

THE FORTH BRIDGE



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The Forth Bridge
Inscribed on the World
Heritage List in 2015

World
Heritage
Site

A Short Guide

April 2023



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INTRODUCTION

This short guide is an introduction to the Forth Bridge World Heritage Site (WHS), its inscription on the World Heritage List and its management and governance. It is one of a series of Site-specific short guides for each of Scotland's six WHS.

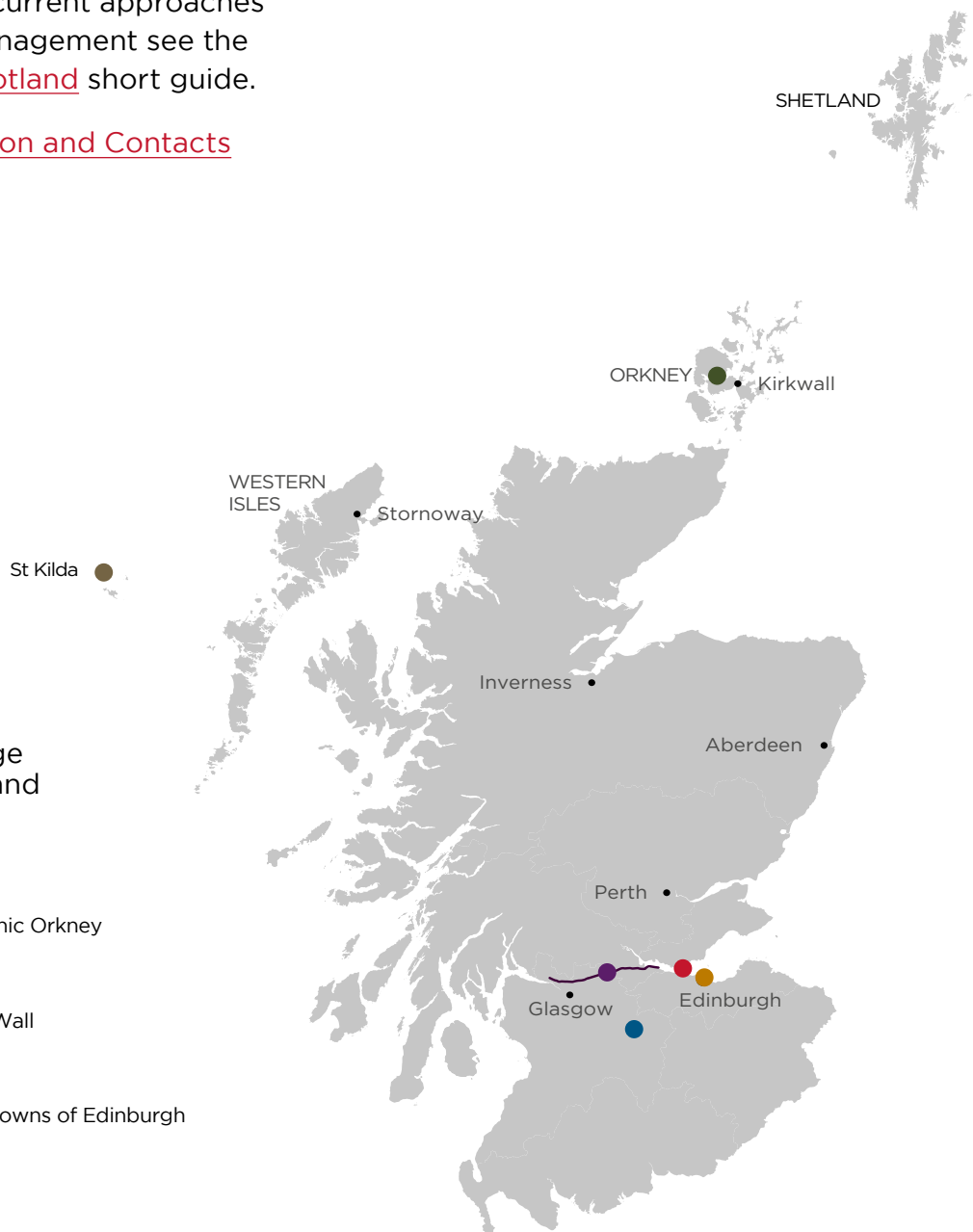
For information outlining what World Heritage status is and what it means, the responsibilities and benefits attendant upon achieving World Heritage status, and current approaches to protection and management see the [World Heritage in Scotland](#) short guide.

See [Further Information and Contacts](#) for more information.

World Heritage Sites in Scotland

Key

- 1 Heart of Neolithic Orkney
- 2 St Kilda
- 3 The Antonine Wall
- 4 New Lanark
- 5 Old and New Towns of Edinburgh
- 6 **Forth Bridge**



THE FORTH BRIDGE WORLD HERITAGE SITE: KEY FACTS

- Inscribed onto the World Heritage List as a cultural WHS in 2015 – the Bridge’s 125th anniversary year.
- The Forth Bridge is a globally-important triumph of engineering, representing the pinnacle of 19th century bridge construction and is without doubt the world’s greatest trussed bridge.
- When opened in 1890 it had the longest bridge spans in the world, a record that held for 27 years. No other trussed bridge approaches its perfect balance of structural elegance and strength combined with its overall scale.
- The Forth Bridge influenced engineering know-how across the globe. It is the world’s first major structure made from mild steel, and many other novel technologies were used in its cantilever design and construction.
- A globally-recognised icon of Scotland, it still plays a key strategic role in the local and national transport network. The Bridge is a shining example of how historic engineering infrastructure can be sensitively managed to meet modern needs.

*Forth Bridge Elevation and Section
1888. © Network Rail, Sir John Fowler
and B. Baker, NRCA110040Sb.*



THE WORLD HERITAGE SITE AND ITS SETTING

THE FORTH BRIDGE

The Forth Bridge is a keystone achievement in the world history of bridge-building and of steel construction. A potent symbol of 19th century belief in human ability to overcome any obstacle, it is one of the world’s supreme engineering achievements and epitomises the ‘can-do’ ethos of the high Victorian age born in the Industrial Revolution.

The railway crosses the Firth of Forth in the east of Scotland, 14 km (9 miles) north west of central Edinburgh, leaving Lothian at Dalmeny and arriving in Fife at North Queensferry. The World Heritage property boundaries are defined by the original contract let for the construction of the masonry and steel elements of the bridge, as represented in the original contract drawings.

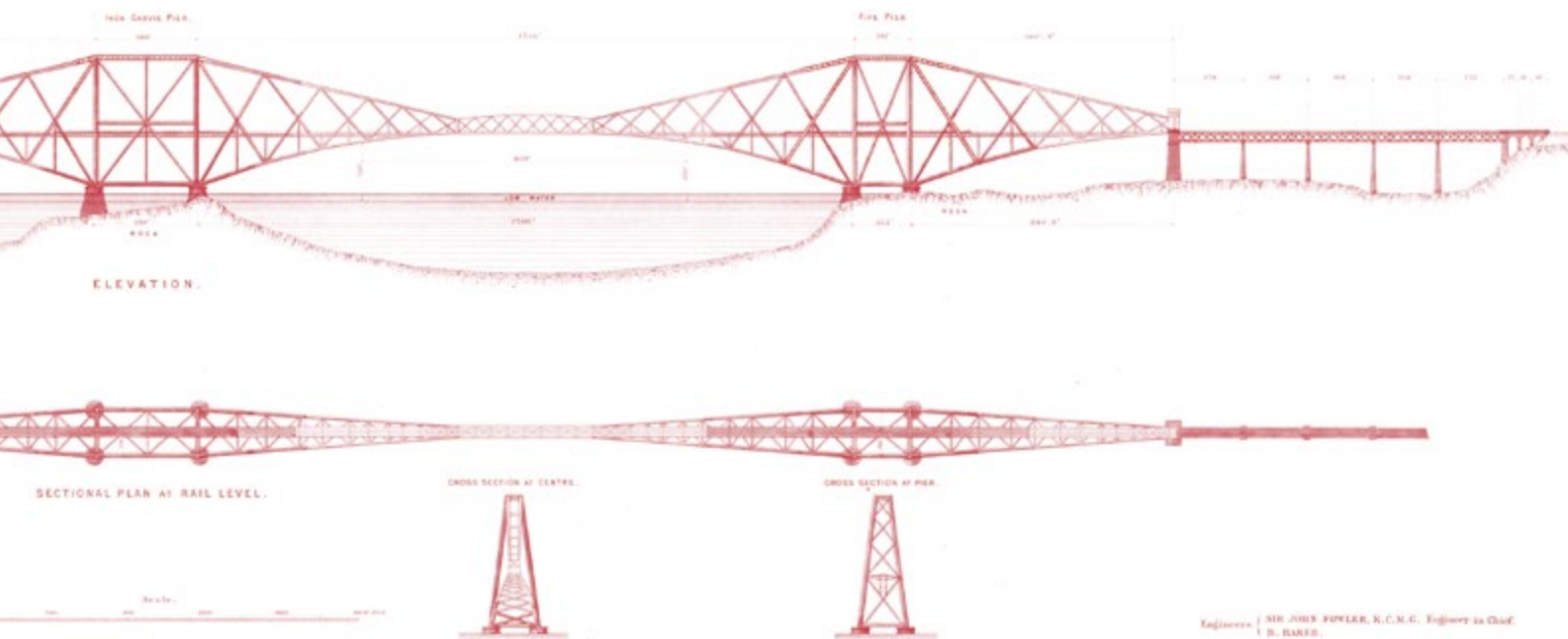
The Forth Bridge Company was formed in 1873 to construct a twin suspension bridge designed by Thomas Bouch. But after the disastrous collapse of Bouch’s Tay Bridge in 1879 work on the Forth Bridge came to an immediate halt.

In 1880, English engineers Sir John Fowler and Benjamin Baker began new designs based on the cantilever principles promoted by Baker, and tenders were issued in 1882. Work on the viaduct by pioneering Scottish engineering contractor, William Arrol, began in 1883, overcoming many challenges in the process. A true marvel when it opened in 1890, construction of the bridge was made as hydraulically-powered machines and tools.

FORTH BRIDGE.

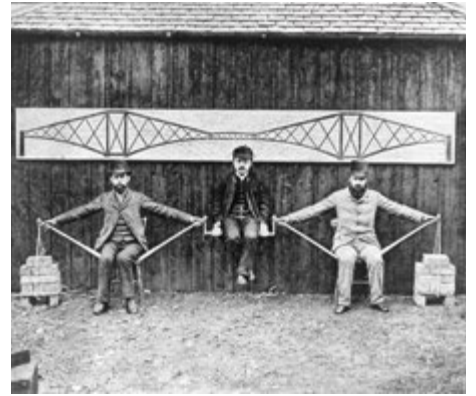
1700 FEET	CLEAR HEADWAY FOR NAVIGATION AT HIGH WATER	150 FEET.
685	DEEPEST FOUNDATION BELOW HIGH WATER	59
168	HIGHEST PART OF BRIDGE ABOVE HIGH WATER	560
342	DEPTH OF WATER IN CENTRE OF CHANNEL	210
150	WEIGHT OF STEEL USED IN CONSTRUCTION	ABOUT 45,000 TONS.
120		
32		

Works executed under Ed. Progress shown up to March 1st to 2nd to September 1st 1890 in this



The bridge is 2,529 metres long and the two largest spans each reach across 521 metres. The cantilevers were designed so as to balance each other during construction - once they met, each main span comprised two 207 metres cantilevers with a 107 metre suspended span between them.

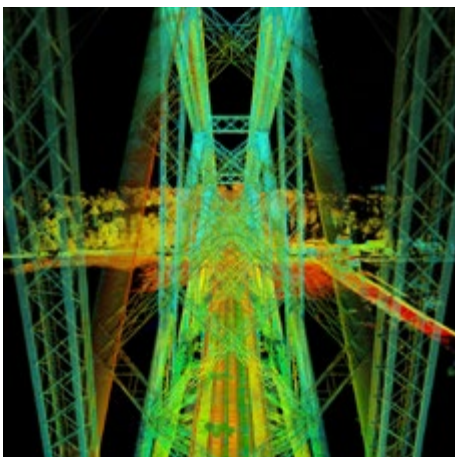
When completed these were the longest spans in the world, and the Bridge held this record until 1917 when it was surpassed by the Quebec Bridge in Canada, a much smaller bridge, but with a longer single span. However, the perfect balance of structural elegance and strength represented by the Forth Bridge has never been matched.



Human cantilever demonstration with engineer Kaichi Watanabe in the centre, 1887 © Institution of Civil Engineers.



View showing the construction of the Bridge.



Forth Bridge, point cloud data.

MANAGING THE SETTING OF THE BRIDGE

Setting is a key factor when considering the protection of a WHS. In the case of the Forth Bridge, the potential impact on Outstanding Universal Value (OUV) of developments close to or in adjacent areas around the Firth of Forth has been subject to rigorous study using computer-generated analysis and physical investigation of many viewpoints. While recognising that the bridge is conspicuous at great distances, nine of the most valued inland views have been built into the development planning systems of local authorities on each side of the Forth.

The 'Bridgehead Zone' provides protection for the area immediately surrounding the Bridge. It comprises the waters between Hound Point and the Queensferry Crossing, shoreline and land that combines existing statutory protection for the built environment (such as Conservation Areas, Listed Buildings and Scheduled Monuments) and for the natural environment (such as wetland Ramsar Sites and Sites of Special Scientific Interest).

STATEMENT OF OUTSTANDING UNIVERSAL VALUE

Each WHS has a Statement of Outstanding Universal Value (SOUV). This provides a clear understanding of the reasons for the Site's inscription on the World Heritage List, and details what needs to be managed in order to sustain the OUV for the long term. The SOUV describes the WHS and its importance, lists the criteria for inscription on the World Heritage List, explains how the WHS satisfies UNESCO's requirements for Authenticity and Integrity, and summarises the management requirements.

Commemorative plaque presented in 1985 by the Institution of Civil Engineers and the American Society of Civil Engineers.



Inchgarvie north cantilever under construction in 1888. © Crown Copyright National Records of Scotland, BR/FOR/4/34/436.

CRITERIA

To be included on the World Heritage List, Sites must meet at least one out of ten selection criteria, as explained in UNESCO's [Operational Guidelines for the Implementation of the World Heritage Convention](#). The Criteria under which the Forth Bridge is inscribed are:

Criterion (i): *Represent a masterpiece of human creative genius.*

The Forth Bridge is a masterpiece of creative genius because of its distinctive industrial aesthetic, which is the result of a forthright, unadorned display of its massive, functional structural elements.

Criterion (iv): *Be an outstanding example of a type of building or architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history.*

The Forth Bridge is an extraordinary and impressive milestone in the evolution of bridge design and construction during the period when railways came to dominate long-distance land travel, innovative in its concept, its use of mild steel, and its enormous scale.

MANAGING THE FORTH BRIDGE

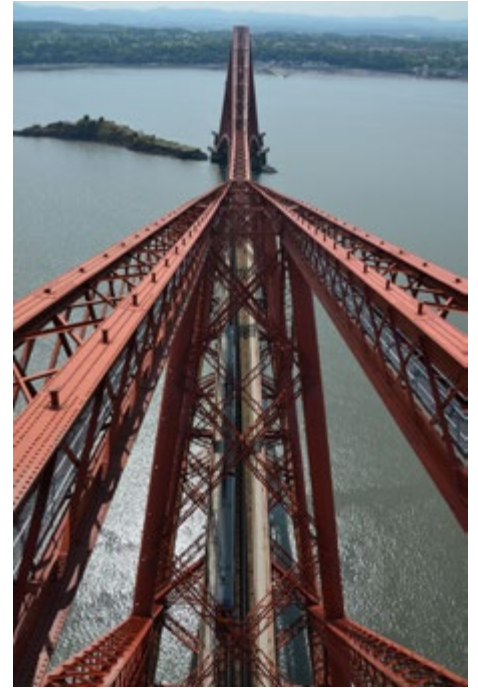
THE FORTH BRIDGE WORLD HERITAGE MANAGEMENT GROUP

Nomination of the Forth Bridge was overseen by the Forth Bridge World Heritage Nomination Steering Group, a sub group of the Forth Bridges Forum. Following inscription, the [Forth Bridges Forum](#) set up a similar subgroup to take forward the Management Plan – the Forth Bridge World Heritage Management Group. This group brings together representatives from local councils around the bridge alongside heritage, transport, business and tourist organisations

The Management Group meets at quarterly intervals to oversee the implementation of the actions outlined in the Management Plan. As the Management Plan is delivered, membership of the Management Group will evolve to include other relevant parties such as other business organisations.



The Forth Bridge from Ferryhills, North Queensferry.



View from the top of The Forth Bridge.

THE PARTNERSHIP MANAGEMENT AGREEMENT

Conservation, maintenance and operation of the Forth Bridge WHS remains the responsibility of Network Rail. Agreement on changes to the Bridge, from routine maintenance to more substantial alteration that requires planning consent, is facilitated via the Partnership Management Agreement (PMA) between Network Rail, Historic Environment Scotland (HES), Fife Council and City of Edinburgh Council.

The specific function of the PMA is to ensure the safe and efficient operation of the Bridge by monitoring, and where appropriate, consenting any works that are required, whilst at the same time protecting its integrity and OUV. The PMA partners meet regularly to ensure that the agreement is properly implemented.

*The three Forth Bridges
from the air looking west.*



THE MANAGEMENT PLAN

The Forth Bridge WHS Management Plan sets out a prioritised list of agreed actions for the WHS. Its principal aim is to maximise the benefits of inscription whilst mitigating any negative impact that might ensue.

As a recent inscription on the World Heritage List, actions have focused on information gathering, project development, and establishing the essential mechanisms for engagement with local communities. These actions aim to help deliver improvements to local infrastructure and site interpretation. The plan also looks beyond the regional confines of the bridge and its setting, to consider wider benefits that may ensue, not least in education, skills and in the promotion of engineering to all generations.

THE VISION

The Forth Bridge WHS will be managed in a sustainable manner, to conserve, enhance and present its Outstanding Universal Value locally, nationally and internationally. The aim is to balance the needs of conservation, operation and access alongside the interests of local communities, whilst also contributing more generally to sustainable economic growth by:

- involving local communities around the property.
- attracting and sustainably managing visitors to the area.
- adding value to the local and national economy.
- developing opportunities for education and learning.

PLANNING AND THE FORTH BRIDGE

World Heritage designation does not result in additional direct legal protection. Instead, the Forth Bridge is protected through the planning system and heritage designations.

Scotland's National Planning Framework 4 requires planning authorities to only support development proposals where the Outstanding Universal Value of a WHS or its setting is protected and preserved.

The Historic Environment Policy for Scotland sets out a series of principles and policies for the recognition, care, and sustainable management of the historic environment.

A series of thematic Managing Change Guidance Notes produced by HES provides best practice advice to help guide changes to the historic environment. One of the guides focuses on [World Heritage](#). It should be used to inform planning policies and help with decisions relating to planning applications affecting the WHS.

The Bridge itself is Category A Listed for its international and national importance. This gives it statutory protection and any change to it requires Listed Building Consent. In addition to the Forth Bridge itself, there are several other listed buildings in the adjacent Bridgehead zone, together with scheduled monuments and parts of a battlefield and a designed landscape

The commencement or 'springing point' at each end of the Bridge structure is protected by North Queensferry Conservation Area, Queensferry Conservation Area and Dalmeny Conservation Area. Any development in a Conservation Area must preserve or enhance the special character of the area, as set out in their respective character appraisals.

A train passing across the Bridge.



The 'Bridgehead zone' set around the Site is a means to engage with, mitigate impacts on, and deliver benefits to adjacent communities. A range of existing protections and controls, as set out in LDPs, serves to protect the close setting of the Bridge, giving the Bridgehead zone the effect of a buffer zone. Nine further views of particular value that are a little way inland have been specifically noted as supplementary guidance to local development plans.



North west caisson, columns and diagonal bracing Fife cantilever.

SUMMARY OF RELEVANT LEGISLATION, POLICY AND GUIDANCE

- *Our Place in Time* – The Historic Environment Strategy for Scotland (March 2014)
- The Town and Country Planning (Scotland) Act 1997 as amended by the Planning etc. (Scotland) Act 2006
- National Planning Framework 4 (2023)
- Planning Advice Note 2/2011 *Planning and Archaeology*
- Planning Advice Note 71/2004 *Conservation Area Management*
- Historic Environment (Amendment) Scotland Act 2011, which amends three pieces of primary legislation:
 - The Historic Buildings and Ancient Monuments Act 1953;
 - The Ancient Monuments and Archaeological Areas Act 1979; and
 - The Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997
- Historic Environment Policy for Scotland (HEPS) (2019)
- *Managing Change in the Historic Environment* Guidance Notes, HES
- Fife Council Local Development Plan
- City of Edinburgh Council Local Development Plan



View from the top of the Bridge looking south towards Queensferry.

FURTHER INFORMATION AND CONTACTS

FORTH BRIDGE COORDINATOR
NETWORK RAIL

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Tel: +44 (0)131 668 8763

KEY LINKS

Forth Bridges Forum:

www.forthbridges.co.uk

Email: fbf.enquiries@amey.co.uk

Forth Bridge World Heritage Site
and related web pages:

www.forthbridges.co.uk/forthbridge/world-heritage.html

UNESCO World Heritage Centre

- World Heritage List: The Forth Bridge:

whc.unesco.org/en/list/1485

The Forth Bridge WHS on the HES website:

www.historicenvironment.scot/forthbridge

The Forth Bridge is owned and operated
by Network Rail:

www.networkrail.co.uk

For planning policies related
to the Forth Bridge, see:

Fife Council: www.fifedirect.org.uk

City of Edinburgh Council:

www.edinburgh.gov.uk