



## Connecting Auckland through innovative engineering solutions: the Northern Corridor Improvements Project

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### Abstract

The Northern Corridor Improvements project is an accelerated highway development scheme that has been identified by the New Zealand government as being necessary to improve travel time and reliability of inter-regional travel between Auckland and Northland. Located on Auckland's North Shore, this project will relieve traffic congestion by adding more traffic lanes along the State Highway 1 Northern Motorway (SH1) as well as constructing an extension to a designated busway corridor. Additionally, the project will provide a direct motorway-to-motorway connection between State Highway 18 Upper Harbour Highway (SH18) and SH1. The project scope involves the construction of twelve bridges, including a piled underpass structure to link SH1 to SH18, retaining walls and over 7km of new walking and cycling paths.

With design complete and construction well underway, this paper will discuss the design of the structures, highlighting the analysis methodology adopted for the fully-integral bridge piers, as well as the design considerations required to integrate the structures with several stages of traffic management. Additionally, this paper will describe the construction of the bridges, including challenges faced, construction methodology adopted, and details developed to optimise constructability.

**Keywords:** Bridge engineering; hybrid alliance; integral bridges; staged traffic management, standardisation.

### 1 Introduction

The Northern Corridor Improvements (NCI) project will create a new direct motorway-to-motorway link on the North Shore by connecting SH1 with SH18. Achieving this will complete the northern end of the Western Ring Route (WRR), a wider Auckland motorway project that has involved the construction of the Waterview Connection and the

significant widening and upgrading of the State Highway 16 Northwestern Motorway (SH16). The Project will provide residents on the North Shore with better connections to Auckland Airport, and provide increased network security and resilience for the whole motorway network. Refer to Figure 1 for a project map and schematic.