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Historic Bridge and Infrastructure Awards 2005

by David Greenfield

On 16 November Gordon Masterton, President of the ICE, made the presentations at the 8th annual Awards ceremony, celebrating civil engineering heritage conservation across England and Wales. This year there were 18 nominations, from which the judges selected two outstanding projects for Awards, with Commendations going to a further seven.

Professor Roland Paxton again chaired the panel of judges, who were:

- Terry Girdler, Chief Structural Engineer of English Heritage,
- Mike Winney, Editor Emeritus of *NCE*
- Andrew Leadbeater, ex-Chairman of the County Surveyors' Society Bridges Group.

Roland said that the entrants this year were tremendously strong and he wished to congratulate them all. "The Awards are important because they recognise and encourage excellence and innovation in conserving historic civil engineering."

Grateful thanks are again due to English Heritage, Network Rail and British Waterways for their continuing financial support, which covered running costs. Support-in-kind was again provided by ICE, CSS Bridges Group and *NCE*.

The two projects which received **Awards** are:

- **Standedge Tunnel strengthening**, near Huddersfield
- **Coalport Bridge strengthening**, Ironbridge Gorge

The seven **Commendations** went to:

- **Victoria Bridge refurbishment**, Severn Valley Railway near Arley, Worcestershire
- **Silver Jubilee Bridge parapet replacement**, between Runcorn and Widnes
- **Crook O'Lune West Viaduct restoration**, near Caton, Lancashire
- **Bugsworth Canal Basin restoration**, near Whalley Bridge, Derbyshire
- **M6 Three-pinned Arched Footbridges refurbishment**, between Shevington and Appley Bridge, Lancashire
- **Hayhurst Swingbridge refurbishment**, Northwich, Cheshire
- **Bersted Crossing Footbridge restoration**, near Bognor Regis, West Sussex

PROJECT DESCRIPTIONS – AWARDS

Standedge Tunnel strengthening



The 4880m long Standedge North Tunnel was constructed in 1890–1894 by the London and North Western Railway, and now carries the Manchester Victoria to Leeds (via Stalybridge) line, near Huddersfield. By the 1990s it was becoming clear that long lengths of the tunnel's horseshoe-shaped brick lining were in danger of progressive collapse.

Network Rail's contractor, May Gurney, appointed specialist tunnel consultant Donaldson Associates to develop a scheme to strengthen and stabilise the failing sections. A phased approach was adopted, which allowed for monitoring during and between each construction stage to determine whether stabilisation had been achieved.

The Panel's Annual Meeting was held at the University of Lancaster from 5–7 September 2005 and started with the Panel joining the ICE's Lancashire Branch, the Lancashire Engineering Society and the North West Mills Group for a well-attended Seminar on 'The Lancashire Cotton Mills'. Two addresses formed the basis of the evening, the first by Colin Dickinson, the author of *Cotton Mills of Preston* (Carnegie Press, £12). He spoke about the historical development of the cotton industry and aspects of its associated mills and machinery. The second by Brian Clancy, who drew upon his experience of renovation and re-use of mill structures provided the basis for discussion of some of the engineering challenges involved.

The Panel's formal meeting was held on the Tuesday afternoon and covered a very wide range of business with its attendant time pressure. This led to the proposal that the Panel should meet on an additional occasion in a twelve-month period. Amongst other agenda items the panel had the opportunity to review its written aims and objectives, receive an update of the activities of the CARE Panel which has been initiating the process to accredit engineers working on heritage related projects and to be informed of the results of the survey of the Teaching of Civil Engineering History in UK Universities together with a series of meeting of interested individuals organised by Tom Swailes and referred to in a previous Newsletter. Reports were received from the dozen or so specialist sub-panels established by the Panel over recent years and included an illustrated presentation by Jack Knight on some of the activities of the recently established 'Tunnels' sub panel comprising Jack and Paul Dunkerley. Good progress was reported by David Greenfield on organisation of the Historic Bridge and Infrastructure Awards Competition for 2005, the results of which are reported in this *Newsletter*. Good progress was also reported on the preparation of the final volume of the *Civil Engineering Heritage* series with publication planned for Summer 2006. Sales of existing volumes generally continued at somewhat slow but steady rate. Consideration was also given to preparations being made to recognise and celebrate three forthcoming birth bi-centenaries – I K Brunel in 2006 and the Thomas' Hawksley and Telford in 2007.

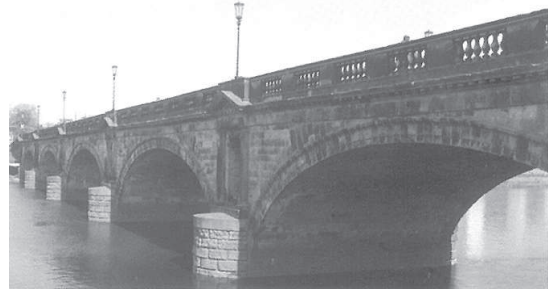
During the Panel's meeting, panel members' partners visited Levens Hall which claims the world's largest Topiary collection.



Lune Aqueduct, Lancaster Canal © Paul Dunkerley

Associated visits to local historic structures included a wide range of bridges in the local area including the Loyn Bridge and the Lune aqueduct. The Panel also had the opportunity to follow the Lancaster Bridges Heritage trail along the River Lune. This trail, the most recent to be produced by a Panel Member, was devised by Paul Dunkerley who has produced the leaflet with the aid of

sponsorship from the Lancashire County Council and Whitbybird.



Skerton Bridge © Paul Dunkerley

The final day was largely occupied by a visit to Manchester's Museum of Science and Industry. The emphasis of the visit was the group of historic structures, which houses the museum including Liverpool Road Station and the Old Goods Warehouse. Michael Bailey, a Trustee of the Museum was a most welcoming, able and interesting guide. There was also the opportunity to walk the adjacent Castlefield Canal Basin area which has a great number of railway and canal structures concentrated in a relatively small area. Thanks are due to the visit organisers and especially to Paul Dunkerley for another successful and interesting annual meeting.

News from Scotland

by Roland Paxton

North Scotland Visit

The Scottish Region's July 2005 Weekend Visit organised by Sandra Purves and myself for the Scottish PHEW Group was based on Drumnadrochit.

The historical engineering works visited are listed below, in addition to which we saw Caledonian Canal, Joseph Mitchell and Waterloo Bridge drawings at Inverness Reference Library laid out by Neil Macleod and Susan Beckley; visited the woodland garden (adjoining the spectacular Divach Falls) of Gillian Nelson, the well-known author of *Highland Bridges*; and, Peter Wilde, Dornoch Museum Curator, who showed us their Fleet Mound winch.

Caledonian Canal East End under the expert guidance of BWB Engineer Andrew Ross from Beaulieu sea lock, brilliantly engineered in very soft ground, to Dolgarroch where, sadly, it was too windy for our booked boat to sail!

'General's Well' Bridge (Dredge 1854 at Ness Islands). Conserved with deck propped in Whin Park, Inverness, where we saw and sampled its change of use!



Miniature train on Dredge bridge © Roland Paxton

Culloden Viaduct (Paterson 1898) with 28 arches, one 100ft span and 132ft high. ‘The Forth Bridge in stone’?

Altnaslanach Viaduct (Paterson 1897), the last timber one on a main line Scottish railway. Tastefully refurbished in 2002 with reinforced concrete deck and piers supporting the track. The walkways are still carried by the timber. Won a Saltire Civil Engineering Conservation Commendation.



Altnaslanach or Moy Viaduct © Roland Paxton

Lovat Bridge, Beaulie (Telford 1814). The fourth longest ‘Highland’ Bridge. Unusual double stringer course.

Conon Bridge Tollhouse, 2–storey (Telford 1830).

Conon Viaduct (Mitchell 1862). 73ft span arches on 45° skew to river – unusual in springing from haunches at right angles to the spans and not the pier lines. Masonry rather than wrought iron girders had been selected for durability.



Conon Viaduct & Telford’s bridge (1809–c.1970) © Whyte

Dingwall Canal (Wilson 1817) – part of which east of the town Bill and Sandra Purves cruised along in their boat!

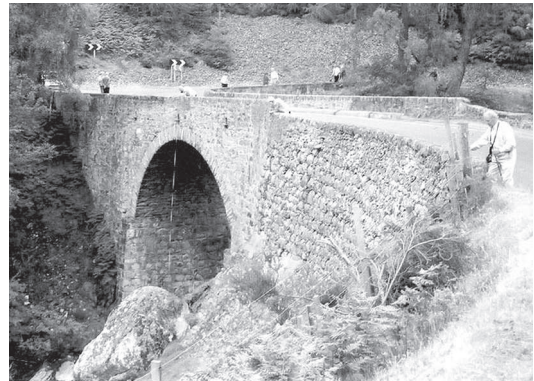
Evanton Bridge (Smeaton 1777 – whose work can only be viewed from underneath because of later widening).

Alness Railway Viaduct (Mitchell 1863). Two 60ft span skew arches. Ornamentation influenced by Telford’s work.

Bonar Bridge (Crouch & Hogg – 1973). 104m tied steel arch. The cairn bearing plaques from Telford’s 1812 cast iron masterpiece, the 1893 and present bridges was noted.

Bridge over Alness on Struie Road (Telford 1817). 66ft span. At an awkward site on 90° bend. An impressive use of rubble stone with squared archstones at each face.

Easterfearn Bridge (Telford 1817). Same road. 50 ft high. At an awkward site on 90° bend. Awe–inspiring coursed boulder approach on rubble masonry base with 50° batters.



Easterfearn Bridge – checking height © Norman Butcher

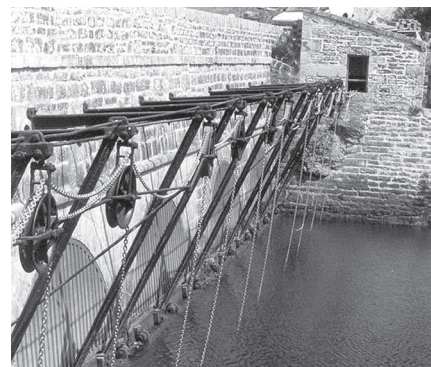
Chanony Lighthouse (A. Stevenson 1846). Stevenson’s innovation of inclined astragals in the lantern of its 13m tower to minimise obscuration of the light beam were noted.



Chanony Lighthouse after inspection © Roland Paxton

Fortrose Harbour (Telford 1817). Largely in original state.

Fleet Mound (Telford 1816). A 1,000 yd long x 60 yd wide x 8 yd high embankment replacing Little Ferry and carrying the Great North Road. Innovative in having tidal flap–gates fitted to six 12ft span arches over the Fleet, with winch operated machinery to regulate more water to sea in times of flood and permanently reclaim 400 acres of valuable land. The historic hand winches were recently replaced and are now curated at Dornoch Museum and the ICE East of Scotland Region’s Museum at Heriot–Watt University.



Fleet Mound flap–gates © Roland Paxton

The handout for the tour was taken from the draft of *Civil Engineering Heritage – Scotland*. The coach commentary was enhanced with local comment by Robin Sutherland as

we passed objects of interest in Sutherland and Lucy MacLennan of Fortrose did likewise in the Black Isle.

We had invited Gillian and David Nelson to be our dinner guests, but in the event did not see Gillian as she had been rushed to hospital after a sudden illness. She is recovering well from an operation and intends to visit Edinburgh soon to seek a publisher for a second edition of *Highland Roads*.

Next July we are planning a Galloway weekend, including visits to the hydro–electric scheme – how about joining us!

The Abbey National Building

by R J M Carr

Abbey House on the west side of Baker Street, London W1, was a prominent landmark with a stone–clad tower which is a familiar feature of the local skyline. It was designed in the 1920s by J J Joass. An imposing building it was the headquarters of Abbey, formerly Abbey National, and the site includes the address of the famous fictional detective Sherlock Holmes.

Substantial redevelopment work by Baskerville Estates is now taking place here. The old building will be replaced by a block of luxury apartments but the tower is to be retained. From the adjoining streets nothing appears to have changed but from Baker Street itself one sees that most of the building has gone with the tower in its usual position supported on steelwork (see photograph below).



Abbey National Building

Pembroke Dock Hangars Refurbishment, 2004–2005

by Ian Anderson



Pembroke Dock Hangar

The former Royal Dockyard at Pembroke Dock, closed in 1926 after WWI, became a Royal Air Force flying boat base in 1930. The Supermarine Southamptons of 210 Squadron flew into Pembroke Dock in June 1931, beginning a long and historic association between flying boats and Pembroke Dock. A flying boat slipway was built in the mid–1930s and the two hangars constructed soon after to maintain the flying boats. Prior to WW2, several types of biplane flying boats operated from Pembroke Dock before the arrival, in 1938, of the Sunderlands. By 1943, no fewer than 99 flying boats were at the base, including both Sunderlands and (US Navy) Catalinas, making it the largest operational station in the world. The base closed in 1957.

The two large hangars that remain are significant features on the skyline, and have been Listed Grade II, as the sole remaining Type B hangars in the UK. The Eastern hangar has recently been restored by Swansea–based Dawnus Construction, working with Barkonsult Consultants, Cardiff (now Merebrook Consulting Engineers), for Milford Haven Port Authority in a £900,000 contract. This involved shot blasting and repainting the hangar's visible internal steel frame, repairs to the external concrete encased steel columns, and the provision of a new synthetic slate roof and cladding. New external high–level walkways were constructed to match existing, and the side annexe was refurbished. Completed in summer 2004, it is intended to be used for heavy engineering work, e.g., boat repair, where a high (40ft) clearance is necessary.

The 'normal' Type B had a clear span of 160ft/48.7m, and internal clear height of 40ft/12.19m, and had nine bays at 30ft, giving an overall length of 270ft approx. The last Type B in the UK apart from Pembroke Dock, was at Martlesham Heath near Ipswich, being demolished around 1992 for a Tesco supermarket. The two Pembroke Dock examples have a clear span of 160ft and similar clear height of 40ft, but only six bays of 30ft 6in/9.3m each, giving an overall length of 188ft approx. Defence Estates drawings for the Type B (Flying Boat Sheds) confirm frame c/c at 30ft 6in.

The roof comprises 17ft/5.25m deep lattice N–girders spanning on to double, laced 18in by 6½ in RSJ columns, the latter being encased in concrete. Secondary pitched roof trusses span between the main girders at 13ft 4in c/c, creating valleys midway between the girders. There are smaller columns at the valley ends within the external side walls, which are 14in/356mm reinforced concrete up to ¾ height approx, extending round the end remote from the doors. There is diagonal wind bracing on plan and vertically in the end bays and one internal bay. The presence of the internal third bay diagonal bracing has led to speculation that the hangars were built as three bay examples and extended. This is apparent looking at the concrete walls as there appears to be a change in the concrete appearance at the third bay column. Defence Estates drawings for the Type B (Flying Boat Sheds) show variations, including 6 bays at Mount Batten (Plymouth) and 3 bays at Pembroke Dock. There are six full height sliding doors in ground and eaves tracks at one end only; it would be expected that normal Type Bs would have had doors both ends. The doors would have been moved on a hand crank system within each door, to give the full clear span opening. The door guides on each side comprise a lattice girder and outside door trestle. The girders at each end are clad, as well as the remainder of the side walls above the concrete walls, the latter of which would have been glazed originally.