

A1 in Northumberland: Morpeth to Ellingham

Scheme Number: TR010041

6.1 Environmental Statement Appendix 2.4 River Coquet Bridge Construction Methodology Sequence

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed
Forms and Procedure) Regulations 2009

June 2020

Infrastructure Planning

Planning Act 2008

**The Infrastructure Planning
(Applications: Prescribed Forms and
Procedure) Regulations 2009**

**The A1 in Northumberland: Morpeth to Ellingham
Development Consent Order 20[xx]**

Environmental Statement

Regulation Reference:	APFP Regulation 5(2)(a)
Planning Inspectorate Scheme Reference	TR010041
Application Document Reference	TR010041/APP/6.1
Author:	A1 in Northumberland: Morpeth to Ellingham Project Team, Highways England

Version	Date	Status of Version
Rev 0	June 2020	Application Issue



A1 Morpeth to Felton

Buildability

Morgan Sindall-WSP-Highways England

Coquet Bridge

Construction Methodology-

Option 2- Bridge Launch with King Post and Cable

Author-N J Thompson

13th December 2018-Rev 2

Introduction

The new Coquet Bridge comprises a three span composite steel/concrete deck with RC piers and abutments. The overall span of the structure is 208m comprising intermediate spans of 49m, 83m and 76m. This arrangement details the pier positions matching the existing bridge pier locations, with the Southern abutment being constructed adjacent to the existing Southern abutment position and the Northern abutment being constructed approximately 27m further north than the existing North Abutment. This is due to deep seated geological slip concerns on the Northern embankment of the river valley. The Southern abutment and pier are founded on bored concrete piled foundations, whilst the Northern abutment and pier are founded on caisson foundations. This construction methodology narrative outlines the construction methodology for construction of the bridge, taking cognisance of the access and environmental restrictions which exist at the site.

Establishment/Access requirements

Access will be established to the work sites from the North and South of the river valley with haul roads down to the sites of the abutments and pier foundations and laydown areas prepared adjacent to each work area. It is likely that tower cranes will be utilised for the purposes of pier base and stem construction and for servicing the deck construction. It is proposed to site a tower crane on the North and South embankment, at a suitable location where a temporary foundation may be established. Care must be taken to ensure that haul routes and lay down areas do not encroach into the adjacent SSSI and environmental measures shall be in place to avoid any impacts from construction activities. These procedures will be outlined within the CEMP. In addition, permanent widening earthworks to the North and South of the river valley will be carried out in conjunction with the access and establishment works to provide the necessary working areas to construct the bridge.

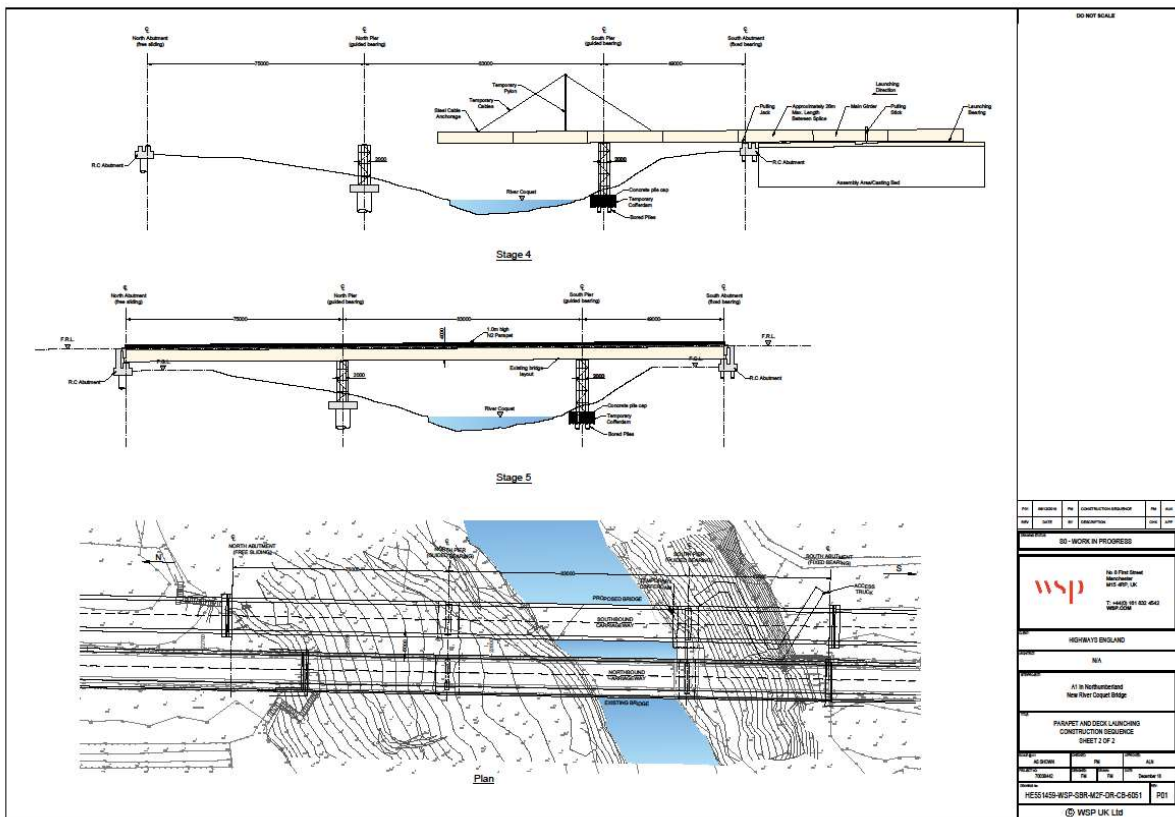
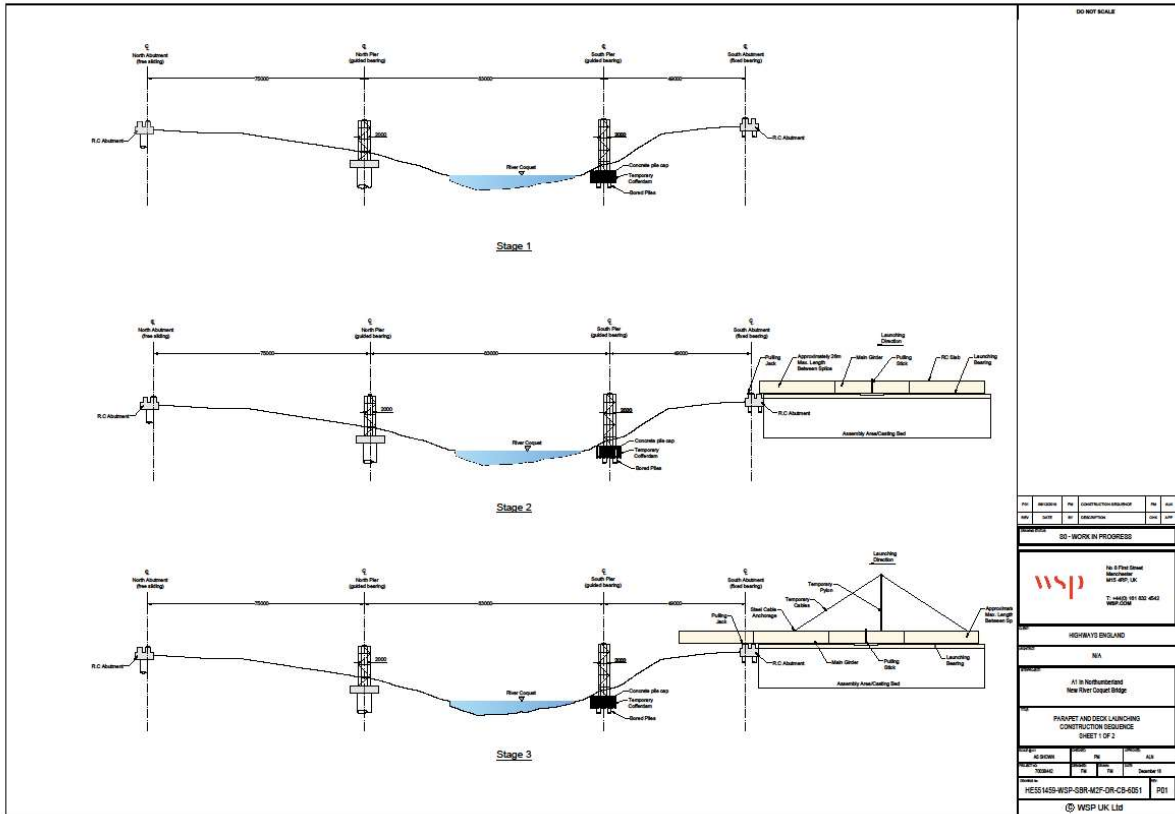
Temporary Works

- **Cofferdam to Southern Pier Base**

In order to construct the Southern Pier base , a sheet piled cofferdam will be installed avoiding the requirement to enter the watercourse .This will be installed with a tracked piling rig and dependant on the quality of the underlying rock, some pre-augering may be needed to allow the piles to be driven to the required level.

- **Sheet Piled retaining Walls to North and South Abutment**

Prior to excavating for the abutments, a sheet piled retaining wall will be installed to retain the existing carriageway. This will be installed with a tracked piling rig and piles installed to a depth of approximately 8m below GL (The level of rock head at these locations will need to be predetermined to ascertain the feasibility of this proposal-if rock head is at a high level, then temporary retaining measures may not be required as the rock face will retain the carriageway)



Coquet Bridge General Arrangement outlining launch sequence.

Abutment Works

- **South Abutment-Piled**

On completion of the temporary works to retain the existing carriageway, the abutment footprint will be excavated down to formation level and a granular piling platform will be installed. A bored piling rig will be mobilised to site and the installation of bored piles to bedrock will be undertaken.

Following this, the RC abutment will be constructed. Piles will be broken down to cut off level, and the base reinforcement will be fixed, followed by the formwork then concrete placed by concrete pump. Scaffolding will be erected allowing the abutment wall steel to be fixed. Proprietary formwork will then be craned into position and the abutment wall concreted using a 32m concrete pump. Following curing, formwork may be stripped, scaffolding removed and the abutment backfilled to bearing shelf level with 6N, placed with a tracked excavator and dumper and compacted in layers. Bearings will then be installed on the bearing shelves and grouted into their final positions.

- **North Abutment –Caisson**

On completion of the temporary works to retain the existing carriageway, the abutment footprint will be excavated down to formation level and a granular piling platform will be installed.

A specialist contractor will then mobilise to install the pair of caisson foundations. These shall be installed by progressively excavating and jacking the precast circular caisson sections down to bedrock level, extending the sections as the caisson sinks. Following this any remaining internal material will be excavated down to bedrock and the void in filled with structural concrete. Following this, the RC abutment may be constructed as the South abutment described above.

Pier Works

- **South Pier-Piled Foundation**

Following installation of the cofferdam, the southern pier works may proceed. A bored piling rig will install the piles to bedrock, working from a level at the top of the cofferdam. On completion of the piling, excavation down to foundation level will be carried out, followed by breaking down of the piles to their finished level using a pneumatic pile breaking attachment

The RC base will be constructed with steel fixing, followed by base formwork and then concreted with a 32 m concrete pump. On curing, the base will be stripped and backfilled, allowing installation of access scaffolding to the full pier height. Steel fixing will then proceed; ensuring sufficient temporary bracing to the pier steel is in place. Proprietary formwork will then be craned into position, with the pier likely to be poured in two lifts. Concrete will be placed using a 40m concrete located on the southern bank. On curing, the formwork will be removed. Following this, bearings shall be installed and grouted into position at the pier heads.

- **North Pier-Caisson Foundation**

The North pier is to be founded on a single caisson foundation and this will first be installed by a specialist contractor. This shall be installed by progressively excavating and jacking the caisson sections down to bedrock level, following which any internal material excavated down to bedrock, and the void in filled with concrete.

The RC base and stem will then be constructed as described above.

Deck Works

- **Steel Deck**

The steel deck comprises braced pairs of girders of depth 4m supported on bearings at the abutment and pier positions. The girders and bracing will be prefabricated in lengths up to 40m at the manufacturer's fabrication facility before being transported to site in single sections for site assembly. They will be assembled on temporary trestles on the Southern approach embankment and site welded and bolted into their finished profile as a braced pair. Temporary works including cantilever soffit supports will be affixed to the deck, and some permanent deck formwork will be affixed prior to launching

The deck will then be launched across the river valley as indicated in the sequence on the drawing before being lowered onto their permanent position onto the bearings.

The launching process will be carried out by a specialist supplier and will require a series of jacks, pulleys and temporary supports to carry out the procedure.

- **Deck Construction and Finishes**

On completion of launching of the deck, the deck construction may proceed. The remainder of the permanent deck formwork will be craned into position and secured, allowing deck reinforcement to proceed. The deck sections will then be concreted in an agreed sequence of pouring, using a concrete pump. Concreting of the parapet edge beam will follow the deck concrete, ensuring adequate alignment is maintained. On curing, the deck will be waterproofed with a spray applied membrane, and deck parapets affixed to the deck edge. The temporary soffit support system panels will then be removed using a proprietary cradle supported from the tower crane. Deck finishes including kerbing, ducting, footways and surfacing will then follow.

© Crown copyright 2020.

You may re-use this information (not including logos) free of charge in any format or medium, under the terms of the Open Government Licence. To view this licence:

visit www.nationalarchives.gov.uk/doc/open-government-licence/

write to the **Information Policy Team, The National Archives,**

Kew, London TW9 4DU, or email

psi@nationalarchives.gsi.gov.uk.

This document is also available on our website at www.gov.uk/highways

If you have any enquiries about this document A1inNorthumberland@highwaysengland.co.uk or call **0300 470 4580***.

*Calls to 03 numbers cost no more than a national rate call to an 01 or 02 number and must count towards any inclusive minutes in the same way as 01 and 02 calls.

These rules apply to calls from any type of line including mobile, BT, other fixed line or payphone. Calls may be recorded or monitored.

Registered office Bridge House, 1 Walnut Tree Close, Guildford GU1 4LZ

Highways England Company Limited registered in England and Wales number 09346363