



## Design Note

### 101 Albert Street - Foundation and Retention System Changes

**Project Name:** 101 Albert Street  
**Project No:** 22131  
**Document No:** ALB-RBG-DNT-ST-00-000-01

Issue Ref	Issue / Amendment Details	Author	Signature	Reviewer	Signature	Date
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### Abbreviations and Terminology

The following abbreviations and terminology are used within this Design Note.

CRR	Cross River Rail
LCA	Licence Construction Area
CRR	Cross River Rail
EDQ	Economic Development Queensland is a government body overseeing the development of priority development areas.

### 1.0 Purpose

The purpose of this document is to describe key foundation, shoring and retention system (retention system) changes that have occurred during the design development stage post DA application, how these impact the Structure as described in the DA Application documents and Schematic Design Report ALB-RBG-REP-ST-00-000-02 [A01] and any effect on the CRR Performance Requirements. The design is currently at the 80% design development (80%DD) stage.

### 2.0 Overview

During design development of the inground structure for the Project there have been two key risk items identified by the Project team as potentially impacting the 101 Albert Street design and CRR Cavern. These risk items and their proposed mitigation measures are as follows:

- i. The current Geotechnical advice which informs the structural design is based on a desktop study. Project specific Geotechnical investigations will be undertaken once the site is accessible. This existing geotechnical borehole information indicates a local zone of weaker material to the Albert Street, north-west corner, within the RL-8m maximum continuous excavation zone (denoted by red hatch in Figure 1), where the extremely weathered rock drops away. There is a risk that the founding material in this area (denoted by blue hatch in Figure 1) is residual soil which would impact retention system piles and column foundations in the area.

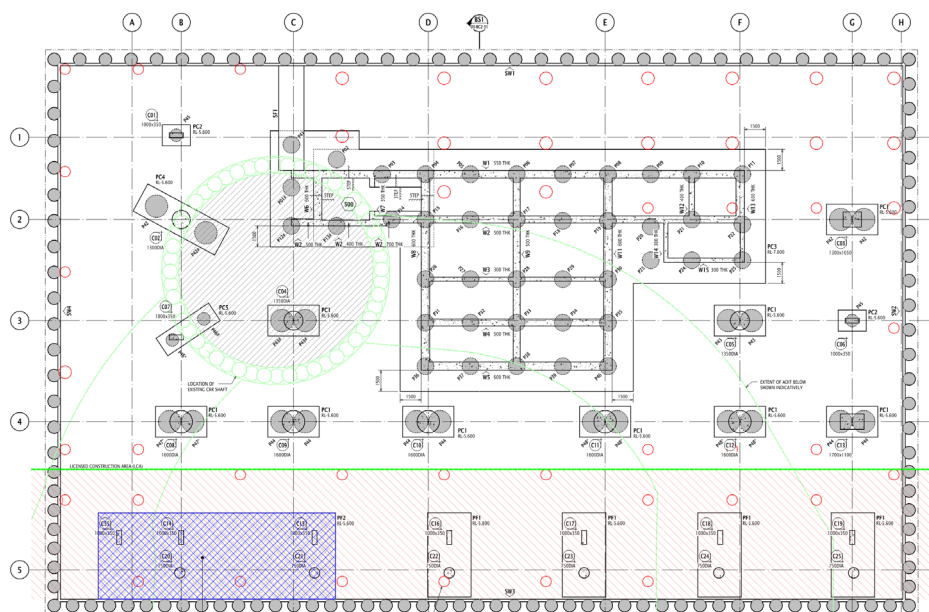


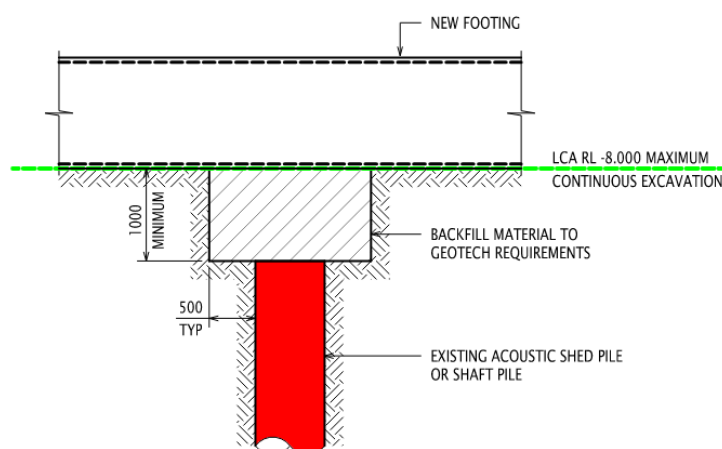
Figure 1 - Proposed Bulk Excavation Diagram

Due to the potential for weaker material, ground improvement works may be necessary within the LCA (i.e below RL-8m). These works would be restricted to the base of some of the pad footings and would involve controlled localised excavation, and replacement with N20 mass concrete. Where works are expected below the RL-8m maximum continuous excavation zone, it is proposed to be undertaken in stages with a maximum excavation depth of 2m and 3m<sup>2</sup> area.

Similarly, due to the potential weaker material, it is necessary to extend the retention system piles along this frontage below the RL-8m to RL-10m.

- ii. There are existing acoustic shed piles across the site that are currently documented to remain. These extend from current ground level to below the future basement depth and terminate in medium to high strength rock. Some of these piles terminate in close proximity to the CRR Cavern. Due to this, there is a risk that these piles could act as stiff points and be loaded by the future foundations.

To mitigate this risk, it is proposed to remove of the tops of the piles below RL-8m to remove possible interaction with future foundations. The pile and surrounding materials will be replaced with an engineered backfill material to be confirmed by the Geotechnical Engineer.



TYPICAL EXISTING PILE BREAK DOWN DETAIL AT NEW FOOTING

Figure 2 - Proposed Detail to Break Down Existing Piles

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### **3.0 Structural Impacts**

The proposed changes have negligible impact to foundation or retention system loads.

### **4.0 Geotechnical Impacts**

The Cavern assessment and geotechnical modelling carried out by the Geotechnical Engineer (EDG) has been updated to reflect the proposed foundation and retention system changes presented in Section 2. The retention system piles do extend deeper than that at DA however the impacts to the CRR Cavern are negligible, and in fact there has been a reduction of the impact on the cavern owing to model refinement.

### **5.0 Vibration Impacts**

The Vibration assessment carried out by the Vibration Engineer (Heilig and Partners) has been updated to reflect the retention system changes presented in Section 2. The vibration due to the retention system piles is deemed less critical than other previously assessed construction activities.

### **6.0 CRR Performance Criteria and Conclusions**

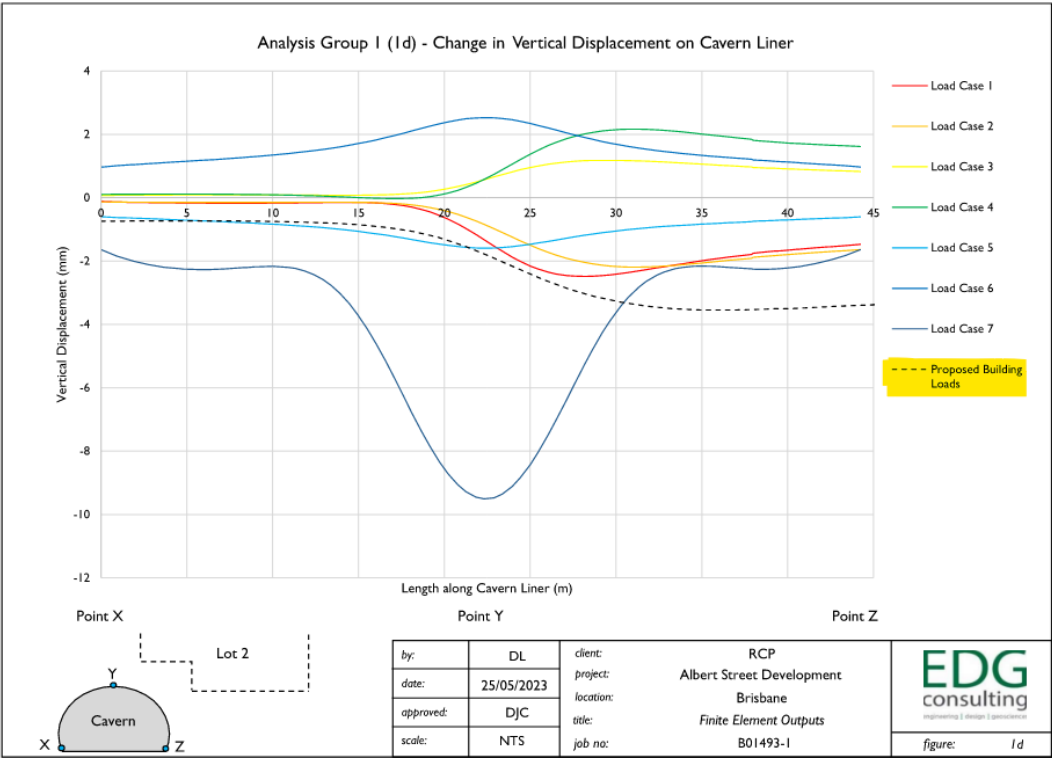
Further to above, the geotechnical model has been updated to reflect the 80%DD structural design. This includes development of the latest refinements of the structural systems, revised wind and building loads (10% contingency still included), geometry, and importantly load combinations in the geotechnical model have been updated to align with the Australian Standard - Structural design actions AS1170.0. The change in vertical displacement on the Cavern liner based on the original DA and current 80%DD Geotechnical Cavern assessments are presented in Appendix A. The load combinations adopted for each assessment have been highlighted yellow. In summary the current displacements due to the 80%DD building with 10% contingency are less than that at DA.

Therefore, it can be concluded that the building still complies with the CRR Performance requirements after the foundation and retention system changes noted above.

Development of the design will continue once Contractor input is available and additional geotechnical investigations are complete.

## **Appendix A**      EDG Cavern Assessment Results

EDG Report B01493-1AE dated 29 May 2023 - Change in vertical displacement on Cavern Liner.



EDG Report B01493-1BC dated 11 August 2024 - Change in vertical displacement on Cavern Liner.

