



The A82 Pulpit Rock Improvements – A Complex Propped Cantilever Viaduct

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Abstract

The A82 is a primary route in Scotland that follows the shore line of Loch Lomond. Following a landslide in the late 1970's near the Scheduled Monument, Pulpit Rock, traffic lights were implemented limiting vehicles to one-way operation. A widening scheme was required to provide a two-way carriageway over a length of approximately 400m. This included a new six span 168m viaduct curved in plan to follow the existing road alignment and running parallel to the loch shoreline. The deck consists of a continuous open trapezoidal steel-concrete composite box girder supported on large diameter intermediate monopile piers socketed into the rock beneath. The construction was phased to minimise road closures. Partial construction of the deck facilitated switching of traffic to the new structure, allowing the remainder of the structure to be completed. This case study paper summarises the design and construction challenges of the viaduct.

Keywords: steel-concrete composite bridge deck, viaduct, monopiles, construction stages, jacking.

1 Introduction

The A82 in Scotland is the main road link from Glasgow and the Central Belt to Fort William, the Highlands and the Western Isles. It passes through Loch Lomond and Trossachs National Park, running parallel to the western shoreline of Loch Lomond. As part of a wider range of proposed improvements to the A82, Transport Scotland developed plans to improve a section of the road near to Pulpit Rock, the site of a Scheduled Monument, located approximately 1 mile south of Ardlui. This site has offered a significant engineering challenge for decades as the road narrows to a width suitable only for a single lane of traffic (*Figure 1.*). Traffic signals were implemented, initially as a temporary measure, but remained in place for over thirty years, contributing to increased journey times and

delays, particularly during the summer tourist season.



Figure 1. Original narrow road

In 2010, Transport Scotland proposed to improve a 400m long stretch of road including a new twin box girder viaduct, constructed 'offline', running parallel to the Loch Lomond shoreline. A further section of online widening, created by cutting into