Three Bridges, Hanwell

an outline history

by **David Perrett**

Of the thirty or so iron aqueducts on the British canal system, Three Bridges at Hanwell in west London (SE 143796) is undoubtedly the most unusual. Three Bridges, or Windmill Bridge as it is sometimes called, was a product of railway rather than canal engineering.

The Grand Junction Canal Company's main line opened from Braunston to the Thames, near its confluence with the River Brent in 1800-1801 (1). The canal left the Thames at Brentford and during two miles rose from the valley of the Brent via a series of eight locks. Six of these, the Hanwell flight, are situated adjacent to the grounds of (the former) St Bernard's Hospital and to the east of the road called Windmill Lane.

The Great Western Railway's (GWR) main line from Bristol to London opened in 1838-41 and it was natural for the GWR to acquire a link with the canal to provide it with a connection to the Thames. The railway and canal met at Bulls Bridge, near Hayes, and a transhipment depot was built there, although the six mile journey to the Thames was slow since eleven locks were involved. The tonnage of coal transferred from rail to barge increased rapidly, to some 50,000 tons in 1850, and a number of proposals for a rail link to Brentford were mooted. A mainly freight branch was proposed in 1854, to a new railway dock on the "Town Meadow and Ozier Bed" at Brentford. The railway and dock scheme received parliamentary consent in August 1855, as the Great Western and Brentford Railway (GWBR).

This line was the last railway project of Isambard Kingdom Brunel (1806-59). Construction of the railway started in early 1856. The GWR did not assist the new company financially, and the dock proved difficult to construct, so further capital was sought in 1857 and 1858. The railway, now leased to the GWR, opened for goods traffic on 18 July 1859, and for passengers on 1 May the following year. The line, 3 miles 77 chains in length from Southall to Brentford Dock, was engineered for a double 7 ft gauge track but initially only a single track was laid. In October 1861 an additional mixed gauge track was laid, and finally in 1875 both tracks were reduced to standard gauge (4ft 8 1/2ins) (2).Both the canal and railway acts had insisted that their alignments avoided the large estate at Osterley Park. The canal and railway therefore occupied the same area between the Park and St Bernard's Hospital (Hanwell Lunatic Asylum), and at the junction of the canal and Windmill Lane they crossed.

The result is Three Bridges, a unique structure, with the railway in a cutting below the canal aqueduct, both crossed by the road. The construction of the bridge was facilitated by temporarily diverting the canal into the grounds of the hospital. The railway and canal cross at an angle of about 35 degrees, and the road and canal cross at right angles (3) (Plate 1). The aqueduct consists of two cast iron spans with an overall length of 59 ft. The trough is about 18 ft wide with an external depth of about 6 ft (Plate 2). The whole is carried above the railway on brick piers. The towpath is to the north of the canal, and there is 10 ft head room to the road bridge. The road bridge is of cast iron beams carrying a modern concrete deck. The abutments rise 40 ft above the railway track, and there are two intermediate supports parallel to the canal and straddling one railway track. The ironwork bears the inscription "Mattw T Shaw / 64 Cannon Street / City. Matthew Turner Shaw appears in the London Directories of the 1850s and 1860s as an iron merchant, so the metalwork of the road bridge would appear to be original (Plate 3).

Although I K Brunel was engineer to the GWBR, during 1856-58 he was mainly pre-occupied with the construction and launch of the SS Great Eastern at Millwall. The trials and tribulations of launching his great ship weakened his health, and in May 1858 he left England to recuperate on the Continent, not returning until September. His health did not improve, and he was required to winter in Egypt, returning the following May. With all these absences, together with his major projects, e.g. the Great Eastern, and Saltash Bridge, it is unlikely that Brunel can be credited with the design of Three Bridges, which a member of his office must have executed. Contemporary drawings of the aqueduct survive in the office of the British Waterways Engineer, Hemel Hempstead, and they are signed by Brunel (Plates 4 & 5). However, the unusual design would undoubtedly have appealed to Brunel. The solution was not entirely original, a three tier bridge having been employed 20 years earlier (4). In 1838 William Hoskings had produced a road/rail/canal bridge for the Birmingham Bristol and Thames Junction Railway (later the West London Railway), where it crossed the Paddington arm of the Grand Junction Canal at Wormwood Scrubs. The design incorporated a 70 ft bowstring bridge of the type then being popularised by George Leather of Leeds. The proximity of this 1838 bridge to Windmill Bridge has led to some confusion in the past. The current bridge on the 1838 site, Mitre Bridge, would appear to be a reconstruction. Returning to Windmill Bridge, traffic levels on both the railway and canal declined from the 1950s. The general decline of traffic has left only rare commercial workings on the canal, and relatively little pleasure traffic negotiates the Hanwell flight. Passenger traffic on the railway was always small, and the service operated by diesel autocars finished

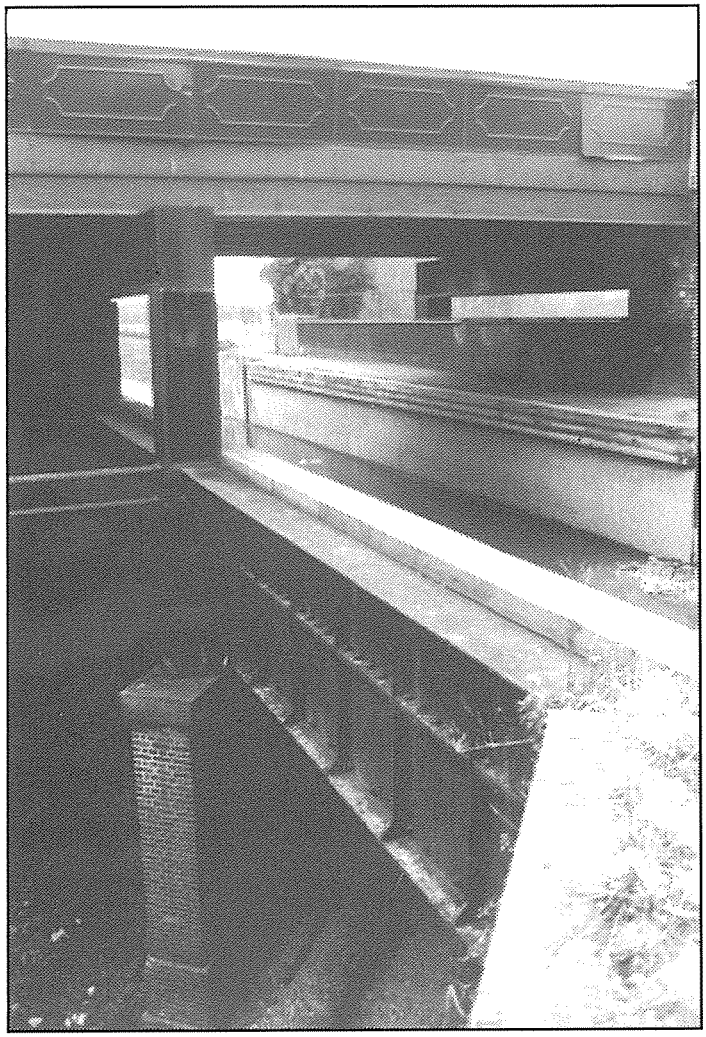

Plate 1. Railway (bottom), canal and road crossing at Three Bridges. (Photo D Perrett)

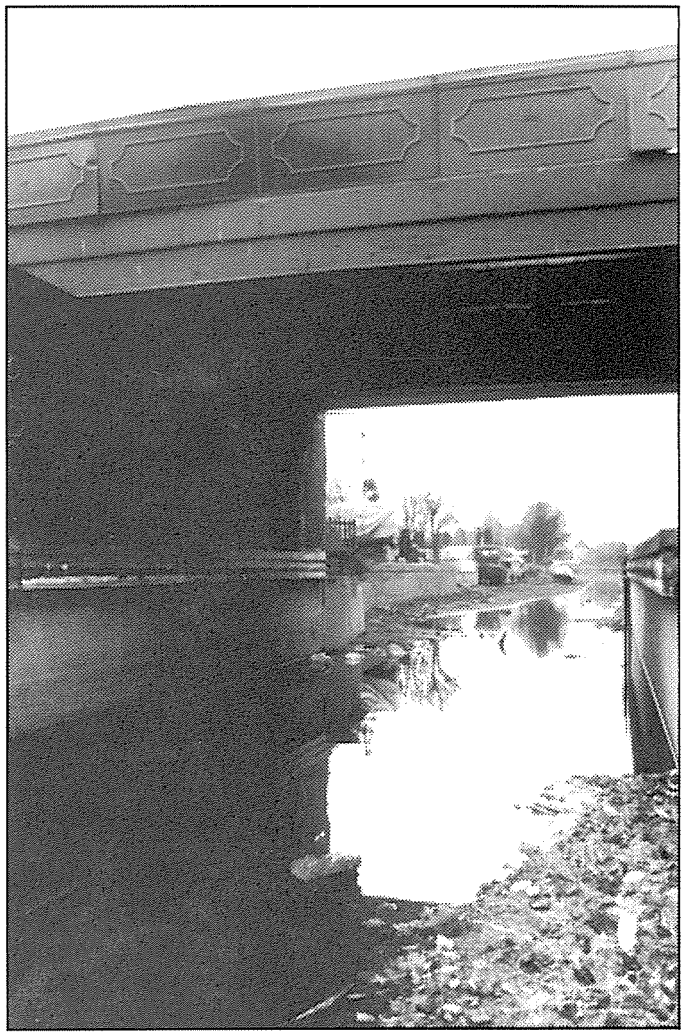

Plate 2. Canal aqueduct during maintenance, with towpath to right (Photo D Perrett)

Plate 3. Canal trough and metalwork of road bridge. (Photo D Perrett)

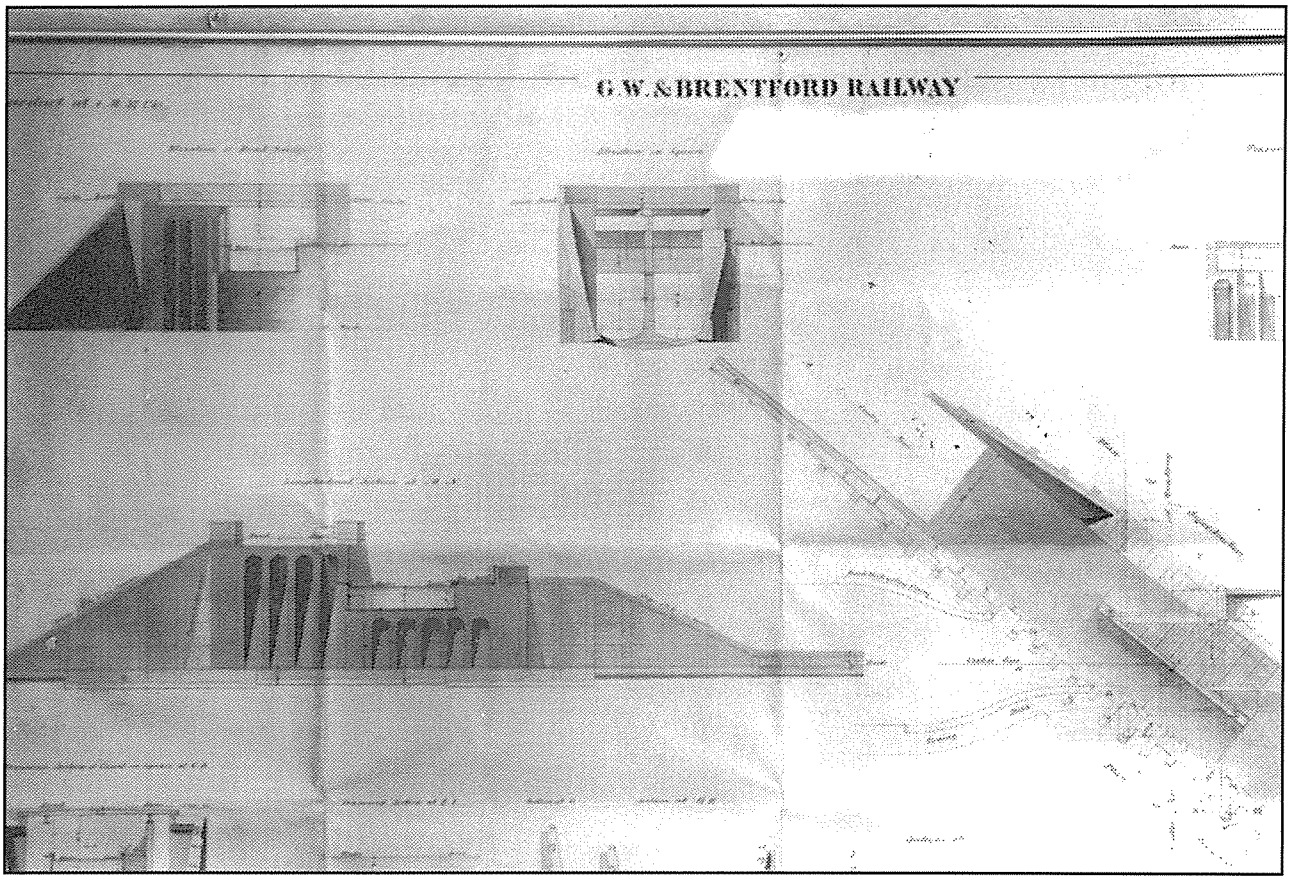

Plate 4. Part of contemporary drawing showing cross-sections of Three Bridges. (Photo D Perrett)

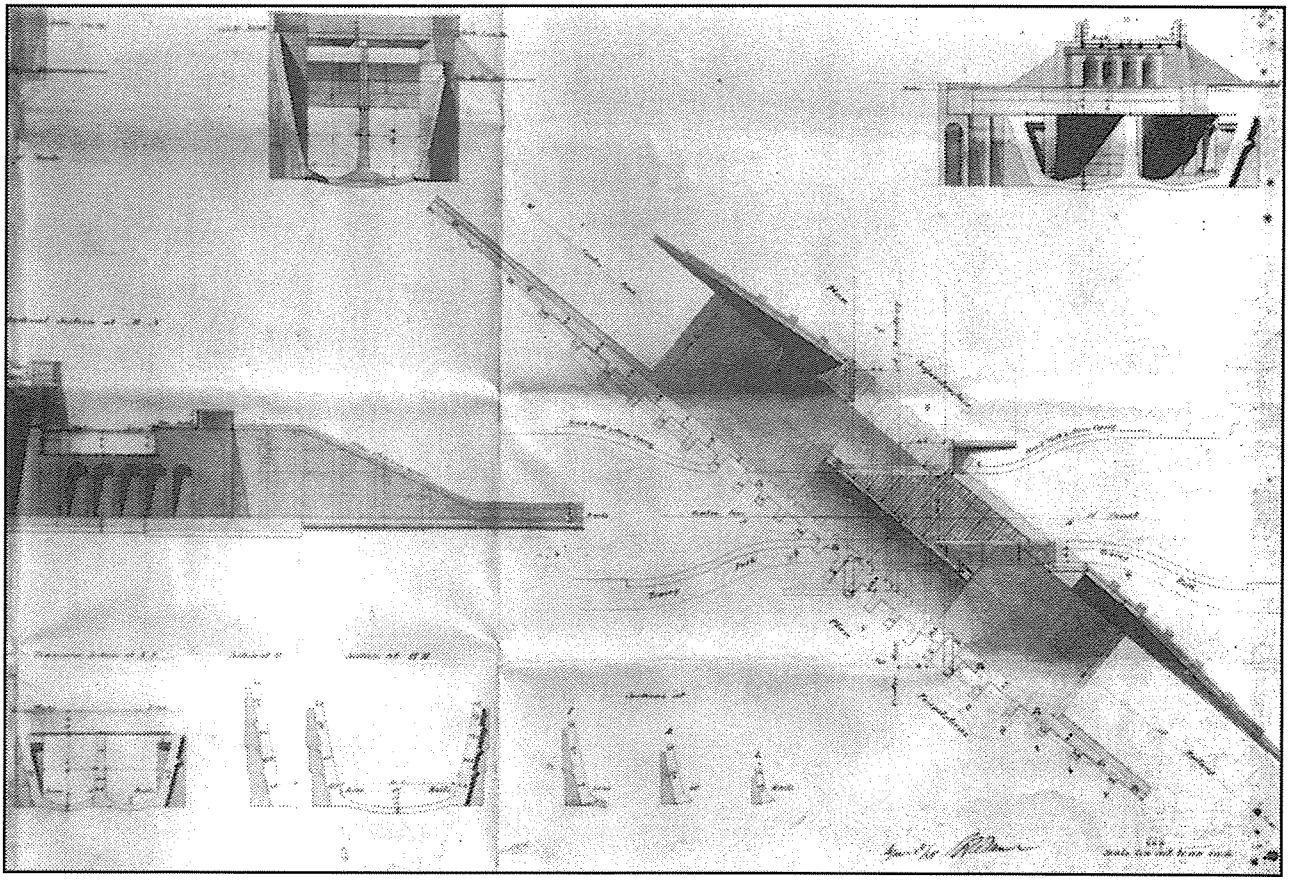

Plate 5. Section of drawing with I K Brunel's signature at bottom right of centre. (Photo D Perrett)

on 4 May 1942. On the other hand, goods traffic was healthy in the 1950s; Brentford Docks handled some 180,000 tons of general merchandise and 20,000 tons of minerals a year, while the railway yard at Brentford Town received some 170,000 tons of minerals, mainly coal. In 1952 single-line working had been introduced as an economy, but the coal trade declined rapidly in the 1960s, and further economies were sought. On 31 December 1964 Brentford Docks closed, and has since been developed as a marina, encircled by new houses. Part of the branch remained to serve Brentford Town Yard, with its refuse transfer depot (5).

References

1. Denney, M., *London's Waterways*. London, Batsford, 1977
2. Jackson, A.A., *London's Local Railways*. Newton Abbot, David & Charles, 1978
3. Tucker, M.T., *Journal of the Railway & Canal Historical Society*, vol 12, 1963, pp101-102
4. Simms, F.W., *Public works of Great Britain*, 1838
5. Davies, R. and Grant, M.D., *London and its Railways*. Newton Abbot, David & Charles, 1983

Acknowledgements

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