

Methodology For T8513 A465 – Neath Masonry Bridge



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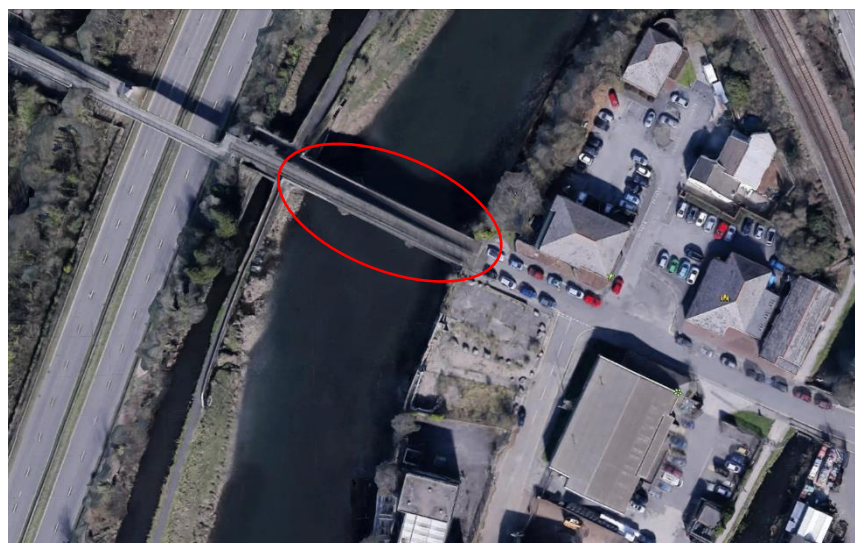
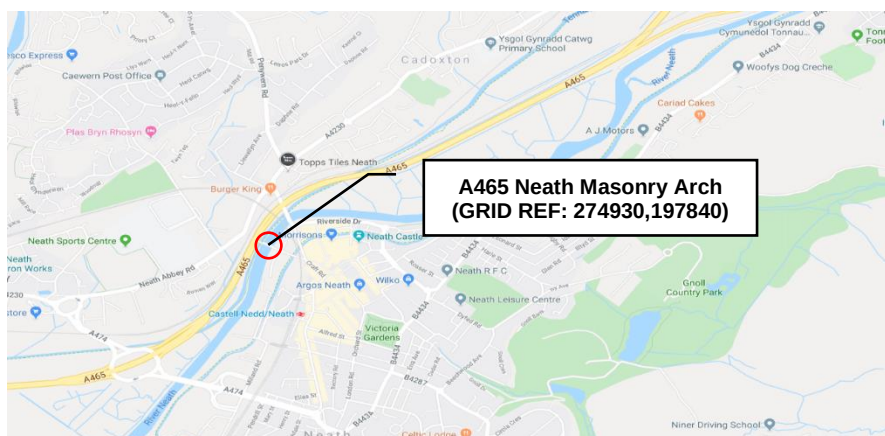
Project Description

The purpose of the works is to determine the bridge foundations levels and the underlying soils to enable Re-Evaluation of the Scour Risk Rating (SRR) at A465 Neath Masonry Arch. In summary, the works comprise of the following:

- Set up all public protection and diversions
- Set up site compound
- Expose test areas by locally removing existing asphalt based surfacing
- Core drill 1no. core through each piers and abutment from deck level
- Set up mining rig for sampling
- Reinstate voids left by cores
- Reinstate bridge deck surfacing

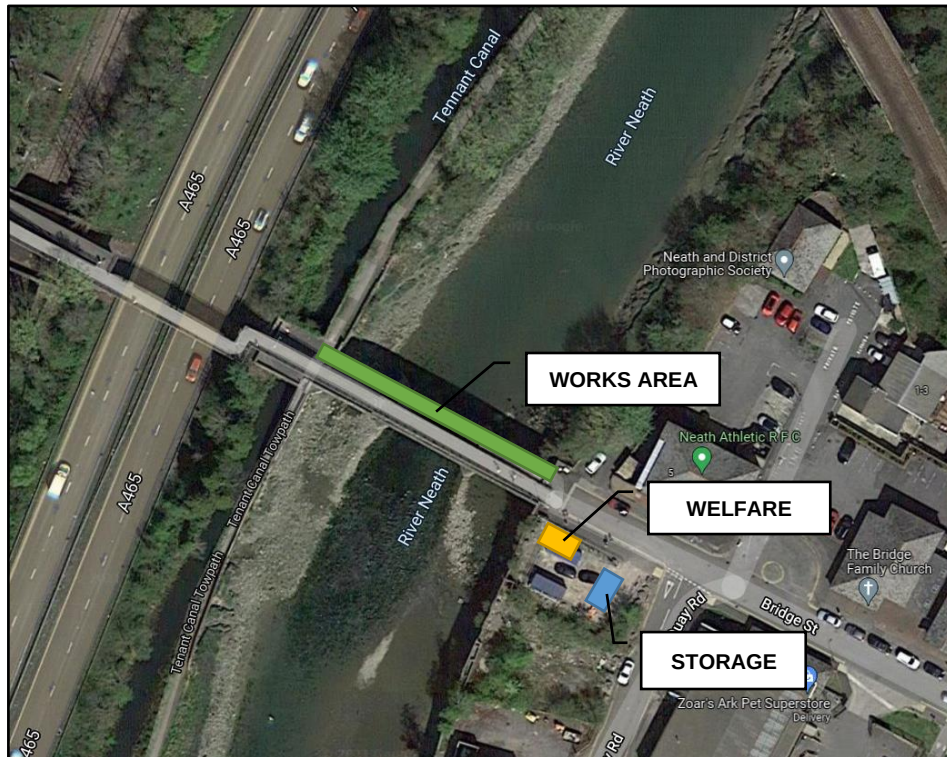
Site Location

The structure is located in central Neath (Grid Ref: 274930, 197840), adjacent to the A465. Bridge Street, SA10 7RF. The bridge itself serves as a pedestrian footway only, between: an industrial estate, tenant canal footpath, and over the A465 to the Nidum Arts Centre.



Site Set-up

A main site compound shall be established on the south-east bank of the bridge, as shown below. Herras fence panels shall be used as demarcation around the site compound and at either end of works area. Welfare is to be a ground hog unit eco 10 type to provide a canteen with onsite office and a small site storage container 10x8. A Knights Brown welfare van equipped with additional wc microwave and running water will also be provided. There will be parking for 2no. site vans and 1no. welfare van within the site compound.



Access

Access to the works area shall be achieved from the Bridge Street on the eastern side of the bridge. A general view of the works area looking west is shown below. Due to the location of the footbridge, the available width for the coring rig is approximately 2.5m.



Communication

All work activities shall be discussed prior to each shift with all site personnel, via the Knights Brown daily briefing, highlighting any changes to the working front and all hazards identified.

All operatives shall have mobile phones and have each other phone numbers. The Knights Brown team shall also have 2 – way radio communication if required.

If in the case of an emergency, emergency services shall be called using a mobile phone and Atkins/SWTRA shall be also notified.

Knights Brown will sign up to flood alerts from NRW as an added precaution.

Programme Considerations

Due to the presence of the pedestrian footbridge on top of the masonry arch bridge, the use of an underbridge unit is not possible. As a result, the works will be performed by core drilling through the original structure from deck level. These will be drilled into the piers to the pier head foundations and into the abutments to the abutment head foundations.

A total of four core drilled holes shall be undertaken. The working time frame shall be night-time working Monday to Friday, 20.00 to 06.00 for a proposed duration of 4 to 5 weeks. A high-level programme is shown below.

- Shift 1 to 2: Set up site and public protection
- Shift 3 to 4: Remove asphalt based surfacing to expose top of bridge deck
- Shift 5 to 20: Core drilling and core sampling through piers and abutments down to formation level
- Shift 21 to 22: Reinstatement of voids left by cores and reinstatement of asphalt based surfacing

Weather forecasts and flood risk shall be taken into account using the NRW website for alerts and regular weather monitoring.

Protection of Specific Area's / Items

To ensure the safety of the general public, the works area shall be closed off using Heras fence panels whilst the operations are being carried out. With the work area over the river being protected by 1.4m high solid masonry parapets, wall boards will be placed in front of the parapets ensure that no debris / water enters the watercourse below. The works area shall be cleaned at the end of every shift. Brushes and shovels shall also be utilised to soak up any surface water with dry sand.

Water

Water shall be taken from designated areas identified by Atkins. A standpipe shall be used to fill up towable water bowzers and brought to the works area. The water from the bowser shall be used to suppress any dust from the

Environment

All refuelling shall be carried out away from the watercourse at the site compound where drip trays and spill kits are available. Spill kits shall be close to any plant being used and drip trays used to catch any leaks on site. All mixing of any materials shall be carried out in the site compound. The grout used to reinstate the voids left by the drilled holes shall be mixed to a consistency to prevent splashing and seepage and will be batched in small controllable amounts. Noise is to be monitored and plant shall be in good condition to reduce the impact on

the surrounding area. All rubbish and surplus material are to be disposed of off-site at the end of each shift.

Additional Information

The river levels normal operating range is between 0.2m and 3.5m 90% of the time. With tidal influences occasionally taking the river level up to 4.5m.

Power

6kva generators shall be used on site for our site power. With fuelling carried out in the site compound located away from watercourse.

Site Lighting

Site lighting will be required during dark period if required via lighting towers. Set up to illuminate site area only; but including the outside face of the bridge during borehole reinstatement grouting

Protection to Watercourse

The potential for harm to the watercourse is considered low. The following mitigation measures shall be implemented:

General

- Risk of material spills shall be reduced by batching in small amounts away from the watercourse in the site compound.
- Dust shall be suppressed via the use of water from a towable bowser.
- Drilling residue liquid spills shall be soaked up with dry sand and shovelled up into bags and removed at the end of every shift.
- Wall boards shall be placed in front of the parapets ensure that no debris / water enters the watercourse below.

Core Sampling

The coring contractor will attach the coring rig & water management system as specified by the site engineer before commencing drilling. An image showing the proposed coring rig can be found below (length 3300mm x width 1750mm).



The borehole cores will be logged onsite by an engineering geologist before being transported to the laboratory.

After removing the core samples, these shall be split into 1-meter increments and stored ready for the lab to test.

Reinstatement of the Core Holes

- Reinstatement of the core holes shall be via the use of heritage lime grout mix 2-part NHL5 lime to 1-part OPC, and clean potable water ratio 0.5, to be blended in mixer.
- The heritage lime grout will be mixed on site in a grout mixer or cement mixer.
- The grout will be injected with a small grout pump under low pressure.
- A plastic membrane shall be placed under the grouting equipment to catch any grout spillages.
- Sand bags shall also be placed around the equipment to create a bunded area to contain any grout spillages.
- Observations to the piers are to be maintained whilst reinstatement of the boreholes takes place. Works are to be stopped if any historic lime grout seepage is observed .
- The volume of lime shall be monitored and any excessive grout usage over the anticipated cored borehole volume, is likely to be filling loose ground or voids. In this instance, the grout mix may need to be thickened up to limit grout flow with a thixotropic additive, such as Fosroc Cebex 653.
- For large grout takes, pea gravel may need to be poured down the boreholes to act as a bulk filler.

Surface Reinstatement

The surface finish of the reinstated cored boreholes shall match the existing.

If the cored surface layer can be removed carefully, it will be replaced and secured back into position with mortar.

Working Shift

- The Knight's Brown supervisor shall manage the site and all health safety and environmental issues.
- The Atkins site supervisor shall direct and advise sampling areas and ensure compliance with the works information and agreed methodology.
- The civils contractor shall complete the unearthing and reinstatement works.
- The geotechnical contractor shall carry out all coring and sampling works.
- The working shift will be 10 hours in duration.
- All plant and materials shall be removed from the work area and be placed in the site container or in the site compound away from the watercourse.
- All points of entry shall be secured to stop illegal access to the workplace and this will be monitored 24/7 by the traffic management contractor.

Sign Off and Clearing site

All works shall be signed off as complete before clearing site.

On the completion of this project, the site will be left clean and tidy and the works signed off with Knights Brown and the Atkins supervisor before leaving site. All equipment and excess material shall be removed before leaving site on a daily basis.