Structural Statement

This structural statement outlines the impacts of construction, operation and maintenance of the Winding Hole on existing structural assets adjacent to the proposed Winding Hole, as well as the design and construction methodology for new structures.

The main structural assets that shall or may be affected are:

1. A610 Highway Embankment
2. River Erewash Bailey Bridge
3. River Erewash Concrete Rail Bridge
4. Haul Road Access Road

A610 Highway Embankment

Structural Form

The A610 highway runs approximately South to North to the East of Langley Mill. It forms the modern boundary between Derbyshire and Nottinghamshire. The alignment of the A610 and embankment crosses the original alignment of the Cromford Canal to the East of the River Erewash. Parts of the A610 embankment were originally part of the redundant Great Northern Railway line that was subsequently re-used for the new highway.

The embankment is constructed of sandy clay, sandy clayey gravel and mudstone fragments (nominal graded fill material) at a gradient of approximately 1:3. No evidence of embankment strengthening or stabilisation is present. The embankment holds shrubbery at the location of the Winding Hole.



Figure 1: A610 Embankment (West side at Winding Hole location)

Current Condition

No inspection work has been undertaken on the embankment. Due to the importance of the A610, it is likely that the embankment is in a fair condition, with no defects significant enough to impact the use of the highway.

During a site visit dated 11/08/26, the embankment was found with local areas of topsoil removed in the vicinity of the proposed Winding Hole footprint. It is unclear who has undertaken these works.



Figure 2: Local removal of material in vicinity of proposed Winding Hole location.

Impact during Construction

The amount of cutting into the embankment has been reduced as much as possible in the preliminary design stage.

At the proposed location, the embankment is circa 26m wide and circa 8m high. The preliminary design shows the maximum height of the wall cutting 3.5m horizontally from the toe into the embankment. To allow for a diverted footpath, a gabion basket wall has been proposed behind the largest wall height to cut an additional 2m into the embankment at a much shallower level. See drawing P26-0012-DWG-012.

At the preliminary design stage, the envisaged construction sequence shall involve the driving of steel sheet piles in the toe of the embankment. Material within the footprint shall be excavated to the proposed bed level to create the Winding Hole. Once exposed, the water-side face shall be made watertight.

Co-ordination between the existing asset owner, Derbyshire County Council, and the design team may be required to ensure that the embankment's long-term use is not impaired by the construction of the Winding Hole.

Impact during Operation and Maintenance

The Winding Hole shall be designed with a 125 year design life and constructed to be watertight. During operation of the Winding Hole and wider canal extension, it is not envisaged that any significant impacts will occur on the embankment.

As part of the retaining structure's routine maintenance, the embankment shall also be inspected for visible defects.

River Erewash Bailey Bridge

Structural Form

What is referred to within this structural statement and planning application as the River Erewash Bailey Bridge is a single span demountable steel truss. The structure is a development of the Bailey Bridge System developed during World War Two. The exact construction date is unknown but thought to be post-1981 based on element sizing and arrangement.



Figure 3: River Erewash Bailey Bridge - South Elevation

The structure spans circa 21.4m East to West with the direction of span square on to the abutment. The overall width of the structure is circa 5m, with an effective carriageway width of circa 3.2m. The external main girders are formed of a series of connected panels 1.549m high overall and 3.048m in length. Each panel comprises top and bottom chord elements formed of back to back 4" x 2" x 7.1 lbs/ft channel sections separated by the vertical and diagonal members

formed of 3” x 1½” x 4.5 lbs/ft channel sections. Each edge girder is formed of 7no. panels longitudinally, producing the overall 21.336m span, with 3no. sets of panels placed in parallel; this is referred to as a “Triple Single” or TS arrangement within available documentation.

The cross girders are formed of steel rolled steel joists, supported on the bottom chord of the main girders and spaced at approximately 1.524m centres. The cross girders in turn support a steel plate deck with integral upstand kerbs. The substructure is formed of a reinforced concrete bankseat abutment. The form of the foundations is unknown

Current Condition

A walkover of the structure comprising a General Inspection-level inspection was undertaken on 11/08/2026. Access was limited to a topside investigation only, where underside faces and substructure elements could only be accessed via specialist access via the River Erewash.

The bridge superstructure was found to be in a good-to-fair condition with no significant defects identified. Dense vegetation at the structure ends obscured inspection of the substructure. Isolated areas of surface corrosion were found with no visible loss. These defects are not expected to have an immediate impact on the use of the bridge during construction.



Figure 4: Surface corrosion of superstructure elements.



Figure 5: Vegetation encroachment on superstructure, obstructing inspection of superstructure.

Impact during Construction

The River Erewash Bailey Bridge forms part of the permanent access route to the Winding Hole site from the West along Hall Road (see drawing P26-0012-DWG-102 in Appendix B). As such, the structure needs to be able to accommodate the imposed loading of heavy construction vehicles.

The available Mabey Compact Bridge Series datasheet indicates that a 7 bay structure in the "Triple Single" or "TS" arrangement can accommodate HA loading or 30 units of type HB loading (ref DMRB BD 37/01) or a single vehicle up to 80 tonnes. Although the magnitude and application of type HA loading has changed since the datasheet was published, 30 units of HB is generally seen as still being analogous to full 40/44 tonne HA loading. This is adequate to accommodate all construction vehicles that comply with the Road Vehicle (Construction and Use) Regulations.

Impact during Operation and Maintenance

Following completion of the construction works, vehicle access will need to be maintained for general canal maintenance. A regular bridge inspection and maintenance regime should therefore be implemented.

River Erewash Concrete Rail Bridge

Structural Form

The River Erewash Concrete Rail Bridge is a disused rail bridge formally used to serve a colliery branch line from the Erewash Valley Line just north of Langley Mill. It was reconstructed circa 1949 but has been disused since the Moorgreen Colliery closed in 1986.

The structure is a 3-span reinforced concrete bridge. The main span is supported near the piers by a concrete half-joint. The main span has a length of circa. 9m at a skew of 24° and spans the River Erewash. The side spans vary in length due to piers being skew to the span, but the abutments are square to the span. The maximum side span is 8m with the minimum side span being circa 5.6m.

The superstructure is formed of a reinforced concrete slab of varying section, the maximum depth being over the intermediate piers. It is likely that the side spans were cast in-situ, while the main span was cast on site and then lifted into position within the half-joint. A pre-cast post and rail parapet is present along both elevations. The structure is still ballasted from the structure's previous use as a railway bridge.



Figure 6: River Erewash Concrete Rail Bridge - North Elevation

The substructure is formed of cast in-situ piers and abutments; the piers have an octagonal shape on plan to limit scour. The foundation form is unknown.

Current Condition

An observation of the structure comprising a General Inspection-level inspection was undertaken on 11/08/2026. Access was limited to observations of the topside only from the adjacent River Erewash Bailey Bridge, where underside faces and substructure elements could only be accessed via specialist access via the River Erewash. Access to the structure could not be obtained due to dense vegetation.

The structure appeared to be in a fair condition. Significant vegetation growth was present to both the topside surface with some vegetation growth noted to the top face of the piers and slab. No

significant areas of spalling or efflorescence were noted to the substructure or superstructure; but only limited areas were visible. Areas of significant deterioration were noted to the parapets, with areas of spalled concrete and some missing rails.

A full understanding can only be gained through a review of archive information and confirmation of this via a thorough inspection. Structures of this form are known to have hidden critical elements, where geometry and condition can only be ascertained through tactile dimension and condition surveys. For example, material properties and the condition of joints.



Figure 7: Dense vegetation on the structure. Spalled parapet elements.

Impact during Construction, Operation and Maintenance

It is not currently intended to make use of this structure for access to the Winding Hole and wider canal extension. But should problems with the River Erewash Bailey Bridge arise, this bridge may be required. Prior to use, a capacity assessment would be required.

The structure was previously used by colliery branch line and therefore is likely to be able to accommodate significant loading in the as-designed condition.

Hall Road Access Road

Structural Form

Hall Road is an asphalt highway, previously used to connect Cromford Road in Langley Mill with the A610. The highway connects to the A610, near the newer Nottingham 26 Business Park roundabout, then passes down the A610 embankment at a typical gradient of 1 in 20. The highway crosses the River Erewash via the River Erewash Bailey Bridge (refer to Section 0), before passing into an industrial yard owned by Wernick AV Danzer and finally connection into Cromford Road.

The main carriageway is approximately 7.3m wide, footways are not present along either edge of the carriageway. The pavement and subbase thickness and quality is unknown. It was constructed as part of the southern section of the Langley Mill Bypass in the early 1980s to enable heavy traffic from the Godkin Opencast Coal site to avoid the centre of Langley Mill.



Figure 8: Hall Road West end, immediately East of the River Erewash Bailey Bridge.



Figure 9: Hall Road East end, on embankment approaching disused A610 junction.

Current Condition

The highway is currently unused, being blocked on the West side by a locked access gate into the industrial yard at the end of the River Erewash Bailey Bridge, as well as being blocked by new vehicle restraint barrier at the connection with the A610. The route of the highway has also been diverted within the industrial yard to follow a new alignment along the north edge of the industrial yard before reconnecting to the public highway at Cromford Road.

The Friends of the Cromford Canal have obtained a right of way to use this road.

The carriageway surface is in fair condition, with areas of superficial vegetation growth. Vegetation removal and patch repairs to isolated areas of the carriageway surface would restore the highway to the as-designed condition.

Impact during Construction

The North-West section of Hall Road by the River Erewash Bailey Bridge is an important component of the proposed access road in drawing P26-0012-DWG-102. The condition and quality of the realigned carriageway north of the industrial yard will need to be checked to confirm that the realigned highway is capable of accommodating all construction vehicles.

Impact during Operation and Maintenance

The long-term aim if the overall canal extension is to improve and maintain this road for future maintenance of the canal.

The existing section of Hall Road to the East of the proposed canal alignment up to the A610 will become redundant following the construction of the full canal. To decommission the carriageway the surfacing will be broken up and vegetation planted to naturally breakdown the surfacing and subbase.

Winding Hole Design Philosophy

General Comments

For full details of the Winding Hole layout and structural proposal, refer to drawings P26-0012-DWG-101 in Appendix B.

Material Retention

Construction of the Winding Hole will primarily involve excavation of existing material.

It is currently intended to use this material at the North of the site, where it is intended to construct new embankments at the top of the proposed locks. In 2024, a flood compensation scheme was carried out to the far North of the site to compensate for any additional flood risk storage lost due to this planned embankment.

Footpath Diversions

Construction of the Winding Hole would require the temporary closure of Footpath FP49 which runs from the current Erewash Canal terminus to an abrupt end at the A610 overbridge, North of the Winding Hole. The adjacent FP45 footpath would be unaffected and acts as an alternative route.

Upon completion of the Winding Hole, the FP49 footpath will see a small diversion around the perimeter of the wall. In the long term, it is envisaged that the new towpath constructed along the West bank of the canal will be an improved alternative footway and cycleway.

Structures

Canal-facing Retaining Wall

A larger profiled retaining wall is proposed to facilitate the Winding Hole cutting into the embankment. At its maximum point, a permanent retained height of circa 3m in the drained case is envisaged. Away from the embankment, a circa 2m retained height is present to tie in with existing walls.

In preliminary design, the wall is to be constructed of driven Z-sheet piles to protect the highway embankment from the canal leaking.

Footway-facing Retaining Wall

Where footpath FP49 shall pass around the Winding Hole perimeter, a gabion basket is proposed to retain a small height of the highway embankment behind the footway. This is expected to be circa 1m high.

Water Supply

The Winding Hole and adjacent basin extension will eventually be watered using the same water as the Erewash Canal, which receives its supply from Moorgreen reservoir.

Construction Methodology

Outline

The construction of the Winding Hole forms part of Phase 1 of the wider Beggarlee Extension (Phase 1 – 30m Extension from the MG Basin, see **Error! Reference source not found.**). Construction of the Winding Hole shall take place within a wider programme that shall see the construction of canal walls and lining of the basin from the canal's current terminus. No watering is envisaged during this phase.

During all phases, full adherence to Construction Design and Management (CDM), Health and Safety Executive (HSE) and established Construction Site Rules shall be maintained and reviewed. Where much of the Winding Hole sits on Canal and River Trust (CRT) land, the FCC have been working with the CRT to ensure compliance.

Before any groundworks commence, the habitat will be re-surveyed by the project ecologists and mitigation measures implemented to conform to all legal requirements as set out in the appendices to the Habitat Survey. This will of necessity be related to the season of the year and will be carefully planned and programmed section by section to tie in with the available labour resources.

Stage 1 – Clearance

It is envisaged that site preparation will utilise a mainly volunteer workforce for tasks such as clearances. Small financial outgoings may arise due to ecologist and other consultant fees in verifying the site. The volunteer workforce shall be significantly cheaper than engaging contractors.

Stage 2 – Piling

Sheet piles shall be driven into the ground in the approximate locations shown in the drawing P26-0012-DWG-101 in Appendix B. To be confirmed during detailed design.

Due to the nature of the ground, it is envisaged that piling specialists shall be employed to ensure high-quality installation. Piling specialists shall work under the standard NEC conditions of contract. Design details and contract supervision (if required) by qualified civil engineers. Utilising qualified and competent personnel at this critical stage increases compliance and likelihood of acceptance especially working at the toe of a highway embankment.

Access to the site for plant will be obtained via the River Erewash Bailey Bridge.

Restrictions will be placed on hours of work, but as the construction sites are located well clear of any residential areas, disruption shall be minimal.

Stage 3 – Excavation

Prior to excavation, to avoid working at height, works including the installation of gabion baskets and laying of the footpath may be undertaken. After, excavation of the passive (canal side) face of the walls shall be carried out to proposed bed level.

These stages following specialist works may be undertaken by the volunteer workforce Waterways Recovery Group (WRG). The WRG is the national volunteer canal construction body, having a strong organisation and a corps of regular skilled volunteers. It has considerable resources and well established training and assessment procedures for the volunteer skills required. The WRG were used during the construction of the initial MG Basin extension.

However, specialists may need to be engaged during some activities to ensure compliance when working around a highway embankment. For example, welding or sealing of sheet piles when exposed to ensure watertightness.

This stage will raise the profile of the FCC further amongst the local community and the wider canal restoration community nationally. It may build the credibility of the FCC as a delivery organisation which could help to unlock additional funding sources – for example, grant funding and large scale fundraising, along the lines of numerous similar campaigns (e.g. Lichfield & Hatherton Canals, Chesterfield Canal, WRG Digger & Van Appeals).

Remaining Structures and Canal Bed

Many elements will be suitable for experienced volunteers, so work packages can be tailored to the funding and skills available.

Appendix A
Photographs



Plate 1. Winding Hole Footprint looking North from South (March 2026).



Plate 2. Winding Hole Footprint looking South from North (August 2026).



Plate 3. A610 Embankment at Winding Hole Location



Plate 4. Existing MG Basin Marina Wall