Case Study

The Falkirk Wheel

EKSPAN's involvement in the Falkirk Wheel was the design, manufacture and installation of the aqueduct expansion joints.

The Falkirk wheel is already Scotland's most recognizable monument to the future. It stands at 35 metres high and weighs a massive 1800 tonnes. Construction of the wheel began in year 2000 and was completed by 2002. The wheel is the centerpiece of the newly refurbished Scottish canal link. The structure connects the upper union canal and a basin that falls into the adjacent Forth & Clyde canal which is 25 metres below. This regenerated canal link also offers a direct navigable route between Glasgow and Edinburgh and a coast-to-coast link connecting the Rivers Forth and Clyde. Both of these canal links were important routes for importing and exporting goods to and from Edinburgh and Glasgow to Europe but with the development of road transportation this meant the beginning of the end for trading in this manner.

JOB BRIEF

- Supplied: Supply and Installation – Canal Expansion joints -12m long
- Supply of bearings for the main structure
- Project Team
- Client: British Waterways
- Scotland
- Structural Consultant: Tony Gee & Partners
- Mechanical Consultant: Bennett Associates
- Main Contractor: Morrison Bachy
- Soletanche JV
- Sub Contractor: Butterley
- Start Date: 2000
- Completion Date: 2002

BEARINGS

EKSPAN also supplied Butterley with two bearings that were specifically designed to take the vertical load of the wheel. As standard, all of EKSPAN bearings supplied are designed technical standards above the minimum BS5400 standards. Further information on bearings can be found in our series of brochures.

The Forth and Clyde canal link was all but killed off in the early 1960's when the A80 Glasgow to Stirling road was rerouted straight through the canal at Castlecary. This was done to save an alleged value of around £16,000. The union canal suffered the same fate just a few years later when the new M8 motorway west of Edinburgh was constructed. The old shipping canals have now been totally refurbished offering waterside walks for families, a cleaner environment for wildlife and many new development opportunities for businesses to expand. The new and improved canal is definitely a big draw for tourists visiting Scotland.

The aqueduct leading on to the gondolas is 104 metres long and each Gondola will hold four boats. Total travel time for the wheel is around five minutes compared with the one day originally required to navigate the eleven locks between the two different canal systems. As well as being an impressive site the wheel is also much quicker than the old system of locks with minimal loss of water.

EKSPAN'S SOLUTION - EXPANSION JOINTS

EKSPAN's involvement in the Falkirk Wheel was the design, manufacture and installation of the aqueduct expansion joints. Designed and constructed at our works in Sheffield, these joints were to fit along the base and sides of the aqueduct to hold the full canal water depth without leakage and to allow for movement between structure sections. The total movement range for the seal supplied is 100mm and the seal water pressure capability is equivalent to many times the canal water depth. As part of the design, the joint was pre-fabricated in EKSPAN's works to include a lifting frame, which facilitated lifting into place by a crane whilst retaining the integrity of the joint structure. Our team of engineers installed the joints within one week. Unexpectedly, the joints were put to test just before the structure was due to be opened when vandals opened one of the floodgates. The aqueduct, gondolas and the newly built visitor center at the side of the basin were flooded but EKSPAN's expansion joints did not leak any water. The watertight expansion joints are warranted leak proof. Further details are available in our seals technical literature.

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