

# ASSET INSPECTION & ENGINEERING SPECIALISTS

DESIGNED TO SUPPORT.  
MADE TO LAST.



[www.ekspan.com](http://www.ekspan.com)



## ABOUT EKSPAN

### EKSPAN CARRIES OUT BRIDGE SURVEYS & INSPECTIONS ON NEW BUILD AND EXISTING STRUCTURES THROUGHOUT THE UK.

We can carry out detailed specialist reports to ascertain the service life on a complete structure or structural bridge components, such as bridge bearings, expansion joints, concrete investigations, waterproofing and speciality coatings. All assessments are in accordance with the latest British and DMRB Standards.

Our specialist teams can offer a wide range of intrusive and non-intrusive techniques to assess the overall condition and ensure any structure complies with current Eurocodes.

With a team of highly skilled engineers, EKSPAN can offer complete turn-key packages for all civil infrastructure, buildings, ports and utility sectors.

Our live monitoring systems can offer critical insights into the condition of any structure, giving early indicators of potentially severe issues avoiding costly remedial works. The ongoing monitoring services allow our engineers to wirelessly view live data readings of critical variables, including linear and angular displacement, strain, load, temperature, and vibration. EKSPAN is uniquely positioned with extensive corrosion control and fireproofing knowledge. No matter what structure or application, EKSPAN can cover all your Early Contractor Involvement (ECI) needs.

## EARLY CONTRACTOR INVOLVEMENT (ECI)

### WHAT IS EARLY CONTRACTOR INVOLVEMENT (ECI)?

Involving the contractor early in the design stage, this will allow the 'buildability' of a design to be assessed and produce an accurate cost of construction in conjunction with the initial concepts,

### THE BENEFITS OF ECI

ECI is well suited to large and complex contracts because it allows an integrated team to gain a good understanding of the requirements, develop innovative solutions, plan and mobilise resources, and manage risks to accelerate delivery and reduce costs.

Source: HS2 Engine for Growth





# BRITAIN'S ROAD BRIDGES ARE INCREASINGLY BECOMING 'SUBSTANDARD'.

THE NUMBER OF SUBSTANDARD ROAD BRIDGES MANAGED BY COUNCILS THROUGHOUT THE UNITED KINGDOM IS INCREASING...



## SERIOUS DECLINE

Serious decline in the number of bridges being assessed for damage caused by river flow.



## 3,105 SUBSTANDARD BRIDGES

Over 1.5m are substandard in the UK.



## HALF THE BRIDGES

Over half the UK's motorways & A-roads have sections in poor or very poor condition.



## CONSIDERATIONS

As weather gets more extreme & traffic volumes increase, bridge owners need to take appropriate action to protect them.

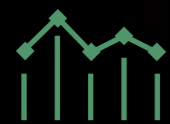


## THE EKSPAN PROCESS

Source: RAC Foundation

# OUR EXPERTISE:

- Mechanical & Elastomeric Bearings
- Waterproofing Systems
- Expansion Joints
- Cathodic Protection
- GRP Structures & Design Calculations



**COSTING ANALYSIS /  
WHOLE LIFE COSTING**



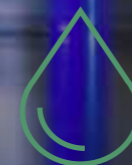
**STRUCTURAL INSPECTIONS  
& ASSESSMENT**



**STRUCTURAL  
MONITORING**



**CONCRETE INVESTIGATION  
/ REPAIR**



**SPECIALIST PAINT & COATING  
INVESTIGATION / REPAIRS**



**TEMPORARY WORKS  
DESIGN**

# PROJECT CASE STUDIES



## MUIRMONT BRIDGE

A detailed inspection of the Muirmont Bridge was undertaken by our ECI team. Following the recommendation of the report, a £300,000 investment was made by Transport Scotland to replace all of the South Abutment bridge bearings.

The team worked with BEAR to develop an ECI package detailing a Bearing Schedule (utilising a Midas Model of the structure to new SOV loadings), a reinforcement design detailing of the abutment shelves and produced permanent works and a temporary works AIP which employed live jacking to minimise disruption.

EKSPAN were selected to undertake emergency works to support the deteriorated south abutment bearings whilst manufacturing the 28 new mechanical bearings began. Following a successful installation, structural monitoring sensors were installed on the North Abutment to monitor temperature and displacement.



### SERVICES

- **Inspection of the Structural Bearings**
- **Preparation of Bridge Bearing schedule, including a Midas Model of the structure**
- **Design, manufacture & install of temporary works**
- **Reinforcement design and detailing of the abutment shelves**
- **Design, manufacture & install of Bridge Bearings**
- **Emergency works installation**
- **Structural monitoring**



## NENE BRIDGE

The project included a complex upgrade to strengthen the existing 'V Piers' on the Nene Bridge in Peterborough. Working alongside the Skanska Design Team, our engineering team worked to develop a suitable temporary works

design scheme to facilitate the replacement of 16 EKSPAN Spherical Bearings to the new Eurocode standard.

By welding and bolting temporary works to the existing steel bridge box beams, EKSPAN jacked the structure by 1.5mm from the newly installed concrete jackets to transfer the load from the newly installed concrete jackets to transfer the load from the existing bridge bearings onto the temporary works. Following the jacking process, EKSPAN removed the existing bridge bearings by removing the concrete bearing plinths by hydro-demolition.

Before the project started, EKSPAN undertook a detailed survey of the existing bridge bearings and successfully designed the new Eurocode-compliant bridge bearings to utilise the existing fixing holes in the bridge box beams, reducing the intrusiveness of the works required for the bearing replacement. Following bolting the new EKSPAN bearings to the structure, the bearing plinths were recast and the grout beds were installed. Once cured to the required strength, the structure was de-jacked onto the new EKSPAN Spherical Bearings.



## TICKTON FLYOVER

The East Riding of Yorkshire Council contracted our engineering team to undertake a bearing inspection of the 460 bridge bearings on the A1035 Tickton Flyover.

During the ECI phase, the EKSPAN team proposed a bespoke temporary works arrangement which utilised jacking locations on both land-based and pier-mounted bearing shelves; this unique approach was one of the determining factors which led to winning the tender.

The team overcame challenges with tidal rivers, traffic management restrictions and site logistics to successfully replace all bridge EN-compliant Bearings, a National Highways Mat type replacement Transflex 900 mechanical expansion joint and a Pitchmastic PmB waterproofing system.

## NEWHAVEN PORT SHEAVE WHEEL REFURBISHMENT

In late 2019 investigative works began to assess the condition of the sheave wheels and counterweight pit of the Newhaven Hydraulic Linkspan.

The linkspan comprises an approximately 45m long steel bridge with steel deck plates. There are two 20t counterweights on cables designed to relieve some of the weight of the bridge with two separate hydraulic rams that control the level of the linkspan. In addition, three steel transition flaps on their hydraulic rams lower onto the berthed vessel with free-hanging finger flaps at the end.

The inspection identified severely deteriorated bearings due to misaligned cables; because of this, the sheave pins, bearings and wheels all needed replacing with the works being carried out without causing disruptions. EKSPAN worked closely with Beckett Rankine to develop a detailed methodology and program to allow the works to be broken down into specific time slots. In addition, the team utilised trial test lifts and commissioning to ensure all the major works could be carried out between ferry sailings.

After completing the sheave wheels works, the team began replacing the two main operating rams. With obstacles such as seized connecting pins and limited working hours, a bespoke hour-by-hour plan was designed to divide the work into phases.

During the ECI stage, the EKSPAN team had the opportunity to undertake trial disassembly and reassembly to ensure each phase could feasibly be completed in the allocated time slots.

Innovation is critical to a smart engineering approach; the team proposed dimensional changes to the sheave wheel assembly, retrofitted stainless steel grease lines, added bespoke rain covers fitted with inspection hatches to allow for ease of future maintenance and developed an emergency ram failure system that allowed a spare ram to be stored locally, with the ability to be installed quickly if one of the main rams developed a fault. Thankfully, all phases of the work were completed as planned without causing any delay.



### SERVICES

- Inspection of the Structural Linkspan Bearings
- Developed a bespoke detailed methodology and programme
- Design, manufacture & install of Temporary Works & additional support stiffeners.
- Remanufacture of Sheave Wheels
- Hydraulic system refurbishment
- Design improvements



## CONTACT US

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