC and the retention of car spaces on the hospital land in pursuance of the long standing mutual cooperation between the hospital and RMC. We assert there is an agreement to this effect with the hospital. We understand that NSW Health Infrastructure do not accept the arrangement as contractual. However NSW Health Infrastructure have advised arrangements for continued egress access both during construction and then for the life of RMC and at least 12 parking spaces together with 2 further spaces which are mostly on RMC land but also partly on hospital land. There is a difference between RMC and NSW Health Infrastructure as to whether the long term position should be governed by a licence or an easement. We hope to resolve that issue directly with NSW Health Infrastructure.



2. The least interference with the operations of RMC during the construction of the project. In this regard our client has obtained reports from Renzo Tonin & Associates in relation to acoustic impacts. Our client has also obtained a report from Douglas Partners in relation to the proposal by the proponent for rock anchors extending into our client's property and in relation to geotechnical aspects including machinery and methods of construction. We enclose a copy of these reports. We have provided NSW Health Infrastructure with these reports. Our client requests that the recommendations of both of the consultants be incorporated into conditions of project approval. Our client requires the adoption of the recommendations in relation to the rock anchor proposal. Our client trusts that there will be satisfactory resolution of the formal grant of the long term parking/access issue. We submit the following matters for incorporation in the project approval arising from recommendations from the two consultants.
  
3. Adoption of conditions arising from recommendations of Renzo Tonin & Associates in report 13 January 2012.
  - 3.1 Re-issue of Acoustic Logic acoustic assessment based on current proposal prior to project approval
  
  - 3.2 The following requirements be imposed on the construction contractor:
    - a. Residential grade mufflers fitted to all diesel engine powered equipment.
  
    - b. Noise barrier be erected on the western side of the construction site to shield the Ryde Medical Centre. This noise barrier would need to be of significant height for it to be effective for the upper level of the Ryde Medical Centre.
  
    - c. Provide a work program showing durations of the various phases of work and give prior notification to the Medical Centre of the days when particularly noisy activities such as rock hammering or piling are to occur.
  
    - d. Provide a mobile phone number of the project manager on site so that if noise levels become an issue at any time, the Medical Centre can contact the project manager and request a change to the activities.
  
    - e. Locate static plant such as generators, concrete pumps and cranes away from the western site boundary and/or providing acoustic screens or enclosures around them.
  
  - 3.3 Adopt the recommendations in 4.3.2 of the Acoustic Logic report which include:
    - (a) Replacing high vibration activity such as rock hammering and pile driving with rock saws and bored piling where required.

- (b) Carry out a detailed vibration study prior to construction commencement which recommends suitable buffer distances or identifies equipment that should not be used also a copy of the study to be provided to Ryde Medical Centre.
- (c) Carry out a dilapidation study of Ryde Medical Centre prior to and post construction works at the cost of and by NSW Health Infrastructure with copy of each to be provided to Ryde Medical Centre.
- (d) Vibration monitoring to be conducted at commencement of excavation to ensure that vibration levels are below the required limits (the required limits to be specified). Results of vibration monitoring to be provided to Ryde Medical Centre.

#### 3.4 Operational phase of Graythwaite Rehabilitation Centre:

- (a) Generator room located adjacent to Ryde Medical Centre boundary (ground floor plan between gridlines A-B and 1-2 to be designed with appropriate wall constructions, acoustic doors and seals so that noise emissions do not exceed the set noise goals at the boundary (set noise goals to be defined).
- (b) Noise mitigation to be installed to the mechanical plant on the rooftop or install acoustic screens along the western side of the plant area.
- (c) Conduct a detailed review of mechanical plant noise emissions once plant selections on locations are finalised including in determination as to the height and extent of the proposed screens around the rooftop plant to ensure satisfactory acoustic control and to determine whether some of the louvred sections of the enclosure should be changed to screens.
- (d) Plant noise to be attenuated to meet satisfactory standards using standard acoustic treatment.

#### 3.5 Prepare a detailed construction noise and vibration management plan prior to commencement of construction to be approved by the Department and to be fully implemented by the construction contractor.

### 4. Rock Anchors and adoption of conditions arising from Douglas Partners recommendations in report 20 January 2012.

- (a) Clarification of the recommended earth pressure distribution for the design of the anchored shoring wall along the western boundary of the proposed GRC development. Douglas recommends this be based on a trapezoidal earth pressure distribution and a lateral earth pressure of  $8H(\text{kPa})$  for the soil and weathered shale, where  $H$  is the retained height in metres.



- (b) Clarification of the redirection of the drain on the northern side of the RMC building and the relocated sewer currently outside the eastern boundary of RMC.
- (c) Ryde Medical Centre to provide advice to NSW Health Infrastructure as to acceptable limits for medical equipment used by Ryde Medical Centre so that NSW Health Infrastructure can ensure works will be carried out so that the medical equipment will continue to function properly taking into account the vibrations generated by excavation works, pile augering and percussion drilling. At present the standard of 5mm/s for continuous vibration to be complied with.
- (d) Continuous quantitative ground vibration monitoring to be carried out during the construction works and in particular during the duration of the demolition, excavation and shoring works. The contractor to be responsible for keeping within these limits (limits to be specified) and should they be exceeded the methodology or equipment used should change accordingly.
- (e) Subject to payment of RMC consultant fees, RMC grant permission to GRC to install anchors beneath its property subject to:
  - (i) Following completion of the permanent works evidence be provided to RMC confirming that all installed anchors have been de-stressed and all physical connection between the anchor and shoring wall have been removed.
  - (ii) NSW Health Infrastructure provide a warranty confirming that all redundant anchors left in the ground will not adversely impact RMC or any future development RMC may wish to undertake or impact NSW Health Infrastructure, other structures or services should the anchors be excavated from within or outside of RMC's property boundary in the future.
  - (iii) Dilapidation survey to be undertaken prior to commencement of the construction works and to be provided to RMC. Second dilapidation survey to be carried out 2 months after all construction works are completed and to be provided to RMC.
  - (iv) NSW Health Infrastructure to provide RMC a financial bond against any damage that may result from the construction works or any other activity by the proponent on either its site or on the RMC site. That NSW Health Infrastructure indemnifies and keeps indemnified RMC from and against any damage or injury or liability that arises from the installation of the rock anchors and any other activity by the proponent on either its site or on the RMC site.

Yours faithfully





T605-01F02 (Rev 0) Acoustic Advice

13 January 2012

Bruce Woolf

Woolf Associates Solicitors

Level 10, 82 Elizabeth Street  
Sydney NSW 2000

Dear Bruce

**RE: RYDE MEDICAL CENTRE & GRAYTHWAITE REHABILITATION PROJECT –  
ACOUSTIC ADVICE**

**1 Background**

Adjacent to the Ryde Medical Centre at Cnr. Fourth Avenue and Ryedale Road, Eastwood, NSW Health Infrastructure is the proponent for a Part 3A project to build a rehabilitation centre known as Graythwaite Rehabilitation Centre.

The Environmental Assessment for the project is currently on exhibition and Renzo Tonin & Associates has been engaged by Ryde Medical Centre to review documents and drawings, and provide acoustic advice on the potential impacts from both the construction and operation of the proposed rehabilitation centre.

In particular, Renzo Tonin & Associates was requested to:

1. Review the acoustic consultant's (Acoustic Logic) report in the Environmental Assessment together with detail of the proposed construction as known to date and to advise of any matters which might be included in a submission to the Department of Planning on the Environmental Assessment to assist in ensuring a benign outcome in terms of noise impact of the construction of the project on the operation of the Ryde Medical Centre;
2. To consider the plans as known to date in terms of location of mechanical equipment and/or to suggest matters in this regard in terms of the long term effect of noise from the proposed plant of the facility on the medical centre.



We also understand that although the time for making a submission has expired, NSW Health Infrastructure supports an extension of time to lodge a submission. The Department of Planning has advised that it would not be likely to complete its assessment of the project until February 2012.

## **2 Peer Review of Part 3A Acoustic Report**

Acoustic Logic prepared a Part 3A Acoustic Assessment for the Graythwaite Rehabilitation Centre (Ref: 20110406.1/1605A/R3/YK) dated 16 May 2011).

Following a peer review of the assessment report, the following comments are provided:

- Section 2 of the report presents a map (Figure 1) showing the outline of the proposed Rehabilitation Centre. However the outline is of a much smaller area than the development area shown on the Part 3A drawings by Nettleton Tribe. The acoustic assessment also predates the latest revision of the drawings. If the full area of the development site or the latest revisions of the drawings have not been taken into account then the acoustic assessment should be reissued based on the current proposal.
- Section 3 of the report presents measured background noise monitoring data used as the basis for the assessment. These results seem reasonable and consistent with typical noise levels in a suburban area of this type.
- Section 4 presents a construction noise and vibration assessment. The guidelines and standards used for the assessment are correct. Section 4.3.1 presents potential noise impacts to nearby receivers. We note that although Ryde Hospital and residences across Furth Avenue are listed as receivers, the Ryde Medical Centre is not listed and has not been specifically assessed. The report indicates potential construction noise levels of 55-65dBA within the hospital (we assume this means internally) and we expect similar noise levels inside the Ryde Medical Centre when excavators, rock hammers and piling works are being undertaken.

An internal noise level of 65dBA significantly exceeds the 45dBA internal noise goal stated in the report. 65dBA inside the Ryde Medical Centre would also significantly compromise the quiet nature of medical consulting rooms and likely interfere with doctor to patient conversations. We clarify that a noise level of 65dBA internally would probably only be realised for rooms that face directly onto the worksite. Internal areas on the west side of the Ryde Medical Centre would be less affected. These high noise levels would also be limited to the bulk excavation stage of the construction. Once the excavation and base building works are completed, noise from the internal fitout stage of the works would be less.



- At a minimum we would suggest that Ryde Medical Centre request the following requirements to be imposed on the construction contractor:
  - Residential grade mufflers fitted to all diesel engine powered equipment.
  - A noise barrier to be erected on the west side of the construction site to shield the Ryde Medical Centre. This noise barrier would need to be of significant height to for it to be effective for the upper level of the Ryde Medical Centre.
  - Provide a work program showing durations of the various phases of work and give prior notification to the Medical Centre of the days when particularly noisy activities such as rock hammering or piling are to occur.
  - Provide a mobile phone number of the project manager on site so that if noise levels become an issue at any time, the Medical Centre can contact the project manager and request a change to the activities.
  - Locate static plant such as generators, concrete pumps and cranes away from the western site boundary and/or providing acoustic screens or enclosures around them.
- Section 4.3.2 of the report presents potential vibration impacts. We agree with the recommendations which include replacing high vibration activities such as rock hammering and pile driving with rock saws and bored piling where required. A detailed vibration study should be carried out prior to construction commencement which recommends suitable buffer distances or identifies equipment that should not be used. A dilapidation study of the Ryde Medical Centre should be requested prior to and post construction works so that any deterioration of the building due to the works can be quantified. Vibration monitoring conducted at the commencement of excavation should be used to confirm that vibration levels are below the required limits.
- Section 5 of the report is a traffic noise assessment. We concur with the general conclusions about traffic noise and do not expect traffic to the new rehabilitation centre to cause any significant noise impacts to Ryde Medical Centre.
- Section 6 of the report is an operational noise assessment which should address noise from operation of the completed rehabilitation facility, such as noise from mechanical plant. Although this section does set operation noise goals, the report does not present any noise predictions which the author indicates is due to a lack of information available at the time of writing. This is probably reasonable as it is rare for mechanical plant to be selected at the early DA stage of a project. Based on the project drawings we make the following comments:



- There is a generator room located adjacent to the Ryde Medical Centre boundary (ground floor plan between gridlines A-B and 1-2). Depending on their purpose generators can operate either all the time, or only during power outages. Depending on their size they can often be among the noisiest item of plant on a site. Therefore this generator room will need to be carefully designed with appropriate wall constructions, acoustic doors and seals so that noise emissions do not exceed the set noise goals at the boundary.
- There are mechanical plant areas on the rooftop of the proposed rehabilitation centre, and concentrated to the west side of the site close to the Ryde Medical Centre. Due to the close proximity of the plant to the boundary, we expect some noise mitigation might be required as part of the installation. Since the location of rooftop plant is slightly higher than the Ryde Medical Centre, acoustic screens along the west side of the plant area would probably work well in this case and screens seem to already have been included on the drawings.
- A detailed review of mechanical plant noise emissions should be conducted once plant selections and locations are finalised. This review should determine whether the height and extent of the proposed screens around the rooftop plant are satisfactory, or whether some of the louvered sections of the enclosures should be changed to screens.
- We concur with the conclusion of Section 6.2 that plant noise could be satisfactorily attenuated using standard acoustic treatments.

In summary, we advise that construction phase noise and vibration has the potential to impact the operation and use of the Ryde Medical Centre due to the high noise and vibration levels that may be emitted, particularly during the excavation works. Significant noise mitigation may be required so that consulting rooms within the Ryde Medical Centre are not adversely affected.

Vibration during the construction phase will also need to be carefully considered and construction methods carefully selected so that the human comfort vibration limits are not exceeded and structural damage does not occur. A detailed construction noise and vibration management plan is essential for this project due to the close proximity of other medical buildings, and should be fully implemented by the construction contractor.

Mechanical plant noise is also a potential impact however it should be able to be fairly readily controlled if a thorough detailed design assessment is conducted and the appropriate noise mitigation measures are installed.

Yours faithfully,



**RENZO TONIN & ASSOCIATES (NSW) PTY LTD**

Michael Gange

*Senior Engineer*

*Environmental Acoustics Team*



**Ryde Medical Centre**  
**Suite 13, 247 Ryedale Road**  
**Eastwood NSW 2122**

Project 72801.00  
Date 20/01/2012  
DF

Attention: Mrs. Robyn Deloughery

Email: rdeloughery1@bigpond.com

Dear Sirs

**Geotechnical Review**  
**Ryde Medical Centre, Eastwood and Graythwaite Rehabilitation Centre, Denistone**

## 1. Introduction

Douglas Partners was engaged by Ryde Medical Centre (RMC) to provide geotechnical advice in relation to the proposed excavation by Graythwaite Rehabilitation Centre (GRC) along the common boundary between the two properties. The advice sought includes:

- The proposal for rock anchors and on any conditions or matters which should be sought by the client should they agree to the placement of anchors; and
- The Jeffery and Katauskas geotechnical reports and advise on any further matters which may impact on Ryde Medical Centre and which should be advised to the Department of Planning.

This report focuses on the geotechnical elements associated with the proposed excavation and shoring wall along the boundary.

## 2. Site Description

A visual walkover of the site was undertaken by DP on 13-01-2012. RMC is bounded by Rydale Road to the west, Fourth Avenue to the north and Ryde Hospital to the south and west. RMC is located on the north side of an east west trending ridge. There is a fall across the site from south to north of approximately  $\approx 2.75$  m (gradient of  $\approx 9$  degrees or 1V:6.5H). The eastern boundary of RMC is currently occupied by an asphalt concrete car park. The condition of the asphalt concrete is generally moderate to poor displaying a number of cracks. Beneath the car park there is a sewer main which is aligned approximately north to south. Between the car park and the main RMC building there is a grass verge with a number of mature trees. A surface water drain leads from the north side of the RMC building across the car park and into the site of the proposed GRC. The main RMC building comprises a 3 storey brick building constructed on concrete piers and appears to be in good condition. The building has been constructed at ground level at its southern end, and moving toward the north the building then extends out over ground level car parking from its midway point (See Figure 1).

### 3. Ground Conditions

Based on Jeffrey and Katauskas Pty (J&K) Geotechnical Reports dated 21 March 2011 and 21 October 2011 (Refs. 24595ZArpt and 24595ZArpt2), two boreholes, JK4 and JK7, were drilled along the adjoining boundary with RMC. The general ground profile is described as follows:

Depth	Description
0 – 0.04 m	<b>Asphalt Concrete</b>
0.04 – 0.2 m	<b>Fill:</b> sand, fine to medium grained yellow brown, with fine to medium grained sandstone gravel;
0.2 – 1.1 m	<b>Silty Clay:</b> Stiff (SPT N = 13), high plasticity, red brown with traces of fine to medium grained ironstone gravel;
>1.1 m	<b>Shale:</b> Low to very low strength, distinctly weathered, light grey and red brown, with clay seams and medium strength bands. Extremely weathered, extremely low strength, orange brown and grey shale is described in borehole JK7 below 9.2 m depth

A standpipe was installed in JK4 and groundwater was measured at 4.4 m depth, which corresponds to RL 88.1 m (AHD).

### 4. Proposed Development

It is understood that the proposed Graythwaite Rehabilitation Centre (GRC) will be constructed along the eastern boundary of Ryde Medical Centre. The proposed development will consist of 3 levels above ground and a single level of basement car parking below existing ground level. To accommodate the basement car parking it is understood excavations of up to a 5.7 m deep will be required at the southern end and reducing to 3.85 m at the northern end.

Nettleton's drawing 3717\_SK134 indicates that the side walls of RMC and the proposed GRC buildings will not be aligned parallel to one another. Instead the side walls of the buildings will be offset from each other by 9.5 m at the northern end and 7.95 m at the southern end. However, the proposed GRC shoring wall will be aligned parallel to the RMC building. The shoring wall is shown to be offset from the main RMC building by approximately 8.2 m at the southern and northern ends. The shoring wall will however be within approximately 3 m of the RMC property boundary at the southern end and 3.8 m at the northern end.

The proposed shoring wall 6 (SW6, Taylor Thomas Whitting (TTW), Drawing S1102) will be constructed partly as a contiguous pile wall and partly as a soldier pile wall with in-filled shotcrete panels. The piles are shown to be embedded by 5000 mm and secured with temporary ground anchors (Type TA3). The sewer main which currently runs along this boundary will need to be relocated to accommodate the new wall.



Details of the final design and layout of these anchors has not been fully developed at this, the planning stage. However, it has been indicated that the anchors are to be installed through each pile at approximately RL 92.5 m and RL 91.5 m toward the southern and northern ends respectively. The anchors are proposed to be installed at 30° below horizontal and extend back into the ground by up to 13 m from the wall (5 m free length and 8 m bond length or 11.2 m horizontal length). This indicates the anchors will cross the site boundary by approximately 7 m at the northern end and 8 m at the southern end. Once the basement is constructed and the structure becomes self-supporting, the temporary anchors will then be redundant.

Where space permits, temporary cut batters are shown above the shoring wall and buttressing the site boundary with RMC. These are understood to be approximately 1.5 m high and graded at 45° (1V:1H) in accordance with J&K's recommendation (J&K report section 4.2.1). It is understood that these are temporary to allow access for the construction of floor slabs and side walls.

## 5. Comments

As the excavation proceeds, temporary anchors will be installed through the shoring wall. The anchors will grouted in place and extend under RMC's site boundary. The end of the anchors will extend as far as the main RMC building and beneath it by no more than 3 m (horizontal length) assuming a maximum anchor length of 13 m (inclined length) installed at 30° below horizontal. The end of the anchor will terminate at RL 86 and RL 85 at the south and north ends respectively. This will be approximately 8 m below existing ground level and anticipated to be approximately 5 m to 7 m below the existing RMC foundations assuming they are a maximum of 2 m deep. No engineering drawings have been provided to confirm this. However the supplied Specification, Ryde medical Centre, 247-249 Rydale Road, Eastwood for Janiculum Pty Ltd, dated 19-2-1982 indicates on page 8 that the building is constructed on footings to a maximum depth of 1.5 m below what was existing ground level. The basement car parking to the northern side of the building is also believed to have been constructed on similar footings.

Once the shoring wall becomes an integrated part of the main Graythwaite structure and therefore self-supporting, the anchors will become redundant. The anchors cables will remain in the ground however it is important that each anchor is de-stressed and any physical connection between the anchor and the shoring wall is removed (i.e. anchor plate and nut). This will allow the anchors to be removed without affecting RMC or GRC structures should RMC ever wish to excavate the ground where these anchors are to be installed.

As requested, a review of the western boundary shoring wall (SW6) design was undertaken for GRC site (TTW Drawing S1102). It should be noted that the working loads shown on the Temporary Anchor Schedule on TTW's Drawing S1102, Rev A appear to be incorrect. It is thought that the working loads should be in the order of approximately 3 times the values shown. However, the current bond length of 8 m (as indicated by the untitled sketch supplied), should have sufficient capacity to cater for these higher loads.

Reference is made to Jeffrey and Katauskas Pty Geotechnical Reports dated 21 March 2011 and 21 October 2011 (Refs. 24595ZArpt and 24595ZArpt2).



The following assumptions (based on the supplied anchor design and the above mentioned report) were made in the review:

- Maximum Face height  $\approx 5.7$  m
- Anchor angle =  $30^\circ$
- Bond length of 8 m taken from 1H:1V line from toe of excavation
- Bond strength of 150 kPa for very low strength shale is appropriate.
- Ultimate bearing capacity of 3000 kPa for extremely low strength shale is appropriate.
- Ultimate shaft adhesion of 100 kPa for compression piles in extremely low strength shale is appropriate.

The J&K report (Ref: 24595ZArpt2, page 17) does not specify a recommended earth pressure distribution for the design of the anchored shoring wall along the western boundary of the proposed GRC development. In this instance, DP would request that this be clarified and would recommend that it is based on a trapezoidal earth pressure distribution and a lateral earth pressure of  $8H$  (kPa) for the soil and weathered shale, where  $H$  is the retained height in metres. This is due to the sensitive nature of the RMC building and the presence of a sewer main within the retained material behind the wall.

The surface drain on the northern side of the RMC building currently extends into the site of the proposed GRC. This drain will need to be re-directed as part of the GRC development. Based on the documents provided it is unclear how or where this drain will be redirected to. Clarification of this should be sought. Similar clarification should be sought for the relocation of the sewer which currently runs just outside of the east boundary of RMC.

Based on a review of geotechnical parameters and design values as provided, Douglas Partners (DP) is in general agreement with the design of the anchors along the western boundary for shoring wall, SW6. DP recommends that RMC grant permission to GRC to install anchors beneath their property but may wish to grant it subject to the following considerations:

- Following completion of the permanent works it is recommended that evidence be provided to RMC confirming that all installed anchors have been destressed and all physical connections between the anchor and the shoring wall have been removed. Furthermore, GRC should provide a statement confirming that all redundant anchors left in the ground will not adversely impact RMC or any future development RMC may wish to undertake, or impact GRC, other structures or services should the anchors be excavated from within or outside of RMC's property boundary in the future.
- As recommended in the J&K report, a dilapidation survey should be undertaken prior to the commencement of the construction works. This will provide a record of any existing defects in existing walls and pavements. A second dilapidation survey should then be carried out 2 months after all construction works are complete. The two dilapidation reports will serve as benchmarks for assessing any claim for damage arising from the works.



- RMC may wish GRC to provide a financial bond against any damage that may result from the construction works.

Vibration and noise should be anticipated with any construction works. The level of vibration and noise felt by those surrounding the works will depend on the ground conditions, the method of construction, equipment used and distance from the source. The closest point of the excavation to the RMC building will be approximately 8 m, and typically the point at which the impact of the works will be most noticeable. J&K have indicated that the excavation of the basement within the shale bedrock is likely to require a Caterpillar D7 and/or larger excavators and may require hydraulic rock hammers where stronger materials are encountered. The anchors will typically be installed using percussion drilling. The anchor holes will extend from the excavation face to approximately 6 m depth below the foundation of the RMC building.

In order to reduce the potential for damage to neighbouring buildings, J&K have recommended relatively conservative peak particle velocity limits of 5 mm/s and 10 mm/s for continuous and intermittent vibrations respectively. Australian and international standards recommend the following limits in component peak particle velocities, which DP would extend to vector sum peak particle velocities for conservative vibration management:

3 mm/s	(> 10 Hz)	Human Comfort Limit - Night	(AS2670)
8 mm/s	(> 10 Hz)	Human Comfort Limit - Day	(AS2670)
3 - 10 mm/s	(0 – 100 Hz)	Sensitive Structures	(DIN4150)
5 – 20 mm/s	(0 – 100 Hz)	Residential Structures	(DIN4150)
20 - 50 mm/s	(0 – 100 Hz)	Commercial Structures	(DIN4150)

From our experience it is anticipated vibrations generated by excavation works, pile augering and percussion drilling can be kept within 5mm/s for continuous vibration. Therefore, DP feel that the J&K limits (relevant for human comfort in particular) are generally acceptable for such works. However, given the potential sensitivity of the medical equipment used by RMC, RMC should seek advice from the equipment suppliers and/or manufactures as to what are acceptable limits for such equipment. It may also be necessary to conduct a trial before excavation commences to verify that the medical equipment will still function properly with vibrations of 5 mm/s.

Generally, contractors will carry out a number of trials at the start of construction to tailor their equipment and construction methodology to the site conditions and vibration limits set. However, it is recommended that continuous quantitative ground vibration monitoring is carried out during the construction works and in particular for the duration of the demolition, excavation and shoring works. This should be requested as a condition of the planning consent. The contractor will be responsible for keeping within these limits and should they be exceeded, their methodology or equipment used should change accordingly. For example, where hydraulic rock hammers are used but are found to exceed the required limits, then rock saws may be used to reduce the impact of vibration and noise.



## 6. Limitations

Douglas Partners (DP) has prepared this report for this project at Ryde Medical Centre, Eastwood in accordance with DP's proposal SYD111232, dated 20/12/2011 and an acceptance received from Dr Michael Deloughery of Ryde Medical Centre. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Ryde Medical Centre 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, or by a third party.

The results provided in the report are considered to be indicative of the subsurface conditions on the site only to the depths investigated at the specific sampling or testing locations, and only at the time the work was carried out. DP's advice is based on observations, measurements, tests and interpretations. The accuracy of the advice provided by DP in this report may be limited by unobserved features and variations in ground conditions across the site in areas between test locations, across site boundaries or by variations in time. The advice may also be limited by restrictions in the sampling and testing which was able to be carried out, as well as the amount of data that could be collected given the project and site constraints. Actual ground conditions and materials behaviour observed or inferred at the test locations may differ from those which may be encountered elsewhere on the site. Should variations in subsurface conditions be encountered then additional advice should be sought from DP.

This report must be read in conjunction with the attached About this Report notes and any other attached explanatory notes and must 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 report or test data, which are not otherwise supported by an expressed statement, interpretation, outcome or conclusion stated in this report. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

We trust that these comments are sufficient for your present requirements. If further assistance is required, please do not hesitate to contact the undersigned.

Please contact either of the undersigned for clarification of the above as necessary.

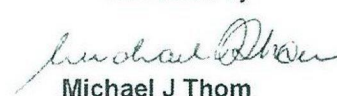
Yours faithfully

**Douglas Partners Pty Ltd**



**David Fleming**  
Senior Associate

Reviewed by



**Michael J Thom**  
Principal

Attachments:      Figure 1 - Location of Proposed Excavation/Shoring Wall to Ryde Medical Centre.  
                         Conditions of Engagement  
                         About This Report

cc:      Woolf Associates (Solicitors) – Attention: Mr Bruce Woolf  
            Email: woolf@zipworld.com.au





Figure 1: Location of Proposed Excavation/Shoring Wall to Ryde Medical Centre. (Measurements are approximate and based on Drawing 3717\_SK134)



## CONDITIONS OF ENGAGEMENT

These conditions of engagement apply to services carried out by the Company and with the Proposal, constitute the terms of an agreement between the Company and the Client. Review and acceptance of other conditions of engagement may be subject to payment of additional fees. Unless agreed in writing, these conditions shall apply to the exclusion of any inconsistent provision which may appear on any order form or other document issued by the Client. The Proposal and these conditions of engagement shall apply to any variations which may be agreed or ordered in the scope of the work and to any supplementary work on the project which may be the subject of verbal agreement.

### 1. Definitions. In these conditions of engagement:

'Company' means Douglas Partners Pty Limited (ABN 75 053 980 117).

'Client' means the person to whom the Company provides services and who is ultimately responsible for payment. The Client may be represented by an Agent (e.g. Consulting Engineer, Architect, Solicitor etc.) who acts with his authority and arranges for or directs the services on his behalf.

'Proposal' means the Company's written offer to provide consulting or other services which accompanies these conditions.

'Services' means the services to be provided by the Company to the Client, as detailed in the Proposal.

Words importing the singular include the plural, and vice versa. Words importing any gender include the other gender.

### 2. Role of the Company. The Company will exercise reasonable skill, care and diligence in providing the Services in accordance with standards ordinarily exercised by members of the profession in the same locality under similar conditions.

The Company may appoint sub-consultants, sub-contractors or agents to perform any part of the Services.

### 3. Role of the Client. The Client (or Agent) must provide to the Company (where relevant):

- written acceptance of the Proposal.
- approvals for access, name of site contact, and keys.
- survey plans and data regarding underground services.
- other information relevant to the brief, e.g. details of proposed construction, loadings, construction levels and cross-section drawings.
- any relevant information available regarding the presence on site of hazardous substances or any prior site usage which may have led to site contamination.

The Company is entitled to rely on information supplied by the Client for the purposes of providing the Services except where such information is in the reasonable professional opinion of the Company likely to be unreliable, outdated, inadequate, incomplete or inaccurate. The Company may suspend the provision of the Services if the Company is unable to obtain the information reasonably required to perform the Services provided written notice is given to the Client.

### 4. Role of Agent. If the Proposal is accepted by an Agent, the Agent warrants to the Company that he has the Client's authority to do so and accepts that he is personally liable for the Client's obligations under these conditions of engagement. If the person who accepts the Proposal does not indicate in writing that he is an Agent at the time of acceptance, he is the Client and liable accordingly.

### 5. Fees. The Proposal indicates whether the Company will provide the Services for a lump sum or a fee calculated by a schedule of rates. If a schedule of rates, then the Company may in the Proposal give an estimate of the total cost.

The estimate of total cost and the lump sum are based on the Company's understanding of the required scope of work and its expectation of sub-surface conditions as detailed in the Proposal. Any statements regarding an expectation of sub-surface conditions

in the Proposal are provided for the purpose of providing a reasonable estimate of cost of Services and are not a professional opinion as to the site generally. The Company will endeavour to provide the Services within the estimate or sum provided.

If undisclosed or unexpected conditions are encountered then additional work not allowed for may be required. Under these circumstances the Company will endeavour to advise the Client and seek its approval before undertaking work which exceeds the estimate or sum.

If any activity is required which is outside the scope of the Proposal, the Company will charge for such additional work at the current standard hourly rates for personnel and equipment. Hire of outside services, if necessary, will be charged at cost plus 10% for procurement.

Unless otherwise stated Goods and Services Tax has not been included in either the rates or lump sum in our proposal and will be charged to the Client, when applicable.

The schedule of rates or lump sum in the Proposal is current for a period of three months from the date of the Proposal.

### 6. Terms of Payment. At the Company's election, invoices will be rendered monthly or on completion of the work and are due for payment in full within 30 days. The Company will charge interest at the rate of 1½% per month on any invoices unpaid after 30 days.

If the Client disputes any part of the invoice then payment of the undisputed portion must not be delayed and a written schedule of the items disputed given to the Company within 10 business days of receipt of the invoice.

### 7. Limitation of Liability. The Company's liability for a breach of section 74(1) of the Trade Practices Act (or any equivalent legislation) is limited at the Company's option to either providing those Services again, or refunding the price of that part of the Services in respect of which the breach occurred.

The Company's liability to the Client for loss or damage caused by a failure to exercise reasonable care is limited to the greater of either:

- \$500,000; or
- three times the fee actually paid by the Client to the Company for the services concerned (to a maximum of \$3,000,000); or
- any other amount agreed in writing between the Client and the Company, subject to payment of an additional fee contributing to the cost of the extra insurance cover.

In all cases of legal liability (whether under contract, in statute, tort or law), the Company's liability to the Client for any loss, damage, liability, expense or cost suffered arising from or in connection with the Company's provision of Services shall:

- be limited to the extent to which the Company's own negligent or wrongful acts, errors or omissions contributed to the loss, damage, liability, expense or cost suffered; and
- not exceed the amount paid under the Company's professional indemnity insurance policy.

The Company shall have no liability for:

- a claim where the Client acts contrary to the Company's written recommendation or purports to use the Services contrary to this agreement.



## CONDITIONS OF ENGAGEMENT (Cont'd)

- a claim unless such claim is notified in writing to the Company within 12 months of the completion of the provision of the Services.
- a claim involving consequential or economic loss or for loss relating to delay of the project.

**8. Copyright.** The Company retains copyright in all drawings, reports, specifications, calculations, computer disks, and other documents provided by the Company. The Company grants a royalty-free, non-exclusive licence to the Client to use this material in connection with the project for which it is prepared. The Client is not permitted to assign, transfer or convey this licence without the prior written consent of the Company.

If the Client is in breach of any obligation to make payment to the Company, the Company may revoke this licence and the Client shall cause to be returned to the Company all material in which such copyright subsists which is in its possession or otherwise destroy such material as directed by the Company.

The Client must not alter or amend any material produced by the Company and must acknowledge the Company's work in all material incorporated into other documents or reports or otherwise used in the public domain.

**9. Termination, Disputes and Governing Law.** This agreement may be terminated by either party if a party commits a substantial breach of its obligations and this is not remedied within fourteen (14) days of receipt of written notice requiring the breach to be remedied.

In the event of termination, the Company shall be paid for all services performed to the termination date plus reasonable termination expenses.

Any disputes between the Company and the Client, shall first be the subject of mediation. This provision shall not prevent the Company from instituting legal action at any time to recover moneys owing and the Client shall pay to the Company the costs and expenses (including mercantile agent's costs and legal costs) incurred by the Company in obtaining payment of any amount not paid by the due date.

The agreement between the Company and Client shall be governed by the laws of the State or Territory of the office in which the Proposal was prepared.

**10. Field Work.** The Company's fees allow for the establishment of equipment to carry out drilling, sampling and testing referred to in the Proposal. In providing the fee estimate and agreeing to conduct the Services, it is assumed that access is available for the equipment and that an adequate supply of water is available if required.

Standby rates will be applicable for delays associated with access, providing water, inclement weather, bogging of vehicles and equipment or any other delays not readily avoided.

The Client accepts responsibility for ensuring that the site is reasonably accessible and safe for the Company and its personnel, sub-consultants, sub-contractors and agents to conduct any field work required. The Company and its personnel, sub-consultants, sub-contractors and agents shall comply with any reasonable directions given by Client in respect of safety and access while on site. If reasonable and safe access to the site cannot be obtained, the Company may suspend the provision of Services for the period specified in a written notice given to the Client. Remobilisation and standby costs incurred as a result of suspension will be borne by the Client.

The unit rates provided are for work within the reasonable capacity of the proposed equipment, using the techniques specified. Unless stated otherwise, no provision has been made for drilling hard filling,

concrete, boulders, cobbles or gravels. Equipment, cones, or drilling bits damaged or lost in hard filling, concrete, gravels, cobbles or boulders will be charged at cost plus 10%. Time spent attempting to recover such equipment will be charged at the appropriate rates for the personnel and equipment.

The methods used indicate sub-surface conditions only at specific locations where samples were obtained or testing completed, only at the time the work was carried out, and only to the depths penetrated. Samples and test results cannot be relied on to accurately reflect the strata variations that usually exist between sampling locations.

Samples and cores obtained from the investigation will be retained, unrefrigerated without a charge for a period of three months following the submission of the report. Thereafter, this period of time may be extended at the Client's specific request for an agreed fee.

**11. Laboratory Testing.** Laboratory testing will be carried out in accordance with Australian or relevant Standards as agreed, or generally accepted industry practice.

**12. Reports.** Reports and documentation are provided for the exclusive use of the Client at a specific time, for a specific purpose and particular project. They should not be used by or relied upon for other projects or purposes on the same site or by a third party without written permission from the Company. This is because project details, statutory requirements and site conditions may change with time affecting report recommendations and conclusions.

The Company does not assume responsibility for interpretations or conclusions from other's review of the report or the test data, which are not otherwise supported by an expressed statement, interpretation, outcome or conclusion stated in the report.

**Investigations.** Written reports will be provided on completion of the work giving a statement of procedures and all field and laboratory results. Interpretation and analysis of results and comments thereon will be provided, where and as indicated in our Proposal. The reports will be based on normally accepted theory and practice and on the limits of information available.

The Company does not assume responsibility for the adequacy of its recommendations when they are used in the field without the Company being retained to observe construction. This is because during construction variations in sub-surface conditions between sampling locations may be exposed which require re-evaluation of previous recommendations.

Three copies of the report will normally be provided and supplementary copies can be made available if requested, at an agreed charge.

**Earthworks Testing.** Written test reports will be provided in accordance with appropriate Standards and with NATA endorsement where appropriate. Unless otherwise agreed, earthworks reports will not contain interpretive comment or advice. Engineering reports providing interpretive comment or an overview of results, can be provided where specifically requested and at an agreed fee.

**13. Construction Site Services.** The Company does not supervise and is not liable for the work of construction contractors.

The Company is not liable for any advice on site which is not confirmed in writing.

Any certification relating to construction or site conditions will be provided in writing and on terms approved by Douglas Partners.



# About this Report



## Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

## Copyright

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

## Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

## Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;

- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

## Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

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

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.



## *About this Report*

### **Site Anomalies**

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

### **Information for Contractual Purposes**

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

### **Site Inspection**

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.