

Memorandum

To: Kate Graham
From: Richard Young
Copy: Bryce Carter
Subject: SH1 Rolleston Access Improvements- Geotechnical Technical Assessment, Dunns Crossing Road Roundabout and associated works

Date: 26 August 2024
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1 Introduction

1.1 Background and Scope

The objective of the State Highway 1 (SH1) Rolleston Access Improvements project is to improve road safety and connectivity for the Rolleston community and includes a range of interventions. This memo relates to the proposed roundabout at the intersection of SH1 and Dunns Crossing Road / Walkers Road and the associated subway and improved pedestrian/cyclist rail crossing. It summarises the geotechnical environmental effects, risks and mitigations in relation to the Notice of Requirements.

1.2 Proposed Works

In summary the concept design for the proposed works comprises:

- Construction of an at grade roundabout
- Construction of a pedestrian subway with access ramps approximately 4.5m below SH1
- Construction of stormwater infiltration basins
- At grade realignment of SH1, Walkers Road, Runners Road, and Dunns Crossing Road
- At grade rail level crossing
- Formation of cut slopes and construction of minor retaining walls
- Utility and services relocation

The proposed works are expected to be built using conventional construction techniques including earthworks excavation, in situ concreting and pavement placement.

2 Geotechnical Assessment

2.1 Overview of Geotechnical Risk

The geotechnical aspects of the design and construction of the subject works are relatively straightforward. The risks associated with the ground conditions are generally low, based on:

- the flat topography
- consistent alluvial geology comprising a thin surficial layer of silt overlying competent gravel
- groundwater at approximately 8m below ground level
- well understood seismic setting, indicating low potential for ground rupture and liquefaction

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2.2 Environmental Effects, Risks and Mitigations

Mitigation of permanent and operational risks and effects associated with ground conditions will be addressed through detailed investigation and design. Effects of the Project during the construction period will be addressed through the construction methodology. Appropriate engineering and construction management practices will mitigate the effect of these activities on the environment through management plans and on-going monitoring.

The environmental effects of the construction and permanent design, the associated risks and the mitigation measures are summarised in the following table.

Environmental Effect	Risks	Mitigations
Construction noise and vibration	Adversely affect owners and occupiers of neighbouring properties.	Constructor to implement a Construction Environmental Management Plan (CEMP) and Noise and Vibration Management Plan (NMP) to address the potential effects.
Erosion, sediment and dust control	Erosion and sediment adversely affect watercourses and dust adversely affects neighbours	Constructor to implement a Construction Environmental Management Plan (CEMP) and Dust Management Plan (DMP) to address the effects
Stormwater infiltration	Risk that the Project will adversely raise the groundwater level and/or affect groundwater quality	Risk will be assessed and mitigated through the stormwater design.
Dewatering	Induces ground settlement. Affects existing abstractions	Works are expected to be above groundwater (located approx. 9.5m below ground level (BGL)) so no dewatering is anticipated for Package 1. This will be assessed and confirmed through design and should dewatering be required, the appropriate consents will be sought.
Earthworks	Risk that imported fill materials associated with the construction of the roundabout and associate batters may adversely affect the receiving environment	Constructor to implement a Construction Environmental Management Plan (CEMP) to address the effects. The batters will be formed at an angle (3:1) allowing for appropriate landscaping and maintenance. The batters will be at an angle (3:1) that can be effectively maintained to reduce the risk of erosion and surface water run off effects.

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