

**Client:** Network Rail LNW

## Design Services Provided

- Emergency response to initial report of movement within the signal box; design of emergency temporary support.
- Specify and obtain ground investigation.
- Provide options for permanent repair works and develop chosen solution, obtain Network Rail approval (Forms 1,2,3).
- Design a system of temporary works and obtain Network Rail approvals.
- Address any Technical Queries arising from site during construction stage.



# Park South Signal Box

## Overview

Park South signal box is a sturdy Furness Railway type 3 design dating from 1883. It controls the adjacent barriered level crossing and movements over Park South Junction. The Junction gives the north access to and from Barrow-in-Furness, as well as a direct route to Dalton Junction.

The signaller here also has a remit over two user worked crossings and a joint (albeit lesser) responsibility with the signaller at Barrow for the safe passage of trains over an Automatic Open Level Crossing (AOLC) used by a nearby works. JNP were commissioned to provide stabilisation of settlement to the lever frame within an operational environment.





## Project Solutions

JNP Group responded swiftly to the initial emergency enquiry, quickly organising proposals for temporary works that could be rapidly implemented. Their design solution included an in-situ reinforced concrete piled ground beam that could be constructed within the building. To accommodate the confined space and minimize vibrations that could impact signal box equipment, 'Grundomat' piles were selected for installation. The design of the temporary works incorporated slender steel members to support the lever frame at a height that allowed the existing timber supports to be removed at a lower level. This enabled the installation of pile caps and ground beams, which would form part of the permanent works.

Additionally, JNP Group designed a temporary support system for the lever frame that would not obstruct the construction of the permanent works. The steel beams in the temporary works were supported by either the existing walls of the signal box or a timber grillage, with jacks used to ensure controlled load transfer between the temporary and permanent structures. Their temporary works solution allowed precise management of load transfers at all stages. For the permanent works, two 'Grundomat' piles were installed in each pile cap, as their practicality made them ideal for the restricted space.



## Project Challenges

- A fast response time was required due to the urgency of the works
- Working within a small building and confined spaces.
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- Signal box contains mechanical signalling equipment which would be sensitive to movement caused by construction works

## Project Solutions

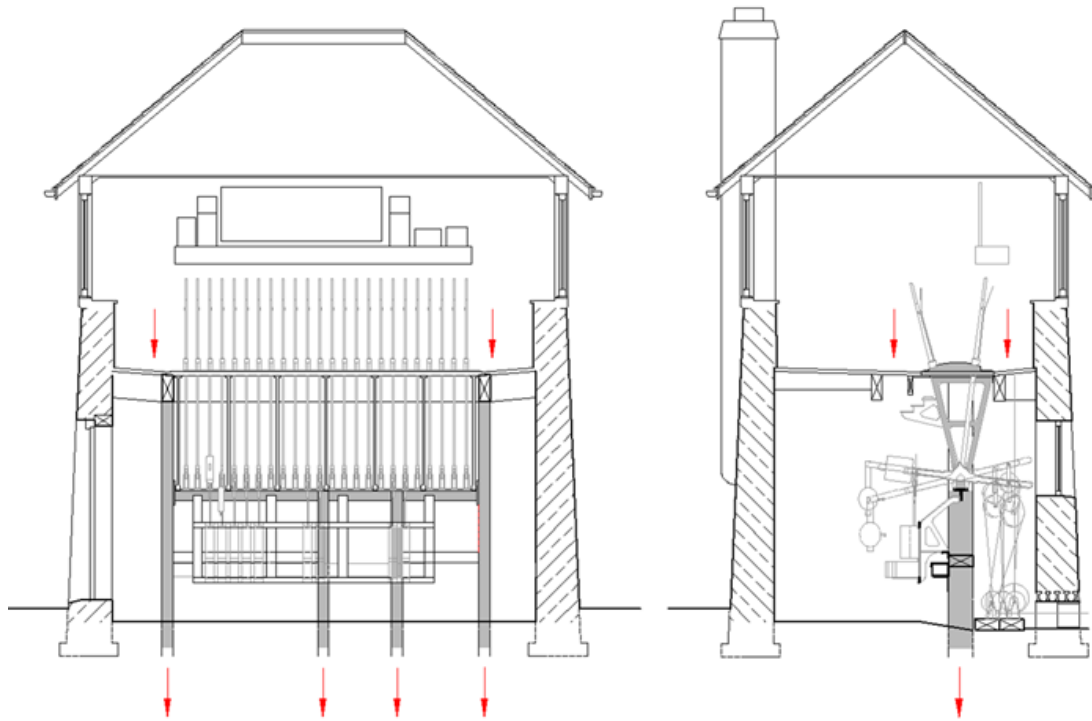
- Temporary works were quickly implemented.
- 'Grundomat' reinforced concrete piles were selected to use as they are suitable for installation within confined spaces.
- JNP Designed a system of temporary support for the lever frame which would not obstruct construction of the permanent works.
- Temporary works solution devised which allowed the transfer of loads from the lever frame to be closely controlled at all stages.



**JNP GROUP**  
CONSULTING ENGINEERS

## Summary

JNP Group responded to an emergency enquiry at Park South Signal Box located in Barrow-in-Furness, Cumbria. Initial movement was reported within the signal box requiring urgent design of temporary and permanent support. A main issue for the client was to have a compliant design but also one that took account of the restricted nature of the site, this led to the use of structural components that could easily be handled in such an area.



## Case Study

### JNP Group Project Team

**Project Manager:**

Neil Taylor

**Project Team:**

Richard Sunderland

