CLEVELAND BRIDGE
Your bridge rehabilitation partner

Cleveland Bridge has a long track record in bridge rehabilitation work from short-duration minor repairs to in-depth long-duration rehabilitation contracts; we cover everything from inspection and replacement to dehumidification and strengthening.

150 years of steel innovation

Cleveland Bridge is a global leader in the design, engineering, fabrication and construction of steel bridges and complex structures. Founded in the UK in 1877, our company has a history of innovation, helping to create some of the world’s most iconic structures, from the Victoria Falls Bridge and the Wembley Stadium Arch, to the Sydney Harbour Bridge and The Shard in London.

Skills and resources for every structural steel challenge

Cleveland Bridge has extensive skills and expertise in design, civil and structural engineering, fabrication, project management, installation, construction and remedial services for steel bridges, buildings and structures – on any scale.

We have the knowledge, facilities and resources to support every aspect of large-scale construction and engineering projects, from new-build programmes to strengthening and refurbishment works, as well as providing support services such as preparation, painting and finishing.

Full package of rehabilitation services

Our expertise and facilities, combined with our trusted supply chain partners, enable us to offer a complete range of rehabilitation services to maintain, restore and preserve all types of bridge – ensuring they continue to provide safe, reliable performance for the long-term.

Our bridge rehabilitation services include:

- Planned preventative maintenance
- Strengthening
- Repair and replacement
- Cable inspection
- Dehumidification – deck boxes, anchorage, main cable and stay cables
- Restoration of historic bridges
- Rehabilitation of expansion joints and bearings
- Retrofitting (e.g. wind barriers)
- Blasting and painting
- Access systems

Creating landmarks worldwide
BRIDGE REHABILITATION
Maintaining and upgrading bridges

Bridges must be continuously maintained to guard against environmental corrosion and deterioration, service-life fatigue and mechanical wear and tear. Some need to be upgraded to cope with increasing traffic loads and changes in usage. Planned preventative maintenance must be scheduled regularly to preserve all critical bridge elements, from piers and decks to bearings and suspension cables.

Cleveland Bridge has the expertise, resources and scale to carry out all forms of maintenance and rehabilitation on all types of bridge, of any age. Our experience as a major bridge builder enables us to diagnose and tackle problems effectively and efficiently, delivering the right rehabilitation solution for every bridge.

We work on both short-span bridges and long-span suspension or cable-stay bridges, with ISO 45001 accreditation, we follow the strictest safe working practices on every site – from working at height and handling lead to managing live traffic.

CASE STUDY
North Yorkshire Moors Railway - Goathland

Cleveland Bridge UK was appointed to fabricate and install the new 84-tonne steel bridge for Goathland Station. The full range of services offered by Cleveland Bridge meant the company was appointed main contractor, managing every aspect of the project to ensure timely completion, with minimal disruption to local people and national park visitors.

The world famous visitor attraction welcomes around 350,000 passengers each year, and many bridges along its scenic route require urgent attention. The bridge project is part of the wider Yorkshire’s Magnificent Journey (YMJ) initiative, a £10 million series of projects funded by grants from The National Lottery Heritage Fund, the Rural Payments Agency and the Local Enterprise Partnership, as well as donations from generous supporters.

The first scheduled work was the replacement of Bridge 27 at Goathland Station, which carries the 180-year-old railway over the Eller Beck. The 20-metre bridge is best recognised as the iconic track leading to Hogsmeade Station, where the young wizards disembark for Hogwarts in the first Harry Potter movie, The Philosopher’s Stone. The bridge was installed in W1908 and had deteriorated beyond economic repair.

The design for the bridge comprised two main steel girders measuring 21.5 metres long and fitted with walkways, trimmer beams measuring ten metres long, and cross girders up to seven metres long. The design mirrors the classic styling of the original bridge, ensuring it blends in with its natural setting. The steel structure sits on concrete sill beams, which were also cast and installed by Cleveland Bridge.

Principal Contractor: taking control of bridge preservation

On most bridge rehabilitation projects we act as Principal Contractor, in accordance with CDM regulations, taking control of the entire project on behalf of the client. That includes planning, managing and coordinating all aspects of health and safety, client liaison, specialist sub-contractor management, and all other associated tasks, such as traffic management.

Our construction professionals are leaders in the bridge-building industry, offering an unrivalled breadth of skills and experience to deal with the most complex challenges faced by bridge owners worldwide.
SERVICES OFFERED
for short-span bridges

Rehabilitation services to maintain and restore bridges
Either principal contractor or within your supply chain

- Strengthening, Repair, Replacement and Restoration
- Blasting and painting to NHSS19A
- Sympathetic repairs to historic steelwork
- Traffic management
- Restoring paintwork; from full bridge repainting to decorative gilding
- Stonework repairs, replacement and lime mortar work
- Restoration and replacement of electrical systems
- Rehabilitation and replacement of high-wear expansion joints and bearings
- Environmental protection
- Access and encapsulation at high and low level

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New steelwork fabrication and installation to NHSS20

Under deck access systems

Pontoon working platforms

Parapet and VRS system refurbishment/replacement

Pre-casting of associated concrete components including installation

New steelwork fabrication and installation to NHSS20

Surface and waterproofing
SERVICES OFFERED
for long-span bridges

Rehabilitation services to maintain and restore bridges
Experts in maintenance and rehabilitation of long span bridges

- Permanent and temporary underdeck access system
- High level temporary access systems
- Dehumidification systems
- Anchorage dehumidification
- Deck dehumidification and repainting
- Cable band bolt & hanger replacement
- Dehumidification, installation and maintenance
- Rehabilitation services to maintain and restore bridges
- Experts in maintenance and rehabilitation of long span bridges
- Permanent and temporary underdeck access system

Creating landmarks worldwide
Main cable internal inspection
Stay cable inspection and replacement
Hand strand replacement
Low level deck access systems
DEHUMIDIFICATION
Advanced corrosion protection for long-span cables, deck boxes and anchorages

In the past 20 years, dehumidification has become a recognised technique for protecting suspension bridge main cables against corrosion. Cleveland Bridge has expertise in installing and maintaining the latest dehumidification systems.

Dehumidification is an effective way to arrest corrosion in existing cables, and to prevent corrosion in new cables. It helps bridge owners to preserve long-span bridges for the relatively low operational cost of dehumidification, rather than the major capital cost of replacing cables or even rebuilding the entire bridge.

The process works by blowing dehumidified air into the cable at a low pressure, allowing the air to permeate into the void between individual cable wires. The dried air collects moisture before being released through exhaust ports. This reduces the relative humidity of the cable to a level at which corrosion is inhibited.

What does dehumidification involve?
A bridge cable dehumidification system comprises a series of injection and exhaust sleeves, fitted along the length of the cable, supported by a system of dehumidified air. The process of specifying and fitting a dehumidification system involves:

1. An assessment of electrical supply and load demands on the bridge.
2. Engineering and layout of the mechanical plant rooms.
3. Detailing of cable injection and exhaust ports.
4. Sizing of plant rooms and internal mechanical equipment, including dehumidifiers and injection fans.
5. Installation, commissioning and training.
6. Ongoing planned preventative maintenance (PPM)
STRENGTHENING
Restoring and increasing bridge strength for long-life performance

Bridges are built to last, often for 100 years or more. Many older bridges may now need to carry heavier traffic than they were designed to support, while others may need repairing or reinforcing to ensure they continue to perform safely.

Cleveland Bridge offers all the bridge repair, reinforcement and replacement services required to maintain or increase the strength, capacity or the load-bearing capabilities of a bridge.

As bridge design and build experts, we can strengthen historic bridges effectively while maintaining the aesthetic features that make them unique. Our experience includes working on Grade I and Grade II listed structures, and on Heritage Lottery funded projects. We can replace any steel components with precision-fabricated new elements – ensuring older bridges remain safe, reliable and fit for today’s loads.

Any strengthening works are carried out to the highest safety standards, and in keeping with the ISO 45001 quality accreditation standard - with minimal disruption to bridge users and the public. Non-destructive testing (NDT) is used to assess any repaired components, before repainting to restore the original appearance.

Expansion joints and bearings: rehabilitation for high-wear components

Bridge bearings and expansion joints are subject to traffic wear and tear, and to considerable abrasion as bridge decks expand and contract throughout their life. Looking after these components is essential to ensure they continue to perform their vital function. Cleveland Bridge can inspect and replace all types of bearings and expansion joints, as part of any turnkey package of bridge works.

Managing expectations – minimising disruption

Stakeholder management is a vital aspect of all Cleveland Bridge rehabilitation works. Collaboration and communication with the client, sub-contractors and project partners are essential to manage expectations and ensure effective coordination of works – so that projects are delivered on time and to the highest standards.

Cleveland Bridge takes special care to minimise the impact of rehabilitation works on bridge users, local people and other stakeholders. Wherever possible, closures are avoided, and works are timed to minimise risks and disruption.
PAINTING
Coatings to protect steel and enhance aesthetics

Cleveland Bridge offers a full range of bridge painting services, from restoring and repairing paintwork in damaged areas through to full bridge repainting. Our specialists can determine the most appropriate paint system for any bridge, and we have particular expertise in painting and restoration works for historic bridges.

Protective paint systems are principally required to preserve the steel structure on any bridge, but painting is also required to maintain aesthetic appearance – which is particularly important for heritage structures.
Any painting project begins by liaising with the client to identify colour schemes and to match new paint to existing colours. We identify the scope of works and the areas to be treated, and install appropriate access systems. We also identify any lead in existing paint systems, so we can put the correct safe working procedures in place. The area to be painted is then encapsulated, cleaned and washed down, and the substrate prepared by mechanical or blasting methods. Repainting can be completed using a full paint system, or a repair system for overcoating in areas where the existing undercoat is still intact.

We can apply multicoat paint systems, where required, to comply with Highways and Network Rail standards.

**CASE STUDY**

**Nottingham Trent Bridge Refurbishment**

Cleveland Bridge took on the role of main contractor for all of the rehabilitation works. The project involved painting all steel and cast-iron elements on the bridge, encompassing a total area of more than 11,000m². To maintain the historic appearance of the bridge, Cleveland Bridge needed to find an exact colour match for all painted areas, as well as the artwork on more than 400 intricately decorated cast rosettes. In addition, 120m² of gold leaf had to be applied to the bridge fascias to restore them to their former glory. Cleveland Bridge worked with a specialist partner to complete this delicate work.

Cleveland Bridge also needed to replace damaged cast-iron parapet components, and repair others in-situ. To recreate the precise design of these historic elements, Cleveland Bridge took moulds of existing in-tact decorations and used them to cast brand new sections. Repairs also had to be made to the heritage stonework on the piers and abutments.

The bridge remained open to traffic and the public throughout, which meant this essential bridge rehabilitation was completed with no disruption to bridge users. Cleveland Bridge was able to achieve the exemplary standards of workmanship and aesthetics required by the council for this Grade 2 heritage structure.
CABLE REPLACEMENT
Maintaining the load-bearing capacity of long-span bridge cables

Corrosion damage can reduce the load-bearing capacity of suspender ropes and stay cables on long-span bridges – meaning corroded cables need to be replaced. Long-span bridges are designed so that a small number of cables can be safely removed and replaced without compromising bridge stability.

As an experienced bridge construction specialist, Cleveland Bridge has the expertise to plan and manage the procedures and load transfer sequencing required for safe and effective cable replacement – for both suspender ropes and cables stays.

On suspension bridges, we can also replace the cable band bolts used to connect the main cables and the suspender ropes to the bridge deck. Our experience includes inspecting and replacing hand strand cables, which are used to provide access to the main cables on suspension bridges.
ACCESS SYSTEMS
Safe access to protect our workforce and the public

Providing safe, effective and appropriate access systems is an essential part of any bridge rehabilitation project. These systems enable engineers and operators to gain direct access to bridge components, offering protection from high winds where necessary, as well as safeguarding bridge users.

Cleveland Bridge can supply the access systems required for any bridge rehabilitation work, including scaffolding systems, high-level gantries and underdeck platforms. We can also design and build bespoke access systems to meet specific requirements.

For long-span bridges, our experience includes providing bespoke underdeck gantries, which move along the entire bridge length. We also provide specialised gantries for main cable access. At lower levels, we use fully enclosed and environmentally controlled scaffolding systems.

WIND BARRIERS
Reduce bridge closures in exposed locations

Closures caused by high winds are a common problem for many long-span bridges in exposed locations. Closing bridges is costly and disruptive, which means measures to minimise exposure to high winds are highly valued by bridge owners and operators.

Cleveland Bridge can retrofit wind barriers to long-span bridges, which effectively protect traffic from high winds. Fitting these barriers enables bridges to remain open, even in poor weather conditions, making them more resilient to the British weather and minimising risks and disruption to road users.
CABLE INSPECTION
Regular check-ups to keep cables healthy

Bridge cables must be inspected regularly to assess their condition, in accordance with international standards. Main cables, stay cables and suspender ropes must all be assessed.

Cleveland Bridge offers the complete range of cable inspection services, including the specialised techniques required for main suspension cables. Our engineers will determine the most effective inspection method for each bridge and cable type. All inspection works are planned and executed to ensure there is minimal disruption to bridge users and stakeholders.

CASE STUDY
Humber Bridge Cable Inspections

A new dehumidification system was installed on the two 1.38-mile-long main cables of the Humber Bridge in 2010. In 2019, Cleveland Bridge was appointed to carry out the first detailed inspection and testing of those cables since that installation – to ensure the dehumidification system was providing effective corrosion protection.

Cleveland Bridge needed to access the 15,000 5mm high-tensile steel wires that comprise each main cable. The complex process of exposing these tightly packed wires involved first removing the protective elastomeric wrap around the cables and the outer layer of circumferential wires, to reveal the high-tensile parallel wires. Wedges were then inserted to separate these wires, allowing them to be comprehensively surveyed. Sample lengths of wire were removed for laboratory testing. Where wires were removed, new wire sections were spliced into the cable and re-tensioned.

Once each section was completed, the cable was hydraulically re-compact and a new layer of circumferential wire was installed. A suitable paint system and a new layer of elastomeric wrap were used to restore the airtight seal. The dehumidification system remained operational throughout the inspection works, ensuring there was no lapse in corrosion protection.

Certifications

Creating landmarks worldwide
CLEVELAND BRIDGE UK

at a glance

- Established in 1877, based in Darlington, England
- Proven track record of design, fabrication and installation of multifaceted steelwork projects.
- Combined group fabrication capacity of 150,000 tonnes per annum.
- Commitment to the highest quality standards throughout the business.
- Full suite of capabilities, from turn-key solutions to provision of product-specific services across multiple sectors.
- Highly experienced engineering team, offering design, value engineering, project and site management expertise.
- Commitment to working with local partners, providing training, experience and employment opportunities.
- Commitment to minimising environmental impact and adherence to international environmental standards.