

NEWTON-LE-WILLOWS

Designing beneath an operational railway

SPECIALIST METHODOLOGY / TEMPORARY WORKS / RAILWAY ASSURANCE

An intensive design-development assignment for Galliford Try, bringing practical excavation expertise into a complex railway underpass proposal.

18 MONTHS

Design development

LIVE RAILWAY

Movement-sensitive infrastructure

CAT 3 REVIEW

Independent design checking



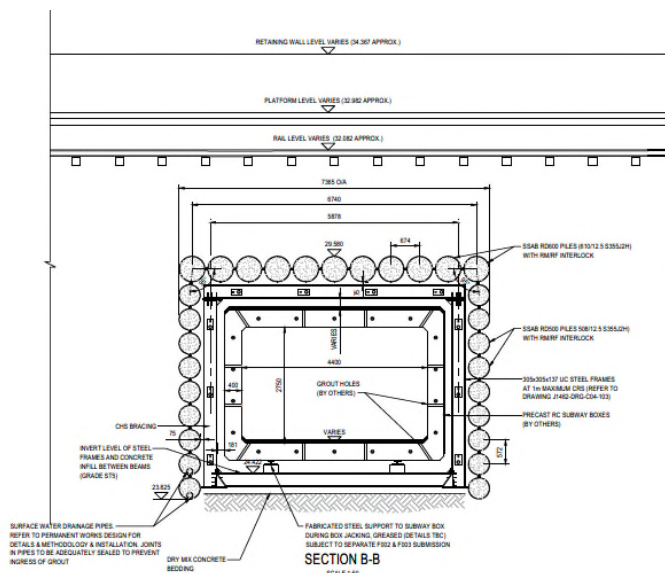
Construction-stage reference photograph from the original project archive. Galliford Try site shown.

THE ENGINEERING CHALLENGE

The brief called for an approximately 30m underpass with around 3m cover to the running rail. Excavation had to be considered alongside the existing platforms, nearby structures and the need to maintain railway operations.

We worked with Donaldson Associates / COWI on the specialist temporary works, alongside Galliford Try and Tony Gee. The assignment combined construction-method development, engineering coordination and responses to independent checking.

Scope featured: specialist design development and construction methodology.



Original proposal: tube canopy and internal support frame cross-section. Design-development extract; not for construction.

OUR DESIGN CONTRIBUTION

Through Delta Civil Engineering, our team developed a method based on interlocking, horizontally installed steel tubes, staged excavation and internal steel frames. The original proposal incorporated precast concrete underpass units.

SAFETY THROUGH DESIGN

Understanding the risks. Developing the sequence. Testing the engineering.

01 PROTECT THE RAILWAY

Assessment of predicted settlement and deflection during tube installation and excavation, including movement affecting the track, platforms and neighbouring structures.

02 CONTROL THE EXCAVATION

Review of face-support proposals, excavation stages, frame spacing and unsupported lengths, addressing stability as the heading advanced.

03 DESIGN THE SUPPORT SYSTEM

Engineering of the canopy, internal frames, connections and thrust arrangements, with working-platform and foundation stability considered together.

04 COORDINATE THE INTERFACES

Consideration of ground conditions, buried services, access, plant requirements and the interaction between temporary support and permanent construction.

THE DOCUMENTED ASSURANCE PROCESS

The project file provides a traceable record of design development, technical review and proposed risk controls.

COWI

000000 COWI UK Limited
RTE Business Park
Rushmore House
London Road
Dulley
DE24 6UP
Tel: 01332 343000
www.cowiconsultants.com

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DELTA ENGINEERING LTD

NEWTON-LE-WILLOWS SUBWAY INSTALLATION TEMPORARY WORKS

NR/L2/CIV/003/F002: STATEMENT OF DESIGN INTENT

NR/L2/CIV/003/F002: STATEMENT OF DESIGN INTENT		
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Issue date	19 th February 2015	

Project title	Newton-Le-Willocks	
Project Number	144619	
CR-T Ref. Number	144619/CR/T1 Issue 6, 20/06/16	Statement Ref: J1462/F002 Rev. B04
Location	Newton-Le-Willocks Railway Station	
ELR	DSE	Mileage 15 miles 60 chains
OS grid reference	E359363 N395329	Structure Number Not Applicable

PART 1: DETAILS

1.1 Scope of Design works

As set out in the Contracts Requirement Technical (CR-T), this submission relates to the Design of the following altered or new asset(s).

Description of asset	Permanent or Temporary Works
Installation of a pipe protection frame, heading support frames and base slabs providing temporary support to enable installation of permanent concrete sub-way boxes underneath the rail line at Newton-le-Willocks Station	Temporary Works

FORM F002

Statement of Design Intent submissions and revisions defining the temporary works and design basis.

DESIGN RISK ASSESSMENT

Recorded consideration of settlement, heave, excavation-face collapse and buried services.

CATEGORY 3 CHECKING

Drawings submitted to Tony Gee for independent review, with technical comments and proposed responses.

FORM F003 PROCESS

Correspondence addressing design-and-check certification, supported by calculations, drawings and sequencing proposals.

Form F002 cover and scope extracts.

Historical design records; not approval certificates.

Evidence shown relates to the design phase. F003 is referenced as an assurance process; a final signed certificate is not reproduced here.

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