Douglas Partners
Geotechnics / Environment / Groundwater

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Attention: [redacted]

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Project 87052.08
07 July 2022
R.001.Rev0
CE/CC

**Geotechnical Assessment**
**Balmoral Quay - Stage 5**
**Liverpool Street, Rippleside**

## 1. Introduction

At the request of [redacted] of Hub Property Group, Douglas Partners have reviewed the revised development plans for Stage 5 works at Balmoral Quay, prepared by SJB Architects for the purposes of assessing whether recommendations and advice contained in our previous geotechnical report 87052.02.R.001.Rev0 dated 20 May 2019 are invalidated or diminished in any way by the proposed revised development plans for the site, along with any further assessment requirements.

## 2. Proposed Development

The proposed development at the site is presented in plan, section and elevation drawings prepared by SJB Architects and made available for our review. The drawing set included Plan Drawings SD01_02 dated 04.05.21, SD02_01 to SD02_08 dated 23.11.21, Elevation Drawings SD05_01 to SD05_02 dated 04.05.21, and section Drawings SD06_01, SD06_02, SD06_10, SD06_11, and SD06_20 dated 04.05.21.

On review of these drawings the proposed development appears to follow a similar footprint across the site, and same number of stories above Harbourside Drive compared with earlier development drawings made available to DP at the time of preparing our geotechnical report. However, it is recognised that the basement car parking arrangement differs, particularly along the site boundary with Balmoral Crescent and adjacent development at 5 Balmoral Crescent.

Previously, it appeared that development of the site proposed to partially cantilever floors to avoid more significant retaining walls along Balmoral Crescent and step the structure to follow the existing slope. Development along the property boundary with 5 Balmoral Crescent indicated a lowering of existing ground level to reduce overall retained height / height difference along the property boundary and the basement car parking extended partially into the proposed cut slope. Apart from a minor portion of basement serving as a retaining wall, the support offered to the property boundary with Balmoral Crescent and 5 Balmoral crescent was via a battered slope.

The revision to the proposed development plans show retention of Balmoral Crescent being integral with the building structure (basement parking retaining full height difference) structure, while a portion of the property boundary with 5 Balmoral Crescent is retained by the lower ground level (setback 10 to 11 m from boundary) stepping up to retain the property boundary at ground floor and Level 1. The remainder of the property boundary coinciding with Barwon Water Pump Station to Harbourside Drive is proposed to be remain battered.

## 3. Geotechnical Assessment

Despite the differences in development plans for the site, such differences do not take away from the recommendations and advice provided in DP report 87052.02.R.001.Rev0. As such DP consider the comments in relation to subsurface conditions, site soil reactivity, excavation, preliminary batter stability, temporary batters, site preparation to be validated along with our geotechnical advice for basement walls, and foundations.

Moreover, it appears the current development plans have accommodated comments on groundwater affecting potential excavations for basement levels by limiting such excavations to a minimum RL 3 m thereby avoiding potential groundwater observed at RL 1.2 m previously.

Previously development plans indicated a portion of the slope along the boundary with 5 Balmoral Cres was to be removed / lowered, while current development proposes to retain the boundary as part of the building structure. Similarly, the extension of the basement car park towards the boundary with Balmoral Crescent proposes to replace the existing batter with a retaining wall integral with the building structure.

Provided cognisance is taken of DP recommendations presented in report 87052.02.R.001.Rev0 and basement walls are designed for retained heights and surcharges imposed by adjacent infrastructure and / or buildings, DP consider the current development plans do not alter our previous comments or advice and as such are considered appropriate for the current development.

Finally, considering the current development plans propose to replace the vast majority of the current slopes with an engineered retaining wall, and the portion of slope between the Barwon Water Pumping Station and Harbourside Drive remaining largely untouched, DP do not consider a slope stability risk assessment is required unless the site falls under an Erosion Control Overlay. This is supported by the proposed development eliminating potential slope instability of the existing batter via replacement with an engineered retaining wall, considered to be an improvement, and limiting earthwork changes to existing slopes such that these slope are in no worse condition than at present.

## 4. Limitations

Douglas Partners (DP) has prepared this report for this project at Balmoral Quay, Rippleside in accordance with DP's proposal 87052.08.P.001.Rev0 dated 30 June 2022 and acceptance received from David Walker dated 1 July 2022. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Balmoral Quay Pty Ltd for this project only and for the

purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

The assessment of atypical safety hazards arising from this advice is restricted to the geotechnical and groundwater components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

Please contact the undersigned if you have any questions on this matter.

Yours faithfully
**Douglas Partners Pty Ltd**

[redacted]
Senior Associate

Reviewed by
[redacted]
Principal