Crossrail

Technical Assessment of Historic Railway Bridges

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Summary

The purpose of this report is to assess the significance of nine historic bridges that would be affected by the Crossrail project. All nine of the bridges were constructed as part of the London & Bristol Railway, otherwise known as the Great Western Railway (GWR), engineered by Isambard Kingdom Brunel and built and opened in eight sections between 1835 and June 1841. They are all located on the first section of the railway to be completed (from Bishop’s Road, London to Maidenhead Riverside), opened on June 4th 1838.

These nine overbridges were originally of a single span. Each has been extended at least once, but all retain significant elements of their original fabric, most notably their main 30ft span semi-elliptical arch over the railway. All of the bridges are examples of a single generic bridge type, constructed in the United Kingdom in thousands during the 18th and 19th Centuries, in order to carry lesser roads and lanes over canals and railways. However, these nine were constructed to significantly larger dimensions than normal in order to accommodate Brunel’s audacious but ill-fated ‘broad gauge’ of 7ft 0¼in, rather than the Stephenson’s smaller (and later ‘standard’) gauge of 4ft 8¾in.

None of the bridges are Listed Buildings or Scheduled Monuments. The bridges also do not lie on any of the seven sections of the GWR that have been placed on the United Kingdom’s Tentative List of World Heritage Sites, a proposal based on the perception that the route is the United Kingdom’s (and thus the world’s) best-preserved early passenger railway. It is nevertheless of note that the reasons for the GWR London to Bristol route’s selection over others that may claim pre-eminence include not only the exceptional quality of its surviving historic structures, but also its overall completeness, thus providing a wider context in which to understand the more notable monuments.

It is clear from the research carried out for this report, and from the tentative World Heritage Site description, that a significant characteristic of the London to Bristol railway is the manner in which the structures and buildings along it were designed to reflect the character and geology of the areas through which it passed. The road-overbridges provided by Brunel reflect this variation, in type, form, materials and detail. These differences are due to considerations of landscape architecture, date,
locally available materials, the class of road or farm track carried and, possibly, latitude allowed to individual contractors in matters of detail.

There were originally 32 similar road-overbridges on the initial London to Maidenhead section of the railway, all apparently constructed to a similar, generic single-arched design, with variations in width reflecting the classes of road carried. All 32 were originally smartly-built of London stock brick with limestone impost and gritstone copings, reflecting the environment of the West End and the clay-lands of rural Middlesex. No other section of the London to Bristol route had bridges matching in both form and material. The rate of survival of these 32 road overbridges has not been good. Only some 14 (five between Paddington and Heathrow Junction and the nine reviewed in this study) now survive with their original 30ft-span (broad-gauge) arches intact. Of these fourteen, only a single example (Site 25: Thorney Lane Bridge) has an angled (skewed) span.

Subsequent to their initial construction, all of these 14 surviving bridges have been extended at one end, or in some instances at both ends, in order to accommodate additional tracks. In six of them (the five surviving examples between Paddington and Heathrow Junction, and Site 20: Wexham Road Bridge) the original fabric is generally largely obscured, each having also been widened on one or both sides as station buildings were constructed on them, or as narrow country lanes were widened into suburban streets. The remaining eight bridges, all of which fall within the current study are more complete. Individually they are of historical, architectural and technical interest, whilst as a group they represent the best surviving Brunel road-overbridges on the original 22.5 miles of Brunel’s London to Bristol railway.

It is apparent that, unlike the surviving Brunel under-line structures and surviving buildings, it is only the road-overbridges, with their large 30-foot spans (five feet greater than the corresponding structures built for the ‘standard’ gauge), that can still demonstrate the unusually large structural and track gauge of Brunel’s original railway. In a number of cases the original broad-gauge bridges were extended with otherwise identical standard-gauge arches that are five feet narrower and one to two feet lower. In these cases especially, the earlier structures benefit from the contrast of scale, the difference in both height and width clearly demonstrating the unusually large dimensions of Brunel’s original railway. It is also apparent that, unlike the under-line structures (including the Hanwell Viaduct and Maidenhead Bridge), the
road-overbridges are amongst the very few surviving historic structures that can be seen from the railway itself.

It is clear that this group of bridges contains all of the remaining appreciable original over-line structures on a 32-mile section of the London to Bristol railway between Paddington and just east of Twyford. In addition, the bridges form an important part of the technical, architectural and historical setting of a cultural heritage feature of national and international importance (and tentative World Heritage Site). Thus, notwithstanding the lack of existing statutory designations, the bridges are collectively regarded as being of **Medium / High Importance**.
1 Introduction

RPS was commissioned by the Museum of London Archaeological Services (MoLAS) to carry out a technical appraisal and assessment of significance of nine historic road-over-rail bridges (hereafter referred to as ‘road overbridges’ or simply as ‘overbridges’) located between Hayes and Slough.

These bridges, all originally of a single span, were constructed as part of the London & Bristol Railway, otherwise known as the Great Western Railway (GWR), engineered by Isambard Kingdom Brunel and built in eight separate sections (by a variety of contractors and some direct labour) between 1835 and June 1841. All of these overbridges are proposed for partial or complete removal and, in some cases, reconstruction as part of the Crossrail project.

The principal reason for the detailed study of these structures was because although the provisional assessment carried out on behalf of Crossrail had identified that none of these bridges are either Scheduled or Listed, they are associated with a tentative World Heritage Site and linked with one of the 19th-century’s most notable engineers.

This specialist report was commissioned with the objective of the need to understand more fully the nature and significance of these structures, thus allowing further consideration of the likely impact of their partial or complete removal by the Crossrail project.

Note: Features are noted throughout this report with numbers (e.g. 22.5m). These represent mileage, as measured from the entrance to the original Bishop’s Road terminus at Paddington. The numbers are expressed as decimals. 22.5m thus represents 22½ miles.
2 Methodology

In order to carry out the assessment, all surviving historic engineering drawings contained in the Network Rail engineering archive for each of the nine overbridges were examined, followed by on-site inspection by a specialist with relevant experience in the assessment of historic buildings and industrial / civil engineering structures. From the documentary and field evidence, an assessment was then made of the evolution, historic integrity and completeness of each bridge.

The overall assessment of significance was carried out by attempting to evaluate the uniqueness or otherwise of the nine bridges in the context of the London to Bristol route as a whole. To do this the route was first broken down into the eight sections in which it was opened, as each would be likely to represent different construction contracts or groups of construction contracts. For each section, the location of the principal historic and surviving principal historic features was noted and an assessment made of the number of overbridges originally constructed and the number surviving in recognisable form today. With regard to the road-overbridges, an assessment was also made of the principal variations in terms of form, scale, materials and detailing, as such variations are clearly important evidence of the engineer’s original ‘architectural’ vision, also variations in local geology and the availability of building materials in the pre-railway environment. Such variations might also be of note as being indicative of an evolving design process during a six-year construction programme, imposed directorial restraint as the project spiralled wildly over budget, or the strictness or leniency allowed to contractors in matters of detail.

The historical situation was assessed from a study of 1st edition 1-inch Ordnance Survey maps dating to the 1840s, which clearly differentiated between road-overbridges, road-underbridges and level-crossings. It was clear from the initial assessment that road-overbridges were provided where the railway was in a cutting and road-underbridges were provided where the railway was on an embankment. Whilst road-underbridges were not considered further as they were not relevant to the study, level-crossings were considered relevant as it appeared that the luxury of road-overbridges with inclined approach embankments was afforded on the earlier sections of the railway to be completed at the Bristol and London ends, whereas less desirable level-crossings were provided, at least initially, on the later sections to be completed. This study allowed the rapid assessment of a) the total number of road-
overbridges originally constructed; b) the classes of roads carried (‘Turnpike roads, lesser public roads and unclassified lanes or farm tracks); c) whether the crossings were ‘square’ to the railway or required more complex ‘skew’ bridges, and d) where level-crossings may have been belatedly substituted as an economy measure.

The assessment of the current situation was derived through the study of current Ordnance Survey mapping, followed by the targeted site inspection of some 85% of the surviving Brunellian road-overbridges between London and Bristol, carried out over a two-day period in January 2005. This survey, which was able to identify variations in the form, scale, materials and detailing of the surviving road-overbridges was a practical proposition owing to the availability of commercial ‘driver’s eye view’ DVD recordings made for the enthusiast market. From these the number, locations and more general variations of the surviving examples were easily noted prior to site survey, allowing a high degree of confidence in the results.

The precise methodology used in order to assess the individual and cumulative significance of the bridges has been devised so as to be consistent with those used by MoLAS for archaeological remains and by Alan Baxter & Associates for the built heritage.

The methodology used by MoLAS for archaeological remains was principally based on professional judgement, with the assessment of importance based on the same criteria as used for the Scheduling of Ancient Monuments; viz. survival, complexity, group value, historical association, rarity, etc. Sites could then be assessed as to whether they were of High (National, including SAMs), Medium (Regional) or Low (Local) importance.

The methodology employed by Alan Baxter & Associates to assess the significance of built heritage features was designed to address only Listed Buildings and Conservation Areas. The assessment method nevertheless was designed to also draw upon knowledge of existing practice and professional judgement. It draws together and incorporates the architectural and historic importance of the building, its finishes and robustness. Necessarily, the assessment of the importance of structures was based largely on their level of statutory designation; viz. High (Grade I and Grade II* Listed Buildings) and Medium (Grade II Listed Buildings).
This specialist report addresses structures of undoubted historic, technical and architectural importance, which for a number of reasons do not enjoy any level of statutory protection. The assessment of their importance has thus had to be arrived at solely on professional judgement. This judgement has been based on a combination of the criteria used by MoLAS and Alan Baxter & Associates; viz. survival, completeness, condition, complexity, group value, historical association, and rarity, as well as on issues of setting, accessibility / visibility and contribution to the local scene. It has also had to heed any contribution made to the wider historical setting of related buildings of national and international importance, and to that of the tentative World Heritage Site. On this basis, structures that enjoy no statutory protection could potentially be assessed as being as important as a Listed Building or a Scheduled Monument, if assessed as being of equivalent interest. A further issue is that of the group as a whole, i.e. cumulative importance.

Due to the number of criteria addressed, it has been found that a three-point scale of importance (Low; Medium; High) was not sensitive enough to provide adequate distinction between so many structures that are ostensibly similar in a number of respects and identical in others. As a result, this report uses a five-point scale of importance, viz. High; High / Medium; Medium; Medium / Low; Low.

The initial assessment of significance is made, bridge-by-bridge, in Chapter 4. An overall assessment of the cumulative significance is made in Chapter 5.
3 Historical Background and Route Description

A railway from London to Bristol was first proposed on 7th May 1832, less than two years after the successful opening of the Liverpool & Manchester Railway. A committee was formed in January 1833 and Bristol interests succeeded in the appointment of Isambard Kingdom Brunel (then only 26 years old) as engineer. An Act was obtained in August 1835 and the first construction contract (for the Wharncliffe Viaduct, Hanwell) was awarded in November of that year.

The young Brunel, then a novice to railway engineering but ambitious to establish himself as England’s finest engineer, promised to survey and build a railway that was not ‘not the cheapest, but… the best’, and ‘the finest work in England’. As a result he chose not the obvious coaching route via the Kennet valley and the Marlborough Downs, but instead chose a route to the north, following the Thames and the Vale of the White Horse. Despite the easier natural topography, many miles of long embankments and cuttings were required in order to achieve the flattest possible gradients and the gentlest of curves. Furthermore, in the interests of speed, safety and comfort, Brunel persuaded his directors to adopt an untried form of track construction, laid to a unique gauge of 7ft ¼in, nearly two and a half feet larger than the Stephenson’s ‘coal-cart’ gauge of 4ft 8½in. The railway was built in a number of sections, the last of which was completed in December of 1841. By the time it was completed, the route had cost almost twice its authorised capital of £3,333,333.

The first section of the railway opened 4th June 1838, from a temporary station on the very western edge of the metropolis at Bishop's Road, Paddington, to another temporary station on the eastern side of the Thames at Maidenhead, a distance of 22½ miles. This section was laid out across the gently undulating clay plains of Middlesex on a continuous grade of 1:1320, requiring almost continuous shallow cuttings and embankments and an 825ft-long, eight-arch viaduct over the River Brent at Hanwell. At the time of opening the principal engineering structures were described as being of ‘white’ bricks (apparently in reality London stock brick), smartly detailed with dressed Bramley Falls limestone. Setting a pattern that was repeated over most of the remainder of the route, the viaduct and all of the lesser bridges were constructed with flattened semi-elliptical arches, rather than the more commonplace semi-circular or segmental arches used by other railway engineers of the period. In keeping with the country traversed, the original minor wayside stations on this section
also appear to have been built of London stock brick, that at Ealing being in a ‘townhouse’ style, the remainder (specifically Southall) being in a ‘Tudor-gothic’ vernacular.

Apart from the Bishop’s Road viaduct that formed the frontage of the original terminus and a couple of multi-arched examples at the throat of the temporary Bishop’s Road terminus, the remaining road-overbridges on this section (32 in total) were built to a ‘generic’, single-arched design. In keeping with their locality, they were smartly and uniformly constructed in London stock brick, relieved with brick string-courses, limestone imposts and gritstone copings. In one surviving instance (Thorney Lane Bridge), a gritstone string-course was substituted. Of the original 35 road-overbridges, some 14 examples have survived in any kind of recognisable form. All of these have been extended (mostly more than once) as additional tracks were laid from 1870 onwards to accommodate further traffic, and as narrow country lanes have become minor or major suburban streets (See Appendix C, plates (a) to (c)).

The next section to be completed was the eight and a half miles from the temporary station at Maidenhead (22.5m) to Twyford (30.9m), which opened on 1st July 1839. In order to maintain the continuous grade of 1:1320, the engineering of this section required the crossing of the Thames at Maidenhead, via two 128ft-span, flattened semi-elliptical arches (still the flattest brick arches ever built), an almost continuous shallow cutting from Maidenhead to Twyford and a shorter cutting at Twyford. Whilst the Maidenhead bridge (subsequently widened) appears to have originally been constructed of red Berkshire brick with Bath stone details, a number of the smaller bridges (possibly all bar one red-brick example at Twyford itself (See Appendix C, plate (e)) appear to have continued the use of London stock brick, with limestone imposts and gritstone copings. Whilst eight of the original 11 road-overbridges have subsequently been lost during the quadrupling of this section in the period 1890-96, survey of the three surviving bridges reveals that a new bridge form had appeared on this section. Thus, whilst the surviving bridges on the original London – Maidenhead and Bristol – Bath sections are of a simple, single-arched variety, two of the three surviving bridges on this section have three arches, a central one accommodating the wide gauge track itself, flanked on either side by similar relieving arches (See Appendix C, plate (d)). In these and all of the subsequent three-arch bridges, the two intermediate piers are further pierced by a single transverse arch. As previously, the semi-elliptical arched form was maintained for the spans. All three of the surviving bridges were adapted to accommodate four tracks, although for the two three-arched
examples this was achieved by threading the additional tracks through one of the existing flanking arches.

Despite an increase in gradient to 1:660, the next four and a half miles to the first major station at Reading (35.7m) were laid out almost perfectly straight, necessitating particularly heavy engineering and delaying the opening to the Berkshire county town until March 1840. The works included bisecting Sonning Hill with a 60ft-deep cutting nearly two miles long, followed by a continuous embankment and a 60ft-span bridge with four side arches over the Kennet. Apart from the surviving buff-brick ‘townhouse’ station at Reading, the other engineering structures appear to have all been of red Berkshire brick. Only one road-overbridge (of four) now survives, carrying the old Bath Road (A4) over Sonning Cutting (See Appendix C, plate (f)). This is a massively scaled-up, red-brick version of the semi-elliptical three-arched type noted above, in this instance with the addition of limestone imposts. This bridge was so large that it accommodates three of the current four tracks within its original main arch.

The following 21 miles from Reading (35.7m) to a temporary station at Steventon (just west of Didcot, at 56.5m) were opened shortly after the Twyford-Reading section, in June 1840. Working westwards from Reading, the railway initially follows the south bank of the Thames, maintaining a ruling gradient of 1:660 using heavy embanking at Tilehurst and a long curving cutting through Purley. At Pangbourne, the Berkshire Downs close in from the west, almost meeting the Chilterns as they press in from the east bank. To break the gap, the Downs are pierced with a half-mile long cutting swinging north, from which the formation exits to cross the Thames via a bridge of four red-brick skew spans at Gatehampton. The route then cuts through Goring before swinging north-west on a two-mile long embankment. This precedes another crossing of the Thames via a heavily skewed, four-arch bridge at Moulsford, as the route gently swings to the west on a continuous ten miles of cuttings and embankments before the line gains the flat brickearths of the Vale of the White Horse just to the west of Didcot. From here the line continues almost perfectly straight before it reached a temporary terminus at the half-way point of Steventon.

Again all of the original minor and major bridges on this section are of red Berkshire brick, each one with semi-elliptical arches. The fourteen road-overbridges on this section (ten of which survive) conformed to the established generic single-arch and three-arch designs, with minor variations in the form and materials used for copings, imposts, string-courses and terminal pilasters (See Appendix C, plates (g) to (h)).
Towards the western end of this section the first level-crossings on the route were encountered, possibly built to reduce the rapidly escalating cost of the railway. Notwithstanding the known parsimonious attitude of the company’s London directors, who were responsible for this end of the railway, the intermediate wayside stations again had ‘Tudor-gothic’ detailing. The surviving station house at Moulsford implies that this former wayside station at least was faced with flint. Railway cottages and the surviving railway hotel, company offices and Board Room erected at Steventon were lavishly constructed of ‘Bath’ stone, again in a ‘Tudor-gothic’ vernacular. The route has subsequently been quadrupled as far as Didcot. As a result, the only road-overbridge to survive in its original state is that at Steventon (See Appendix C, plate (h)).

The succeeding eight miles of perfectly straight formation traversing the brickearths of the Vale of the White Horse between Steventon (56.5m) and a temporary station at Challow (Farringdon Road) (63.5m) contained no engineering features of note and was opened only fifty days after the Reading – Steventon section, on 20th July 1840. This section appears to have originally had eleven level-crossings, and the only overbridge constructed (carrying the Oxford – Wantage turnpike) necessitated approach embankments. It was almost certainly of red Berkshire brick, probably with three semi-elliptical arches. This bridge was reconstructed in 1932 when the section from Wantage Road to Challow was quadrupled.

The succeeding 17 miles from Challow (Farringdon Road) (63.5m) gently swing south-west through the western Vale, still rising via a continuous series of long shallow cuttings and long low embankments, to the railway’s summit at Swindon (77.2m). The route then gently falls as far as a temporary terminus at Hay Lane (Wootton Basset Road) (63.5m). This section had been completed by 16th December 1840. From the summit at Swindon, the route to the west was to contain two steep inclines of 1:100 and it was originally thought necessary to use locomotives with smaller wheels between Bristol and the summit. As a result all trains would be required to stop at Swindon and in early 1841, shortly before the line’s completion, it was decided to erect the railway’s workshops and main locomotive depot here. Because of the required stop at the summit, a grand station with hotel and refreshment rooms was belatedly opened at Swindon in July 1842. The station (half of which still survives) consisted of a two-storey block on each platform. These were linked to each other and to the hotel by covered bridge at first-floor level. The station
and hotel were built to a slightly classicised ‘townhouse’ vernacular, in marked contrast to the single-storey ‘Tudor-gothic’ of the railway’s wayside stations.

Towards Challow, on the flatter eastern end of this section, level-crossings again predominated, interspersed with one single-arched and two three-arched, red brick bridges of the generic semi-elliptical types, again with minor variations in the form and materials used for copings, imposts, string-courses and terminal pilasters (See Appendix C, plates (i) to (j)). Closer to Swindon two individually-designed single-arched bridges were provided, one carrying the Swindon – Highworth turnpike, the other carrying Ermin Street. Both conformed to the semi-elliptical arched type, although both are built of rough-hewn grey Swindon sandstone relieved with additional detailing (See Appendix C, plate (k)). At Hay Lane there is a further single-arched (brick) bridge. There were originally eight road-overbridges on this section. The six survivors are generally little-altered, although the single-arched bridge at Hay Lane appears to have been completely refaced.

The 14 miles from Hay Lane (80.2m) to Chippenham (93.7m) were completed in May 1841. In order to maintain a relatively straight alignment and a 1:660 gradient as the railway descended towards Chippenham, Bath and Bristol, a succession of increasingly impressive embankments and cuttings were required. Notwithstanding these, it proved impossible to avoid a sharp two-mile decline of 1:100 between Wootton Basset and Dauntsey. Between Hay Lane and Wootton Basset, grey Swindon stone was used for bridges and engineering structures (See Appendix C, plate (l)), followed by a length with red brick bridges (See Appendix C, plates (m) and (n)). Towards Chippenham, ‘Bath’ stone predominates (See Appendix C, plate (o)), including the surviving single-storey ‘Italianate’ station of ‘Bath’ stone in the later town. All ten of the original road-overbridges survive. All are of the ‘generic’ three-arched, semi-elliptical type found elsewhere, with minor variations in detail. The quality of the red brick and ‘Bath’ and Swindon stone used appears to have been highly variable and a number of the surviving bridges have suffered much patching with brick. Others display more extensive brick re-facing.

Opened on the 30th June 1841, the section descending from Chippenham (93.7m) to Bath (107m) demanded the heaviest engineering on the route and was the final section of the railway to be completed. From the platform ends at Chippenham, the railway immediately crosses the ‘Bath’ stone (partly refaced in brick) ‘Roman’ viaduct, the eastern section of which crosses over the A4 Bath Road by an austere but
massive ‘Bath’-stone ‘triumphal arch’. The viaduct is followed by a two-mile long embankment up to 30ft tall, then by a three-mile long cutting to Corsham, crossed at three points with examples of the generic road-overbridges with one or three semi-elliptical arches which, while refaced, appear to have originally been entirely of ‘Bath’ stone (See Appendix C, plate (p)). At Corsham a long cutting in rock is entered, spanned by two unique and unusually wide segmental-arched ‘Bath’ stone spans (See Appendix C, plate (q)) and a ‘Bath’ stone cattle creep, heralding the start of a long decline at 1:100 and penetrating the Cotswold scarp via the two-mile Box Tunnel, the longest ever constructed when built. Still descending, the line emerges from the tunnel’s famous triumphal ‘Roman’ west portal in a deep cutting, spanned by the A4 via a high and expanded, ‘Bath’-stone version of the generic road-overbridge with three semi-elliptical arches (See Appendix C, plate (r)). The descent continues through the 198yd-long Middle Hill Tunnel with its triumphal ‘Roman’ portals before passing under the A4 again, which this time is carried on a unique, steeply-skewed and ornamented, 48ft-wide semi-elliptical, single-arched road-overbridge in ‘Bath’ stone (See Appendix C, plate (s)).

The railway then crosses the Bradford-on-Avon turnpike on a fine semi-elliptical Bath-stone bridge and then the Avon via the long segmental arch of Bathford Bridge (unfortunately refaced in brick). These signal the final approach to Bath, which the railway makes in close proximity to the Kennet and Avon canal, with minor roads crossing the railway on generic three-arched bridges of ‘Bath’ stone (See Appendix C, plate (t)). In making its way to Bath station it was necessary to divert the canal as the railway was carried round the flank of Bathwick Hill and through Sydney Gardens (See Appendix C, plate (u)) before passing under and beside the backs of the highly-fashionable houses of Pulteney (or London) Road via two short tunnels and the Dolemeads (or St James) Viaduct of 37 plain stone arches. Swinging west again, it crosses the Avon by the 88ft-long, classically-detailed, segmental skew arch of St James’ Bridge before arriving at the Bath (Spa) station, which had been reached by working east from Bristol almost a year previously.

The whole of the Chippenham – Bath section of the route, which was firmly under the more generous financial direction of the Bristol Directors, is the most audacious in engineering terms, as well as being the most lavish in terms of landscape architecture and finish. All of the key structures on it are classically inspired and built of ‘Bath’ stone (more properly Corsham stone), prodigious deposits of which were discovered during the driving of the Box tunnel. As a result, virtually all of the 17
road-overbridges are ‘one-offs’. The sole exceptions are three generic single-arched examples (See Appendix C, plate (p)) and two three-arched examples between Chippenham and Corsham, and two three-arched examples between Bathford and Bathwick (See Appendix C, plate (t)). All of these are (or were) of ‘Bath’ stone. Two of the three single-arched examples have been extended with further arches. Four of the five ‘generic’ bridges between Chippenham and Corsham are now much refaced in brick.

The final section of the route descending through the narrowing Avon valley from Bath (Spa) (107m) to Bristol (Temple Meads) (118.5m), was actually the fifth section of the railway to have been completed, having been open for business since the 31st August 1840. Maintaining a gentle and even gradient, and a relatively straight alignment through the narrow valley that winds from the ornate ‘Jacobean’ station at Bath almost to the terminus at Bristol with its fine mock-hammerbeam roof, required continuous heavy engineering works. Thus, on leaving Bath station the railway immediately traverses the two 80ft spans of Bath (west) bridge (formerly of laminated timber, since rebuilt), then a 73-arched viaduct. It then traversed five (now four) tunnels before emerging onto the Avon meadows on the south-eastern side of Bristol, which are crossed with a mile-long viaduct including three significant crossings of the River Avon or the Floating Harbour.

The architectural character of the engineering features of the Bristol – Bath section differs markedly from the remainder of the route. Thus, grey Bristol stone is used for all of the bridges, tunnel portals and viaduct arches, virtually all of which are constructed in a ‘Tudor-gothic’ vernacular, with four-centred arches. Of the five tunnels, three have complete or ‘ruined’ castelated ‘Tudor-gothic’ portals, whilst that nearest Bristol (now a deep rock cutting) had ‘Norman’ or ‘Romanesque’ portals. There were originally nine road-overbridges on this section, of which six have survived, all in unaltered form. All are of identical ‘Tudor-gothic’ form, varying only in width or alignment with respect to the formation (See Appendix C, plate (v)). Mirroring the road-overbridges at the extreme east of the route (from London to Maidenhead, opened in 1838), all of the examples between Bristol and Bath are single-arched structures.

From the above, it is clear that both the original stations and the other engineering structures on the route were conceived and designed with respect to the local topography, the availability of locally-available building materials and the amount that
the Bristol and/or London Directors were willing to provide in order to underwrite Brunel's ambitions as a landscape designer and creator of 'the finest work in England'. Whilst many of the variations in design clearly relate to accepted practicalities of the day in terms of fitness of purpose and the desire to use locally-available materials where possible, others may possibly relate to the latitude allowed to contractors in matters of detail. The more fundamental variations demonstrably relate to Brunel's desire to create a sense of place in the landscape, and where appropriate, a sense of the dramatic or of the sublime. One aspect of this was the handling and treatment of road-overbridges, which in some areas were and still are the most highly visible aspect of the railway. It is in this context that any structures on the route need to be understood.
Site 29: Old Stockley Road (or Starvehall Road) Bridge (12.1 miles)
Old Stockley Road Bridge was built in 1835-8 as a ‘standard’ London stock brick 13ft 6ins-wide overbridge for unclassified lanes, with gently splayed abutments flanking a 30ft-span semi-elliptical arch, accommodating two broad-gauge tracks (subsequently two mixed broad-/standard-gauge tracks from 1861 until the abolition of the broad-gauge in May 1892). The original bridge was extended to its south c. 1874-78 with a matching semi-elliptical c. 28ft-span* arched extension, accommodating a single line only. At about the same time the original bridge was also abutted to its north with a matching 15ft-wide arched span*, also accommodating a single track. Both additional tracks appear to have been added (possibly in two phases) c. 1874-8. The atypical location of the new tracks on either side of the original formation appears to have been dictated by the close proximity of the Grand Junction (now Grand Union) Canal immediately to the north of the original formation, thus limiting the space available for additional lines on the north side.

All three arched spans consist of semi-elliptical arches, built in matching London stock brick, with white hydraulic mortar. They have matching brick string-courses and dressed gritstone copings. All three arches spring from matching limestone imposts. There is a raking buttress to each side between central and southern arched spans. These retain fabric from, and reflect the angle of, the lost south abutment of the original Brunel bridge. Whilst both ends of the bridge were extended c.1874-8, both of the later abutments replicated the gently splayed Brunel originals, rather than having the later form of steeply-angled wing walls found on a number of the other bridges extended during the Southall – Slough and Slough – Maidenhead quadrupling of the 1870s. Three of the four parapets and terminal pilasters of the later sections of the bridge have been rebuilt in the mid 20th century with ugly red engineering brick and blue engineering brick copings, but the parapets and copings of the original centre section remain unaltered.

The original bridge is thus c. 50% complete. The centre section remains well-preserved, with no significant alterations to the surviving Brunel fabric. The matching arched spans at the north and south ends are of lesser historic or technical importance than the primary fabric, but they are of historical note in apparently being broad-gauge structures.
The bridge is currently closely visible from the public domain, both at its northern end and from the modern dual-carriageway bridge to its east. The bridge is located close to a modern science park development and lies adjacent to the Grand Union Canal. The bridge lies close to the Grand Union Canal, but its immediate setting has been degraded through modern industrial development. The bridge nevertheless retains its close visual relationship to an adjacent historic bridge over Grand Union canal.

(* Note: This span only accommodates a single line of track, being partially carried over the cutting flank. Both this span, and the 15ft-span on the north side of the track, are thus wide enough to accommodate a single line of broad-gauge rails. It seems that, whilst the relief lines from Paddington westwards were generally laid to the north of the original formation and engineered for standard gauge track only, some of the structures on the earlier sections to the east of West Drayton (this length included) were designed to initially accommodate a single line of mixed standard- (4ft 8½in) and broad-gauge (7ft ¼in) tracks to either side of the original formation.)

Summary

Site 29: Old Stockley Road Bridge

Type: 13ft 6ins-wide overbridge for unclassified lanes
Surviving primary features: Main 30ft arch, gritstone copings and parapets, Bases of original N. and S. abutments
Percentage original bridge surviving: c. 50%
Later Extension: Matching 1870s 15ft and 28ft arched spans to north and south
Preservation of original rural setting: Moderate
Visibility from public domain: Good
Importance of resource: Medium/Low

Site 28: Kingston Lane Bridge (12.6 miles)

Like Old Stockley Road Bridge, Kingston Road Bridge was built in 1835-8 as a 'standard' London stock brick 13ft 6ins-wide overbridge for unclassified lanes, with gently splayed abutments flanking a 30ft-span semi-elliptical arch, accommodating two broad-gauge tracks (subsequently two mixed broad-/standard-gauge tracks from 1861 until the abolition of the broad-gauge in May 1892). The original bridge was extended to its south c. 1874-78 with a matching semi-elliptical c. 28ft-span* arched extension, accommodating a single line only. At about the same time the original bridge was also abutted to its north with a matching 15ft-wide arched span*, also accommodating a single track. Both additional tracks appear to have been added
(possibly in two phases) c. 1874-8. The atypical location of the new tracks on either side of the original formation appears to have been dictated by the close proximity of the Grand Junction (now Grand Union) Canal immediately to the north of the original formation, thus limiting the space available for additional lines on the north side. The cutting was widened to the south sometime between 1895 and 1935, when an additional siding was laid through the bridge’s c.1874-8 southern arch. The bridge was closed to vehicular traffic in February 1958 and now carries a public footpath.

All three arched spans consist of semi-elliptical arches, built in matching London stock brick, with white hydraulic mortar. They have matching brick string-courses and dressed gritstone copings. Only the southern two arches have limestone imposts, the northern arch instead springing from brick imposts. There is a raking buttress to each side between central and southern arched spans. These buttresses retain fabric from, and reflect the angle of, the lost south abutment of the original Brunel bridge. Unlike Old Stockley Road Bridge (Site29), when the two ends of the original bridge were extended c.1874-8, the new east and west abutments were given steeply-angled wing walls, rather than being gently splayed as in the Brunel originals. The parapets and copings of the original Brunel centre section survive unaltered, as do the matching parapets, copings and terminal pilasters of the later sections.

The original bridge is thus c. 50% complete. The centre section remains well-preserved, with no significant alterations to the surviving Brunel fabric. The matching arched spans at the north and south ends are of lesser historic or technical importance than the primary fabric, but they are of historical note in apparently being broad-gauge structures.

The bridge is currently closely visible from the public domain, due to bends in the approach ramps. It is also more distantly visible (500 metres) from the eastern end of the platforms at West Drayton station to the west. The bridge is located close to the Grand Union Canal, but its immediate setting is currently degraded through the demolition of former industrial sites. The bridge nevertheless retains its close visual relationship to an adjacent historic bridge over the Grand Union Canal.

(* Note: This span appears from maps to have initially accommodated only a single line of track, the southern span being carried partially over the cutting flank, as is still
found at Old Stockley Road Bridge. Both this southern span, and the 15ft-span on the north side of the track, were thus wide enough to have accommodated a single line of broad-gauge rails. It seems that, whilst the relief lines from Paddington westwards were generally laid to the north of the original formation and engineered for standard gauge track only, some of the structures on the earlier sections to the east of West Drayton (this length included) were designed to initially accommodate a single line of mixed standard- (4ft 8½in) and broad-gauge (7ft ¼in) tracks to either side of the original formation.)

Summary

Site 28: Kingston Lane Bridge (12.6 miles)

*Type: 13ft 6ins-wide overbridge for unclassified lanes*
Surviving primary features: Main 30ft arch, gritstone copings and parapets, Bases of original N. and S. abutments
Percentage original bridge surviving: c. 50%
Later Extension: Matching 1870s 15ft and 28ft arched spans to north and south Preservation of original rural setting: Moderate
Visibility from public domain: Good
Importance of resource: Medium/Low

Site 25: Thorney Lane (or Iver Lane) Bridge (14.4 miles)

Whilst also built in 1835-8, Thorney Lane Bridge differs from any of the other Brunel bridges studied. It originated as a London stock brick 18ft-wide arched road overbridge for minor public roads. It originally had gently spayed abutments at each end, flanking a 30ft-span, semi-elliptical arch, designed to accommodate two broad-gauge tracks (latterly two mixed broad-/standard-gauge tracks from 1861 until the abolition of the broad-gauge in May 1892). So as not to disrupt the angle of the existing road, the bridge is orientated at an angle to the railway formation, necessitating a skewed brick arch. The original bridge was extended to its north with a matching 25ft-span* skewed extension added during the Southall – Slough quadrupling of 1878. This extension was subsequently further extended with the addition of a further 25ft-span skewed arched extension, built in 1914 for the addition of a further single-line loop. In more modern times a modern steel footbridge has been erected to the immediate west of the bridge, so as to allow the carriageway to be widened to the bridge’s full width.

The 1835-8 and 1878 arched spans are both built of London stock brick, with white hydraulic mortar, semi-elliptical arches on limestone imposts and dressed gritstone
copings. Uniquely these spans both also have the added refinement of dressed gritstone string-courses. There are raking buttresses to each side of the pier between the 1835-8 and 1878 arched spans. These retain fabric from the original north abutment of the original Brunel bridge and thus reflect the angle of the surviving Brunel abutment to the south. The 1914 span is built for a significantly wider road carriageway than the earlier spans but interestingly, its northern abutment is gently splayed, thus matching the form of the Brunel original at the south end of the bridge (i.e. no steeply-splayed wing walls). The 1914 span also has gritstone string-courses and copings matching those of the original bridge and the 1878 span. The eastern parapet to the 1835-8 and 1878 sections was subsequently rebuilt in the mid 20th century using blue engineering brick, but the gritstone string-course was retained and the earlier copings reused.

Because it retains its original arch, gently splayed south abutment, gritstone string-course and copings, the original bridge is some c.70% complete. It is thus a comparatively well-preserved example of an original 1835-8, 18ft-wide road-overbridge for a minor public road. Furthermore, it is the only example noted that was built to a higher specification than normal, being both skewed (so as not to interfere with the existing road alignment) and in having the additional refinement of a gritstone string-course in place of the normal brick variety. Whilst the similar 1878 and 1914 25ft-span arches to the north are of lesser historic or technical importance than the original 30ft-span southern arch, they too are well-preserved and they also provide a scale for better appreciating the much more generous dimensions of the original Brunel structure adjacent.

The bridge is easy to view at close quarters from the modern steel footbridge immediately adjacent to its west and, slightly more distantly, from the eastern end of the platforms at Iver station. The bridge retains its semi-rural setting despite suburban development to south-west. The view from Iver station platform is currently somewhat obscured by the modern steel footbridge.

(*Adequate for two standard gauge (4ft 8½in) tracks. By the time of the 1878 quadrupling between Southall and Slough the broad gauge was already in decline. The dimensions of this span confirm that the new relief lines west of West Drayton were clearly built to accommodate two sets of standard gauge (4ft 8½in) tracks only, both located to the north of the original formation.)
Summary

Site 25: Thorney Lane Bridge (14.4 miles)
- Type: 18ft-wide overbridge for minor public roads (skew arch)
- Surviving primary features: Main 30ft skew arch and W. parapet, gritstone copings, S. Abutment and approach, Base of original N. abutment, Unique gritstone string-course
- Percentage original bridge surviving: c. 70%
- Later Extension: Matching 1870s 25ft (standard gauge) arched span to north, plus 1914 25ft (standard gauge) arched span to north again (matching standard-gauge spans provide scale)
- Preservation of original rural setting: Moderate / Good
- Visibility from public domain: Very Good
- Importance of resource: Medium / High

Site 24: Dog Kennel (or Ritching’s Park) Bridge (15 miles)
- Like Old Stockley Road Bridge and Kingston Lane Bridge, Dog Kennel Bridge was built in 1835-8 as a 'standard' London stock brick 13ft 6ins-wide overbridge for unclassified lanes. It originally had gently spayed abutments at each end, flanking a 30ft-span, semi-elliptical arch, designed to accommodate two broad-gauge tracks (latterly two mixed broad-/standard-gauge tracks from 1861 until the abolition of the broad-gauge in May 1892). In 1878 the northern abutment was largely demolished and the bridge was extended to its north with a matching arched 25ft-span extension during the Southall – Slough quadrupling. The unclassified lane remains an unmetalled track, which is also a permissive footpath.

Both of the arched spans are built in London stock brick, with white hydraulic mortar, semi-elliptical arches on limestone impost, brick string-courses, and dressed gritstone copings. The southern (1835-38) span and the northern (1878) span retain their original parapets, approaches, gritstone copings and terminal pilasters. The 1835-8 bridge retains its southern abutment intact. There is a raking buttress to each side between the two arched spans. These retain fabric from the original northern abutment, with the angle of the buttress reflecting the angle of the original northern abutment. The northern (1878) abutment is gently spayed and thus, apart from the lesser size of its arch, the northern (1878) part of the bridge exactly matches the 1835-8 southern part.

The bridge retains its original Brunel 30ft-span semi-elliptical arch, parapets, southern abutment, approach and terminal pilasters intact. It thus remains c. 75% complete and represents a good example of its type. Like all of the other bridges
studied, it has lost much of its original northern abutment due to addition of the complementary 1878 25ft standard-gauge arch adjacent. The additional arch and its northern abutment that replaced the original northern abutment remain entirely as built. Whilst the matching (1878) 25ft-span arch and its northern abutment are of lesser historic or technical importance than the original elements of the bridge, their identical form and smaller dimensions provide a vivid illustration of the much more generous dimensions of the original Brunel broad-gauge structure adjacent.

The bridge retains its undisturbed rural setting and still carries an un-metalled farm track (a permissive footpath). The bridge remains easy to view at close quarters from bends in the approach tracks. The bridge is also more distantly visible (<100metres) from the platforms at Iver station to the east.

(*Adequate for two standard gauge (4ft 8½in) tracks. By the time of the 1878 quadrupling between Southall and Slough the broad gauge was already in decline. The dimensions of this span confirm that the new relief lines west of West Drayton were clearly built to accommodate two sets of standard gauge (4ft 8½in) tracks only, both located to the north of the original formation.)

Summary
Site 24: Dog Kennel Bridge (15 miles)
Type: 13ft 6ins-wide overbridge for unclassified lanes
Surviving primary features: Main 30ft arch, gritstone copings and parapets, S. Abutment and approach, Base of original N. abutment
Percentage original bridge surviving: c.75%
Later Extension: Matching 1870s 25ft (standard gauge) arched span to north only (matching standard-gauge span provides scale)
Preservation of original rural setting: Very Good
Visibility from public domain: Good
Importance of resource: Medium/High

Site 23: Trenches (or Trencher’s) Bridge (16.4 miles)
Like Old Stockley Road Bridge, Kingston Lane Bridge and Dog Kennel Bridge, Trenches Bridge was built in 1835-8 as a ‘standard’ London stock brick 13ft 6ins-wide overbridge for unclassified lanes. As with the above-mentioned bridges it originally had gently spayed abutments at each end, flanking a 30ft-span, semi-elliptical arch, designed to accommodate two broad-gauge tracks (latterly two mixed broad-/standard-gauge tracks from 1861 until the abolition of the broad-gauge in May 1892). In 1878, during the Southall – Slough quadrupling, the northern abutment was largely demolished and the bridge was extended to its north, although unlike Old
Stockley Road, Kingston Lane and Dog Kennel Bridges, Trenches Bridge was extended with a 36ft-span* wrought-iron girder span. In 1914, during the creation of the Langley – Dolphin (Slough) loop, this girder span was shortened to 26ft and extended to the north again with a matching 26ft steel girder span. Unlike the surviving original, gently splayed southern abutment, the new northern (1914) abutment has steeply-angled wing walls. In 1935 the lane was downgraded and the bridge now carries a public footpath only.

Like Old Stockley Road, Kingston Lane, and Dog Kennel Bridges, the original arched span is built of London stock brick, with white hydraulic mortar, semi-elliptical arches on limestone impost, brick string-courses, and dressed gritstone copings. The original (1835-38) span and southern abutment retain their original parapets, approach, copings and terminal pilasters. There is a raking buttress to each side of the pier between the original arched span and the later girder span. These retain fabric from the original northern abutment, with the angle of the buttress reflecting the angle of the original northern abutment. There has been some cementacious repointing to the parapets and terminal pilasters, but otherwise there have been no significant alterations to the original Brunel fabric. The approach embankments remain semi-wooded.

Because the bridge retains its original Brunel 30ft-span semi-elliptical arch, parapets, southern abutment, approach and terminal pilasters intact, it thus remains c. 75% complete. It also represents a good example of its type. Like all of the other bridges studied, it has lost much of its original northern abutment because of the addition of further tracks. The girder spans mar the appearance of the primary fabric somewhat however, whilst the lack of a matching, standard-gauge (1878) arched bridge adjacent makes it more difficult to appreciate the generous dimensions of the original Brunel structure adjacent than in other locations. The steel and wrought-iron spans are of no historic, visual or technical note.

This bridge is distantly visible (c. 200metres) from the St Mary’s Road Bridge to the west. The site retains its semi-rural setting, despite dispersed suburban and industrial development nearby, whilst the un-metalled track over it remains redolent of its original state.

(*Adequate for two standard gauge (4ft 8½in) tracks and a third standard-gauge siding (extended into a loop in 1914). By the time of the 1878 Southall – Slough quadrupling the broad gauge was already in decline. The dimensions of the 1878
span confirm that the new relief lines west of West Drayton were clearly built to accommodate two sets of standard gauge (4ft 8½in) tracks only, both located to the north of the original formation, with an additional standard-gauge loop at this location.)

Summary

Site 23: Trenches Bridge (16.4 miles)

Type: 13ft 6ins-wide overbridge for unclassified lanes
Surviving primary features: Main 30ft arch, gritstone copings and parapets, S. abutment and approach, Base of original N. abutment
Percentage original bridge surviving: c. 75%
Later Extension: 1870s girder span extended in 1914
Preservation of original rural setting: Moderate
Visibility from public domain: Good
Importance of resource: Medium / Low

Site 22: St Mary’s Road Bridge (16.6 miles)

Like Thorney Lane Bridge, St Mary’s Road Bridge was built in 1835-8 as a ‘standard’ London stock brick 18ft wide arched road overbridge for minor public roads. As with the other bridges it originally had gently spayed abutments at each end, flanking a 30ft-span, semi-elliptical arch, designed to accommodate two broad-gauge tracks (latterly two mixed broad-/standard-gauge tracks from 1861 until the abolition of the broad-gauge in May 1892). In 1878, during the Southall – Slough quadrupling, the northern abutment was largely demolished and the bridge was extended to its north with a matching (and slightly skewed) 25ft-span* arched extension. In 1914 the bridge was extended further north again, with a skewed 19ft 9in-span single-line, steel girder span built for an additional loop from Langley to Dolphin (Slough). Unlike the surviving original, gently splayed southern abutment, the (1914) northern abutment has steeply-angled wing walls.

Like Old Stockley Road, Kingston Lane, Thorney Lane and Dog Kennel Bridges, both the original 1835-8 and 1870s arched spans are built of London stock brick, with white hydraulic mortar, semi-elliptical arches on limestone imposts, brick string-courses, and dressed gritstone copings. The original (1835-38) 30ft arch and southern abutment retain their original parapets, approach, copings and terminal pilasters. There has been some modern cementacious repointing to the parapets and original terminal pilasters, but there have been no significant alterations. There is a raking buttress to each side of the pier between the original arched span and the
1878 span. As previously, these buttresses retain fabric from the original northern abutment, with the angle of the buttresses reflecting the angle of the original abutment.

Because the bridge retains its original Brunel 30ft-span semi-elliptical arch, parapets, southern abutment, approach and terminal pilasters intact, it thus remains c. 75% complete. It represents a well-preserved example of its type. Like all of the other bridges studied, it has lost much of its original northern abutment due to addition of the complementary 1878 25ft standard-gauge arch adjacent. Whilst the matching (1878) 25ft-span arch to the north of the original bridge is of lesser historic or technical importance than the original elements, the identical form and smaller dimensions of the 1878 arch provide a vivid illustration of the much more generous dimensions of the original Brunel broad-gauge structure adjacent. The steel span is of no particular historic, visual or technical note.

The bridge is closely visible due to bends in the public road running over it. It is also more distantly visible from Middlegreen Road Bridge to the west (c. 600 metres) and from Trenches Bridge to the east (c. 200 metres). It is also sited close to the historic core of Langley village, a Conservation Area. The approaches are semi-wooded and the site retains a semi-rural character, despite dispersed suburban and industrial development nearby.

(*Adequate for two standard gauge (4ft 8½in) tracks. By the time of the 1878 Southall – Slough quadrupling the broad gauge was already in decline. The dimensions of this span confirm that the new relief lines west of West Drayton were clearly built to accommodate two sets of standard gauge (4ft 8½in) tracks only, both located to the north of the original formation.)

**Summary**

**Site 22: St Mary’s Road Bridge (16.6 miles)**

*Type: 18ft-wide overbridge for minor public roads*
*Surviving primary features: Main 30ft arch, gritstone copings and parapets, S. abutment and approach, Base of original N. abutment*
*Percentage original bridge surviving: c. 75%*
*Later Extension: Matching 1870s 25ft (standard gauge) arched span to north, abutted to north again by 1914 steel girder span (matching 1870s standard-gauge span adjacent provides scale)*
*Preservation of original rural setting: Moderate*
*Visibility from public domain: High*
*Importance of resource: Medium*
Site 21: Middlegreen Road Bridge (17.1 miles)

Like Thorney Lane and St Mary's Road Bridges, Middlegreen Road Bridge was built in 1835-8 as a 'standard' London stock brick 18ft-wide arched road-overbridge for minor public roads. As with the other bridges it originally had gently splayed abutments at either end, flanking a 30ft-span, semi-elliptical arch, designed to accommodate two broad-gauge tracks (latterly two mixed broad-/standard-gauge tracks from 1861 until the abolition of the broad-gauge in May 1892). In 1878, during the Southall – Slough quadrupling, the northern abutment was largely demolished and the bridge extended to its north with a matching arched 25ft-span* arched extension. In 1914 the 1878 extension was in turn abutted to its north again by a 20ft-span level-beam steel girder span for a single-line loop from Langley to Dolphin (Slough). Again, unlike the surviving original, gently splayed southern abutment, the (1914) northern abutment has steeply-angled wing walls.

Like the previously assessed bridges, both the original 1835-8 and 1870s arched spans are built of London stock brick, with white hydraulic mortar, semi-elliptical arches on limestone imposts, brick string-courses, and dressed gritstone copings. The original (1835-38) 30ft arch and southern abutment retain their original parapets, approach, copings and south-western terminal pilasters. The original south-eastern terminal pilaster has been recently rebuilt, with a blue-brick coping, doubtless following vehicle damage. There has been some modern cementaceous repointing to the south-western terminal pilaster. Again, there is a raking buttress to each side of the pier between the original arched span and the 1878 span. As previously, these buttresses retain fabric from the original northern abutment, with the angle of the buttresses reflecting the angle of the original abutment.

Because the bridge retains its original Brunel 30ft-span semi-elliptical arch, parapets, southern abutment, approach and one terminal pilaster intact, it thus remains c. 72% complete. It represents a well-preserved example of its type. Like all of the other bridges studied, it has lost much of its original northern abutment due to addition of the complementary 1878 25ft standard-gauge arch adjacent. Whilst the matching (1878) 25ft-span arch to the north of the original bridge is of lesser historic or technical importance than the original elements, the identical form and smaller dimensions of the 1878 arch provide a vivid illustration of the much more generous
dimensions of the original Brunel broad-gauge structure adjacent. The steel span is of no particular historic, visual or technical note.

The bridge is currently easy to view at close quarters from an adjacent area of public woodland. The bridge is also more distantly visible (c. 600 metres) from St Mary’s Road Bridge to the east. It retains its original rural setting, despite dispersed suburban and industrial development nearby. The view from the west is currently slightly marred by a pipeline bridge located adjacent to the western side of the bridge.

(*Adequate for two standard gauge (4ft 8½in) tracks. By the time of the 1878 Southall – Slough quadrupling the broad gauge was already in decline. The dimensions of this span confirm that the new relief lines west of West Drayton were clearly built to accommodate two sets of standard gauge (4ft 8½in) tracks only, both located to the north of the original formation.)

Summary
Site 21: Middlegreen Road Bridge (17.1 miles)
Type: 18ft-wide overbridge for minor public roads
Surviving primary features: Main 30ft arch, gritstone copings and parapets, S. abutment and approach (S.E. pilaster rebuilt), Base of original N. abutment
Percentage original bridge surviving: c. 72%
Later Extension: Matching 1870s 25ft (standard gauge) arched span to north, abutted to north again by 1914 steel girder span (matching 1870s standard-gauge span adjacent provides scale)
Preservation of original rural setting: Moderate
Visibility from public domain: High
Importance of resource: Medium

Site 20: Wexham Road Bridge (18.0 miles)
Like Thorney Lane, St Mary’s Road and Middlegreen Road Bridges, Wexham Road Bridge was built in 1835-8 as a ‘standard’ London stock brick 18ft-wide arched road-overbridge for minor public roads. As with the other bridges studied it originally had gently splayed abutments at either end, flanking a 30ft-span, semi-elliptical arch, designed to accommodate two broad-gauge tracks (latterly two mixed broad-/standard-gauge tracks from 1861 until the abolition of the broad-gauge in May 1892). Possibly from the outset, and certainly by 1875, the original bridge was abutted to its south by a further 15ft-span semi-elliptical arched span, adequate for
the broad-gauge and shown on a map of 1875 as accommodating a mixed broad-
/standard-gauge siding serving a brick works. Between 1899 and 1925 this siding
was extended and realigned to form an additional loop. In 1878 the original bridge
was subsequently further abutted to the north by a 36ft-span* wrought-iron girder
span crossing a further three tracks during the Southall – Slough quadrupling. This
girder span was replaced and the remainder of the bridge widened to the east and
west with ugly level-beam structures on reinforced concrete columns c. 1964. At the
same time, the former 15ft-span southern arch and the historic southern approach
embankment were buried within the widened embanked approaches. The original
parapets and terminal pilasters have been entirely lost.

This bridge is now less than 50% complete and the remains are now marred or by
ugly and inappropriate extensions over and to north, south, east and west. The
buried southern arch may be of interest as it was clearly built for the broad-gauge. It
is probably unlikely to be as early as 1835-8, but may have been an early addition.

The bridge now sits in a modern urban context. The surviving primary fabric is
difficult to see from the public domain due to the various modern extensions. Its
former rural setting is now completely lost in suburban and light industrial
development.

(*Adequate for three standard gauge (4ft 8½in) tracks. By the time of the 1878
Southall – Slough quadrupling the broad gauge was already in decline. The
dimensions of this span confirm that the new relief lines west of West Drayton were
clearly built to accommodate two sets of standard gauge (4ft 8½in) tracks only, both
located to the north of the original formation. At this location the quadrupling clearly
also involved a third (standard gauge) loop line.)

Summary

Site 20: Wexham Road Bridge (18.0 miles)
Type: 18ft-wide overbridge for minor public roads
Surviving primary features: Main 30ft arch, Bases of original N. and S. abutments
Percentage original bridge surviving: <50%
Later Extension: Matching 15ft arched span to south (buried) and 1960s
concrete girder span to north. Also widened to E and W. in 1960s with concrete
girders and new parapets)
Preservation of original rural setting: Very poor
Visibility from public domain: Moderate
Importance of resource: Low
Site 15: Leigh Road (or Biddles or Middle Road) Bridge (19.8 miles)

Like Old Stockley Road, Kingston Lane, Dog Kennel and Trenches Bridges, Leigh Road Bridge was built in 1835-8 as a ‘standard’ London stock brick 13ft 6ins-wide overbridge for unclassified lanes. As with the above-mentioned bridges it originally had gently splayed abutments at each end, flanking a 30ft-span, semi-elliptical arch, designed to accommodate two broad-gauge tracks (latterly two mixed broad-/standard-gauge tracks from 1861 until the abolition of the broad-gauge in May 1892). In the period 1878-82, during the Slough-Maidenhead quadrupling, the northern abutment was largely demolished and the bridge was extended to the north with a matching 25ft-span* arch.

Both the original arched span and the 1878-82 span are built in London stock brick, with white hydraulic mortar, both with semi-elliptical arches on limestone imposts, brick string-courses, and dressed gritstone copings. The southern (1835-38) span retains its original southern abutment and approach. The northern (1878-82) span has steeply-angled wing walls. The central pier is without buttresses. The lower section of both east and west parapets are of redder stock brick throughout (probably rebuilt in 1878-82), with the upper 60cm of both in early 20th-century granular Fletton-type brick. The original gritstone copings were retained however and both phases of repair work reflect the original design. More recently the terminal pilasters and short sections of the parapets at the north-west and south-east corners have been sympathetically reconstructed (‘as existing’), no doubt after minor road-traffic impacts.

Because of the loss of most of its original northern abutment and parapets, the original bridge is now c. 65% complete. Like all of the other bridges studied, it has lost much of its original northern abutment due to addition of the complementary 1878-82 25ft standard-gauge arch adjacent. Whilst this matching arch is of lesser historic or technical importance than the original elements, its identical form and smaller dimensions provide a vivid illustration of the much more generous dimensions of the original broad-gauge structure adjacent. This contrast is currently difficult to appreciate from the public domain however, except from some nearby factory offices. The rural setting is now entirely lost, and the bridge is now in an industrial estate.
(*Adequate for two standard gauge (4ft 8½in) tracks. By the time of the 1878-82 quadrupling west of Slough the broad gauge was already in decline. As with the 1878 relief lines between West Drayton and Slough, the dimensions of this span confirm that the relief lines west of Slough were built to accommodate two sets of standard gauge (4ft 8½in) tracks only, both located to the north of the original formation.)

Summary
Site 15: Leigh Road Bridge (19.8 miles))
Type: 13ft 6ins-wide overbridge for unclassified lanes
Surviving primary features: Main 30ft arch, gritstone copings, S. abutment and approach, Base of original N. abutment
Percentage original bridge surviving:c. 65%
Later Extension: Matching 1870s-80s 25ft (standard gauge) arched span to north (matching standard-gauge span adjacent provides scale)
Preservation of original rural setting: Poor
Visibility from public domain: Poor
Importance of resource: Medium/Low
5 Overbridges on the London to Bristol route

It is apparent from Chapter 3 and the analysis contained in Appendix A that the road-overbridges provided by Brunel for the London to Bristol railway vary in type, form, materials and detail throughout the railway’s length. The principal variations currently appear to relate to date (whether of the later 1830s or the early 1840s), the locally available materials, and the class of road or farm track carried. Other variations may possibly also relate to the stability of the associated earthworks (cutting sides or approach embankments - i.e. geology) and / or any latitude allowed to individual contractors in matters of detail. As this study concerns bridges over the railway, the discussion need not further address bridges under the railway (underbridges).

Scale
The unusual size of these otherwise relatively repetitive and conventional bridges is due to Brunel's uncompromising adoption of the 7ft¼"

Bridge Types
The survey of the route and available primary and secondary sources has revealed that bridges over the railway (overbridges) were constructed where the railway was in a cutting, whilst bridges under the railway (underbridges) were constructed where the railway was on an embankment. Preferably, where the railway formation and the pre-existing road were both at elevations close to the natural land surface, the road would be carried over the railway using inclined approach embankments and a road-overbridge. Whilst this approach was invariably adopted on the earlier parts of the railway to be completed, at a number of other locations, notably on the flatlands through the Vale of the White Horse, level-crossings were used for all but the most important crossings. It is currently unclear whether this unsatisfactory situation was the result of diminishing finance, or because the numerous bridges and long approach embankments would have disrupted the appearance of the otherwise flat terrain. The former explanation appears more probable.
The survey has shown that the original road-overbridges provided during the railway’s construction comprised four main types. These were:

- minor cattle creeps and farm accommodation bridges;
- 13ft 6ins-wide minor road bridges for unclassified lanes and farm tracks;
- 18ft-wide road bridges for minor public roads and
- larger road bridges, up to 42 ft wide, for major public and turnpike roads.

**Bridge Forms**

In the case of the cattle creeps / accommodation crossings and unclassified lanes and farm tracks, the accommodation crossing, tracks or lanes would invariably be diverted (if necessary) to cross ‘square’ to the railway formation, so as to ease construction. In the case of 18ft-wide bridges for minor public roads and the wider bridges carrying major public and turnpike roads, the bridges would either be constructed square to the formation or at an angle (‘skew’) to it, dependant on the existing road alignment, which was left invariably left unaltered by construction.

Where the road did cross over the railway at an angle, the bridge would invariably involve the construction of one or more complex ‘skewed’ arches.

Aside from the distinction between square and skew bridges, the rapid route survey has revealed that only two principal ‘generic’ bridge-forms were used for road-overbridges on the route. These are:

- a single-span arched variety spanning two railway tracks with a 30ft arch and
- a three-span arched variety with a 30ft central arch spanning two railway tracks, flanked by a relieving arch of between 10- and 30-ft span, depending on bridge height. In these bridges the two intermediate piers were each pierced with a smaller transverse arch.

The only exceptions were the cattle-creeps / minor accommodation bridges (which were invariably 3-span level-beam structures with timber decks, and with masonry / brick or timber piers) and three (now lost) multi-arched road-overbridges on the approaches to, or at the Bishop’s Road terminus (see Tutton, M., 1999, Paddington Station 1833-1854, fig. 13).

The two principal bridge-forms were apparently used interchangeably for all classes of bridge, both for crossings over cuttings and for crossings where the road has to be carried up and over the railway formation using inclined approach embankments. The exceptions to this were the first sections of the railway to be completed, namely the London to Maidenhead and Bristol to Bath sections, where the single-arch type of overbridge was used exclusively, both for bridges over cuttings and for bridges with
inclined approach embankments. Throughout the length of the railway, the abutments of the bridges were gently splayed with shallow terminal pilasters and without wing walls.

The arch form almost universally employed by Brunel for arched bridges on the route was the flattened semi-ellipse. The principal exceptions were a couple of major road-overbridges at Corsham (each with a single, exceptionally wide-span, segmental arch) and the overbridges between Bristol and Bath, which all employed four-centred, ‘Tudor-gothic’ arches. In technical terms, Brunel’s use of the semi-elliptical form of arch was not ground-breaking in itself, as semi-elliptical arches had previously been used by Perronet and the Rennies. The form was not widely used by any of Brunel’s contemporary railway engineers however, who generally preferred the segmental arch form. The semi-elliptical is a practical one for railway use however, minimising outward thrust whilst maximising the space available for trains to pass. Their use is indicative of Brunel’s scientific education, and reflects Brunel’s more scientific application of the form displayed at the Wharncliffe Viaduct at Hanwell and taken onto a completely new level with the Maidenhead Bridge over the Thames. The latter, with its two flattened semi-elliptical arches with a span of 128ft and a rise of only 24ft 6ins, remains the world’s longest unsupported brick structure.

Design

Within each length of railway, the lesser bridges were all constructed to relatively generic designs, with only minor variations in terms of materials and detail. Only the most important bridges carrying major public and turnpike roads display real individuality of terms of design, decoration and finish. In some case this individuality was restricted to size, a number being simply massively scaled-up versions of the more generic designs, with only minor additional embellishments.

Materials

The materials used throughout the route vary widely, reflecting local availability and a desire to make the railway sit easily in its landscape. Thus London stock brick bridges with limestone imposts predominate between London (0m) and just east of Twyford (c. 30.5m). From Twyford (c. 30.8m) to east of Chippenham (c. 92m), red brick predominates, with a significant number of bridges of Swindon stone from c. 74m to c. 84m. Between the east side of Chippenham (c. 92m) and Bath station (107m) ‘Bath’ stone is used exclusively for bridges, whilst between Bath station and Bristol (118.5m), grey Bristol stone is used.
**Detail**

The choice of material and design for minor details also varies significantly along the route, on all classes of bridge. This applies particularly to the design and choice of materials used for of copings and string-courses. The design of terminal pilasters also varies, whilst imposts are almost exclusively found for the arch springings of the London-stock bridges between London and Twyford.

**Survival**

The route has been subject to continuous upgrading and repair since it was completed. Numerous sections of the route, particularly west of Swindon, have had additional tracks added in order to accommodate additional traffic, resulting in the lengthening or adaptation of the original bridges. Thus, of the 76.5 miles between London and Swindon, only the following sections of route now remain as a two-track railway as originally designed:

- Milton / Steventon to Wantage Road (4 miles)
- Challow to Uffington (2.5 miles)
- Shrivenham to Swindon east (Highworth Junction) (4.5 miles)

The original formation of the remaining 42.5 miles west of Swindon is considerably less altered, with only some five miles of route having been changed. It will nevertheless be noted that of the total route of 118.5 miles, only slightly more than 50 miles remain as a twin-track railway as originally designed. Because of this and other factors, of the original c. 110 overbridges marked on the 1st Edition 1-inch Ordnance Survey mapping, only 66 survive in anything like recognisable form. Of these, some ten examples are of the larger and more individual type designed for major public and turnpike roads (of which some five are significantly skewed), and two are of three-span level-beam type (one cattle creep and one minor aqueduct). The other fifty-four overbridges divide pretty equally between the more generic 13ft-6ins-wide and 18ft-wide varieties. Only a very small proportion of these are significantly skewed.

Other changes have resulted from road improvements, whilst the suburbanisation of Middlesex and western London has also caused numerous bridges to have been replaced entirely or significantly altered through widening. Currently, of the original c.110 overbridges marked on the 1st Edition 1-inch Ordnance Survey mapping, only 66 survive in anything like recognisable form. Of these sixty-six, thirty have been
extended or altered so as to accommodate further tracks, although in three instances this has been achieved through inserting additional tracks through the side arches of original three-arched bridges. Thus, of the original c.110 overbridges noted, only some 39 examples have remained substantially in their original form. Many of these, as well as many of the altered examples, have nevertheless been subject to ongoing repairs and maintenance, which has been more or less sympathetic. Thus whilst the London-stock brick bridges and the bridges of grey Bristol stone have proved relatively durable, many of the bridges built of ‘Bath’ stone, Swindon stone and soft red Berkshire brick have been subject to unsightly patching, or complete re-facing, normally in hard grey, blue or red engineering brick. Many bridges have also been subject to parapet replacement, either to widen them slightly, or as a result of vehicle impact.
6  Cumulative Assessment of Sites 15 to 29

From the above it will be noted that all of the bridges affected by the Crossrail project lie on the first section of Brunel’s London to Bristol railway to be completed, namely the 22.5 miles from Bishop’s Road in London to the temporary terminus at Maidenhead Riverside, opened on for traffic on 4th June 1838.

Excluding the Bishop’s Road viaduct that formed the frontage of the original London terminus, this section of railway originally possessed some 34 road-overbridges, all of which appear to have been smartly and uniformly constructed in London stock brick, relieved with string-courses (usually of brick), limestone imposts and gritstone copings. Excepting two multi-arched bridges spanning the station throat, all of these road-overbridges appear to have been constructed to a ‘generic’ single-arch design, each with a single semi-elliptical arch of the standard 30ft span required by Brunel’s broad gauge. As none of the roads were major public or turnpike roads, it is probable that all of these bridges would have been either 13ft 6ins or 18ft wide. Some 12 of these single-span bridges appear to have been skewed, the remainder crossing perpendicular to the railway.

All of the bridges inspected are individually unremarkable engineering structures. They were all built to formulaic designs that are repeated (with minor variations) throughout the length of the railway from London to Bristol. They are also mirrored on a number of the other, later railways for which Brunel was responsible. Only in the Thorney Lane Bridge is the design tailored to meet local circumstances. The variations in the construction of these generic bridges along the route are significant however.

The survival of the original 34 London stock brick bridges between London and Maidenhead has not been good. Neither the original Bishop’s Road viaduct, nor the two multi-arch bridges on the approach to the original Bishop’s Road terminus, have survived. Of the 32 generic, single-arch road-overbridges, only some 14 (five between Paddington and Heathrow Junction and the nine under study) now survive with their original 30ft-span (broad-gauge) arches intact. Of these, only a single example (Site 25: Thorney Lane Bridge) has a skew span. Since their initial construction, all of these bridges have been extended at one end, or in some instances both ends, in order to accommodate additional tracks. Furthermore, the
surviving original fabric of six of these 14 bridges (the five probable surviving examples between Paddington and Heathrow Junction, and Site 20: Wexham Road Bridge) is now significantly obscured by later fabric, each having also been widened on one or both sides, as station buildings have been constructed on them, or as narrow country lanes have transmuted into minor or major suburban streets, with consequent loss of parapets and terminal pilasters. As a group, the remaining eight bridges (Sites 15, 21, 22, 23, 24, 25, 28 and 29) thus represent the most complete surviving Brunel road-overbridges on the original 22.5 miles of railway.

Whist the use of London stock brick characterised the original London to Maidenhead section, the material was also used, at least intermittently, as far west as Twyford, 32 miles out from London. Despite the widespread demolition and replacement of road-overbridges during the Maidenhead - Didcot quadrupling in 1890-95, two further London stock brick road-overbridges survive in recognisable condition on this section. These are the pair of three-arched examples located in a deep cutting to the east of Twyford station. These two bridges share the same characteristic details of brick string-courses and limestone imposts of the earlier bridges between London and Maidenhead, contrasting sharply with the road-overbridge at Twyford station itself, which is the first of the red brick bridges (with no imposts) that characterise much of the railway between Twyford and Chippenham. These two bridges differ from generic single-arched bridges on the earlier London to Maidenhead and Bristol to Bath sections of the railway in that they are the first (and probably also the earliest) of the generic three-arched design of overbridge, used interchangeably with the single-arched variety throughout the remainder of the railway between Maidenhead and Bath.

It is clear from the research carried out for this report, and from the description in the UK’s tentative World Heritage Site List (see Appendix B), that a significant characteristic of the London to Bristol railway is the manner in which the structures and buildings along it were designed to reflect the character and geology of the areas through which it passed. It is also apparent that, unlike the surviving original under-line structures, it is only the road-overbridges, with their large 30-foot spans (five to six feet greater than the corresponding structures built for the ‘standard’ gauge), that can still demonstrate the unusually large structural and track gauge of Brunel’s original railway. Also unlike the under-line structures (including the Hanwell Viaduct and Maidenhead Bridge), the road-overbridges are amongst the very few surviving historic structures that can be seen from the railway itself.
None of the bridges to be affected by Crossrail are Listed. Furthermore, none fall within any of the seven sections of railway identified on the UK Tentative List for World Heritage Sites (see Appendix B). However, they represent the best-preserved examples of a bridge type that, in terms of materials and detail, is unique to the first section of the London to Bristol Railway to be completed. In a number of cases, they benefit from the contrast of scale with abutting standard-gauge structures of identical form and the contrast in both height and width between the original arches and those adjacent. These contrasts emphasise the unusually large dimensions of Brunel's original railway. These bridges are individually and collectively of historic, architectural and technical interest, notwithstanding the lack of existing statutory designations. They also contribute towards the wider historic setting of a number of Grade I and II* historic railway structures and tentative World Heritage Site. The bridges are therefore regarded as being of Medium to High Importance as a group.
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Appendix A

Summary of historic features between Paddington and Bristol

Paddington to Maidenhead Riverside (-0.5m to 22.5m)
Opened 4th June 1838. Gradient 1:1320

Sub-section Paddington to Heathrow Junction. (-0.5m to 12m)
Features of note: Paddington Station and Hotel (-0.5m) (opened January to May 1854); original Bishop’s Road terminus, goods depot and Locomotive Depot (site of) (0.0m) (temporary, timber, closed 1854, demolished); Westbourne Park Locomotive Depot (site of) (0.9m) (closed 1906, demolished); Wharncliffe Viaduct, Hanwell (7.1m to 7.5m) (891ft long, up to 65ft high on eight semi-elliptical arches of 70ft span, of ‘white’ brick and Bramley Falls limestone).

Early stations: Ealing (Broadway) (5.5m) (‘Townhouse’ style, demolished) (opened December 1838); Hanwell (7.1m) (demolished) (opened December 1838); Southall (8.9m) (Tudor-gothic, demolished) (opened May 1839).

Later Stations: Paddington Station and Hotel (-0.5m) (opened January to May 1854); Royal Oak (0.4m) (opened 1871, closed and demolished 1990s); Westbourne Park (1m) (opened 1871, closed and demolished 1990s); Acton (4m) (opened 1868); West Ealing (previously Castle Hill or Ealing Dean station) (6.3m) (opened 1871); Hayes & Harlington (10.6m) (opened 1864).

Originally two lines of tracks, separate suburban tracks added between Paddington and Westbourne Park in 1871, then to Southall between 1874 and 1st October 1878 and on to Slough by 25th November 1878, the new lines generally being standard gauge only. Generally now six to eight+ tracks from Paddington to Ealing Broadway (5.5m), reducing to four + tracks thereafter. This section of the route was electrified c.1995 for the ‘Heathrow Express’ service.

Overbridges: Originally c. 21 overbridges (excluding the viaduct carrying Bishop’s Road itself), c. ten of which were skewed, the remaining c. 11 being perpendicular to the tracks. Of these, at least the westermost two (both skewed) were multi-arched, due to the number of tracks within the original station throat. Despite subsequent suburban development and additions of up to six further tracks, some eight arched bridges with 30ft (broad-gauge) arches survived on this section 1993-4, although at least two of these have subsequently been demolished or completely reconstructed during road improvements. Whilst responses from Network Rail on the remainder has not proved conclusive, it currently appears that up to five bridges may still retain a 30ft-span Brunel arch of semi-elliptical pattern intact. All of these bridges have clearly been lengthened with at least one further northern span. All five have also been widened with additional steel or concrete structures, either in for road-widening or in connection with the erection of station buildings at street level. Two have been widened on one side only, whilst the other three have been widened on both sides.

Surviving Overbridges (all originally single semi-elliptical arch, London stock brick, generally with limestone impost):

Perpendicular type: Possibly four examples(?): The Broadway, Ealing (5.5m) (extended to north, widened to east and west and incorporated into station structures); Longfield Road or St Leonard’s Road, Ealing (6.1 or 6.8m) (extended to north and widened to east (?) and west); Drayton Green Road / Station Road, West Ealing (6.3m) (extended to north, widened to west and incorporated into station structures); Station Road, Hayes (10.8) (extended to North, widened to West and incorporated into station structures).

Skewed type: No examples

Heathrow Junction to Maidenhead Riverside (12m to 22.5m)
Features of note: West Drayton railway coke ovens beside Grand Junction canal (site of) (12.2m); West Drayton engine house (site of) (14m); Surviving timber Brunellian building to west of Slough station (18.3m); Taplow engine house (site of) (21.9m).

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1 White HP, 118. Evidence of some bridges implies that certain lengths were engineered to broad-gauge clearances however
Early stations: West Drayton (site of) (13.2m) (opened 4th June 1838, demolished and moved 1884); Langley (16m) (opened 1845, demolished); Slough (18.2m) (Classical ‘townhouse’ style) (opened 1840, demolished); Maidenhead Riverside (site of) (22.5m) (Temporary, timber) (opened 4th June 1838, closed November 1871, demolished).

Later Stations: West Drayton (13.0m) (moved to present site 1884); Iver (14.5m) (opened 1924); Burnham (20.8m) (opened 1899), Taplow (22.1m) (opened 1871).

Originally two lines of tracks, separate suburban tracks added between Paddington and Westbourne Park in 1871, then to Southall between 1874 and 1st October 1878 and on to Slough by 25th November 1878, the new lines generally being standard gauge only. The quadrupling had been extended to Taplow by 1882.

Overbridges: Originally c. 13 overbridges, c. three of which were skewed, the remaining c. ten being perpendicular to the tracks. Nine bridges survive, all altered.

Surviving Overbridges (all originally single semi-elliptical arch, London stock brick, generally with limestone imposts):

Perpendicular type: Eight examples: Old Stockley Road Bridge (12.1m) (extended to north and south); Kingston Lane Bridge (12.8m) (extended to north and south); Dog Kennel Bridge (15m) (extended to north); Trenches Bridge (16.4m) (extended to north); St Mary’s Road Bridge (16.5m) (extended to north); Middlegreen Road Bridge (17.1m) (extended to north); Wexham Road Bridge (18m) (extended to north and south and widened) and Leigh Road Bridge (19.5m) (extended to north)

Skewed type: One example: Thorney Lane Bridge (14.4m) (with gritstone string-course) (extended to north)

Maidenhead Riverside to Twyford (22.5m to 30.9m)
Opened 1st July 1839. Gradient 1:1320

Features of note: Maidenhead Bridge (23m) (2 x 128 ft semi-elliptical flat brick spans) (red Berkshire brick and Bath stone).

Early stations: Twyford (site of) (31.9m) (opened 1st July 1839, later moved 100 metres east).

Later Stations: Maidenhead (24m) (opened November 1871); Twyford (31.8m).

Originally two lines of tracks, quadrupled Taplow-Didcot 1890-96. For various reasons, the additional tracks were laid to the north and south of the original formation towards Maidenhead and to the south of original formation towards Twyford.

Overbridges: Originally c. 11 overbridges, c. four of which were skewed, the remaining c. seven being perpendicular to the tracks. Only three examples survived the quadrupling of 1890-96.

Surviving Overbridges (all originally single semi-elliptical arch, London stock brick with limestone imposts or red Berkshire brick with no imposts):

Perpendicular type: Two examples of three-arched type to east of Twyford Station: (30.1m); (30.4m). Both of London stock brick, with limestone imposts, both accommodating additional tracks in original southern arches.

Skewed type: One example: Twyford Station bridge (red Berkshire brick, no imposts) (30.7m) (extended to south).

Twyford to Reading (31m to 35.7m)
Opened 31st March 1840. Maximum gradient 1:660

Features of note: Sonning Cutting (32m to 33.7m) (1.7 miles long, up to 60ft deep). Kennet bridge and viaduct (34.7m) (60ft main span and four side arches in red Berkshire brick); Surviving Brunel station building at Reading (35.7m) (‘Townhouse’ style).

Early stations: Reading (35.7m) (opened 31st March 1840).

Later Stations: Maidenhead (24m) (opened November 1871); Twyford (31.8m).

Originally two lines of tracks, quadrupled by 1893.

Overbridges: Originally c. four overbridges, c. three of which were skewed. Only one example (of timber) was perpendicular to the tracks. Only one bridge (a very high, 31ft-wide, three-arched, red Berkshire-brick skew bridge with limestone imposts at Sonning, carrying the

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2 White HP, 118. Evidence of some bridges implies that certain lengths were engineered to broad-gauge clearances however
A4 Bath Road) survived the quadrupling of 1893. It appears from historic photographs that the other bridges were also three-arched, Red Berkshire-brick bridges with limestone imposts.

Surviving Overbridges (all probably semi-elliptical three-arched, red Berkshire brick, with limestone imposts):  

Perpendicular type: No examples.  
Skewed type: One example: A4 Bath Road bridge, Sonning (31ft-wide) (33.3m).

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Reading to Steventon (35.7m to 56.5m)  
Opened 1st June 1840. Maximum gradient 1:660  
Features of note: Course of railway through Goring Gap (Pangbourne to Cholsey) (41m to 48m); Red-brick Thames bridges at Gatehampton (43.9m) (four skew spans of 64ft 4ins) and Moulsford (47.3m) (four skew spans of 87ft 8ins); Surviving flint-built Tudor-gothic station house and hotel at Moulsford (47.7m); Surviving ‘Bath’ stone Tudor-gothic railway hotel, Board room and Company offices at Steventon (56.5m); Terrace of Tudor-gothic railway worker’s cottages at Steventon (site of) (56.6m) (demolished late 1960s).

Early stations: Pangbourne (41.4m) (Tudor-gothic, demolished) (opened 1st June 1840); Goring (& Streatley) (44.5m) (demolished) (opened 1st June 1840); Moulsford (Wallingford) (31ft-wide) (33.3m) (opened 1st June 1840, closed 1892, demolished); Didcot (53m) (temporary, timber) (opened 1844, demolished 1885); Steventon (56.5m) (temporary, timber) (opened 1st June 1840, closed and demolished 1965).

Later Stations: Tilehurst (38.5) (opened 1882); Cholsey (48.3m) (opened 1892).  
Features of note: No engineering features of note (very flat landscape).

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Steventon to Farringdon Road (Challow) (56.5m to 63.5m)  
Opened 20th July 1840. Maximum gradient 1:754 to 1:660  
Features of note: No engineering features of note (very flat landscape).

Early stations: Wantage Road (site of) (60.2m) (opened 1845, demolished 1932, closed 1960s); Farringdon Road (Challow from 1864) (site of) (63.5m) (Temporary, timber) (opened 20th July 1840, demolished 1932, closed 1960s); Farringdon Road goods shed (site of) (63.5m) (demolished May 1965).

Later Stations: None.  
Features of note: No engineering features of note (very flat landscape).

Surviving Overbridges: None (probably originally semi-elliptical, red Berkshire brick, with no imposts).
Farringdon Road (Challow) to Hay Lane (Wootton Bassett Road) (63.5m to 80.2m)
Opened 16th December 1840. Gradient 1:754-1:660 up to Swindon, 1:660 down to Hay Lane.

Sub-section Farringdon Road (Challow) to Swindon (63.5m to 77.2m)
Opened 16th December 1840. Gradient 1:660 up to Swindon.
Features of note: Surviving Brunel building at Swindon station (‘Townhouse’ style, Corsham stone) (77.2m). Apart from the cutting across Baulking Common (66m) there are no other engineering features of note (very flat landscape).
Early stations: Uffington (site of) (66.3m) (closed and demolished 1960s); Shrivenham (site of) (71.3m) (Tudor-gothic) (opened 16th December 1840, closed 1964, demolished 1965); Swindon (Classical ‘Townhouse’ style) (77.2m) (opened 14th July 1842).
Later Stations: None
Originally two lines of tracks, quadrupled from Uffington (66.3m) to Shrivenham (71.3m) and from Highworth Junction (76.1m) to Swindon (77.2), probably in early 20th century.
Overbridges: Originally c. seven overbridges, c. one was skewed, the remaining c. six being perpendicular to the tracks. There were also c. five level-crossings. Five bridges survive, all in largely original condition. In general the bridges on this section appear to have been of red Berkshire brick, without imposts, although two at the extreme western end are of grey Swindon stone.
Surviving Overbridges (generally semi-elliptical, red Berkshire brick, with no imposts, but also two grey Swindon sandstone examples):
Perpendicular type: One single-arched type (red Berkshire brick, no imposts, rebuilt parapets) (Baulking) (66m); One single-arched type (Swindon sandstone) (B4006, Swindon) (75.6m); Two three-arched type (Red Berkshire brick, no imposts) (71.6m and 71.9m).
Skewed type: c. One single-arched type (Swindon Sandstone) (Ermin Way, Swindon) (74.8m).

Sub-section Swindon to Hay Lane (Wootton Bassett Road) (77.2m to 80.2m)
Opened 16th December 1840. Gradient 1:660 down to Hay Lane.
Features of note: Surviving Brunel and later buildings at former Swindon Works (77.5m to 77.9m); Swindon railway village (77.5m to 77.8m) (‘Jacobethan’ style). Railway worker’s cottages at Hay Lane (77.2m) (temporary, demolished 1932). No engineering features of note (very flat landscape).
Early stations: Hay Lane (Wootton Bassett Road) (site of) (80.2m) (demolished).
Later Stations: None
Still two lines of tracks, except from Swindon station (77.2m) to c.78.6m.
Overbridges: Originally c. one overbridge only, perpendicular to the tracks. It is of red brick.
Surviving Overbridges (semi-elliptical, red Berkshire brick, no imposts): Perpendicular type: One single-arched type (red brick, no imposts, possibly refaced) (80m).
Skewed type: None.

Hay Lane (Wootton Bassett Road) to Chippenham (80m to 93.7m)
Opened 31st May 1841. Gradient 1:660 down, with 1.5 miles at 1:100 down between Wootton Bassett and Dauntsey.
Features of note: Wootton Bassett incline (84.5m to 86m); Chippenham Station (93.7m) (Italianate, Corsham Stone).
Early stations: Wootton Bassett (site of) (82.8m) (opened 31st May 1841, closed 1960s); Chippenham (93.7m) (Italianate, Bath stone) (opened 31st May 1841).
Later Stations: Christian Malford Halt (site of) (89.9m) (closed 1965, demolished).
Still two lines of tracks.
Overbridges: Originally c. ten overbridges, c. three of which were skewed, the remaining c. seven being perpendicular to the tracks. All survive. There were also at least two cattle-creeps with beam decks, one of which survives with a replacement deck (85.4m). Three bridges between Swindon and Wootton Bassett are of grey Swindon sandstone (81.3m, 82.2m and 83.2m). Between Wootton Bassett and the outskirts of Chippenham the bridges
are of red brick, without imposts, whilst there are two ‘Bath’ stone bridges on the eastern side of Chippenham. Many of these bridges are patched or refaced.

Surviving Overbridges (generally semi-elliptical, grey Swindon sandstone, red brick, with no imposts and ‘Bath’ stone):

**Perpendicular type:** No single-arched type; two three-arched type (grey Swindon sandstone) (81.3m and 82.2m); three three-arched type (red brick, no imposts) (82.6; 85.6 and 88.2); two three-arched type (‘Bath’ stone) (92.8 and 93.2).

**Skewed type:** No single-arched type; one three-arched type (grey Swindon sandstone) (83.2m), one three-arched type (red brick with no imposts) (87.6m).

**Chippenham to Bath (93.7m to 107m)**

Opened 30th June 1841. Gradient 1:1000 to 1:660 down, with 2 miles at 1:100 through Box tunnel.

**Features of note:** Chippenham viaduct (93.9m to 94m) (‘Roman’ style, ‘Bath’ stone); Chippenham embankment (94.1m to 96.1m) (2 miles long, up to 30ft high); Corsham Cutting (96.5m to 98.7m) (3 miles long); Corsham broad-gauge goods shed (97.9m); Box Tunnel (98.7m to 100.8) (3212 yds long, ‘Roman’ ‘Bath’ stone portals); Middle Hill Tunnel, Box (101.3m to 101.4m) (198 yds long, ‘Roman’ ‘Bath’ stone portals); Bathford Bridge (103.9m) (‘Classical’ segmental arch, ‘Bath’ stone, refaced in brick), Sydney Gardens bridges, Bath (106m to 106.3m) (‘Classical’, ‘Bath’ stone); Sydney Gardens East and West Tunnels, Bath (106m to 106.5m) (231ft and 297ft long, with ‘Classical’ and ‘Roman’ ‘Bath’ stone portals); St James’ or Dolemeads viaduct, Bath (106.5m to 106.8m) (255yds long, 37 round ‘Bath’ stone arches); St James Bridge, Bath (106.8m) (‘Classical’, ‘Bath’ stone 88ft stone skew span, rebuilt as existing 1926-7).

**Early stations:** Corsham (site of) (97.9m) (opened 30th June 1841, closed 1960s, demolished); Box (site of) (101.6m) (opened 30th June 1841, closed 1960s, demolished).

**Later Stations:** Bathwood Halt (103m) (closed 1965, demolished); Bathampton Junction (104.2m) (closed 1966, demolished).

Still generally two lines of tracks throughout, except between 96m and 97m, where additional tracks are laid to the north of the original formation.

**Overbridges:** Originally c. 17 overbridges, c. two of which (both on the A4 Bath Road) were skewed, the remaining c. 15 being perpendicular to the tracks. One of these (at 98.1m at the former Corsham station) is of the cattle-creep type with beam decks. All bar one of these bridges survive. The cattle-creep bridge has a replacement concrete deck however and a number of the bridges are much patched in later brick. Most of the bridges on this section are of Corsham or Bath stone, although the three nearest Chippenham (96.3m, 96.6m and 96.9m) are completely faced with (possibly secondary) brick, excepting their ‘Bath’ stone parapets. Many of the bridges have architectural pretensions, notably the western A4 bridge at Box (101.7m), the bridges at Corsham (97.9m to 98.4m) and those in Sydney Gardens, Bath (106m to 106.3m). Two of the Sydney Gardens bridges and the Sydney Gardens tunnels have a unique horseshoe profile.

Surviving Overbridges (generally semi-elliptical arches, all of Bath or Corsham stone):

**Perpendicular type:** Five single-arched semi-elliptical type (93.6m, 96.6m, 97.8m (all fairly generic) and 106.1m & 106.1m, Sydney Gardens (‘Bath’ stone, classical detailing); two unusually wide span, segmental-arched bridges (97.9m & 98.2m, Corsham); three semi-elliptical three-arched type (fairly generic); one cattle-creep type (stone piers) (98.1m, Corsham); two horseshoe-shaped single-arched type (106.2m, Sydney Gardens); one cast-iron (106.1m, Sydney Gardens).

**Skewed type:** One semi-elliptical single-arched type (‘Bath’ stone, classical detailing, 48ft wide) (western A4 bridge, Box); one semi-elliptical three-arched type (‘Bath’ stone, generic detailing, 24ft wide) (eastern A4 bridge, Box).

**Bath to Bristol (107m to 118.5m)**

Opened 31st August 1840. Gradient 1:1320.

**Features of note:** Bath Spa station (107m) (‘Jacobethan’, Bath stone); Bath (west) bridge (107.2m) (two 80ft ‘gothic’ laminated skew timber arches, rebuilt 1873-8); Bath (west) viaduct (107.2 to 107.5m) (73 semi-circular and Tudor-gothic grey stone arches); Twerton Short Tunnel (108.7m) (Castelated Tudor-gothic grey stone portals); Twerton Long Tunnel (109m)
(264yds long, Castelated Tudor-gothic grey stone portals); Saltford Tunnel (111.5m) (176yds long, Tudor-gothic grey stone portals); St Anne’s Park (or Fox’s Wood) Tunnel No. 3 (115.5m to 116m) (1017yds long); St Anne’s Park (or Fox’s Wood) Tunnel No. 2 (116.2m) (154yds long, ‘ruined’ castelated Tudor-gothic portals); St Anne’s Park cutting (116.5m to 116.7m) (formerly 330yd-long Fox’s Wood No 1 tunnel, with ‘Norman’ portals); Avon bridge, Bristol (117.1m) (100ft-span with 36ft side spans, all Tudor-gothic), Bristol viaduct and two former bridges over Floating Harbour (117.3m to 118.3m) (1-mile long, all Tudor-gothic grey stone arches); Bristol Temple Meads (old) station (118.5m) (Tudor-gothic).

**Early stations:** Bath Spa station (107m) (‘Jacobethan’, Bath stone) (opened 31st Aug 1840); Twerton (site of) (108m) (closed 1917, demolished); Salford (site of) (111.1m) (opened December 1840, closed 1960s, demolished); Keynsham (113.4m) (opened December 1840, demolished); Bristol Temple Meads (old) station (118.5m) (Tudor-gothic) (opened 31st August 1840, closed 1960s, now Empire & Commonwealth Museum).

**Later Stations:** Oldfield Park Halt (107.8m), St Anne’s Park (site of) (116.7m) (opened 1898, closed 1970, demolished).

Still generally two lines of tracks, except from 107m to 107.5m and from 116.6m to 118.5m.

**Overbridges:** Originally c. nine overbridges, c. two of which were skewed, the remaining c. seven being perpendicular to the tracks. Six bridges survive, all of the single arch type. These are all of grey stone, all with a unique Tudor-gothic arched form also replicated on all under-bridges, viaducts and the Twerton tunnel portals on the Bristol – Bath section.

**Surviving Overbridges (all Tudor-gothic arches of grey stone):**

**Perpendicular type:** Six single-arched Tudor-gothic type (stone).

**Skewed type:** None surviving.
Appendix B

Description of tentative World Heritage Site

Name of Property:
The Great Western Railway: Paddington - Bristol
(selected parts)

Geographical Location:
London - Bristol, England

Description
The Great Western Railway between London and Bristol was authorised by Parliament in 1835, and was opened in stages from both ends from 1838 onwards. The detail of its construction was entirely the conception of Isambard Kingdom Brunel and was to be, in his own words, ‘the finest work in the kingdom’. It was opened throughout in 1841 with the completion of Box Tunnel, the greatest engineering feat of early railway construction. Built to Brunel’s broad gauge of seven foot, its engineering works achieved a grandeur at that time unmatched elsewhere in the country and, as they were suited to high speed running, most of these structures have survived and are in daily use.

The Great Western Railway is represented by its magnificent termini at Paddington and Bristol Temple Meads, by the portals of Box and Middle Hill Tunnels, by the river bridges over the Avon in its western section and over the Thames at Maidenhead, by the Swindon Railway Works and Village, by the cutting at Sydney Gardens, Bath and by the viaduct at Hanwell. The survival of these, and many other lesser structures such as the station at Bath, combine to make the Great Western Railway the most complete railway of its date in the world. Regarded among other important early UK railways, including the Stockton and Darlington Railway, Liverpool and Manchester Railway and the London and Birmingham Railway, as best representing the primary phase of world railway development, the Great Western is the best preserved of this group.

The structures and buildings along the line were designed to reflect the character and geology of the areas through which the line passed and, at the western end of the line, introduce the theme of the approaching city. Thus from Chippenham to Bath the architecture of the tunnel portals, viaducts and bridges is grandly classical in keeping with Bath’s Georgian image, while to the west of the city the detail becomes gothicised reflecting Bristol’s historic role as England’s second city.

The first element of the proposed World Heritage Site is the complex of first generation buildings at Brunel’s Grade 1 Listed Temple Meads Station. The offices and boardroom at Temple Meads are currently being converted into a museum, the engine shed has been turned into The Exploratory, while the train shed is exhibition space. The 1865 front block of the later station is the main reception area for the present mainline station. The original line then sweeps north over the Floating Harbour, and then east on an embankment over the Feeder canal to the River Avon which it crosses by a masonry Gothic arched bridge (Grade I Listed) where the first element concludes.

The proposed Site recommences at Bath. It enters the World Heritage city of Bath via the turreted Twerton Tunnels and a long viaduct with infilled arches. These arches, whose facades are dignified by drip moulds over the window and door openings, were originally let as dwellings in order to recoup some of the engineering expenses of this section of line. The railway approaches the station by a battlemented masonry viaduct which crosses

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3 From: World Heritage Sites - The Tentative List of The United Kingdom of Great Britain and Northern Ireland, Department for Culture, Media and Sport (Buildings, Monuments and Sites Division) (1999)
the Avon at a very oblique angle, the original wooden spans having been replaced in brick. Bath Spa Station has lost its roof over the track and has been extended, but the handsome central section of its Jacobean facade is as designed by Brunel. The line then recrosses the Avon with a fine classically detailed three arched masonry bridge with a central 88 feet span before proceeding to Bathwick on a masonry viaduct. The section of line to the east of Bathwick Hill through Sydney Gardens, with its swept retaining walls and cast iron and masonry bridges, is perhaps the most graceful railway townscape in the country. The proposed Site closes beyond the Warminster road bridge.

The next section comprises the portals of the two tunnels at Box where the refined classical portals of the short Middle Hill Tunnel complement the massive western portal of the 3195 yard long Box Tunnel. East of Box Tunnel the railway passes through Chippenham on a long embankment, pierced by an underbridge accommodating the former Great Western Turnpike, leading to the town itself where a impressive viaduct straddles the town centre. The station at Chippenham retains much of its original appearance and there is a handsome masonry outbuilding which, reputedly, was the engineering works office for this section of line.

At Rodbourne Road in Swindon, the proposed Site recommences and broadens to encompass the historic core of the former Railway Works and Village. Many of the industrial buildings of the Works date in part to Brunel’s involvement with the Site and have been or are currently being restored for retail, heritage and office uses. The original office building with its later additions now houses the National Monuments Record Centre, Brunel’s 1846 Fitting Shop is being converted into a railway heritage centre, while ranges of his wagon shops are incorporated in the Great Western Designer Outlet Centre. The Village was designed by Brunel and largely completed by 1850. In addition to the rehabilitated terraces of masonry cottages which contain a variety of dwelling layouts, it has shops, public houses, a church and rectory, a park, a barracks block for single men (converted to a chapel and then a museum), a Drill Hall (converted to a cottage hospital and now a community centre) and an impressive Mechanics Institute. It is without doubt the finest surviving example in the country of a planned railway town. The proposed Site ceases at the station which, although a sorry remnant of its former glory, is a very historically important site in relation to the railway and the development of Swindon.

East of Swindon the gradient of the line becomes very gentle and there are fewer engineering structures other than bridges, with those over the Thames at Basildon and Goring being particularly fine. The small complex at Didcot has Listed structures and at Steventon a surprisingly grand house was built as a temporary terminus and for a short time housed the GWR boardroom. The core of the station at Reading is also of note, while Sonning cutting to the east of Reading was one of the major engineering works on the eastern half of the line and though comprised by recent development retains much of its original aspect.

The proposed Site restarts to encompass a single structure - the magnificent bridge over the Thames at Maidenhead. Opened in 1838 the twin elliptical central arches of 130ft span were the flattest brick arches built in the country up to that date.

The proposed Site recommences where the line is carried over the valley at Hanwell by the impressive Wharncliffe Viaduct which is on the section of line opened in 1838. Built in brick by Messrs Grissel and Peto in a vaguely Egyptian style, the viaduct is 900 feet long with eight arches of 70ft span and carries the amorial bearings of Lord Wharncliffe in the centre of the southern elevation. The Viaduct was originally 30ft between parapets but was widened in the late 19th century in like style. East of the Viaduct the proposed Site terminates as the original line becomes lost in the multiplicity of lines carrying suburban as well as mainline traffic.

It re-emerges at Paddington Station with its superb trainshed roof designed by Brunel, with architectural embellishment by Sir Digby Wyatt, and the railway hotel and offices. This comprises the final element of the proposal.
Boundaries
The proposed Site comprises seven outstanding individual elements and is restricted to the line of the original GWR railway and the structures associated with I K Brunel; it does not include present day track and operational infrastructure.

The first element commences in the west with Temple Meads Station including Brunel’s Company Offices, Boardroom, Trainshed on the north-western side of the present station forecourt, and his Bristol and Exeter Offices on the opposite side of the forecourt. It then follows the line of original bridges over the Floating Harbour, the Feeder and the River Avon. The second element is within Bath (Twrerton Tunnel and Viaduct and Bath Station, St James Bridge, Sydney Gardens), and the third is at Box (Middle Hill and Box Tunnels). The fourth is within Swindon where it broadens out to include, to the north, the Railway Works bounded by Rodbourne Road, Kemble Drive and the Gloucester railway line, and to the south the area of Railway Village bounded by Rodbourne Road, Faringdon Road and East Street and along the line to the station. East of Swindon, the fifth element of the Site is the bridge over the River Thames at Maidenhead and the sixth is the Wharncliffe Viaduct at Hanwell. The final element is Paddington Station itself.

**Justification of Outstanding Universal Value Criteria met: Cultural Criteria (i), (ii), (iv) and (vi)**

Assurances of authenticity or integrity
Despite being in operation as a railway for over 150 years, many of the buildings and structures have survived intact. Paddington and Temple Meads Stations have been sympathetically restored and converted respectively. Where there has been early doubling of the track, as at the Wharncliffe Viaduct, this has also been done in a similar style retaining one side as original, while some bridges, such as that over the Avon in Bristol, have had detached bridges built alongside to carry the increased traffic. Railway structures are maintained to serve operational requirements and the needs of passengers, while large parts of the GWR Works at Swindon are extant, adapted for new uses which retain the scale and functional character of the complex. Housing and related buildings in Swindon’s Railway Village survive as a striking group which retains the historic topography and appearance of the area.

Comparison with other similar properties
Several factors have uniquely combined to preserve the historic integrity and appearance of the London to Bristol section of the Great Western Railway:

• the larger gauge of the GWR required greater clearances of all its overstructures and thus when high speed locomotives were introduced in the second half of the 20th century this line, unlike all other early mainlines, did not need the drastic alteration that has affected those other lines;

• the GWR, alone of all the great railway companies, comprised a single unit in the Railway Grouping of the 1920s and thus maintained its distinctive operational and engineering traditions until post-war nationalisation. This completeness contrasts with the other early mainlines, such as the Liverpool and Manchester where only isolated elements survive (including the pioneer Liverpool Road Station which is included in the proposed Manchester and Salford World Heritage Site) and the London and Birmingham Railway which has lost its London terminus, has been greatly altered and has abandoned its original Birmingham terminus. The first public railway - the Stockton and Darlington Railway – was not a mainline passenger railway and its early section has largely been dismantled.
Site 15: Leigh Road Bridge (19.8m)

Site Location

East Elevation (Schematic - Not to Scale)

West Elevation from South-west

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Site 20: Wexham Road Bridge (18.0m)

East Elevation (Schematic - Not to Scale)

Site Location

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East Elevation from East
Site 21: Middlegreen Road Bridge (18.0m)

East Elevation (Schematic - Not to Scale)

Site Location

East Elevation from North-east
Site 22: St Mary’s Road Bridge (16.6m)

East Elevation from East (Schematic - Not to Scale)

East Elevation from North-east
Site 24: Dog Kennel Bridge (15m)

East Elevation (Schematic - Not to Scale)

Site Location

East Elevation from Iver Station Platform

West Elevation from North-west
Site 25: Thorney Lane Bridge (14.4m)

Site Location

East Elevation from South-east

West Elevation from Iver Station Platform

East Elevation (Schematic - Not to Scale)

Modern
1914
1878
1835-8

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Site 28: Kingston Lane Bridge (12.6m)

Site Location

15m
14m
13m
12m
11m
10m

Site 26
Site 27
Site 28
Site 29

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East Elevation (Schematic - Not to Scale)

S
N

1835-8
1874-8

DOWN
MAIN
UP
MAIN
DOWN
RELIEF
UP
RELIEF

STEPS

STEPS

East Elevation from West Drayton Station Platform

West Elevation from North-west