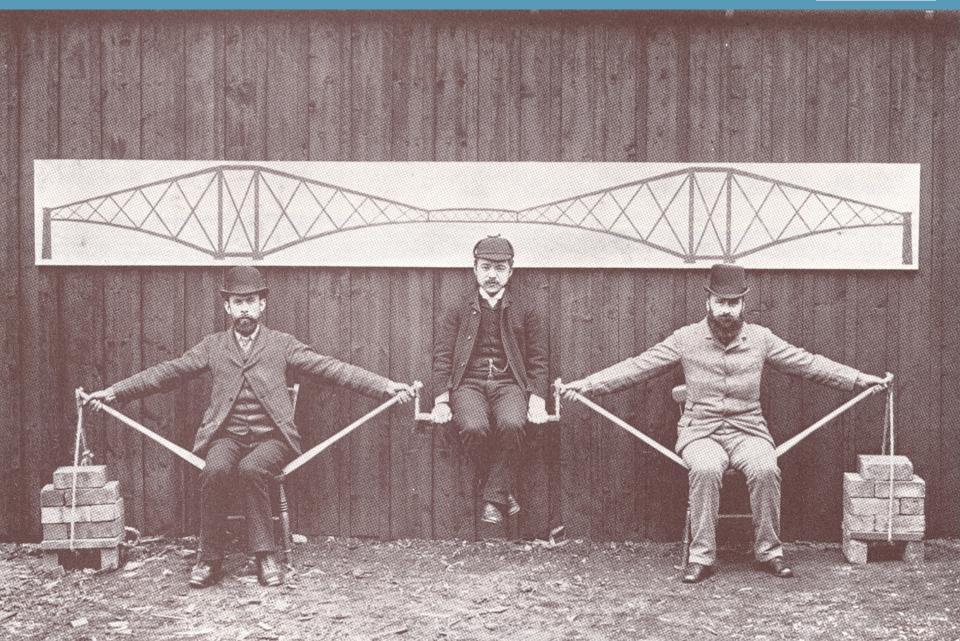
## WORLD HERITAGE UK TECHNICAL WORKSHOP, EDINBURGH The Forth Bridge





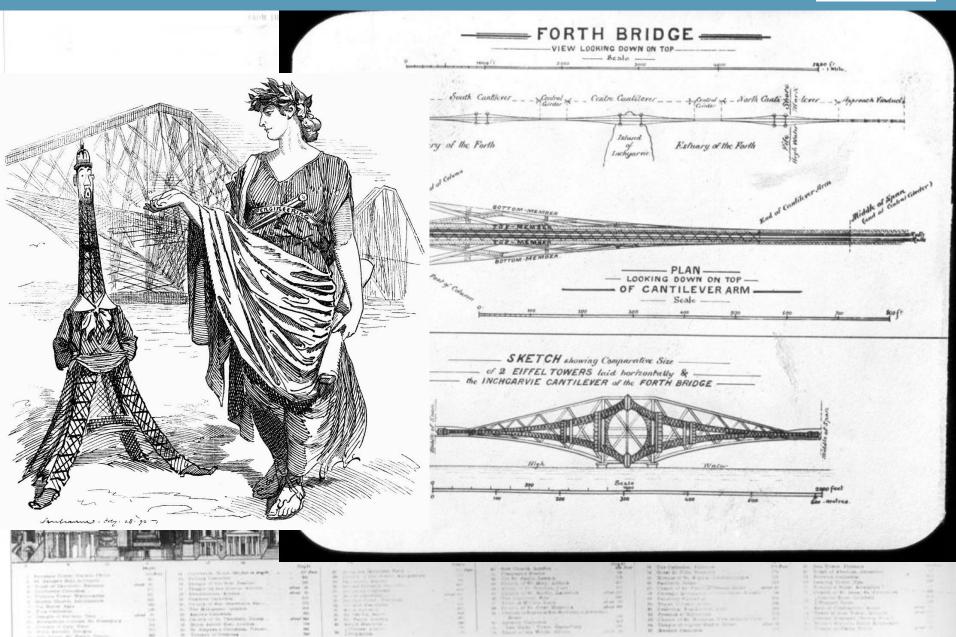
## Demonstrating the Cantilever Kaichi Watanabe, c.1887





## Engineering Wonder, Major event, widely reported Contemporary reports from *Engineering*, Punch magazine...

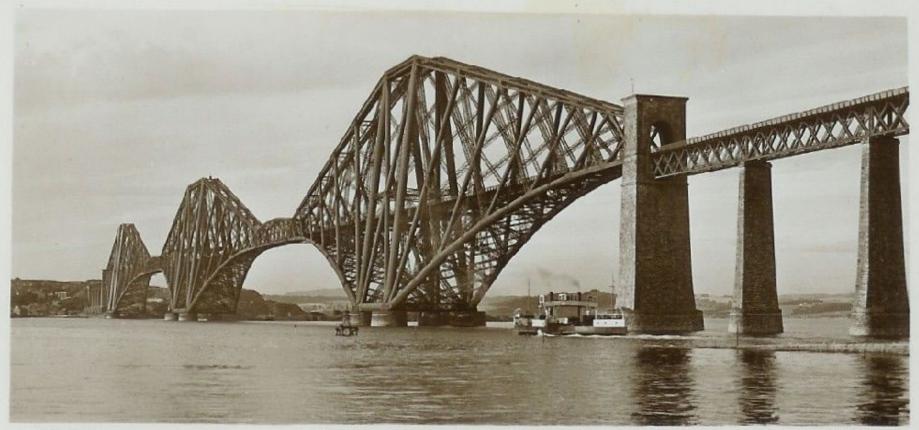




### THE FORTH BRIDGE: widely quoted statistics

Example of a Ralston's postcard





COPYRIGHT

### THE FORTH BRIDGE

W. RALSTON LTD

THE LABOUR OF 5000 MEN (NIGHT AND DAY) FOR 7 YEARS OPENED MARCH 4th 1890 COST OVER £3,000,000

Total Length 1½ miles including Approach Viaducts - Two Central Spans 1710 ft. each Highest Part Above Sea Level at High Tide 361 ft. - Depth Below Sea Level 91 ft. 54,000 Tons of Steel 6,500,000 Rivets

ENGINEERS - Sir John Fowler and Sir Benjamin Baker

CONTRACTOR - Sir William Arrol





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Excellence Award July - December 2012



### Planning

Full and proper consideration taken to all aspects of the work from the compilation of hazard elimination risk assessments to full plans of works.



#### Professionalism

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- Contracts delivered on budget
- ✓ Contracts delivered with no H&S issues
- Contracts delivered to your satisfaction

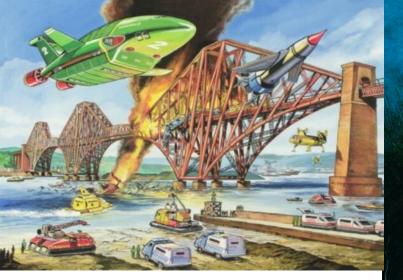
CONTACT FORTH DEMOLITION TODAY AND GET YOUR PROJECT STARTED



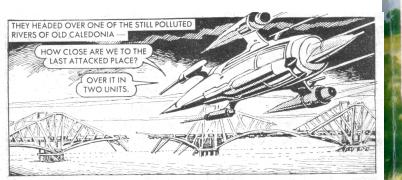




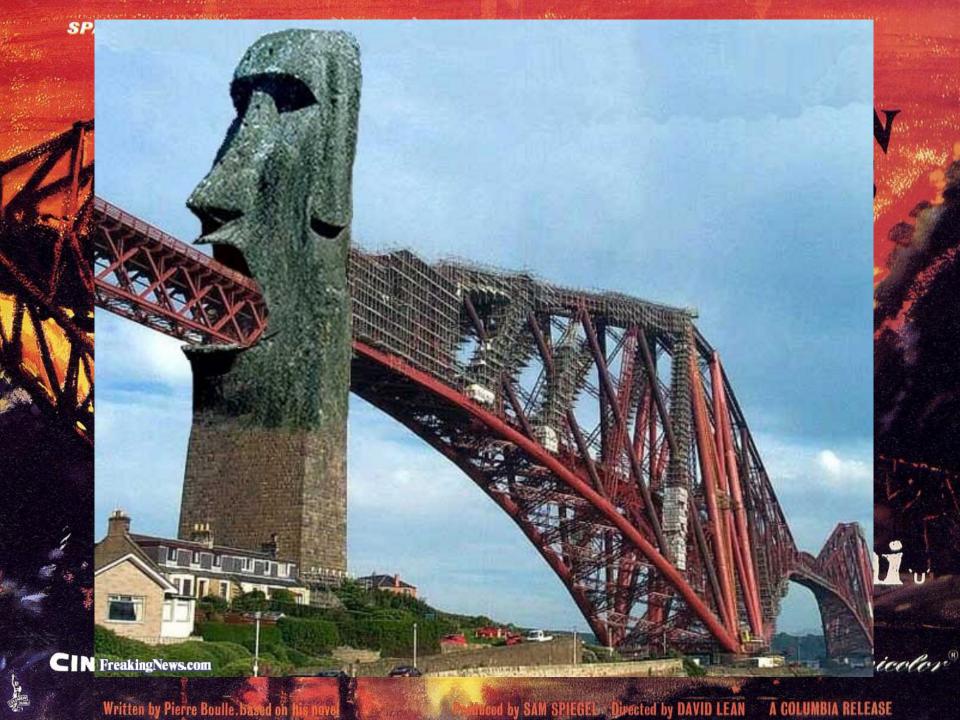
















The Forth Bridge, viewed from the Hawes Pier, Queensferry, May 2015

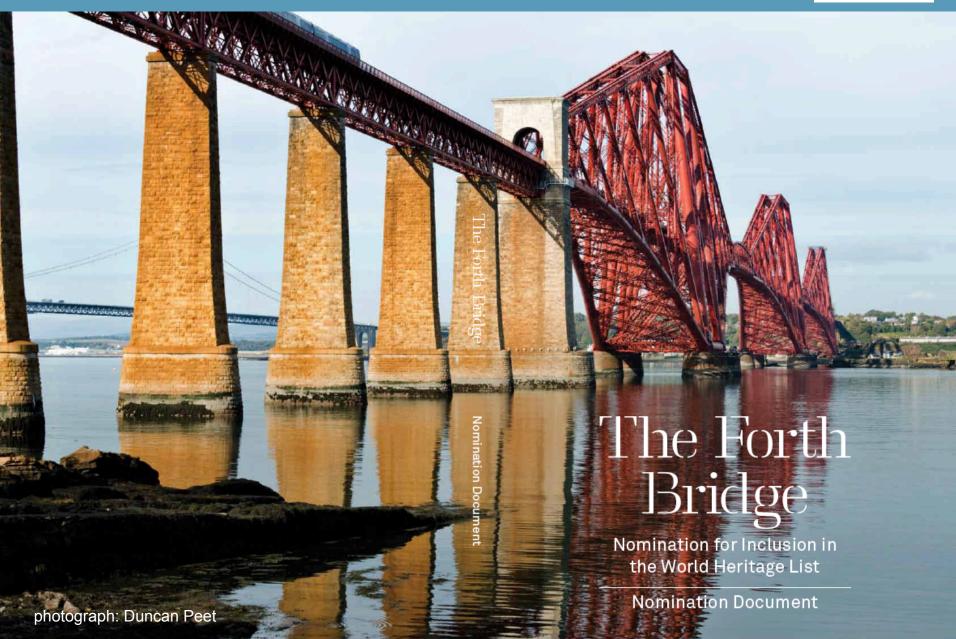
## The nomination team at Historic Scotland receives the dossier from the printers, January 2014





## The Nomination Document Completed and submitted to UNESCO, January 2014





## Celebrating the submission of the Nomination 20 January 2014





## ICOMOS Technical Evaluation Mission October 2014





## ICOMOS Technical Evaluation Mission October 2014





## Session 39, UNESCO World Heritage Committee Sunday 5th July 2015, former West German Parliament, Bonn





### Session 39, UNESCO World Heritage Committee

The UK Permanent Delegation's view of the chamber





### Session 39, UNESCO World Heritage Committee

Members of the World Heritage Committee at work...

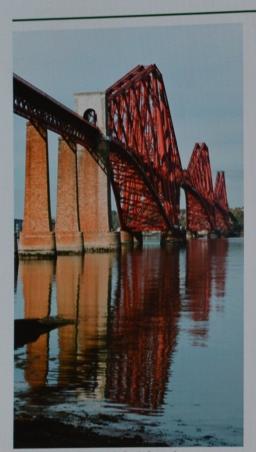




## Session 39, UNESCO World Heritage Committee The Forth Bridge nomination was presented by ICOMOS in French



Le pont du Forth



Vue du pont du Forth depuis South Queensferry

**ICOMOS** 

### Brève description

Ce pont ferroviaire enjambant l'estuaire du fleuve Forth, en Écosse, est le plus long pont cantilever à travées multiples du monde. Ouvert en 1890, il fonctionne encore aujourd'hui et reste un important pont ferroviaire pour le transport des passagers et des marchandises. Cette structure de grande envergure, longue de plus de 2,5 km, a été élaborée et réalisée grâce à des principes de conception et des méthodes de construction de pointe du génie civil. Son esthétique industrielle caractéristique résulte de la présentation franche et dépouillée de ses éléments structurels. Le pont du Forth, novateur dans son concept, son style, ses matériaux et son envergure, marque une étape importante dans l'histoire de la construction des ponts.

#### Catégorie de bien

En termes de catégories de biens culturels, telles qu'elles sont définies à l'article premier de la Convention du patrimoine mondial de 1972, il s'agit d'un monument.



### 39th Meeting of UNESCO's World Heritage Committee, Bonn, Germany, 5th July 2015









### A Team Job: Impossible without key partners Worked through the Forth Bridges Forum, run by Transport Scotland



### Local authorities













**Transport Scotland** 











**Forth Estuary Transport Authority** 



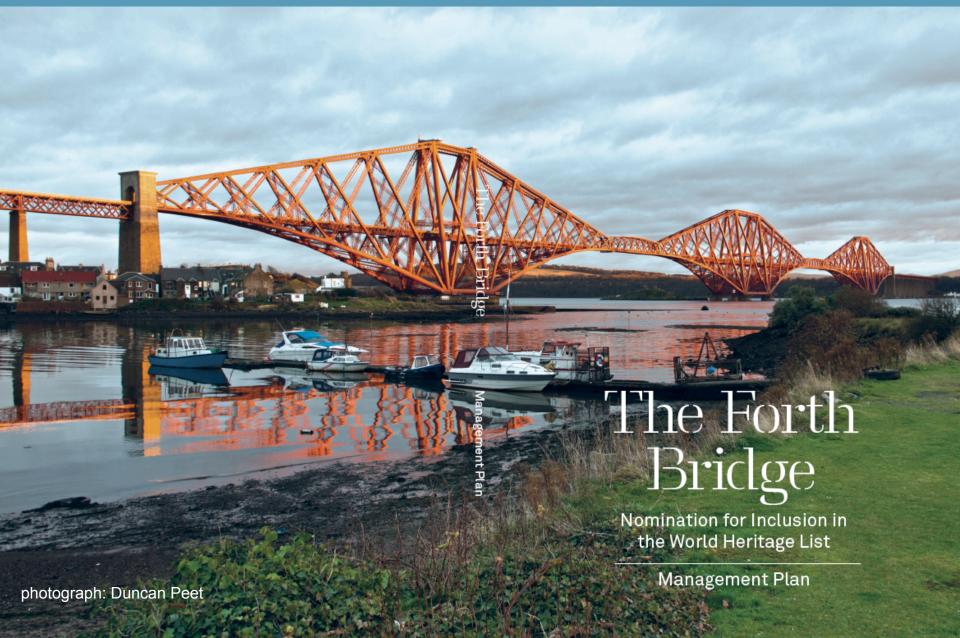
**Forth Replacement Crossing** 



**Local Community Councils** 

## The Management Plan Completed and submitted to UNESCO, January 2014





### The Management Plan The Signatories representing the main partners



Foreword

rd

### Foreword

Many would argue that the World Heritage listing of the Forth Bridge is long overdue, and others mistakenly believe that it is already a World Heritage Site. Add to this the fact that the bridge will in 2015 see its 125th birthday, and that it is in as good condition as it has ever been after a massive restoration project, and it becomes clear that this is an excellent time to be putting forward a nomination for World Heritage inscription.

With this in mind, we, the lead organisations within the Forth Bridges Forum, are delighted to be able to take forward this World Heritage nomination. There is, in addition, the added excitement of the neighbouring Forth Road Bridge reaching its 50th anniversary in 2014, and the prospect of the completion of the new Queensferry Crossing in 2016. Three consecutive years from 2014 to 2016 will therefore celebrate major engineering achievements spanning three centuries, and the aspiration is that World Heritage inscription in 2015 will provide a major focus within this celebratory festival period, providing a solid foundation for the future conservation and promotion of the Forth Bridge.

Bridge is hugely important for Fife. the City of Edinburgh, Scotland, and for the UK, both as a major piece of operational transport infrastructure, and as an icon of a great industrial age. The bridge has now been operating for 124 years, a fact which demonstrates beyond doubt the success of its design. which was born in the most difficult circumstances - the aftermath of the Tay Bridge disaster. It is also a testament to the quality of the maintenance regimes and staff of the various railway companies and contractors that have cared for the bridge over the last twelve and half decades. The fact is, especially following the most recent period

There is no doubt that the Forth

of investment and restoration, the bridge is in remarkably good condition, and with the help of this Management Plan, should remain so for many decades to come.

Whilst potential inscription of the Forth Bridge will not itself impact on its operational function as an essential part of the UK's mainline rail network, it is likely to have a significant effect upon the areas adjacent to each end of the bridge, and potentially on the region, Scotland and the UK more generally. The bridge is already a tourist attraction in its own right, and the publicity generated by potential inscription as a World Heritage Site has the potential to attract many more visitors and create challenges and opportunities for the adjacent communities in Fife. Edinburgh and the Lothians. This Management Plan will therefore seek to identify ways in which the benefits of inscription can be maximised beyond the management and care for the bridge itself, whilst also considering ways of minimising or preventing some of the problems that might ensue as a consequence of an increase invisitors to the area. It will also look beyond the regional confines of the bridge and its setting, and consider wider benefits that may ensue, not least in the context of education and skills, and in the promotion of engineering amongst our younger generations in particular.

This Management Plan is being implemented with the assistance of many partner organisations and local people. It is encouraging that the nomination has received such strong support from the public and all the member organisations of the Forth Bridge World Heritage Steering Group, and we very much look forward to working together over the next six years to ensure both the successful management of the Forth Bridge itself, and the impact of inscription more broadly, should the nomination be successful.







David Middleton Chief Executive, Transport Scotland



I.N. Wolfed

lanWalford

Chief Executive,



Steve Grand

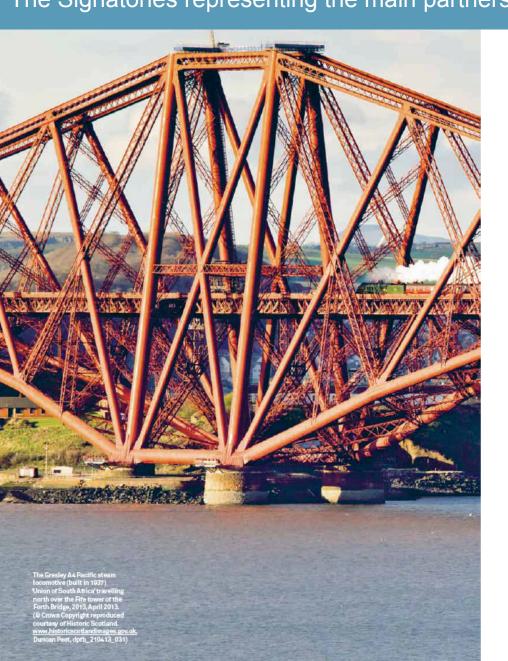
Steve Grimmona Chief Executive, Fife Council



Sue Bruce Chief Executive, City of Edinburgh Council



Malcolm Roughead Chief Executive, Visit Scotland







### The Management Plan The need to establish a monitoring system



Section 6

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### Monitoring the State of Conservation

In accordance with Article 29 of the World Heritage Convention, the Department for Culture, Media and Sport, must on behalf of the United Kingdom Government produce periodic reports on the legislative and administrative provisions and state of conservation of the World Heritage Site. They will be undertaken within the six-year time scale of the World Heritage Convention periodic reporting exercise and guided by best practice. The results will be used to assess the implementation of the Strategic Action Plans detailed in Section 7 of the Management Plan.

Opposite: The south suspension span, with restoration work rearing completion in July 2011 (@ Crown Copyright reproduced courtesy of Historic Scotland. www.historicscotlandimages.gov.uk, Miles Oglethorpe, DSC\_5886)

### 6.a Key Indicators for Measuring State of Conservation

Key indicators are established in

the Management Plan for

measuring quantitatively

and qualitatively the state of

conservation of the Forth Bridge. A principal means of achieving this will be via Network Rail's CARRS (Civil Asset Register and electronic Reporting System system), which is tailored to the maintenance and monitoring needs of the Forth Bridge. In addition, the company has an asset management plan which is currently under full review, in line with Network Rail's Strategic Major Structures Policy (programmed for 2013/2014). This will include annual care and maintenance budget statements along with assessment for the need for theoretical major works based on the expected serviceable lifespan of the new protective

CARRS was developed as a structures asset management system to operate at a national level, allowing Network Rail to replace the multiple local systems previously in operation throughout the network, thus having a single view of the national structures asset portfolio. The CARRS system is a work flow system which holds records in a

coating systems recently applied to the bridge as part of the restoration project. common format (file/folder) providing the ability to schedule and receive updates of examination reports electronically into a supporting document management system and also allow for the electronic sign off of reports that will generate work items which can be exported to the people and organisations responsible for carrying out the work.

### The Management Plan The need to demonstrate that we are looking after the Bridge



16 Section 1 Section 1



O Microne df

rons dft Acrylic Urethane Top Co

400 Microns dft Glass-flake epoxy Main Coat

50 Microns dft

12-20,000 Microns dft

train numbers has freed capacity to permit an increase in the numbers of passenger train numbers of passenger train numbers of passenger train numbers of passenger train numbers has freed capacity to permit an increase in the numbers has freed capacity to permit an increase in the numbers has freed capacity to permit an increase in the numbers has freed capacity to permit an increase in the numbers has freed capacity to permit an increase in the numbers has freed capacity to permit an increase in the numbers has freed capacity to permit an increase in the numbers of passenger train numbers has freed capacity to permit an increase in the numbers has freed capacity to permit an increase in the numbers has freed capacity to permit an increase in the numbers of passenger train numbers has freed capacity to permit an increase in the numbers of passenger train numbers has freed capacity.

In summary, general wear and tear has little significant impact on the bridge. Regular maintenance of the railway itself, along with a routine care and maintenance regime for the structure addresses any items of general wear and tear. Replacement of worn components is generally limited to the rails themselves and to the embedded timber baulks on which they sit. The timbers in the troughs absorb some of the impact energy of the trains and spread the load.

Top: While it was possible to spray paint many of the surfaces, many parts of the Forth Bridge required final hand painting, July 2009. (© Courtey of Balfour Beatty)

Below: The new Epoxy glass-flake coating system that has been applied to the bridge, replacing the original paint, which contained lead. (@ Courtesy of Duncan Sooman, Scot Rail)

Opposite: An abseiler carrying out maintenance work beneath the permanent way within the north approach viaduct of the Forth Bridge, August 2012. (© Grown Copyright, reproduced courteey of Historic Scotland. www.historicscotlandimages.gov.uk. Miles Odlethorp. DSC. 7664) Historically the Forth Bridge had been the principal path for coal trains serving the large thermal power station at Longannet, but the re-opening of the Stirling-Alloa-Kincardine railway line has greatly reduced this load. At its height, the overall freight traffic amounted to some 6,000 freight train journeys per annum, each outward train being up to 1,400 tonnes in weight - but very much less coming back because they usually returned empty. However, the bridge remains an important freight route (e.g. for pipes and cement) and can be called on at any time as the only diversionary route to again service Longannet. Meanwhile, the reduction in freight

Epoxy zinc phosphate blast primer

Steelwork (Surface prepared

To Swedish Standard Sa 21/2)

#### Conservation Measures

The property is protected through the planning system by its designation as a Category W. Listed building. The draft Management Plan identifies actions to further protect and enhance the condition of the historic fabric, many of which will be achieved through the Partnership Management Agreement.

One such measure is for example, the recent removal by Network Rail of some unsightly cable troughs from the south face of the South Jubilee Tower, which has returned this granite elevation to its original clear view. A Conservation Management Plan (CMP), will help to build on the achievements of the recent restoration works.



Table collated from information in the Network Rail CARRS report (and see 6.a Monitoring)

#### South Arches 3 Span Masonry Arch Viaduct

Constructed in granite. Arches noted to be in good overall condition with no notable defects reported for many years. Widespread leaching and efficience reported in addition to vegetation ingress issues.

#### North Approach Viaduct

Constructed in early steel, metallic 5-spans viaduct, coated in old 5-coat Alkyd system throughout between 1993 and 1997. Oldest and therefore poorest paint on the bridge but still serviceable. Envisage need to commence repainting in approximately, 5-yearst time, Systematic attention required regarding contact points during annual maintenance contract. Minor non-urgent steekwork repairs envisaged to be carried out along with contact points. As this travels over dry land in Fife, and is relatively easily accessed, this part has what is now the oldest paint. So it is early in the programme for attention.

#### North Tower, Constructed of Granite

Twin barrel arch over the running lines. Internal Spiral Staircase in relatively poor condition, though non-essential. Maintenance of stairs to be programmed in within the next 5 years. No repainting envisaged within next 15 years. Systematic attention to contact points.

#### North Queensferry, Internal Viaduct

All elements coated in glass-flake epoxy system with exception of beys 5 and 6 North. North Queensferry internal visduct. Glass-flake systems applied during 1937 to 2011. Alkyd System applied 1996/1997. Repainting may be expected to Alkyd system areas within 5 to 10 years. No repainting of glass-flake system envisaged within 10 years. Systematic attention required to contact points during annual maintenance contract. Minor non-urgent steelwork repairs envisaged to be carried out along with contact points.

#### North Queensferry Pier and Cantilever

All elements coated in glass-flake epoxy system except Fife North "C" Bracings, glass-flake systems applied during 1997 to 2011. Alkyd system applied 1996/ 1997. No repainting envisaged to glass-flake areas for 10 to 15 years. Possible need to repaint areas of Alkyd coatings areas within 5 to 10 years. Systematic attention required to contact points during annual maintenance contract. Minor non-urgent steelwork repairs envisaged to be carried out along with contact points.

#### North Suspended Span

Soffit coated in 1996 with old 5 coat Alkyd system and we could expect to have to repaint within 5 to 10 years. Structure above base of wind fence coated in epoxy glass-flake system 2004 to 2010. No repainting of this area expected in next 15 years. Systematic attention required to contact points during annual maintenance contract. Minor non-urgent steelwork repairs envisaged to be carried out along with contact points. Some attention may be required to the old gantly system - now locked off at end of span.

#### Inchgarvie Internal Viaduct

All Elements coated in epoxy glass-flake main coat system between 2005 and 2011. No repainting envisaged within the next 15 years. Systematic attention required to contact points during annual maintenance contract. Minor non-urgent steelwork repairs envisaged to be carried out along with contact coints.

#### Inchgarvie Tower and Cantilevers

No expectation to repaint within 15 years. Systematic attention required to contact points during annual maintenance contract.

Minor non-urgent steelwork repairs envisaged to be carried out along with contact points.

#### South Suspended Span

Structure above base of wind fence coated in epoxy glass-flake system 2003 to 2008. Soffit coated in 1996 with "Old" 5 coat Alkyd system and we could expect to have to repaint within 5 to 10 years, Attention also may be required to the old gantry system - now locked off at end of span. Systematic attention required to contact points during annual maintenance contract. Minor non-urgent steelwork repairs envisaged to be carried out along with contact points.

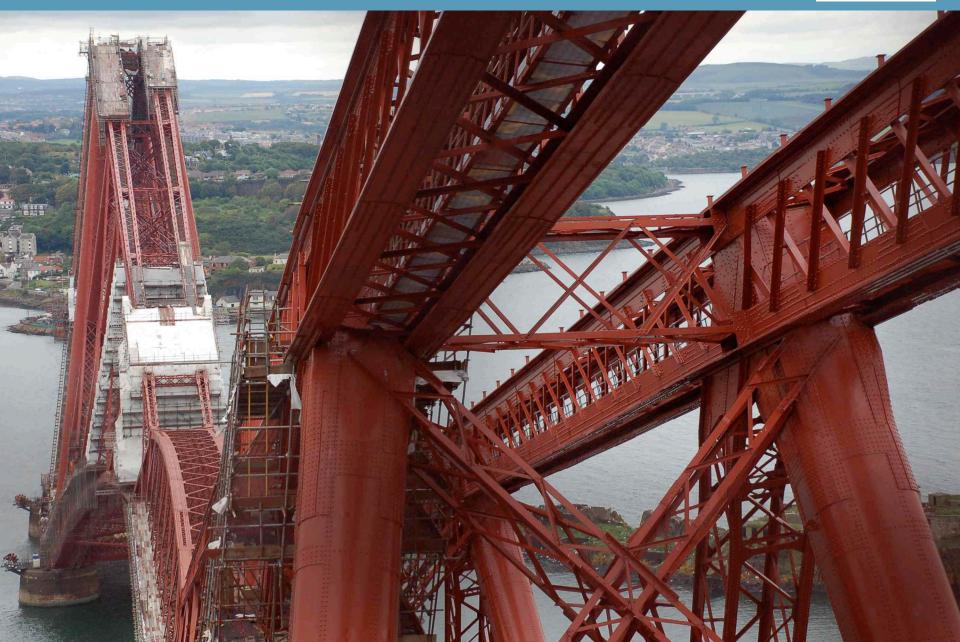


Ian Heigh of Network Rail, who managed the restoration of the Forth Bridge



## Biggest Restoration Job in the World? View in 2011 looking north from the Queensferry tower



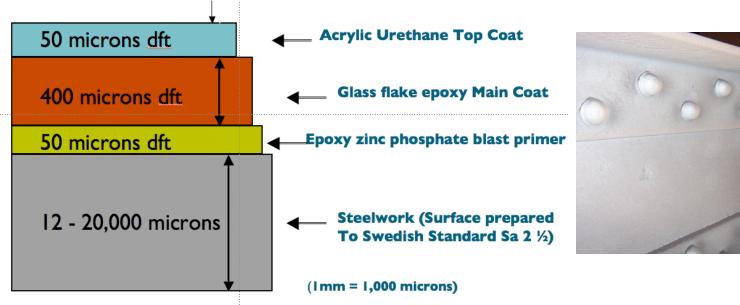


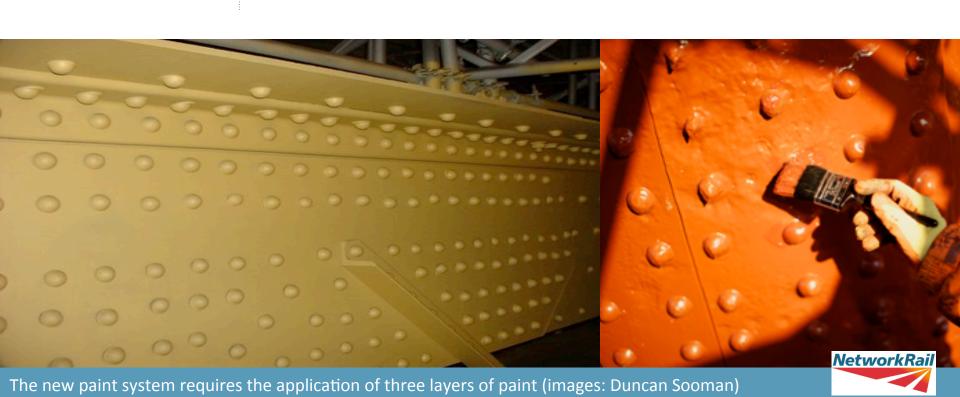
### Scaffolding & Encapsulation

Images from Network Rail, Balfour Beatty & Edinburgh Photographic Society









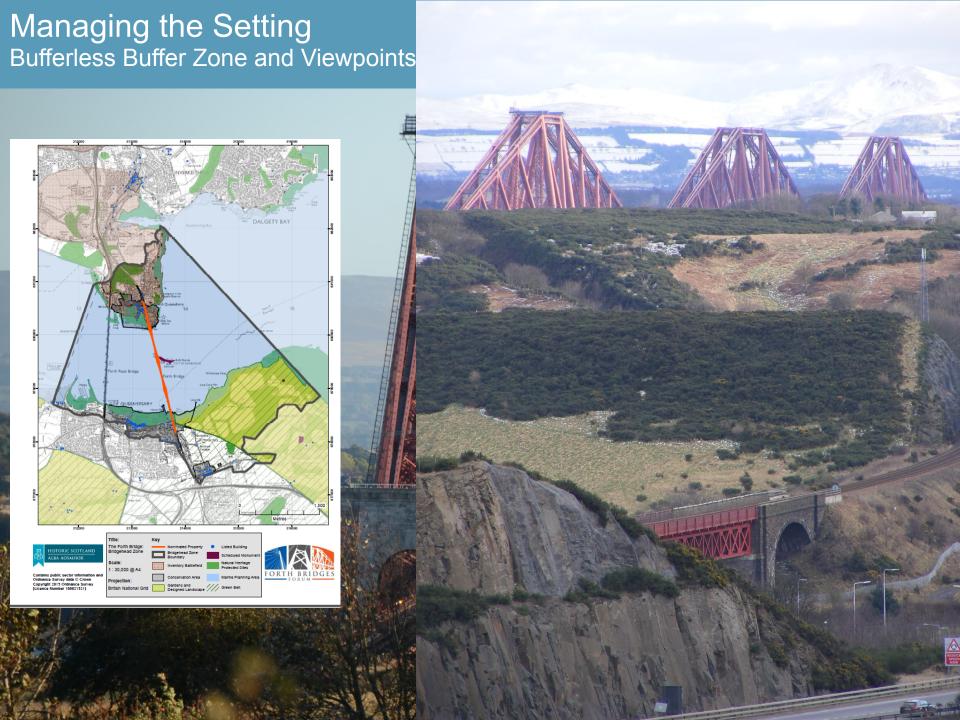
### Awards for Restoration Project

National Railway Heritage and Saltire Engineering Awards, 2012





Representatives of the teams who worked and continue to work on the Bridge



## James Rebanks advises the nomination process Assessing the potential economic gain





### THE FULL SHOPPING LIST OF POTENTIAL BENEFITS

#### Potential national benefits

- •Positive PR for Scotland PLC Raises international status of a Scottish icon a 'must see' attraction
- •An opportunity to showcase Scottish design and engineering Year of Design
- •Adds value to Scottish heritage portfolio one more reason to come to Scotland, see multiple WHSs
- •Potential for spotlight on Scottish design and creativity we did this and we're doing other great things, come see!

#### **Potential regional benefits**

- •Raise (international) profile of a regional cultural asset Why should inward investors take Fife seriously? Liveability/culture.
- •Adds value to the Edinburgh cultural offer cultural tourism etc. Showcase Edinburgh to China, India etc.
- •Can become an excellent satellite attraction from Edinburgh Stay longer, there's more to see and do.
- •A gateway to the rest of Scotland (North) have you thought about leaving Edinburgh and travelling North?
- •Raise profile of Fife for tourism, for relocation and for tourism
- •Potential to develop packages/itineraries to translate interest in bridge into wider regional experiences
- •Potential to develop a package of WHSs in and around Edinburgh for international market
- •A focus for the region as a centre of engineering and design selling the region to others with this interest.

#### Potential local benefits

- •Potential to raise profile of area relative to Edinburgh not peripheral but critical
- •Potential for tourism growth in South and North Queensferry Make the whole tourism product ready for the opportunity
- •Potential for developing the bridge as a visitor attraction climb the bridge, hear its stories, adrenalin experiences etc.
- Potential for translating car driver eyeballs into £££ major visitor centre off main road linked to town (cars contained)
- •Potential for increasing footfall on trains from Edinburgh the best day trip from Edinburgh (foot passengers) new services?
- •Potential for increasing cruise visitor footfall WH 'sells' for cruise ship passengers gear up for footfall
- New focus for conservation fundraising Lottery etc.
- •New opportunities for socio-economic investment E.g. EU trans-national projects with other WH partners
- •New focus for community heritage projects the story of the communities needs to be part of this WH
- •New focus for infrastructure developments in communities car parking etc.
- Potential to market these communities and businesses to wider world
- •Cultural glue for Forth communities use the bridge to tell the story of the Forth through the ages
- •Potential for major education benefits school/college/FE focus on bridge and links to other WHSs
- •Opportunities for private businesses to translate and make accessible the OUV narrative tours etc. entrepreneurs be ready!
- •Boost to civic pride "this thing in our community is as important and special as the pyramids"



### SCOTLAND FOR YOUR HOLIDAYS

### Managing the local Impact of World Heritage Maximising the benefits and minimising negative impact









# Public Consultation Process Public meetings and publicity campaigns





#### I HAVE FALLEN IN LOVE WITH THE FORTH BRIDGE

Strapping girders, **lusty arches:** the span of my ambition, shore to shore you link me with the old bones, the new ways, the true trains that take me down the path of all my loves. You lift up your wide arms to take in the tide, roll with the shaking wind that whistles in the rushes of the wild banks. You thrill me with your size, your strong embrace; you roar with achievement, you make me proud: I could hug you. Let me take the Queensferry train, slide through you to freedom.

The pipes play and the kilts sway to greet us. You are the opening, the gap we streak through to the woolly wilds of Auld Reekie and Bonnie Old Dundee; to the sea of workers' blood, the red rust of the past that clings and hugs the bones of dead engineers. In the Albert Hotel, tucked up, I hear you moan in the darkness. Naked. I pull back the curtains and see you floodlit in all your entrancing glory. Shine on, shine you crazy bridge....

KEITH ARMSTRONG

#### The Forth Bridge's 125th Birthday Cake 4th March 2015



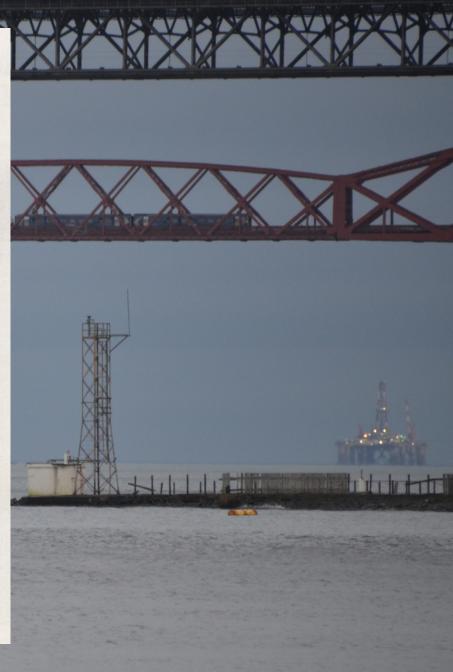














# **COMMUNITY**UPDATE

NORTH QUEENSFERRY • PUBLISHED BY NETWORK RAIL • MARCH 2015





N. QUEENSFERRY VISITOR CENTRE & LIFT ACCESS PROPOSAL

FULL PROPOSAL TOUR

S. QUEENSFERRY BRIDGE WALK
PROPOSAL









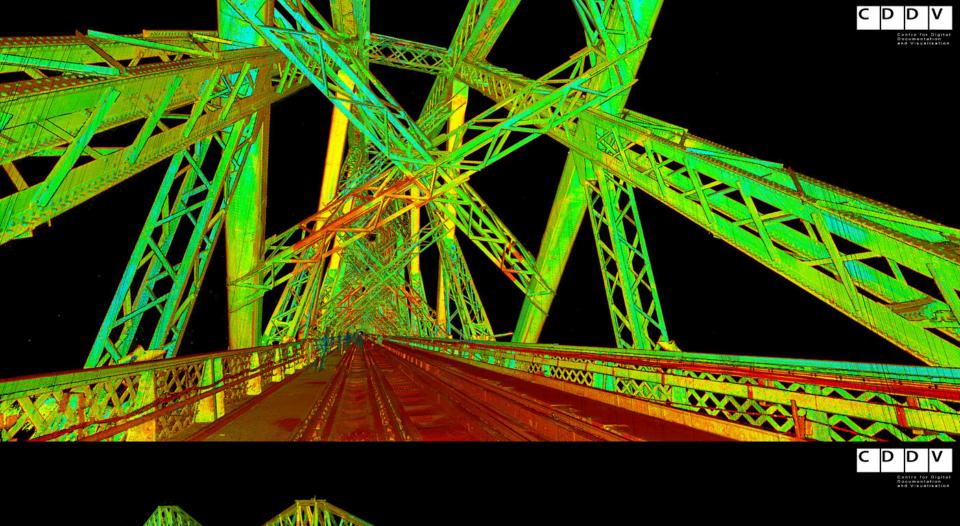








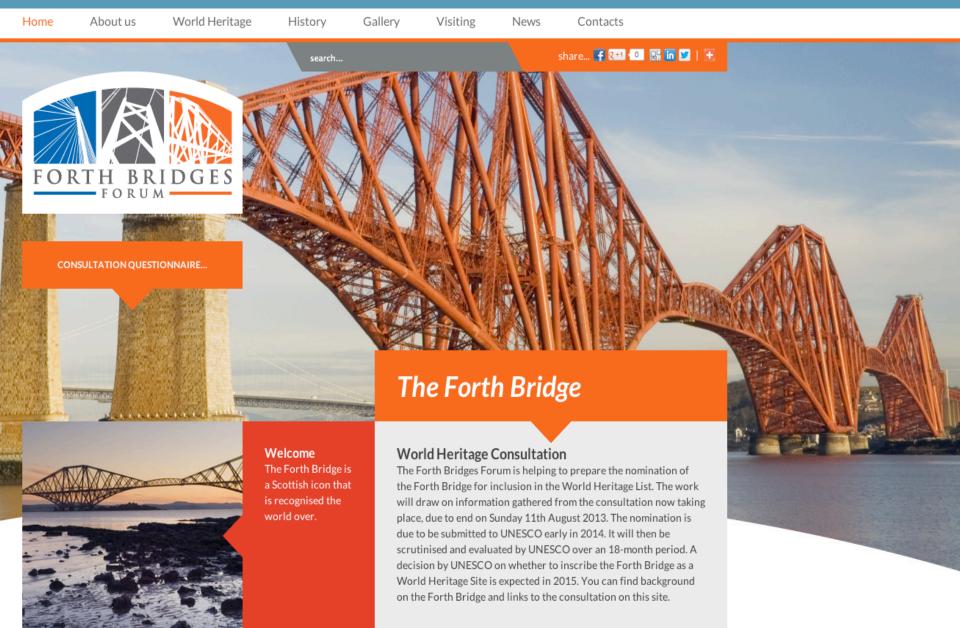






## Forth Bridges Forum website Creation of dedicated Forth Bridge pages





#### **ICOMOS Technical Evaluation Mission**

Records held by Network Rail & National Archives of Scotland





#### Documentation of Construction (1882-1890) Rail Collections in the National Records of Scotland









