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28 February 2012
Ref: 24595ZA2let

Aurora Projects Pty Ltd
Level 6
50 Berry Street
NORTH SYDNEY NSW 2060

ATTENTION: Mr Daniel Lingwood

Dear Sir

GEOTECHNICAL REVIEW OF SUPPLIED REPORTS
PROPOSED GRAYTHWAITE REHABILITATION CENTRE
RYDE HOSPITAL, FOURTH AVENUE, DENISTONE, NSW

We have been provided with the following reports for review:

1. Renzo Tonin & Associates (NSW) Pty Ltd letter, Ref: "T605-01F02 (Rev 0) Acoustic Advice" dated 13 January 2012;
2. Douglas Partners Pty Ltd letter, Project: 72801.00 dated 20 January 2012;
3. Woolf Associates Solicitors letter dated 15 February 2012.

This current geotechnical review report must be read in conjunction with our previous geotechnical investigation report, Ref: "24595ZArpt2" dated 21 October 2011. In order to complete our review, we were provided with relevant architectural, structural and hydraulic design drawings as well as a survey plan showing the locations of existing buried services, as listed in the attached Appendix A.

Our comments on the supplied Renzo Tonin & Associates and Douglas Partners (DP) reports are presented separately below. With respect to the letter prepared by Renzo Tonin & Associates, we have only made comment on geotechnical issues raised. The

Woolf Associates letter provided a summary of the recommendations made in the two other letters, and as such we have not provided further comment.

Renzo Tonin & Associates letter dated 13 January 2012

We concur with the suggestions made in the 2nd bullet point on Page 3, and in the 2nd last paragraph on Page 4, as they are consistent with the recommendations provided in Section 4.1 of our geotechnical report.

Douglas Partners letter dated 20 January 2012

DP essentially concur with the advice provided in our geotechnical report. However in the 2nd paragraph on Page 4, DP recommended that the subject anchored shoring wall adjacent to Ryde Medical Centre (RMC) [ie. Shoring Wall- SW6 as shown on the supplied Taylor Thomson Whitting (NSW) Pty Ltd (TTW) drawings] be designed on the basis of "*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.*" This advice was provided in Section 4.2.3 of our geotechnical report and was applicable to the design of anchored retaining walls located in areas which are highly sensitive to lateral movement.

From a shoring wall design perspective, we are uncertain why the RMC building is "sensitive". In Section 4 of the DP report, they state that the subject shoring wall will be set back a horizontal distance of 8.2m from the RMC building. DP also state that the maximum excavation depth adjacent to the RMC building will be 5.7m. In the 1st paragraph of Section 5, DP state "*the supplied specification ... indicates on page 8 that the (RMC) building is constructed on footings to a maximum depth of 1.5m below what was existing ground level*". The relevant boreholes from our geotechnical investigation include JK4 and JK7, as identified in Section 3 of the DP report. Both these boreholes encountered weathered shale bedrock at 1.2m depth.

In our opinion, the RMC building which is supported on footings most likely founded in the weathered shale bedrock, is located outside the zone of influence of shoring wall SW6. As such, we cannot justify the wall being designed for a lateral earth pressure of 8H (kPa). For this situation, we consider that a lateral earth pressure of 6H (kPa) to be more appropriate for the design of SW6.

DP also raised the issue of the sewer main being positioned behind SW6. Based on the supplied hydraulic design drawing prepare by SPP Group Pty Ltd, the northern end of the existing sewer line is to be re-diverted to run outside the proposed building footprint. The southern end of this sewer line, which will be retained, lies a short distance within the Ryde Hospital western property boundary and runs parallel to the eastern side of the RMC building. Based on the sewer details and cross-sectional sketches provided by TTW in an email dated 23 February 2012, some of the retained length of the sewer line will be positioned above a 1 Vertical on 1 Horizontal line inclined up from bulk excavation level; that is, within the zone of influence of SW6.

In a TTW email dated 24 February 2012, we were advised that the shoring wall analysis was completed using the computer program "Wallap". From back-analysis, TTW has confirmed that shoring wall SW6 was designed for a lateral earth pressure of 6H (kPa), in accordance with Section 4.2.3 of our previous geotechnical investigation report. TTW provided us with the maximum calculated deflections for both temporary and permanent conditions. For the anchored length of SW6 (ie. south of Grid Line E on TTW Drawing No. S1101$^{REV\ C}$), the calculated deflections were generally less than 10mm except for the upper cantilevered portion of the contiguous piled length (ie. south of Grid Line H), where a maximum deflection of 16.2mm was calculated for the temporary condition. TTW then showed that by increasing the installation level of the temporary anchors by 1.6m (ie. from 1.0m below Level 1 to 0.6m above Level 1), the maximum deflection would reduce from 16.2mm to 3.1mm.

For the cantilevered portion of the soldier pile wall between Grid Lines D & E (ie. adjacent to the northern end of the nearby RMC building), we were advised earlier today by

Ms Emma Kent of TTW that the maximum calculated deflection in the temporary condition (critical scenario) was in the order of 20mm. By inclusion of temporary anchors along this length, Ms Kent anticipated that the deflections in the temporary condition would reduce to less than 10mm.

TTW has confirmed that the current pile diameter and spacings for SW6 are adequate for a lateral earth pressure of 8H (kPa), however, additional reinforcement would be required.

In order to control potential movement of the sewer line, we recommend that the maximum deflection of SW6 be limited to 10mm. As such, we recommend that the following works be carried out:

1. The installation level of the temporary anchors through the southern contiguous piled length of SW6 should increase in height by 1.6m.
2. Temporary anchors should be installed and appropriately positioned through the solider pile wall between Grid Lines D & E, so that the maximum deflection in the temporary condition is limited to no more than 10mm.

Based on the available information, and by controlling deflections to less than 10mm, we cannot justify redesigning SW6 for a lateral earth pressure of 8H (kPa), as suggested by DP. Provided our two recommendations listed above are implemented, it is our opinion that the expected deflection of SW6 [based on a design lateral earth pressure of 6H (kPa)], would have negligible effect on the sewer line.

We recommend that a CCTV inspection be undertaken of the retained length of the sewer line prior to the commencement of construction. If it is found that the sewer pipe is damaged, it may be prudent to replace the damaged portions of the pipe once SW6 has been restrained by the permanent structure.

We concur with the recommendation made by DP at the bottom of Page 4 of their report that a second dilapidation survey be completed on the RMC building a short time after completion of construction to assess whether any construction related damage has

occurred. This second dilapidation survey must be carried out by the same consultant who completed the initial survey.

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

Andrew Jackaman
Senior Associate

Encl. Appendix A: List of Supplied Design Drawings

APPENDIX A

LIST OF SUPPLIED DESIGN DRAWINGS

Architectural Drawings prepared by Nettleton Tribe Partnership Pty Ltd

1. Drawing No. 3717_SK134, dated 22/11/11
2. Drawing No. 3717_102, Issue G
3. Drawing No. 3717_111, Issue M
4. Drawing No. 3717_112, Issue L
5. Drawing No. 3717_113, Issue L
6. Drawing No. 3717_114, Issue L
7. Drawing No. 3717_201, Issue H
8. Drawing No. 3717_202, Issue G
9. Drawing No. 3717_301, Issue F
10. Drawing No. 3717_302, Issue F
11. Drawing No. 3717_321, Issue G
12. Drawing No. 3717_322, Issue G
13. Drawing No. 3717_323, Issue G
14. Drawing No. 3717_324, Issue H
15. Drawing No. 3717_325, Issue G
16. Drawing No. 3717_326, Issue G

Structural Design Drawings prepared by Taylor Thomson Whitting (NSW) Pty Ltd (Job No. 101672)

1. Drawing No. S1101, Revision C
2. Drawing No. S1102, Revision C
3. Drawing No. S1103, Revision B
4. Drawing No. S1104, Revision C
5. Drawing No. S1105, Revision C

Hydraulic Design Drawing prepared by SPP Group Pty Ltd

1. Drawing No. SY100085_H-001, Issue 4

Survey "Plan Showing Inground Services" prepared by Norton Survey Partners

1. Reference No. 33719, Issue A, dated 18/3/11