

# THOMAS TELFORD'S HOLYHEAD ROAD: THE A5 IN NORTH WALES

by Jamie Quartermaine, Barrie Trinder, and Rick Turner

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with contributions by Jo Bell, Edward Holland, and Richard Newman

> CBA Research Report 135 Council for British Archaeology 2003

Published in 2003 by the Council for British Archaeology Bowes Morrell House, 111 Walmgate, York, YO1 9WA

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British Library cataloguing in Publication Data
A catalogue record for this book is available from the British Library

ISBN 1-902771-34-6

Cover designed by

Typeset by Archetype IT Ltd, www.archetype-it.com

Printed by Pennine Printing Ltd, Ripponden

The CBA acknowledges with gratitude a grant from Cadw: Welsh Historic Monuments towards the publication of this volume

A full catalogue of sites is available from the Archaeology Data Service at http://ads.ahds.ac.uk/catalogue/library/cba/rr135.cfm

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### List of conventions and abbreviation

Throughout the text, sites on the line of the road are referenced by their numbers in the site gazetteer (Appendix 4). A full catalogue has been deposited at the Archaeology Data Service. The project numbers for each site are shown within square brackets, eg [0801].

The names and spellings used follow the current usage on modern Ordnance Survey plans.

The Welsh words for river (afon) and lake (llyn) are used with reference to rivers and lakes in Wales. The Welsh word for bridge (pont) is used except where the English usage is established (eg Menai Bridge).

**Depot** Small, walled, rectangular, or sub-circular bays set out from the road edge along the length of the Holyhead to London Road. They were used for storage of materials for surfacing and repairing the road.

**Weighbridge house** A combination of toll house and weighing machine house. Only two examples are

known along Telford's road in Wales, at Lon Isa and Ty Isaf. The weighbridge machinery was kept in the lower portion of the house.

#### **Abbreviations**

BPP British Parliamentary Papers
ESJ Eddowes Salopian Journal
ICE Institution of Civil Engineers
OA North Oxford Archaeology North

OS Ordnance Survey PRO Public Record Office

RCAHM(W) Royal Commission on Ancient and

Historical Monuments in Wales

TICCIH The International Congress for the

Conservation of the Industrial

Heritage

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Jamie Quartermaine, a senior project manager at Oxford Archaeology North, has been closely involved in the Holyhead Road project since its inception. His principal areas of research are the archaeology of landscapes within the highland zone and industrial landscapes throughout northern England.

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Rick Turner has been an Inspector of Ancient Monuments with Cadw since 1989 and archaeological advisor to the Transport Directorate of the National Assembly for Wales. He studied both engineering and archaeology at Cambridge University. While Cheshire County Archaeologist he chaired the East Cheshire Textile Mills Survey.

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## Acknowledgements

This book would not have been possible without the support of the many people who have been involved both directly and indirectly since the project was first conceived. The Holyhead Road surveys and the production of the book was funded by Cadw: Welsh Historic Monuments. The research on the Holyhead Milestones was funded by the Welsh Office Highways Directorate (now the Transport Directorate of the National Assembly for Wales) and their assistance throughout is gratefully acknowledged.

In particular we acknowledge the vision and enthusiastic guidance of Rick Turner (Inspector of Ancient Monuments, Cadw), who has led the whole project from the outset. The project was managed throughout by Jamie Quartermaine (OA North).

The survey work on the Holyhead Road was primarily undertaken by Jo Bell and variously assisted by Peter Redmayne, Neil Wearing, Chris Wild, and Vix Hughes. The illustrations were by Emma Carter, Andrea Scott, Mark Tidmarsh, and Dan Elsworth. The reports were written primarily by Jo Bell, with contributions by Barrie Trinder, Rick Turner, and Jamie Quartermaine. A separate study of the Holyhead Milestones was undertaken by Ian Miller and a report on the Provis Notebooks was provided by Richard Newman.

The authors would particularly like to thank Andy Cochran, and also Tim Dorken, Andy Phillips, and Alwyn Williams, all of the Transport Directorate of the National Assembly for Wales, for their assistance throughout the various stages of the project. From Cadw we would like to thank Nigel Davies for providing maps and Judith Alfrey and Tony Render of the listings department for the provision of listing details. Thanks are due to John Latham and Stephen Kane of the National Trust for sharing their research on the Conwy Suspension Bridge.

The detailed study of the milestones was informed by architectural paint research by Ian Crick of Crick Smith Conservation and by Helen Callaghan who produced plaster casts of selected milestone plates.

As the project involved the detailed survey of a number of buildings, we would like to thank the following property owners for allowing the survey and for their support: Gareth Owen of Lon Isa toll house, Jan Baxter of Ty Isaf toll house, and Mr J Doran of Conwy for the survey of Mona coach house.

Stephen Priestley, Peter Kirby, and John Powell of the Ironbridge Institute are thanked for their assistance in assembling the documentary evidence, and Mike Chrimes of the Institution of Civil Engineers for help and support with the study of the documents in their collection. Ken Hoverd of Archive is to be thanked for providing the admirable photography incorporated within the volume. Chris and John Kenyon, Wyn Parry (Stena Lines), W Daniell (National Library of Wales), John Cave (Holyhead Maritime Museum), Dafydd Gwyn, and David Longley (Gwynedd Archaeological Trust) are thanked for their advice, information, and for the use of illustrative material.

Photographic copies of plates from the *Telford Atlas* were taken with the kind permission of John Powell, Librarian at the Ironbridge Institute. The authors would also like to acknowledge the Royal Commission on the Ancient and Historial Monuments of Wales (RCAHM(W)) for their kind permission to reproduce illustrations from their collection. In particular we would like to thank David Percival and Geoff Ward (RCAHM(W)) for the use of their survey of the Mona Inn and for contributing to the description of this building in the text (Chapter 7). We would also like to thank Stephen Hughes (RCAHM(W)) for permission to reproduce the drawings of a weighbridge from Banwen Ironworks railway.

The volume was edited by Carol Allen, Tertia Barnett, Ian Miller, Rachel Newman, and Jamie Quartermaine of Oxford Archaeology North and by Rick Turner and Peter Wakelin of Cadw. It was copy-edited by Mike Ponsford for the CBA.

## Summary

This book documents what was arguably the most significant achievement of Britain's greatest civil engineer, Thomas Telford, – the London to Holyhead Road. It presents the results of a survey of the 83 miles (133km) of the Welsh section of the road from Chirk to Holyhead undertaken in 1999 and 2000 and also the 14-mile (23km) spur road between Bangor and Conwy that forms part of the Chester Road.

The building of the Holyhead Road originated with the passing of the Act of Union between the Irish parliament in Dublin and the British parliament in London in 1801. This prompted the need for fast and reliable communication between the two capital cities of the UK, but the turnpikes of the period, particularly through north Wales, were well short of adequate. This resulted in the granting of Acts of Parliament for the first major road-building programme financed by civilian government. This involved the improvement of existing turnpikes and the creation of new roads on a route that passed through the mountainous topography of Snowdonia.

Work on the road began in the autumn of 1815 and was to continue until 1826 with the opening of the Menai Bridge. While Telford's road was built to a very high standard for the period and was far superior to those of his contemporary MacAdam, it was much more expensive. His principal aim was to construct a road with gradients no worse than 1:30, a bold aim given the extreme topography of north Wales and the fact that the earlier turnpikes were as steep as 1:6.5 in places. To achieve his aim he constructed numerous embankments including the major embankment of Nant Ffrancon in Snowdonia, the large Ty-Nant embankment constructed along an almost sheer-sided gully, and the 1300yds-long (1187m) Stanley embankment across the Stanley Sands to gain access to the Holy Island.

Telford's numerous stone bridges were built to a simple but rugged design that enabled the uninterrupted movement of traffic across them. His road is, however, best remembered for its major bridges, such as the arched cast-iron Waterloo Bridge at Betws-y-Coed and the suspension bridges at Conwy and most notably across the Menai Straits. The Menai Bridge (at the time the largest suspension bridge ever built) was considered by Telford to be his greatest single engineering feat.

Alongside the road he also constructed the supporting infrastructure – depots for storing road surface materials, milestones, toll houses, and also coaching inns, notably the New Inn at Mona on Anglesey. Of the road and its furniture there is now variable survival. The road surfaces are for the most part buried under more recent surfaces and although the roads and bridges typically survive, they have often been expanded to accommodate later 20th-century traffic. Remarkably the majority of depots, milestones, and toll houses remain, albeit in variable condition. Many of the toll house gates survive but are no longer *in situ*. The roadside walls also often intact, but have been altered considerably by ongoing maintenance.

The heyday of the Holyhead Road during the late 1820s and 1830s was shortlived, as Telford's great achievement was to be superseded by technological change with the coming of the railways. Between 1837 and 1850 the successive opening of railways between London and Holyhead resulted in a steady decline in traffic along the road, to the extent that in some sections of the road grass was observed to grow in the centre. In the 20th century, however, the road enjoyed a new lease of life with the development of the motor car and the influx of tourist traffic to north Wales.

# Crynodeb

Mae'r llyfr hwn yn adrodd hanes un o gampau mwyaf arwyddocaol Thomas Telford, peiriannydd sifil enwocaf Prydain, sef y Ffordd o Lundain i Gaergybi. Mae'n cyflwyno canlyniadau arolwg o'r 83 milltir (133km) o'r rhan o'r ffordd sydd yng Nghymru rhwng Y Waun a Chaergybi a gynhaliwyd yn 1999 a 2000 a hefyd y ffordd esgair (23km) rhwng Bangor a Chonwy sy'n rhan o Ffordd Caer.

Adeiladwyd Ffordd Caergybi yn sgîl y Ddeddf Uno rhwng senedd Iwerddon yn Nulyn a senedd Prydain yn Llundain yn 1801. Crëoedd hyn yr angen am ffordd gyflym a dibynadwy o gyfathrebu rhwng dwy brifddinas y DU, ond roedd ffyrdd tyrpeg y cyfnod, yn enwedig drwy ogledd Cymru, ymhell o fod yn ddigonol. Arweiniodd hyn at Ddeddfau Seneddol ar gyfer y rhaglen adeiladu ffyrdd gyntaf o bwys a ariannwyd gan lywodraeth sifil. Roedd hyn yn cynnwys gwella'r ffyrdd tyrpeg a fodolai a chreu ffyrdd newydd drwy dirwedd fynyddig Eryri.

Dechreuodd gwaith ar y ffordd yn hydref 1815 gan barhau tan 1826 pan agorwyd Pont Menai. Er i ffordd Telford gael ei hadeiladu yn ôl safon uchel iawn am ei chyfnod (roedd yn uwch ei safon o lawer na ffyrdd MacAdam, un o gyfoedion Telford), roedd yn ddrutach o lawer. Ei nod pennaf oedd adeiladu ffordd gyda graddiannau nad oedd yn waeth na 1:30, nod beiddgar o gofio am dirwedd eithafol gogledd Cymru a'r ffaith bod y ffyrdd tyrpeg cynharach mor serth â 1:6.5 mewn mannau. Er mwyn cyflawni'r nod hwn adeiladodd argloddiau niferus gan gynnwys arglawdd mawr Nant Ffrancon yn Eryri, arglawdd mawr Ty-Nant a goddwyd ar hyd ceunant ag iddo ochrau cwbl serth, ac arglawdd Stanley 1300 llath (1187m) o hyd ar draws Traeth Stanley er mwyn cyrraedd Ynys Gybi.

Roedd cynllun syml ond cadarn i bontydd cerrig niferus Telford a oedd yn galluogi trafnidiaeth i lifo'n rhwydd ar eu traws. Fodd bynnag, roedd ei ffordd yn fwyaf enwog am ei phontydd trawiadol, megis Pont fwaog Waterloo ym Metws y Coed a wnaed o haearn bwrw a'r pontydd crog yng Nghonwy ac yn fwyaf nodedig ar draws y Fenai. Ystyriai Telford mai Pont Menai (y bont grog fwyaf a adeiladwyd erioed ar y pryd) oedd ei gamp beirianneg unigol fwyaf.

Ar ochrau'r ffordd hefyd adeiladodd y storfeydd seilwaith ategol ar gyfer storio defnyddiau wyneb ffordd, cerrig milltir, toll-dai, a thafarndai'r goetsh fawr hefyd, a'r mwyaf nodedig o'r rhain yw'r Dafarn Newydd ym Mona ar Ynys Môn. Dim ond rhannau o'r ffordd a'i nodweddion cysylltiedig a oroesodd. Claddwyd y rhan fwyaf o wynebau'r ffordd o dan wynebau mwy diweddar ac er bod y ffyrdd a'r pontydd wedi goroesi gan fwyaf, fe'u hehangwyd yn aml er mwyn gwneud lle i drafnidiaeth ddiweddarach yr ugeinfed ganrif. Yn rhyfeddol, goroesodd y rhan fwyaf o'r storfeydd, cerrig milltir a tholldai, er bod eu cyflwr yn amrywio. Goroesodd nifer o glwydi'r tolldai ond nid ydynt yn eu lleoliad gwreiddiol bellach. Mae'r muriau sydd ar ymyl y ffordd yn aml yn gyfan hefyd, ond maent wedi'u gweddnewid yn sylweddol yn sgîl gwaith cynnal a chadw parhaus.

Byrhoedlog oedd anterth Ffordd Caergybi yn ystod diwedd y 1820au a'r 1830au, wrth i newidiadau technolegol yn sgîl dyfodiad y rheilffyrdd fwrw cysgod dros gamp fawr Telford. Rhwng 1837 a 1850, wrth i'r rheilffyrdd agor rhwng Llundain a Chaergybi gwelwyd dirywiad cyson mewn trafnidiaeth ar hyd y ffordd, cymaint felly fel y nodwyd bod glaswellt yn tyfu yng nghanol y ffordd mewn rhai rhannau ohoni. Fodd bynnag, yn yr 20fed ganrif, cafodd y ffordd hwb o'r newydd yn dilyn datblygu'r cerbyd modur a'r llif o drafnidiaeth ymwelwyr i ogledd Cymru.

#### Résumé

Ce livre documente ce qui fut sans doute le plus important accomplissement du plus grand ingénieur civil de la Grande-Bretagne, Thomas Telford, la grande route allant de Londres à Holyhead. Il présente les résultats d'une enquête sur les 133 Km de la section galloise de la route, de Chirk à Holyhead, entreprise en 1999 et en 2000, ainsi que sur l'embranchement de 23 km entre Bangor et Conwy qui fait partie de la route de Chester.

La construction de la Route de Holyhead a commencé par le passage du «Act of Union» entre le parlement irlandais à Dublin et le parlement britannique à Londres en 1801. Ceci a créé un besoin de communications rapides et fiables entre les deux capitales du Royaume-Uni mais les routes à péage de l'époque, tout particulièrement au nord du Pays de Galles, n'étaient pas vraiment adéquates. Ceci a eu pour résultat le passage de lois pour le premier

grand programme de construction de routes financé par le gouvernement civil. Ceci entraîna l'amélioration des routes à péage existant déjà et la création de nouvelles routes sur une voie qui traversait la topographie montagneuse de la région de Snowdonia.

La construction de la route commença à l'automne de 1815 et continua jusqu'en 1826, date de l'ouverture de Menai Bridge. Bien que la route de Telford ait été construite selon des normes très élevées pour l'époque et qu'elle se révéla être vraiment supérieure à celles de son contemporain MacAdam, elle était bien plus coûteuse. Son principal objectif fut de construire une route ayant des inclinaisons de moins de 3,3%, un objectif audacieux étant donné la topographie extrême du Nord du Pays de Galles et le fait que les routes à péage déjà construites avaient, dans certains

endroits, des inclinaisons de 15,4%. Afin d'aboutir à son objectif, il construisit de nombreux remblais, y compris l'important remblais de Nant Ffrancon en Snowdonia, le grand remblai de Ty-Nant construit le long d'une ravine à bords presque verticaux, et le remblai de Stanley, de 1187 m de long, qui traversait Stanley Sands pour arriver à l'île de Holyhead.

L'architecture des nombreux ponts de pierre de Telford était simple mais solide et permettait à la circulation de les traverser sans interruption. Néanmoins, la route est célèbre pour ses grands ponts, comme le Waterloo Bridge, avec ses arches en fonte, à Betws-y-Coed et les ponts à suspension de Conwy et, notamment, celui de Menai Straits. Telford estimait que le Menai Bridge (à l'époque, le plus grand pont à suspension jamais construit) était son chef d'oeuvre.

Le long de la route, il construisit également des dépôts à l'appui de l'infrastructure, pour le stockage de matériaux pour la chaussée, des bornes, des bâtiments de péage, et aussi des auberges, notamment New Inn à Mona dans l'île d'Anglesey. De la route et de ses éléments auxiliaires, tout n'a pas survécu de même. Pour la plupart, les chaussées sont ensevelies sous des revêtements plus récents et bien que, typiquement, les routes et les ponts aient survécu, ils ont souvent été élargis en fonction de la circulation de la fin du  $20^{\rm ème}$  siècle. Il est remarquable que la majorité des dépôts, des bornes et des bâtiments de péage survivent encore, bien que leur état varie. De nombreux portails de bâtiments de péage survivent mais ne se trouvent plus sur place. Les parois des bords de route sont également souvent intacts mais ont été considérablement modifiés par la maintenance suivie.

L'âge d'or de la Route de Holyhead, à la fin des années 1820 et pendant les années 1830 ne dura guère, car le grand accomplissement de Telford allait être dépassé par le changement technologique et supplanté par l'arrivée des chemins de fer. Entre 1837 et 1850, l'ouverture de lignes ferroviaires entre Londres et Holyhead eut pour résultat un déclin constant de la circulation sur la route, au point où, dans certaines parties de la route, on voyait pousser de l'herbe au milieu. Toutefois, au  $20^{\text{ème}}$  siècle, la route connut une nouvelle jeunesse grâce au développement de l'automobile et à l'afflux de touristes au nord du Pays de Galles.

# Zusammenfassung

Dieses Buch dokumentiert die wohl bedeutendste Errungenschaft des größten Britischen Bauingenieurs, Thomas Telford, die Straße von Holyhead nach London. Es beinhaltet die Ergebnisse von Vermessungen, die zwischen 1999 und 2000 entlang eines 133 km langen Abschnitts des walisischen Teils der Straße von Chirk nach Holyhead, sowie des 23 km langem Teilstücks der Chester Straße zwischen Bangor und Conwy durchgeführt wurden.

Die Konstruktion der Holyhead Straße hatte ihren Ursprung in einem Gesetzeserlass der ein Bündnis des Irischem Parlaments in Dublin und dem Britischem Parlament in London im Jahr 1801 zur Folge hatte. Daraus erwuchs die Notwendigkeit zu einer schnellen und verläßlichen Kommunikationsroute zwischen den beiden Hauptstädten, denn die gebührenpflichtigen Straßen, vor allem die durch Nord Wales, waren nicht ausreichend. Daraufhin verabschiedete das Parlament ein Gesetz, woraufhin das größte Straßenbauprogramm erstmals von einer Zivilregierung finanziert wurde. Es beinhaltete die Verbesserung von existierenden Mautstraßen und die Schaffung neuer Strecken durch das gebirgige Terrain von Snowdonia.

Der Straßenbau begann im Herbst 1815 und

dauerte bis zur Eröffnung der Menai Brücke im Jahr 1826. Telfords Straße wurde zwar nach sehr hohen Maßstäben gebaut und weit übertraf die seines Zeitgenossen MacAdam, sie war allerdings auch sehr viel kostspieliger. Sein Hauptziel war eine Straße mit Steigungen unter 1:30 zu konstruieren, ein waghalsiges Ziel, wenn man die extreme Topographie von Nord Wales bedenkt, in der die alten Mautstraßen stellenweise Steigungen von 1:6.5 hatten. Um dieses Ziel zu erreichen baute er zahllose Straßendämme, wie zum Beispiel der größte Damm von Nant Ffrancon in Snowdonia, den großen Ty-Nant Damm, der entlang eines fast vertikalen Felsenschnitt verlief, und den 1187m langen Stanley Straßendamm über die Stanley Sands, der den Zugang zu der Insel Holyhead ermöglichte.

Telfords zahlreiche Steinbrücken waren von einfachem aber robusten Design das einen ununterbrochenen Verkehrsstrom ermöglichte. Seine Straße ist aber vor allem durch ihre bedeutenden Brücken berühmt, so zum Beispiel die bogenförmige gusseiserne Waterloo Bridge bei Betws-y-Coed und die Hängebrücken bei Conwy, im besonderen die über die Menai Straits. Die Menai Brücke (die derzeit größte Hängebrücke aller Zeiten) wurde von

Telford als sein größtes technisches Meisterstück angesehen.

Entlang der Route ließ er überdies Versorgungslager Straßenoberflächenmateriealien, Meilensteine, Zollhäuser und Herbergen bauen, die bekannteste ist die New Inn auf Anglesey. Von der Straße selbst und ihrer dazugehörenden Infrastruktur gibt es heute verschieden gut erhaltene Überreste. Straßenoberfläche ist zum größten Teil von modernem Straßenbelag verdeckt, und obwohl die Straßen und Brücken weitgehend erhalten sind, wurden sie im laufe der Zeit oft erweitert, um dem Verkehr des späten 20. Jahrhunderts stand zu halten. Es ist  $\operatorname{der}$ bemerkenswert das größte Versorgungslager, Meilensteine und Zollhäuser erhalten sind, wenngleich in unterschiedlich gutem Zustand. Viele der Schlagbäume sind erhalten, oft allerdings nicht mehr an Ort und Stelle. Die Aufschüttungen entlang der Straße sind auch oft noch

intakt, wurden aber erheblich durch laufende Instandhaltungen verändert.

Die Blütezeit der Holyhead Straße während der späten 20iger und 30iger Jahren des 19. Jahrhunderts war nur kurzlebig, da Telfords größte Errungenschaft von neuen technologischen Entwicklungen, vor allem durch das Aufkommen der Eisenbahn, verdrängt wurde. Die schrittweise Eröffnung der Eisenbahnabschnitte zwischen Holyhead und London zwischen 1837 und 1850 hatte einen stetigen Rückgang des Verkehrs entlang der Straße zur Folge, in solchem Maße, daß entlang einigen Abschnitten Gras in der Straßenmitte zu wachsen begann. Im 20. Jahrhundert erwachte die Straße dann wieder zu neuem Leben, was dem Aufkommen des Automobils und dem Zustrom von Touristenverkehr nach Nord Wales zu verdanken war.

#### **Foreword**

#### Thomas Telford's Holyhead Road: The A5 in North Wales

Roads and conservation are rarely linked in people's minds. In the late 1990s, there were bitter protests by conservationists against such road schemes as the Newbury and Batheaston Bypasses. However at the same time in Wales, the Welsh Office and later the National Assembly for Wales were developing a different policy for a major trunk road. The A5 on mainland Wales did not match the evolving standards for a trunk road. A number of improvements and bypasses were planned to meet these new standards, with some involving land owned by the National Trust and others passing through the Snowdonia National Park.

Modern road engineers were not the first to have faced the challenges presented by the topography of this part of Wales. They were building directly upon the work of Thomas Telford, perhaps Britain's greatest civil engineer, who had designed and built the Holyhead Road from Shrewsbury to Holyhead between 1815 and 1826. He considered this his greatest achievement and it contained his most famous single structure, the Menai Suspension Bridge. The standards that Telford set, and the skill with which his assistants and contractors carried out the work was to make this part of the Holyhead Road, the best road in the world at the time. It also represented the first major government-sponsored infrastructure project of modern times.

A study of the A5 across the mainland of north Wales commissioned by the Highways Directorate of the Welsh Office in 1995 recognised the great historical importance of the road and recommended that where possible all future improvements on the mainland should be kept within its present boundaries. Two years later, my colleague, Peter Hain, then Minister of State, confirmed these recommendations and announced that all future, major improvements should be dropped. He also charged Cadw and the Highways Directorate to undertake a systematic

study of the road to identify what survived from Telford's Road and use the study to underpin the development of a management strategy for the conservation of this road as an historic route.

I am delighted to say that this report presents the full results of this study, and covers not only the route of the road on mainland Wales but also the lengths across Anglesey and the spur road from Conwy to Llandegai. It has revealed the fascinating history of how the Holyhead Road was designed, built and used, and has shown how much of Telford's original construction has survived. What was designed to carry horse-drawn mail coaches is still able, to a large extent, to meet the demands of modern cars and lorries.

Sustainability underpins all the policies of the National Assembly. The collaboration of the Transport Directorate and Cadw in this study is now leading to the development of a management strategy of the whole road in which its conservation and promotion is paramount. This will have to be a partnership as the Assembly is now only directly responsible for the remains of Telford's Road across most of mainland Wales. Other stretches are the responsibility of four unitary authorities and many associated buildings are now in private ownership. As a first step, the conservation and restoration of the full set of distinctive milestones is underway and I hope that a draft of the full management strategy will be the subject of a wide consultation in the near future. The management strategy should show how the principles of sustainability could be applied to road schemes. There is also the opportunity to promote the historic interest of this great civil engineering achievement to the thousands of motorists and visitors who use the road. In this way one of Wales' greatest historical assets can contribute to the economic regeneration of the beautiful landscapes of north Wales.

> Sue Essex AM, Minister for Environment, National Assembly for Wales



Figure~1.1~Portrait~of~Thomas~Telford, from~Telford's~Atlas~first~published~in~1838~(Ironbridge~Institute~Library)

# 1 Introduction

# by Rick Turner and Barrie Trinder

The science which has been displayed in giving the general line of the road a proper inclination through a country whose whole surface consists of a succession of rocks, bogs, ravines and precipices, reflects the greatest credit upon the engineer who had planned them (BPP 1819 V.115).

This book documents and celebrates what was arguably the most significant achievement of Britain's greatest civil engineer, Thomas Telford (Fig 1.1)—the London to Holyhead Road. The highlights of this road, the Conwy and Menai Suspension Bridges, are justly famous around the world and their history is well recorded (Provis 1828; Paxton 1980). The book presents the results of a survey project that was the first to look systematically at the great wealth of original documentation for the 83 miles (133 km) of the Welsh section of the Holyhead Road from Holyhead to Chirk, and its 14-mile (23 km) spur road to Conwy, which forms part of the Chester Road (Fig 1.2).

Although the road was constructed from London through to Holyhead, only on the Welsh sections are the remains still evident, particularly where the more advanced engineering schemes were executed. The works on the Welsh section of the Holyhead Road, the Conwy spur, and the short section from the Welsh border to Shrewsbury were financed by a specially appointed Parliamentary Commission under Telford's direct control, whereas the remaining 154 miles (248 km) of the road, from Shrewsbury to London, remained under the control of sixteen pre-existing turnpike trusts. The preferential treatment given to the Welsh section reflects the poor condition of the roads in this region prior to Telford's works. This was attributable, at least in part, to the hostile terrain through which they passed. There is enormous diversity from the flat and, in places, marshy terrain of Anglesey, through the incredibly rugged topography of Snowdonia (Fig 1.3), to the sinuous and sometimes steep-sided valleys of the Dee and Conwy.

Cadw: Welsh Historic Monuments commissioned the Lancaster University Archaeological Unit (LUAU, now Oxford Archaeology North) to undertake a comprehensive archaeological survey. This survey was based upon a transcription of all the information contained within 65 surviving original specifications (PRO WORK 6/89 and 6/90) onto first edition and current 1:10,000 Ordnance Survey maps. Barrie Trinder, appointed as the survey's historical consultant, provided much useful background information, particularly from the reports presented to the Parliamentary Commission (British Parliamentary Papers (BPP) 1810–51). With the aid of these maps and documents, the whole route from Holyhead to Chirk was walked in October and November 1998

and the structures that remained from the original road construction recorded (LUAU 1999).

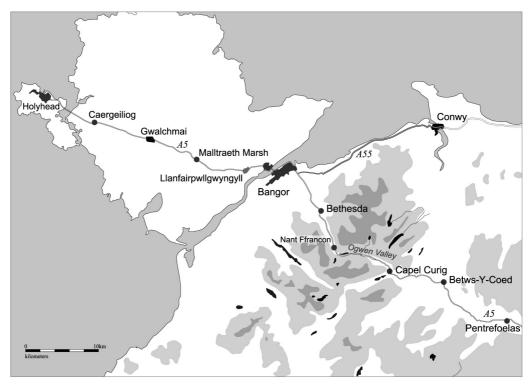
In 1999 this methodology was extended to the Chester Road. Some detailed surveys were undertaken, and comprehensive recommendations for listing and scheduling for both routes were made (LUAU 2000a). Since 1999, many more sources of documentary evidence have been located and investigated for the first time and the importance of the contemporary works at Holyhead Harbour have been recognised (Fig 1.4).

The results of this project have not only contributed to our knowledge and understanding of what was to become the model for road building in the 19th century (Parnell 1838), but have also enabled the development of a management strategy for the present A5 in Wales that follows the line of Telford's route. This management strategy will ensure the future protection and sympathetic conservation of the surviving original portions of Telford's Holyhead Road, as well as promoting its importance to the thousands of motorists who use the road every year.

# Background to the construction of the Holyhead Road

The road was planned at a time when the British state saw potential enemies all around it. In 1800 Britain had been at war with France for seven years. In December 1796 the Irish liberationist, Wolf Tone, had sailed into Bantry Bay with a force of 6000 French troops (Beckett 1966, 259), while on 22 February 1797 a small French force had landed at Fishguard in Pembrokeshire. These events and rumours of Napoleon's plans to invade Britain encouraged the United Irishmen to attempt an insurrection in May 1798, which was brutally suppressed. These key factors led to the passing of an Act of Union between the Irish and the British parliament in Westminster, which came into force on 1 January 1801. From then on, the Irish MPs and peers sat in the parliament of the United Kingdom. The need for fast and reliable communication between the two principal cities of the United Kingdom for the transport of mail, Irish parliamentarians, government officials, and if necessary soldiers, was of pressing importance. The Holyhead Road was to provide this link between Ireland and the rest of Britain.

The need for communications through north Wales was set within the context of the earlier road system that was the result of speculative private ventures by the turnpike trusts, each established by a private Act of Parliament. Initially the turnpike trusts developed around the main centres of population and



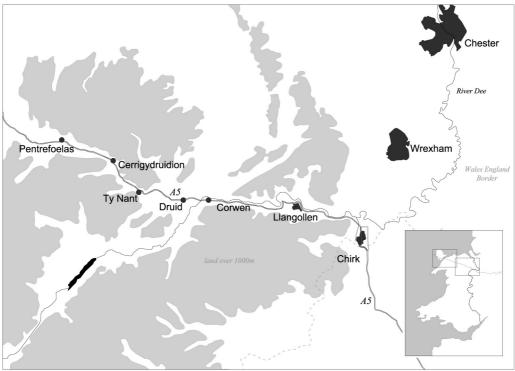


Figure 1.2 Plan to show the 83 miles (138km) of Telford's Holyhead Road surveyed in this report. This also shows Telford's spur road to Conwy

their markets and so did not produce a coherent arterial transport system. By 1750 the major network was focused on London and around regional centres like Bristol, Hereford, and Worcester (Albert 1983). By 1770 a more complete pattern had emerged that extended into many parts of Wales and as far as Holyhead (Dodd 1925, 130). Despite these turnpike roads, at the end of the 18th century travellers in north Wales and on their way to Ireland from Holyhead faced long and often dangerous journeys that included crossing the Afon Conwy and the Menai Straits by ferry.

In 1801 Joseph Huddart and John Rennie had investigated the options for the routes between London and Dublin and particularly for the Irish Sea crossing; they recommended that the crossing via Holyhead and



Figure 1.3 The modern A5 in Snowdonia: the typical landscape for Telford's Holyhead Road (OA North)

Howth to the north-east of Dublin was the most suitable for improvement. Some works were undertaken at both ports. John Rennie's massive Admiralty Pier, which protected the Inner Harbour at Holyhead, was finally completed in 1821 (Sivewright 1986, 7–8). The land route was ignored for the time being.

#### The origins of the road

In 1810 a Parliamentary Select Committee was established to inquire into the possible routes that could be improved from London to Holyhead. It was chaired by Sir Henry Parnell (1770–1842), the MP for Queen's County in Ireland. Parnell had voted against the Act of Union in 1800, but he became a passionate advocate for the improvement of the state of Ireland and was renowned for his ability to understand and present complex financial matters in Parliament (Stephen and Lee 1917, 342–5). It was this committee that appointed Thomas Telford to prepare a survey and report on the line of the Holyhead Road. Parnell and Telford were thus the two key figures who saw this great project to completion. The first contract was awarded in 1815 and the route in Wales completed with the opening of the Menai Bridge in 1826 (Telford 1838a, 228).

Thomas Telford (1757–1834) was recognised by the committee as 'an engineer of great eminence' and was at the height of his career when he was appointed to the Holyhead Road project. Many of his road building techniques used on the Holyhead Road were developed during his appointment as the superintending engineer to the Parliamentary Commission responsible for building a network of roads in the Highlands of Scotland and for the construction of the Caledonian Canal (Haldane 1962) from 1803. At the end of his life Telford acknowledged that 'the formation of roads has been my chief occupation' (Telford 1838a, 205) and this was to earn him the nickname of the 'Colossus of Roads'.

The Parliamentary Select Committee recommended that the Government should take direct control for the financing and building of the improvements from Shrewsbury to Holyhead. This was to be achieved by buying out the interests of six turnpike trusts and two ferry operators and putting Telford in charge of specifying, commissioning, and managing the building works. In 1815 an Act of Parliament provided the powers and finance for a newly founded Parliamentary Commission to carry out the construction of the Holyhead Road, making this the first major civilian, state-funded infrastructure scheme of modern times (55 Geo III c.152 (1815)).

In 1819 Telford reported on the condition of the road from London to Shrewsbury. He made recommendations in that year and the next for improvements to be undertaken by the existing sixteen turnpike trusts (Telford 1820). These trusts operated over less challenging terrain than their



Figure 1.4 The Old Harbour at Holyhead in 1815, prior to the completion of the Admiralty Pier (National Library of Wales)

Welsh counterparts and had considerably higher incomes. As a result the cost of Telford's suggested improvements was about one quarter of that for the work west of Shrewsbury. Finally in 1823 the Parliamentary Commission took over the responsibility for Holyhead Harbour and the harbours of Howth and Dun Laoghaire in Ireland. Telford again acted as their engineer (BPP 1824 IX.293: Fig 1.4). The almost contemporary introduction of steam packets was to have a great impact on the reliability and the length of the crossing, ensuring that the mail service from London to Dublin kept to strict timetables. The dramatic reduction in the travelling times which resulted from these improvements can be seen by comparing Time Bills of 1815 and 1827 between Holyhead and Llangollen (POST 10/7; POST 10/203).

#### The story of the road

Throughout the period of construction there was a celebratory and congratulatory feel about this great governmental building project. The first major bridge just east of Betws-y-Coed was named Waterloo after the battle and incorporated the emblems of England, Ireland, Wales, and Scotland to commemorate the new unified parliament of the United Kingdom. Two columns dedicated to heroes of the Battle of Waterloo stand alongside the road, that to Lord Hill in Shrewsbury and that to the Marquis of Anglesey at Llanfairpwllgwyngyll (Fig 1.5). On the

dockside at Holyhead a classical triumphal arch was erected to record a visit of King George IV and his embarkation for Ireland in 1821, with inscriptions in Latin and Welsh (Fig 1.6; Watson 1917).

The Holyhead Road was primarily designed to take mail coaches and their passengers. It also stimulated a considerable amount of stage coach, posting, and private traffic. A limited amount of freight was carried by stage vans and more locally by large wagons. This traffic needed to be serviced by frequent changes of horses and by inns to provide refreshment and overnight accommodation for the weary travellers. Telford designed and built an inn at Mona in the centre of Anglesey. Other coaching inns, built to service the earlier turnpikes in the towns along the route, developed and prospered from the improvements to the Holyhead Road (see Chapter 7).

The heyday of the Holyhead Road during the late 1820s and 1830s was short-lived, as Telford's great achievement was to be superseded by technological change with the coming of the railways (Fig 1.7). Between 1837 and 1850 the successive opening of railways between London and Holyhead resulted in a steady decline in traffic along the road. In 1851 Parliament stopped financial support for the maintenance of the road (BPP 1851 XXIX.117).

The development of the motor car and the lorry was to bring the Holyhead Road back to life. The Ministry of Transport was created in 1917 and took over responsibility from the Office of Works



Figure 1.5 Marquis of Anglesey's Column, Llanfairpwllgwngyll (Ken Hoverd)

for the Holyhead Road and its main structures. The Ministry undertook work to strengthen and widen the cast-iron Waterloo Bridge in 1929 and to improve the journey over the two headlands at Penmaenmawr by building a number of tunnels in 1935 (Humphreys 1937). It commissioned various investigations into the Menai Bridge. These led to the replacement of the suspension chains and the decking between 1938 and 1941 (Maunsell 1946), while a new road bridge was built alongside the Conwy Suspension Bridge in 1958 (see Chapter 6).

Following a fire in 1970 that destroyed the wooden-lined, metal tubular railway bridge across the Menai Bridge, Robert Stephenson's Britannia Bridge was remodelled with two decks, the lower of which took the railway and the upper the main road (see Chapter 8). When opened in 1980 the trunk road traffic bypassed Telford's route between Llandegai in the east and Llanfairpwllgwyngyll in the west, leaving his Menai Bridge to local traffic only. In the 1990s the A55 across north Wales was upgraded into a dual carriageway and a new tunnel created under the Afon Conwy. From there many stretches of Telford's Chester Road were bypassed or partly obliterated by the new road built to Llandegai. The A55 across Anglesey was completed in 2001 following a new line which crosses Telford's road at several locations. This means that Telford's Anglesey Road is being managed by the local authority for much of its length. In other places some stretches have



Figure 1.6 Classical style arch at Holyhead Harbour with inscriptions in Latin and Welsh (Ken Hoverd)

become isolated and are no longer accessible to traffic.

The A5 trunk road on mainland Wales has been treated differently, however. The last major improvement at the Glyn Bends was completed in 1997. This bypassed Telford's famous embankment at Ty Nant. Other improvements were planned at Pont Padog, Bethesda, and at Halfway Bridge, all within the Snowdonia National Park. That at Pont Padog involved land owned by the National Trust. These improvements met with significant opposition and led to the commissioning of A5 Trunk Road, Llandegai to Chirk Route Study: Future Management and Improvement Strategy (SGS 1996). This built on the results of the archaeological assessments of the routes of the planned improvements undertaken earlier in the 1990s by the Gwynedd Archaeological Trust (Davidson and Flook 1994). The report concluded that the most important cultural heritage site to be damaged by these improvements was Telford's road itself. As this strategy, and the policies described in Driving Wales Forward: a Strategic Review of the Welsh Trunk Roads Programme (Welsh Office 1998) recognised the A5 on mainland Wales as an Historic Route, all the proposed improvements were dropped in favour of developing a management strategy for the whole route.

## Organisation of this volume

The text has been written by three principal authors, Jamie Quartermaine, Barrie Trinder, and Rick Turner, with considerable additional contributions by Jo Bell, Edward Holland, and Richard Newman. Each chapter has a lead author. Any additional contributions by other authors have for the most part been integrated into the text to produce a consistent

The structure of the volume echoes the formation of the building of the road from the pre-road landscape, through its construction and use, and on to its future management. Chapter 2, written entirely by Barrie Trinder, examines the context and landscape from which the need for the road was conceived. Chapter 3, written by Barrie Trinder and Richard Newman, with contributions by Jo Bell, examines the administration by which the road was commissioned and ultimately built. Chapter 4 looks at the individual elements that make up the road; written principally by Jamie Quartermaine, it includes a section on the small bridges by Jo Bell and Richard Newman. Chapter 5 incorporates the summary results of the survey of the road by Jo Bell and an assessment of the survival of the Telfordian elements by Jamie Quartermaine. Chapter 6 examines the major engineering



Figure 1.7 Penmaenmawr Head, Telford's Holyhead Road with the railway viaduct and tunnel below, by S G Russell, 1849 (National Library of Wales)

achievements of the road. This looks at the major embankments (by Jamie Quartermaine), the Waterloo Bridge (by Richard Newman), the Conwy Bridge (by Edward Holland), and the Menai Bridge (by Rick Turner). Chapter 7, written by Rick Turner with contributions by Barrie Trinder, examines the infrastructure, inns, and harbours necessary to support the traveller on the road. Chapter 8, by Rick Turner and Barrie Trinder, looks at the later history of the road, its decline with the introduction of the railways, and its new lease of life to accommodate the

tourist industry of north Wales. Finally Chapter 9, by Rick Turner, reflects on the impact that the Holyhead Road has had on the communications and economy of north Wales.

The last part of the volume consists of a series of Appendices, detailing extracts from Parliamentary Papers pertinent to the Holyhead Road, lists of contracts and contractors commissioned to construct the road, a gazetteer of all the milestones on the road, and a gazetteer description of all the sites referred to in the main text.

# 2 The turnpike roads in north Wales and the coming of Thomas Telford's road by Barrie Trinder

#### The roads before Telford

In 1700 most travellers bound from England to Ireland began their sea passage at Chester. By the middle of the 18th century, however, although there was no formally accepted route, most people went by road from Chester along the coast to Holyhead, a journey which involved difficult and dangerous ferry crossings at Conwy and Bangor. Jonathan Swift was accustomed to travel through Holyhead, when he commented in 1727 that the port was 'an unprovided and comfortless place' (Harper 1902, 308). The antiquarian John Loveday also embarked from Holyhead on visits to Ireland in 1732 and 1733 (Markham 1984, 122 and 126); on the first occasion he travelled there from Shrewsbury through Welshpool, Machynlleth, and Tan y Bwlch, and on the second occasion through Llangollen, Ruthin, and Conwy. Holyhead's growing significance as a port was shown by the turnpiking of the road across Anglesey from the Bangor Ferry in 1765 (5 Geo III c.56).

The coaching route across north Wales that was later to be improved by Telford was established by the Shrewsbury hotelkeeper Robert Lawrence (Trinder 1980, 44–6; Trinder 1996, 196–7). In May 1779, while landlord of the Raven Hotel, he began a thrice-weekly coach service from Shrewsbury to Holyhead through Ellesmere, Wrexham, Mold, St Asaph, and Conwy. He conveyed only four passengers, with a journey time of 36 hours (Owen and Blakeway 1825, 526-7; Evason 1984, 80-1). The following year this service was supplemented by another through Oswestry, Llangollen, Corwen, and Llanrwst, which meant that there were departures from Shrewsbury every weekday. By 1810, when Thomas Telford was invited to advise the government on the route between London and Dublin, there was little doubt that the principal packet port for travellers to Ireland was Holyhead. Richard Ayton remarked in 1813 that 'there is no trade of any kind in this place but the continued influx of strangers brings money into it and is the chief support of the inhabitants' (Ayton 1814, 196).

In November 1780 Lawrence took over the Lion Hotel, Shrewsbury's most prestigious inn (Fig 2.1). It had recently been constructed for John Ashby (Champion 2000), an eminent solicitor, agent to some leading landed families, and 'guardian of many secrets' (Nichol 1969–70, 53–62). In that year Lawrence inaugurated the first through coach services between London and Holyhead. He afterwards began to develop services to Bristol and Bath that connected with Holyhead coaches. He also tried energetically to improve the routes from Shrewsbury across north Wales. It was judged a

mark of his success that in September 1782, Earl Temple, the newly appointed Lord Lieutenant of Ireland, travelled to Dublin by way of Shrewsbury and passed a night at the Lion. In Minshull's guide to Shrewsbury (1803, 28) it was stated that 'of late years this town has been a principal thoroughfare between London, Birmingham, Bristol and Dublin through the perseverance of Mr Lawrence'.

Lawrence belonged to one of several consortia of innkeepers that established stage coach and posting services not just from Shrewsbury to Holyhead, but to London, Bristol and Bath, Lancashire, and up the Severn Valley to the mid-Wales resorts of Aberystwyth and Barmouth. When the Lion Hotel was offered for sale in 1817 it was described as:

...the great key to all the roads between Holyhead, London, Bath, Cheltenham, Bristol, Liverpool, Manchester, north and south Wales, to and from which places coaches are running daily without intermissions . . . No house upon any of the great roads stands in higher estimation having a constant influx of the first families in the kingdom (*Shrewsbury Chronicle* 14 May 1817).

Under the statutes for highways passed in the reign of Queen Elizabeth I, the responsibility for the maintenance of most roads in the mid-18th century lay with parishes, which were in turn responsible to county Quarter Sessions. Surveyors - not professional men, but people who served in turn in other parish offices as overseer of the poor or constable were appointed annually. They were able to call on 'statute labour', six days' work a year by most individuals and the provision of a vehicle for the same number of days by people of substance. During the 17th century, it became customary in many parishes to impose a highway rate rather than to demand statute labour, although in theory a parish could still demand statute labour until 1839 (Webb and Webb 1913, 29-31).

#### Turnpike roads

Parish responsibility was tolerable when it applied to roads used principally by local residents, but it seemed unjust to people who lived in parishes charged with the upkeep of the principal thoroughfares between great cities. The establishment of turnpike trusts was a means of transferring the costs of main roads from those who happened to live alongside them to their users. The word 'turnpike' originally meant a gate and there were gates at which tolls were collected on roads controlled by turnpike trusts. Such roads came to be called 'turnpikes' and the processes of bringing



Figure 2.1 Lion Hotel, Shrewsbury, purchased by Robert Lawrence in 1780 (Ken Hoverd)

a road under the authority of a trust came to be described by the verb 'to turnpike'. The first Turnpike Act, passed in 1663, related to the Great North Road in Hertfordshire. Only four more acts were passed in the remainder of the 17th century, but the pace of legislation quickened after 1700, as illustrated in Table 2.1 (Albert 1972, 202–23: Pawson 1977, 341–60).

By 1780 the greater part of the main road system had been subjected to turnpike control. Subsequent acts related to entirely new roads or to minor routes which were turnpiked to prevent their being used by travellers intent on avoiding toll-gates. Turnpike trustees were empowered to make charges fixed in Acts of Parliament for use of their roads and to erect toll-gates where money could be collected. They also had an obligation to set up mileposts along their routes and were able to borrow money for improvements on the security of future toll income. Improvements in the journey times of advertised stage coaches as well as archaeological evidence on some routes show that much was achieved (see Chapter 1: origins of the road).

The ability of turnpike trustees to improve the roads in their charge was constrained by the limitations of their potential income, as well as by their lack of engineering and administrative expertise. The French writer Charles Dupin, discussing one of Telford's reports on the Holyhead Road in 1825, remarked that 'This road, so essential for maintaining the communication between six or seven million of His Majesty's subjects on one side of the Irish Channel and twelve million on the other, can never be put into a proper state of repair and safety if it is left to local interests to support and manage it' (Dupin 1825, 61). Most Turnpike Acts included long lists of local notables who were appointed trustees, but the energy with which a trust was managed depended on the typically small numbers of men

Table 2.1 Number of roads 'turnpiked' in England and Wales, 1663-1779

| Date      | No. of roads |
|-----------|--------------|
| 1663–1700 | 5            |
| 1700–1749 | 144          |
| 1750–1759 | 171          |
| 1760–1769 | 170          |
| 1770–1779 | 75           |

who attended meetings. Nor did most 18th-century turnpike trusts call upon professional expertise when contemplating improvement, as the civil engineering profession was in its infancy and some of its practitioners regarded road building as inferior in status to the design of bridges or the construction of harbours.

The turnpike road system developed as quickly in north Wales in the second half of the 18th century as in most parts of England: there were fourteen principal acts relating to roads in mid- and north Wales between 1752 and 1782 (cf list of acts in bibliography; Albert 1972, 202-23: Pawson 1977, 341-60).

North Wales was, therefore, not backward in road building compared with lowland England. Four acts relating to roads in north Wales were passed in 1769, but the list of acts for the following parliamentary session included some of the principal roads in Norfolk, Oxfordshire, and Warwickshire.

The turnpikes certainly relieved the financial burden of those parishes crossed by major roads, but they had the effect of making road travel more exclusive and expensive. They often incited rioting among the poor, most famously in south Wales, the Rebecca Riots of 1839-44. These were clandestine raids in which parties of men dressed in women's clothing smashed toll-gates and harried toll keepers in protest at the imposition of a toll upon wagons bringing agricultural lime to improve the pasturelands (Jones 1989). John James recorded that 'The turnpikes were, by the lower classes, universally regarded as an obnoxious regulation - more adapted for the convenience of the wealthy portion of the community . . . '(James 1841, 155).

The predicament of turnpike trustees in an area of scattered population and limited natural wealth like north Wales was summarised by Thomas Pennant. He noted at Dolgellau that 'every entrance . . . is barred by a turnpike in imitation of other places and every approach mended for a short distance by the help of the scanty tolls' (Rhys 1883, 230). Turnpike trustees in north Wales nevertheless achieved substantial improvements in the road system in the second half of the 18th century. On his journey from Shrewsbury to Holyhead in 1732, John Loveday had found the best portion to be the first 8 miles (12 km) in the direction of Welshpool where still only 'a causeway wide enough for one horse runs . . . with

some interruption for about 8 miles' (Markham 1984,

By the end of the century the roads in north Wales had been transformed and by 1800 stage coaches could travel, if with uncertain timing, from Shrewsbury not just to Holyhead but also by several routes to Aberystwyth, Barmouth, and Tywyn. By the mid-1820s services between Shrewsbury and the coastal resorts were regularly timetabled. In 1826 there were services from Chester to Barmouth in thirteen hours and from Brecon through Builth and Llandrindod Wells to Newtown (Shrewsbury Chronicle 15 May 1826). The completion of a new road from Machynlleth led to predictions that Aberdyfi and Tywyn would become 'places of fashionable resort for bathing' (ibid). In 1826 most Aberystwyth coaches left Shrewsbury at 5am and arrived at Aberystwyth at 8pm. In the following year, however, after the completion a new stretch of road through Llanbrynmair they left an hour later and arrived an hour earlier (Shrewsbury Chronicle 13 July 1827).

#### The turnpike period on the Holyhead Road

The first section of the subsequent main road from Shrewsbury to Holyhead to have been turnpiked was that between Oswestry and Froncysyllte, which was taken over by the trust managing the road from Welshpool to Wrexham in 1756 (29 Geo II c.68). Two years later the roads from the Welsh Bridge in Shrewsbury including the route to Oswestry were turnpiked. In 1763 the boundary between these two trusts was moved from Oswestry to the tenth milestone from Shrewsbury. The road across Anglesey from Porthaethwy (Bangor) Ferry to Holyhead was turnpiked in 1765 (5 Geo III c.56) together with the roads around Llangollen and the subsequent Holyhead Road from Froncysyllte as far as Pentrefoelas in 1777 (17 Geo III c.100). The Llangollen Trust was praised by the Shrewsbury Chronicle on 26 November 1785 for the improvements that it had carried out to the route between Corwen, Cernioge, and Llanrwst that avoided several considerable hills. For the most part, however, these turnpike trusts took over existing roads.

The exception among the roads making up the Holyhead Road was the route between Pentrefoelas and Llandegai. This was turnpiked relatively late, as the result of an Act of Parliament passed in May 1802 (Moore-Colyer 2001, 155). It was opened to some traffic in the autumn of 1804 and to coaches in the summer of 1805; for long stretches the road was completely new. At its eastern end it branched at Pentrefoelas from the route from Shrewsbury to Holyhead, which had been used by Robert Lawrence's coaches from 1780 (Trinder 1980, 44–6), through Llanrwst, where it crossed the Afon Conwy to Conwy, and thence over Penmaenmawr and Penmaenbach to Llandegai and Bangor. At the western end the road formed part of the improved



Figure 2.2 Nant Ffrancon, showing the turnpike road of 1802-08 below Telford's Holyhead Road (Ken Hoverd)

landscape on Mynydd Llandegai, which Richard, first Baron Penrhyn was creating in Snowdonia.

Construction of parts of the route on the Penrhyn Estate had begun before the Act of Parliament was obtained. A route up the western side of the pass of Nant Ffrancon and past Llyn Ogwen to Capel Curig was begun in 1791 (Millward and Robinson 1978, 159). Sir Richard Colt Hoare noted at Capel Curig on 10 July 1799 that 'A magnificent road is now forming between Llyn Ogwen and Capel Cerrig (sic) by Lord Penrhyn who in his public works is a great benefactor and ornament to this country. He is now building an inn of Gothic architecture at Capel Cerrig and making a good road which will lead from thence to the foot of Snowdon' (Thompson 1983, 115). The Pentrefoelas to Llandegai turnpike of 1802, developed from the initial success of the road, was also largely inspired by Lord Penrhyn (Moore-Colyer 2001, 155). It was acknowledged that the establishment of this new turnpike road owed much to Robert Lawrence. According to the landowner, Thomas Kenyon of Pradoe, who had many links with the coaching trade, it was financed by a subscription raised in Shrewsbury (Shrewsbury Chronicle 4 December 1829; Owen and Blakeway 1825, 516-21). The new turnpike followed the east side of the Nant Ffrancon pass on the opposite side of the valley from Penrhyn's earlier road. Archaeological evidence shows that in parts it was overlain by Telford's road (Fig 2.2). This ambitious turnpike then followed around the western side of Llyn Ogwen, took the course of the marshy bottom of the Llugwy valley, where it had to be raised on top of an embankment [0907], and onto a new bridge [0810] over the Afon Llugwy at Capel Curig (Fig 2.3; Moore-Colyer 2001, 155). Richard Pennant, Lord Penryhn, was very proud of his new road (Lord 1998a, 76-7); in his portrait he points to a map of the turnpike and a view



Figure 2.3 Capel Curig bridge for the turnpike road of 1802–08 (Ken Hoverd)

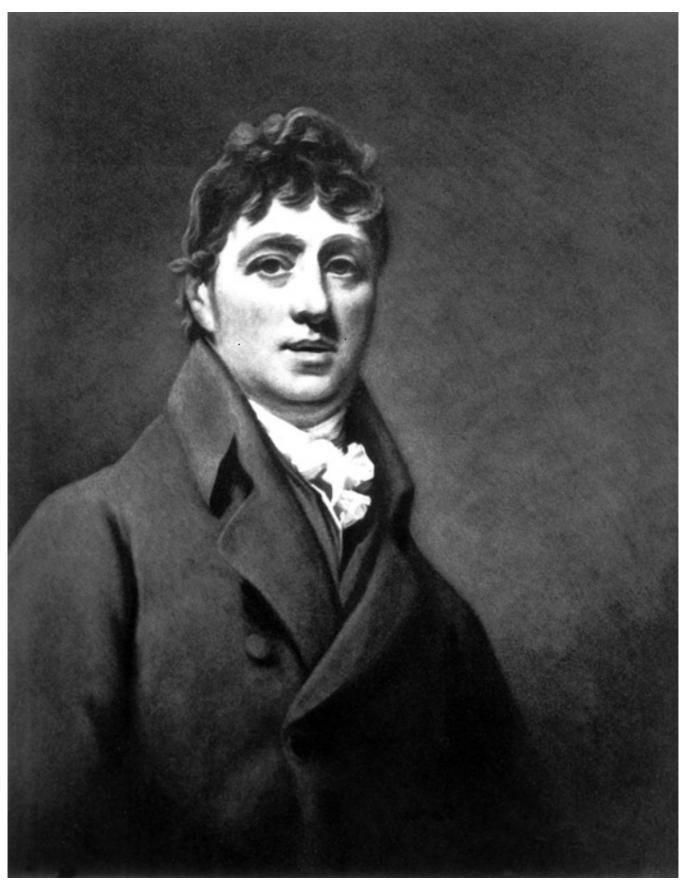
of the new inn at Capel Curig appears in the background.

#### State of the road before the construction of the Holyhead Road

Despite the improvements carried out by the turnpike trusts and the pioneering work of coaching entrepreneurs, travel in north Wales remained difficult in the early years of the 19th century, particularly in winter. In 1809 Hall remarked of a steep section of the new turnpike near Penmachno that it was 'little more than the substitution of a staircase for a ladder' (Hall 1811, 133). Telford's report of 1811 (BPP 1810–11 III.801) quotes the results of a survey which demonstrated that between 1 January and 27 March 1810, a period of 85 days, the daily mail coach from Shrewsbury to Holyhead was between one and five hours late 71 times and in the reverse direction on 75 occasions. Between April and December 1809 the coach suffered six major accidents through overturning or through failures of shackles or springs caused by the uneven condition of the road surface.

It is clear that Telford tended to exaggerate his own achievements in building the road across north Wales to Holyhead both by disparaging those of his predecessors and exaggerating the horrors of travel in the region before 1810. In 1819, for example, he justified the expenditure of public money on the road which enabled people to travel through Wales 'without being exposed to being broken in pieces at every step, or to the danger of falling over steep precipices against which the road was not in the smallest degree protected' (BPP 1819 V.115). Telford was dismissive of the Capel Curig turnpike. In his autobiography he referred to 'feeble efforts made in forming a mail road by Capel Ceriog [Capel Curig]' and to a route 'quite unfit for wheel carriages' (Telford 1838a, 208).

While much had been achieved by the turnpike trusts and their engineers, the improvements they could bring about were limited by constraints on resources. As they could only spend money raised in tolls or on the security of a reasoned forecast of future toll income, the income was not sufficient to pay for ambitious projects, particularly in a region of sparse population. Reflecting this situation, Sir Henry Parnell, chairman of the Holyhead Road Commission set up to oversee the establishment of a new road to Holyhead, had become impatient with the inadequacies of the turnpike road system. In the legislation relating to the Holyhead Road passed in 1819, the six trusts between Shrewsbury and Bangor



Figure~2.4~~Engraving~of~Telford~as~a~younger~man,~after~a~painting~by~Sir~Henry~Raeburn,~published~in~1835~(National~Library~of~Wales)

were relieved of their control of the route to Holyhead, although they continued to manage other roads. Authority was then given for a wholly new road to replace the Anglesey turnpike (59 Geo III c.30).

## The life and work of Thomas Telford, 1757–1834

Telford was born in Eskdale, Scotland, in 1757 and began his working life as a stonemason in Edinburgh from 1780. Two years later he moved to London before becoming superintendent of the construction of the Commissioners' House in Portsmouth Dockyard in 1784 (Fig 2.4; Rolt 1958, 12, 15). He came under the patronage of William Pulteney, MP for Shrewsbury, who commissioned him, probably in the closing months of 1786, to restore Shrewsbury Castle to a luxurious residence. This helped Pulteney to develop his political ambitions. It was doubtless through Pulteney's influence that Telford, then 30 years old, was appointed Surveyor of Public Works for the County of Salop (Shropshire) in 1788. This was not a formal appointment and, while he carried out many assignments for the county, he was paid on a project basis. It was during his time in Shrewsbury that Telford became a member of a highly influential circle of entrepreneurs and businessmen who lived in the town (Trinder 1980).

After the death of William Clowes, the engineer of the Shrewsbury Canal, Telford was engaged to complete the waterway that linked the county town with the Coalbrookdale Coalfield at Trench. In this capacity he was responsible for building the iron aqueduct that carried the canal over the River Tern at Longdon on Tern (Gibb 1935, 31). Telford was certainly acquainted with William Reynolds, at whose Ketley ironworks experiments on the castiron members used in the structure were undertaken. William Reynolds was also a partner in the Coalbrookdale ironworks, where castings were made in 1796 for an iron bridge designed by Telford, as County Surveyor, to replace the masonry bridge at Buildwas, which had been destroyed in the great flood of February 1795. Telford also knew Charles Bage, whose understanding of what could be done with iron was probably even greater than that of Reynolds. Bage gave advice on Telford's projected iron bridge of a single arch to replace London Bridge (Skempton 1980, 71).

From 1793 Telford was 'general agent' to the Ellesmere Canal, in which capacity he was responsible for the construction of the great embankment and aqueduct at Pontcysyllte (Fig 2.5), although his precise role in the design of the structure is unclear (Hadfield 1993, 110–14). Telford gained his first experience of road building in Shropshire when he built the road linking his wooden bridge at Cressage, erected between 1799 and 1801, with the Eaton Constantine crossroads (Trinder, 1968). His most important patron, William Pulteney, brought

Telford into contact with the British Fisheries Society. From 1801, this led to a long series of partly government and partly privately financed projects in the Highlands of Scotland (Haldane 1962). These roads were built in the hope of stimulating the economy of the Highlands – it had never recovered from the aftermath of the 1745 rebellion. His voluminous correspondence, some of it originating from obscure inns in the Highlands, shows a mastery of the detail of every project with which he was concerned. It was while working in Scotland that Telford developed an understanding of the management of major construction projects.

The completion of the Pontcysyllte Aqueduct in 1805, together with his work on the Caledonian Canal and on the Gotha Canal in Sweden, brought Telford to celebrity status. He was in his early 50s when he first became directly involved with the Holyhead Road in 1810–11. In the decades before his death at the age of 77 in 1834, he was the acknowledged leader of the civil engineering profession in Great Britain (Gibb 1935, 270).

#### Telford and other road builders

The Holyhead Road was the principal project of the mature period in Telford's life. The scale and quality of Telford's achievements cannot be underestimated. At the same time, since the publication of Charles Hadfield's Thomas Telford's Temptation (Hadfield 1993, 184–9), he cannot be regarded as uncritically as by some past biographers. Through detailed analysis of the language used by Telford in his autobiography and of the editing of that autobiography by John Rickman (Telford 1838a), Hadfield shows how Telford tended to lavish praise upon his subordinates, but to ignore or diminish the achievements of his equals. He also claimed responsibility for decisions that were not his alone. Hadfield further shows how Telford and his editor consistently failed to acknowledge that William Jessop was principal engineer of the Ellesmere Canal and that Jessop was responsible for the decision to build the Pontcysyllte Aqueduct, the great waterway in the sky that was opened amid many celebrations on 1805 (Fig 2.5). They also disregarded the fact that Jessop had been responsible for the building of the Caledonian Canal opened in 1825 (see Chapter 3).

In writing about the Holyhead Road, Telford took little account of Jessop, who died in 1814. As John Rennie, who died in 1821, was in no sense a rival as a builder of roads, Telford duly credited Rennie's work on the harbours at Holyhead and Howth (Telford 1838a, 205–7). In his account of the Holyhead Road, Telford does appear, nevertheless, continually to exaggerate the poor state of roads in north Wales before 1815. There is no doubt that they were greatly improved in the two following decades, but they had also been transformed in the previous half-century. Telford notes that several years before his first survey, a new mail coach line had been marked up



Figure 2.5 Pontcysyllte Aqueduct, completed by Telford in 1805, 1,007ft (307m) long and 127ft (38m) high, built to carry the Ellesmere Canal in an iron trough (Ken Hoverd)

through the valleys of the Llugwy and Ogwen (Telford 1838a, 208). Telford declined to say who was responsible for this, however, although he acknowledged that it was a shorter route, with which he must have been wholly familiar. The sponsors of this road included Robert Lawrence, the stage coach entrepreneur, and Thomas Kenyon of Pradoe, a Holyhead Road Commissioner, both of whom Telford must have known as County Surveyor and also as a resident in Shrewsbury Castle. He must also have been acquainted with Lord Penrhyn, another sponsor.

The archaeological evidence in this volume is of particular importance in identifying the remains of these earlier roads, particularly of the turnpike between Pentrefoelas and Llandegai, which was authorised in 1802 and opened in 1804 (Moore-Colyer 2001, 155). It also shows the quality of Telford's road building, which was of a higher standard than any contemporary projects and

made possible by the availability of government funding.

#### Telford's assistants and contractors

Telford gathered around him a group of craftsmen who came to be associated with most of his principal works (Lawson 1980, 17-18; Rolt 1958, 82). Matthew Davidson, who died in 1818, was a friend of his youth in Eskdale. A learned lowland Scots mason, at Telford's instigation he practised his talents at Bath, erecting Montford Bridge to Telford's design. He acted as the clerk of works at Pontcysyllte and subsequently served as resident engineer for the eastern portion of the Caledonian Canal (Rolt 1958, 80). John Simpson was a stonemason from Stenhouse in Midlothian who had arrived in Shrewsbury in 1790 to work on the new church of St Chad, designed by

### A place in Shropshire society

Holyhead Road.

An understanding of Thomas Telford's role in the design and construction of Holyhead Road must also take into account his place in Shropshire society. Since

he had powerful friends and patrons in Shropshire, it was very likely that when he was asked to advise on the best route between London and Dublin he would choose one which passed through Shropshire. During the 1790s and the first years of the 19th century, he was part of a group of men and women of exceptional abilities who were active in Shrewsbury and its surrounding districts (see p 14). Among this group was Robert Lawrence, the coaching entrepreneur, and Robert Darwin, a doctor and moneylender on a large scale and the father of Charles Darwin. William Reynolds, the ablest of the Shropshire ironmasters, Charles Bage, designer of the Ditherington Flax Mill, the first iron-framed building in the world, and Archibald Alison, the philosopher and author of *An* Essay on Taste, all lived in the county. Telford was an accepted if eccentric member of this elite (Lawson 1980, 1-18; Trinder 1980, 43-4). He never married and had an extraordinary appetite for work throughout his life.

## 3 How the road was built

## by Jo Bell, Richard Newman, and Barrie Trinder

## The Parliamentary Commissions

The Act of Union that united the parliaments of England and Ireland in 1801 increased the numbers of eminent people travelling between London and Dublin. In the words of Thomas Telford, this 'produced constant irritation and complaints respecting the road through north Wales and gave rise to warm discussions in Parliament' (Telford 1838a, 206). Since a reliable route to Dublin was also strategically valuable, two important military depots, the barracks at Weedon in Northamptonshire and the Armoury in Shrewsbury, were built alongside this road during the Napoleonic Wars. In 1801 Joseph Huddart and John Rennie investigated the routes between London and Dublin and recommended that a route via Holyhead and Howth was the most suitable for improvement (Telford 1838a, 205). A further parliamentary committee was directed to enquire into the routes to Holyhead in 1810 and 1811. It was this committee that first brought Thomas Telford, already regarded as 'an engineer of great eminence', into direct contact with the project. In May 1810 he was ordered to begin a survey of the road 'without regard to special interests' (BPP 1810-11 III.801).

Although in 1811 the Parliamentary Select Committee recommended that the government should take direct control for the financing and building of the road improvements from Shrewsbury to Holyhead, there was a four-year delay between its submission and the passing of the enabling Act of Parliament (55 Geo III c.152, 1815), largely because of the Treasury's reluctance to commit the expenditure. The Holyhead Road Commission was established in 1815. The Commission's inspiration and chairman, Sir Henry Parnell (1776–1842), was a man of great energy who provided the legal, financial, and managerial backing which the engineers needed to transform the road. It was his energetic lead that ensured that the project proceeded smoothly. Parnell had been frustrated by the need for private finance to undertake major road building. This is why he took the system developed for the Highland Roads in Scotland one step further by having all the roads and bridges on the Holyhead Road in Wales directly financed by government (Hughes 1964). He was supported by Alexander Milne, the secretary of the Commission. Milne must have been responsible for drafting the different Acts of Parliament under which the Commission operated, in addition to overseeing all the contractual arrangements and payments to contractors. The extensive records of the building of the Holyhead Road, now within the Public Record Office (PRO WORK 6/89 and 6/90), must have been produced by Milne's office. Over the next fifteen years further legislation increased the powers of the Commission and granted further large sums for the improvement of the road. (The principal legislation is outlined in the bibliography under 'primary sources'.) Work on the road began in the autumn of 1815. Telford made it his first priority to improve what he regarded as the worst sections of the road in Wales, particularly that from Betws-y-Coed across the Afon Conwy and along the three-mile (5km) long face of Dinas Hill to Rhydllanfair (BPP 1817 III.179). Telford divided the mainland Welsh section of the road into three districts for management purposes: Shrewsbury to Chirk; Chirk to Cernioge; and Cernioge to the Bangor Ferry. By 1819 he reported that 'many of the most dangerous portions were rendered commodious and safe' (BPP 1819 V.115). After 1819 work west of Shrewsbury was carried on in accordance with the Acts of 1815 (55 Geo III c 152, 1815) and 1819 (59 Geo III c.30, 1819). Separate reports were presented annually to Parliament.

The same detail was applied to the road all the way from the Welsh Bridge in Shrewsbury to Holyhead Harbour. Within eleven years of the establishment of the Holyhead Road Commission, the principal engineering works in Wales were completed. The road through the pass of Nant Ffrancon, the pass of Ty Nant, the new road across Anglesey (completed in the spring of 1822), the Stanley Embankment, Chirk Bank, and the Menai Suspension Bridge [0215] were all opened by 30 January 1826 (see Chapter 6). Later in that year Telford reported that 'this great length of road in north Wales continues to be maintained by the Commissioners in a perfect state, and the merits of the substantial plan on which it has been constructed become every year more apparent' (BPP 1826 XI.47). In 1827 he reported that 'from Chirk along the Parliamentary Road to Holyhead, the surface of the road is uniformly hard and smooth, constant attention being bestowed in maintaining it in perfect order' (BPP 1826-27 VII.81).

Although the Act of 1815 (55 Geo III c.152,1815) permitted work on the English section, it was not until 1819 that serious work began east of Shrewsbury. Some major improvements were, however, carried out before that date by the more enlightened turnpike trusts. There was some hesitation to invest during the 1820s while Telford was proposing a new and direct route from Wellington to Chirk avoiding Shrewsbury. The Commission was also looking to expand its role by extending its work to other routes. This included the road along the north Wales coast between Llandegai and Chester, where it was responsible for the Conwy Suspension Bridge [C032], new routes around Penmaenmawr and Penmaenbach, and the route from Stonebridge,

near Coventry, to Liverpool (BPP 1829 V.103; BPP 1830 XV.23; BPP 1831 XII.29).

## Telford's management of the **Holyhead Road project**

#### The development of civil engineering and management

Management of complex projects became of vital importance in the late 18th and early 19th centuries. Thomas Telford was one of the foremost practitioners in this period. Study of his involvement with engineering works reveals the application of concepts of modern-day project management. The roads, canals, harbours, and drainage schemes with which early 19th-century engineers were involved were massive undertakings that required planning, budgets, scheduling, allocation of resources, monitoring, and control.

It was possible in the late 18th century for management of complex engineering projects to be undertaken by individuals. For example, James Brindley, the pioneering engineer of the Bridgewater Canal, was said to have negotiated with landowners, directly handled the payment of the workforce, and acted as land surveyor. He was also the designer of the canal, bridges, and boats, and acted as quantity surveyor (Smiles 1862). Telford himself acted as superintendent in charge of construction and project administrator for the Ellesmere Canal in 1793. His role was criticised, however, as it was thought to be too much responsibility for one man (Hadfield 1993, 16). Towards the end of the 18th century, the impracticalities of undertaking major construction projects in such a manner had been realised (Boucher 1963, 62), particularly as the number of major construction projects increased. The profession of civil engineering had begun to be defined and developed and it was to this profession that Telford decided to devote himself in 1793. He later declared that he had 'a stronger disposition for executing works of importance and magnitude than the details of house architecture' (Telford 1838a, 34).

By the start of the 19th century there was thus recognition of a need to specialise and to delegate responsibilities to particular individuals. For example, John Rennie, the organiser of the work on the Kennet and Avon Canal, was principal engineer in charge of the project. His instructions were put into practice by a resident engineer, under whom were resident agents and their assistants who controlled quality and procured material. The contractors building the canal answered to this managerial organisation (Boucher 1963, 63). Very similar ideas of management structure were employed by Telford on his projects. When the Holyhead Road scheme commenced he was already using mechanisms familiar to today's project managers. It is with the Holyhead Road that Telford appears to have reached maturity as a manager of his projects.

#### Development of Telford's project management

It was during the period of Telford's work on roads in the Scottish Highlands that he acquired experience of the organisation of major construction projects. He acted as the principal engineer, both as consultant and project manager, and was involved simultaneously in a range of other projects. During his time in charge of the Holyhead Road scheme, Telford was also concerned with the construction of the second Harecastle Tunnel, the planning of the Macclesfield Canal, improvements on the Birmingham Canal, the draining of the Fens, and the second phase of construction work at Aberdeen Harbour (Telford 1838a).

Telford's notebooks for the period also reveal a more peripheral involvement in a variety of additional projects (ICE T/HO). For example, he was providing advice and procuring workmen for the building of the Gotha Canal in Sweden. Such a large workload not only required Telford to appoint trusted subordinates to whom major tasks were delegated, but also necessitated the use of considerable management skills to function adequately, as many of these projects were managed at a distance and by proxy.

As principal engineer on the Caledonian Canal (Haldane 1962; Penfold 1980a, 139), Telford saw that the role of a resident engineer was of paramount importance. Working under Telford on this project were two superintendents or resident engineers, each with an assistant (Penfold 1980a, 130). Unfortunately this structure was compromised by the appointment of William Jessop as consulting engineer and senior to Telford, without any clear line of accountability (Lindsay 1968; Hadfield 1993, 122). There was an implication that Telford was not trusted to carry out such a project on his own and his reliance on Jessop for approval of design drawings led to tensions. It is possible that Telford's resentment of the situation led him to edit out Jessop's contribution to the project when he wrote his autobiography (Telford 1838a).

### The Holyhead Road management team

Following his appointment in 1810, Telford became principal engineer for the road in 1815. He was subsequently invited in 1818 to develop the designs for the Menai Suspension Bridge [0215] (Rolt 1958, 119). In 1819 he reported on the condition of the Holyhead Road in England and made detailed recommendations and costing for the improvements to be carried out by the individual turnpike trusts that made up the route, with finance from the Parliamentary Commission (BPP 1819 V.115). Finally when the Parliamentary Commissions for the Holyhead Road and the harbours at Holyhead and Howth were merged in 1823, Thomas Telford became the principal engineer for the improvement of the whole route from London to Dublin (Watson 1917, 122-4).

Enormous trust was placed in Thomas Telford by the Holyhead Road Commission. In turn Telford was to place similar trust in his handpicked team of deputies. The management team was built around men who had worked for him previously, like William Provis and John Wilson (Rolt 1958, 125-134). He had two resident engineers who instructed four inspectors (Telford 1838a, 209). William Provis, effectively Telford's delegated deputy, was primarily responsible for building the most important structure on the route, the Menai Bridge (Provis 1828). When the project started in 1815, Telford was 58 years old, William Provis was 23, and the chairman of the Commission, Henry Parnell, was 39 years old. The difference in ages probably explains the great respect that Telford was afforded by the other two men.

William's brother, John Provis, appears to have acted as resident agent. In Telford's autobiography, John Provis is mentioned only as being inspector for the ironwork used primarily in the building of the Menai Bridge, which was supplied from William Hazledine's Upton forge near Shrewsbury. Telford states that John Provis 'was appointed by me for that sole service' (Telford 1838a, 209). The notebooks of John Provis reveal, however, that his role was much wider (LUAU 2000c). Provis was involved with the road from at least 1821 until 1837 (ICE Provis 1, 2, 3). For part of this time he was resident engineer at Glyndyfyrdwy, near Corwen (ICE Provis 1). He was primarily concerned with land-take, procurement, and compensation payments for damages incurred as a result of road building (LUAU 2000c, 6–13), but as he also signed the agreements with the contractors (LUAU 1999, 17), he fulfilled the role of agent. A Mr W Jebb worked for John Provis and valued the costs of land-take and damages (ICE Provis 1).

To carry out the works required to build the Holyhead Road, Telford relied on a close team of specialists based in north Wales. His role was to lay down the guiding principles of budget and specification, while others executed the tasks within these defined boundaries. Within the team, roles and delegated responsibilities seem to have been defined and understood. In modern terms this would be a very slim and cost-effective management team for such a major government project, especially where communication was by letters delivered by the mail coaches and word of mouth.

#### Specifications and costs

#### Telford's specifications

Detailed specifications of the road design were Telford's key to success in constructing the road. Telford's first step was to employ a team of surveyors 'familiar with hilly country' (North Wales Gazette, 8 August 1811) to survey the land through which the Holyhead Road would run. Once the survey was complete he chose a route, marked it on the ground with posts, and divided it into 123 'lots' of varied lengths. A specification was then written for each lot.

In the style of modern specifications, each allotted a start and end point and explained in vard-by-vard detail exactly what work should be done. The specification might include, for example, instructions for raising or lowering the surface of an existing road, for rock cutting, or making-up to lay a new road, and for responding to obstacles such as rock outcrops or marshy land. In the case of Anglesey Lot 5, the first two parts of the specification for the route are described as follows:

88 linear yds – Across corner of first Field from road, to be 32 ft wide and have a Stone Dyke [wall] on each side. The bank in the middle must be cut down so as to reduce the fall to one uniform incline. 944 linear yds - Across the next six gently sloping Fields. The sundry inequalities are to be cut or embanked so that the fall thro the last two Fields shall be no where steeper than 1 in 25, and thro the first four it shall be one uniform incline. To be 32 ft in breadth in the first two Fields and 28 ft for the rest, to have Breastwalls where embanked and a Stone Dyke on each side for the whole length. below (PRO WORK 6/89/Lot 5).

Each specification could also include:

a professionally surveyed map: Anglesey Lot 5, for example, had a typical map in which the beginning and end of the lot was marked with an oblique line (Fig 3.1). It showed field boundaries and relevant sections of existing roads such as the one to Beaumaris. Landmarks included farm names and the coast at the Menai Straits. Several lots had no maps, however, and those maps that were in existence covered only the areas immediately adjacent to the road.

plans and elevations of significant structures: Anglesey Lot 24 specification, for example, included elevations and plans for a bridge (Fig 3.2), of 20ft (6m) span with measurements, brief annotations, and simple descriptions. Where embankments or cuttings were specified, the source of materials and the construction method were clearly laid out. Major or unusual structures, such as the Menai Bridge [0215] or the Waterloo Bridge [0379], were not generally covered by the specifications held at the Public Record Office, although they may have been given individual lot numbers.

an undertaking by the contractor to perform the work by a certain date: in Anglesey Lot 5, for example, Isaiah Gill, Richard Hodges, John Preston, and Robert Price undertook in 1820 to do the work on or before 1 June 1822 at a cost of £6,722 4s 6d.

The importance of the specifications for the construction of the road has been demonstrated by recent fieldwork (LUAU 1999). This has shown that the road never deviated from the route and style shown on the specification maps and that the built structure was invariably as planned.

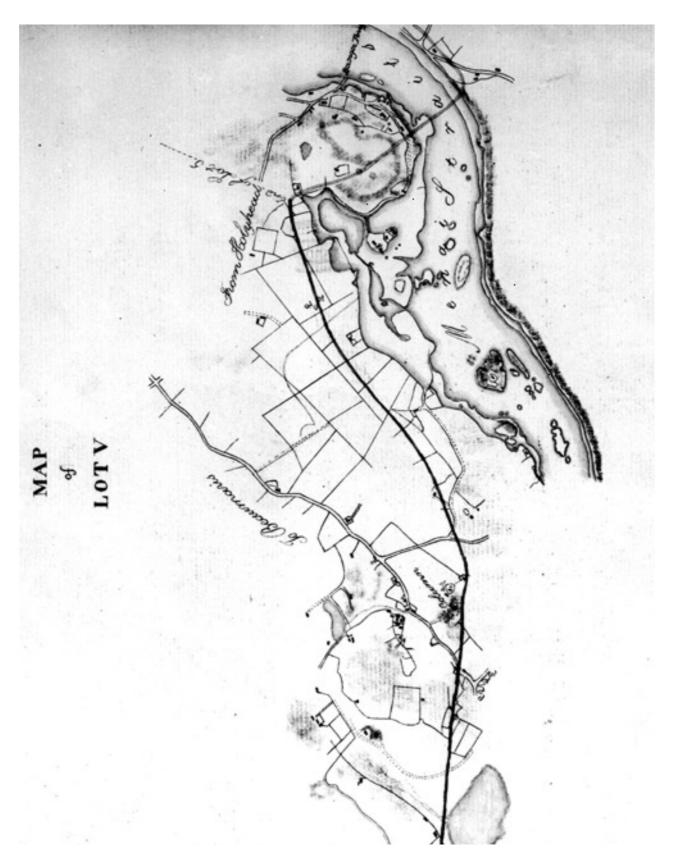


Figure 3.1 Anglesey Lot 5 Map from Telford's specification for the road (Public Record Office)

How the road was built 21

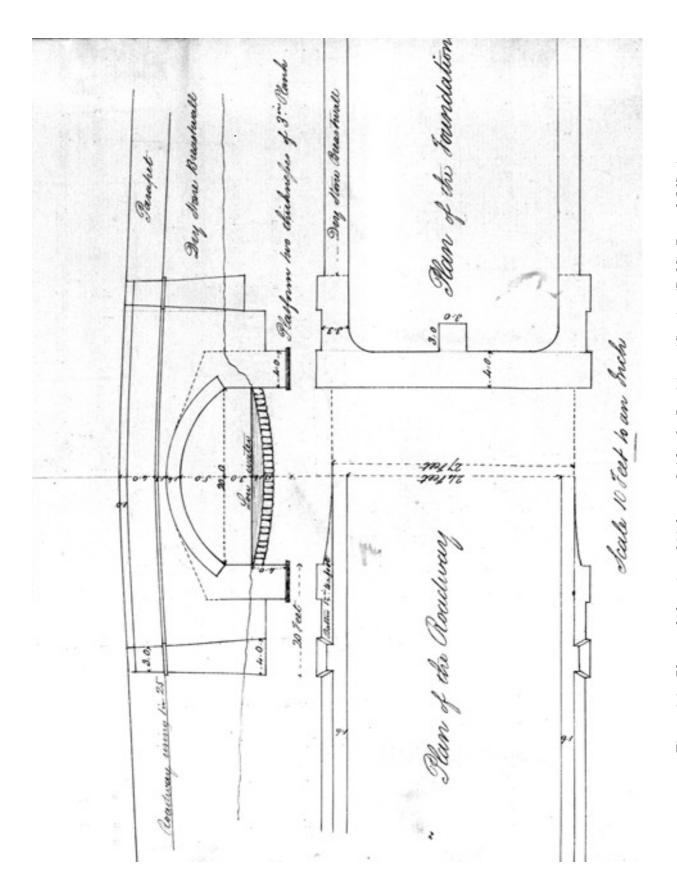


Figure 3.2 Plan and elevation of 20 ft span bridge for Lot 24 specification (Public Record Office)

#### Sequence of lots

The sequence of lots did not run in an uninterrupted numerical sequence, ie starting with Lot 1 at Holyhead and finishing with Lot 123 in Chirk, but instead were in the order in which they were planned to be built. As such, the sequence provides insights into the process of decision-making as the road was planned and the organisational and engineering aspects of Telford's project. The lots were generally given priority according to the likely difficulty of construction or the urgency of the need for a new road. Exceptions were the major built structures such as the Menai Bridge [0215] or the Stanley Embankment [0003], which generally came later in the plan. By tackling the most notorious stretches of existing road, or areas where no established route existed first, Telford was able to improve the quality of the route quickly, shorten journey times, and demonstrate that his works were effective.

The first lot was that which runs through Nant Ffrancon, where a 5-km cutting through a mountainside and the construction of a huge retaining wall at the western tip of Llyn Ogwen were among the challenges facing contractors (PRO WORK 6/89/Lot 1; Fig 2.2). Later lots tended to include sections where the new road simply followed the line of a recent turnpike road. The shorter lots were often those where intensive work was required, while longer lots represented relatively easy sections of road building.

#### Project costs

To ensure best value, as with many projects today, the Holyhead Road scheme relied on competitive tendering, in which the specifications formed part of the contractual agreement. The cost of the project was based on the acceptance of costed tenders for individual lots. Provided that the tenderer was considered competent and unlikely to go bankrupt during the execution of the works, the lowest tender was accepted. Quality was not compromised for cheapness, however, for on particularly difficult sections Telford was allowed to fix the price himself and to select a suitably experienced contractor (Telford 1838a, 210-11). These arrangements seem to have been made to counteract the problems encountered by Telford in his work on Scottish roads, where there was conflict between the Road Commissioners' desire for quality and the wishes of the contributors paying for the work to have the cheapest price. In particular, through the experience of contractors failing to discharge their obligations adequately, Telford appreciated that the expertise and resources possessed by a contractor needed to be a qualifier to any low tender prices (Haldane 1962, 55).

This sort of contract could put enormous pressure upon the contractors. For example, John Straphen was one of Telford's most reliable contractors. He had worked for him in Scotland and, as Straphen and Stanton, won a number of the early lots on the

Holyhead Road. Straphen was forced to withdraw from the contract to build the masonry works at the Menai Suspension Bridge because of the financial risks involved (see Chapter 6; Rolt 1958, 121) and does not seem to have undertaken any further work on the road from that date. A letter to Telford also survives in his papers from the contractor John Stanton complaining that it was impossible for him to undertake the work for the price set (ICE T/HO.29).

Earlier projects, such as the Caledonian Canal, lacked detailed written specifications (Penfold 1980a, 143). The problems encountered in consequence seem likely to have prompted the issuing of these on Telford's later schemes. The contractual agreements for each lot on the Holyhead Road consisted of a detailed specification of the work to be done. These specifications were tightly defined to ensure that work would be consistent along the route, despite lots being built by different contractors. To ensure that progress was maintained and that monies were paid only once work had been completed satisfactorily, a system of payment on delivery was formulated:

The works contracted for were measured monthly, and the progress certified by the inspector, whose certificate, counter-signed by me, was transmitted to the Secretary, who authorized the contractor to draw nine-tenths of the amount; the remaining one-tenth was retained in the hands of the Commissioners, as security for due performance of the contract. When the contract was certified to have been completed, the balance was paid within two months, with interest upon the sums retained (Telford 1838a, 210).

Similar methods of payment for performance were used earlier on the Caledonian Canal (Penfold 1980a, 140). By these means expenditure against the budget was tightly controlled and the loyalty of the contractor ensured. One of Telford's strengths was his control over expenditure. Of all his 19th-century construction projects, only the Aberdeen Harbour and the Menai Suspension Bridge seem to have greatly exceeded the agreed budget (Telford 1838a, 134).

# Quality control and monitoring of the Holyhead Road project

The quality of the work undertaken on the road was checked by the four inspectors (Telford 1838a, 209). The attention to detail that this entailed is illustrated by Telford's inspectors being supplied with a gauge to check the size of the broken stones used in the road construction (Fig 4.1). Furthermore, they were empowered to inspect any aspect of the Holyhead Road construction they considered suspect (LUAU 1999, 10), a right enshrined within the specifications. For instance, the drain specification stated 'where it is deemed necessary by the Engineer, the Drains both above and below the road, within the distance of 20 yds shall be

opened at the Expense of the Contractor' (PRO WORK 6/89). Inspectors were able to ensure, therefore, that contractors adhered to the issued specification and that standards were maintained along the course of the road.

Telford's notebooks reveal that he was in charge of the broad outline of projects. His progress report on the Holyhead Road of 16 March 1822 was simply a number of important points and contrasts strongly with the notebook entries of John Provis, which were painstakingly detailed (LUAU 2000c, 6). This signifies the difference between the leader of the project, responsible for concepts and outline instructions, and the person responsible for executing actions.

Telford was interested in both practicalities and details. He believed that practical knowledge was as important as theory and design skills for an engineer to be 'qualified to insist on the due performance of workmanship, and to judge merit' (Telford 1838a, 3). This attitude is clearly demonstrated by the expertise of his teams. John Provis, for example, was required to be an excellent surveyor (as proven by the quality of his notebook's sketch maps and the apparent accuracy of his estimations) in order to be able to fulfil the resident agent's role and to assess the validity of the compensation claims. Expenditure was monitored through meticulous accounting of the damages not only to land, but also the loss of trees and even what was termed 'temporary damages' such as the loss of crops (ICE Provis 1, 2,

Much less is known about how the contracts were carried out, where the labour and materials were drawn from, and what experience the contractors had that attracted the notice of Telford and his deputies. The wealth of documentation still to be explored in the Public Record Office could cast light on these questions. For example, the file series PRO MT 27/59 records, lot by lot and day by day, the weather, the numbers of men in the different trades, and the number of horses and carts in attendance. The Engineers' Cash Books (PRO MT 27/14 and PRO MT 27/15) record, month by month, payments for minor works, maintenance, and the supply of tools and materials over and above the main contracts.

From the beginning, Telford seems to have recognised some of the problems of carrying out work on the remoter and more exposed parts of the route and how he had to keep the existing roads operational. In a draft of a letter to the Commissioners written in 1815, he describes his proposals for the Bangor to Cernioge section (ICE T/HO.9):

... many parts are situated in narrow and rugged passes and precipices which render the temporary roads impracticable. It will therefore be necessary that the intercourse, during the time most of the improvements are carried out, shall be again restored to the prior line by Conwy and Llanrwst to Cernioge . . . I beg leave to state, that as the interfering with the present road during the winter would probably cause great inconvenience and might by the same measure damage the communications of the Post Office . . . and as the country, during the winter months does not afford any convenient accommodations for lodging a great number of strangers, this mode of proceeding would also be most prudent . . . A number of tools and utensils are already provided and proper workmen can be had upon a short notice . . .

By the time of the Holyhead Road scheme, although monitoring of progress, budgets, and quality was necessarily left to his subordinates, Telford continued to pay close attention to detail when the need arose.

He was involved in detailed design changes to the Menai Bridge at one level and in design of mileposts and gates at another. Unlike some of his predecessors, such as John Rennie, Telford also frequently visited those projects for which he was principal engineer. John Rennie's son, Sir John Rennie, related a story that exemplifies Telford's formidable character in his later years and also his attention to detail in monitoring the works. In the 1830s Telford and Sir John Rennie were appointed engineers to a project to improve a drainage outfall near Wisbech. Rennie stated that he and Telford frequently visited the works whilst they were in progress and on one occasion were caught in a severe rainstorm:

The rain now came down heavier than ever, so that we had no alternative but to retrace our steps back to the dirty old 'public' at the Ferry, called Cross Keys, about 3½ miles distant. We got back, thoroughly soaked, about three in the afternoon. I immediately stripped and went to bed. Old Telford, being a strong, hearty man of about 70, instead of following my example, ordered a large fire to be made in the only sitting-room there was, called for a newspaper, and sat himself down to dry. After two hours' nap I was thoroughly refreshed, and went down to the sitting room. When I entered there was such a steam that I could hardly see anything but approaching the fire, found Telford had nearly dried himself, and he abused me thoroughly for being so effeminate as to go to bed (Rennie 1875, 201).

## The significance of Thomas Telford's management skills

The early beginnings of project management were nurtured by the great engineers in the pioneering days of major construction projects, in tandem with the development of civil engineering as a distinct discipline. By the time of the Holyhead Road scheme, Thomas Telford had refined his management skills. Undoubtedly some of these techniques came from his peers, but he developed other skills as a consequence of his experience. His planning and design were precise and clear instructions were issued that formed part of contractual agreements, with financial retentions built in to ensure completion. Expenditure was meticulously recorded and controlled, progress was monitored, and provision was made for the rectification of sub-standard work at a cost to the contractor only.

#### The contractors

Prospective contractors were invited to respond to newspaper advertisements which asked for suitably experienced contractors to apply for lots. The tenders contained a cost breakdown (PRO WORK 6/69) and on this basis alone the Commissioners accepted the lowest tender, provided that, in theory at least, the tenderer was 'supported by character and security' (Telford 1838a, 210). In practice this was not always the case and in at least one instance they employed a contractor who proved to be unsuitable, despite warnings received (Hughes 1963, 56).

The general contractors were not specialists but came from a number of trades and professions ranging from masons to surveyors. Each contractor undertook the entire work within a lot. One of the most successful was Thomas Evans who described himself as a surveyor (PRO WORK 6/69). He built the double-arch bridge [0395] over the Llugwy in Lot 25 (PRO WORK 6/89/Lot 25). Around Llangollen, where he won most of the contracts, he not only had the road laid, but also rebuilt cottages affected by the road works (PRO MT 27/18). Contractors like Evans and another called George Deas, who won new contracts year after year, must have been consistently cheaper than other tenderers. They must also have met the standards required in order to avoid the penalty clauses in their contracts.

Most of the contractors would have been able to understand written specifications and submit tenders, although in some instances other people must have been used for these purposes, as some contractors signed contracts by applying their mark. One such was Robert Price of Gill, Hodges, Preston, and Price, another of the most successful contractors on the road scheme (PRO WORK 6/89). Gill, Hodges and Co were among the few contractors who were singled out by Telford for praise in his autobiography. He stated that the Stanley Embankment was completed to schedule and specification through their 'unexampled exertions' (Telford 1838a, 213).

The contract for Gill, Hodges and Co ran from 25 April 1822 to 13 December 1824 at a cost of £20,834 12s 10d (PRO MT 27/17), making the Stanley Embankment the third most expensive structure on the road after the two suspension bridges. Work progressed so well with the contract that the Embankment was opened to traffic in the summer of 1823, so completing the new road across Anglesey (Telford 1838a, 213). The number of workmen and horses for the building of this structure is recorded

(PRO MT 27/59). Work seems to have begun in December 1821 with, on average, one carpenter, one smith, and 63 labourers in attendance. By February 1822 the workforce had risen and, besides the carpenter, smith and six horses, 139 labourers were employed. Later, in May 1822, the workforce also included 34 quarrymen indicating that the stone facing of the embankment was underway.

#### Disputes and dismissals

Judging from their names, many of the general contractors would appear to have been Welsh and it was obviously in their favour that they were local to north Wales. There were exceptions when non-Welsh contractors were employed, however. John Straphen of Straphen and Stanton was a Scot from Inverkeithing in Fife, who was based in Shrewsbury (Trinder 1999, 54). It is of interest that Straphen and Stanton challenged a contract for Lot 15, requiring that the price be increased and variations made to the original specification (PRO WORK 6/69). They were also involved in one of the few disputes between contractors and Telford. In 1816 Telford was notified by a Mr R W Price of Rhinlas that some of the workmen employed on the road scheme had applied for parochial relief as a consequence of being compelled by their employer, Straphen and Stanton, to purchase provisions from their company-run 'truck' or trading shop (PRO WORK 6/69). This truck shop was also brought to the attention of Sir R W Vaughan when he travelled along the road who raised the matter directly with the Commissioners. His concern was that a scheme paid for by Parliamentary funds should not be associated with such unpopular and disreputable employment practices.

Telford ordered William Provis to investigate. Provis reported that Straphen and Stanton's work was of good quality but that their employees were distressed by the imposition of the truck shop. He felt that their extreme dissatisfaction was likely to be detrimental to productivity and that the truck shop might bring disgrace upon all those involved with the Holyhead Road. Provis had approached Straphen and Stanton concerning the shop, but had been told it was none of his business as it was not a contractual matter. This may have been technically correct but Telford refused to let the matter lie and wrote to them on 18 June 1816: 'The principle of compulsion is abominable, I recommend that you immediately discontinue it. Indeed Mr Provis states distinctly and I can easily conceive he is correct that the practice of it very seriously injures your own interest by disgusting the best of the workmen' (PRO WORK 6/69).

There may be a threat implied in this statement and although they were subsequently awarded two contracts, Straphen and Stanton won no new contracts after 1818 (Appendix 4; BPP 1830 X.131).

Only two contractors appear to have failed to meet the standards laid down in the specifications (Hughes 1963, 55). Thomas Roberts, of Bryn Selwrn in Merionethshire, won four contracts in 1817 and 1818 (Appendix 4; BPP 1830 X.131), but he was unable to complete them to timetable. As a result Provis, dissatisfied with his management in general, advised the Commissioners to replace him (Hughes 1963, 55). The evidence of the day book for 1818, which recorded the daily activities on the project, suggests that Roberts was more frequently absent from his works than other contractors. Without management the daily progress of his workmen was inadequate: on one day the road inspector recorded that his men had only worked a couple of hours (PRO MT 27/57). Provis commented that Roberts 'does not understand his business, nor how to manage workmen' (PRO WORK 6/69). As a result of Provis's dissatisfaction, the remainder of his contract commitments were transferred to Gill, Hodges and Co.

The other example of a failing contractor was a consequence of lack of engineering ability. In 1817 John Jones of Bangor was awarded Lot 17 near Bangor (BPP 1830 X.131), a relatively straightforward stretch of road building. The day book for the week beginning 9 March 1818 records that 'the chief operation this week has been the taking up and relaying the bottoming more perfectly' (PRO MT 27/57). Provis ordered Jones to remake his stretch on a number of occasions (Hughes 1963, 56), leading Telford to write in 1818 that he was 'proceeding to Bangor to re-inspect poor useless Jones' operations. The reform is commenced but I fear he will be ruined. I cannot help it for the road shall be properly and substantially executed' (PRO WORK 6/69). Whether or not Jones went out of business as a result is not clear, but he was never awarded another contract on the Holyhead Road. The Commissioners had awarded him the contract on the basis of his low tender, ignoring the advice of G Pennant of the Penrhyn Estate and Commissioner of the Capel Curig Turnpike Trust, who had stated that Jones had been the surveyor for the Trust, but had been dismissed from his post for incompetence (Hughes 1963, 56).

#### **Preferred contractors**

Telford gathered around him a number of contractors who came to be closely associated with his works and whom he insisted on selecting for the sensitive and difficult aspects of the project. These included John Straphen who, with John Lawrence, son of Robert Lawrence the coaching entrepreneur, succeeded to John Simpson's building business. In addition to his early contracts on the Holyhead Road, Straphen was involved in building the columns commemorating Lord Hill and the Marquis of Anglesey which adorn the road (LUAU 1999; fig 1.5). John Wilson, a stone mason who originated from Dalton, Cumbria, built the stone piers of Pontcysyllte and also worked with Telford in Sweden and on the Caledonian Canal. With his two sons he took over responsibility for erecting the stonework of the Menai Bridge [215] from Straphen and he was working with them on the Birmingham and Liverpool Junction Canal when he died in 1831 (Rolt 1958, 181).

Another key contractor was Thomas Rhodes, whom Telford described as a 'practical mechanic of first-rate ability' (Telford 1838a, 224). Thomas Rhodes began life as a ship's carpenter in Hull and worked for Telford on the lock gates for the Caledonian Canal. He became the superintendent of the iron and timberwork on the Menai and Conwy suspension bridges (Beckett 1987, 103 and 113).

Perhaps the most influential of Telford's close colleagues was a Shropshire born Englishman, William Hazledine. He was the foremost iron founder of his age. In 1795 he established in Shrewsbury the foundry where the beams and columns of the first iron-framed textile mill were cast. This foundry was to provide castings and forgings for many of Telford's major projects (Skempton 1980, 62-83). Within a few years, Hazledine had constructed the ironworks at Plas Kynaston near Pontcysyllte and operated ironworks and coal mines in the Coalbrookdale coalfield.

There is no doubt that Hazledine and Telford were friends. Hazledine may have met Telford first when he was admitted into the same Freemason's Lodge in 1789 (Tonkin 1949, 174; Rolt 1958, 66). The friendship may have influenced Telford in his earliest business involvements with Hazledine, but it is unlikely that Telford would have continued to award him contracts if Hazledine had ever failed him. Like Telford, Hazledine was a practical craftsman and they were of similar background and age. Telford admired Hazledine and referred to him as 'the arch conjurer Merlin Hazledine' (Perkins 1979, 10).

Hazledine was the obvious choice for the contract to provide castings for the Waterloo Bridge, from his works at Plas Kynaston. He had already provided the ironwork for Telford's earlier most successful cast-iron structures, the Pontcysyllte Aqueduct and the Bonar Bridge. At the latter he had completed the casting of the ironwork one year ahead of schedule (Hume 1980, 164). As Waterloo Bridge [0379] was a structural derivative of these earlier structures, Hazledine was already familiar with the design requirements. His continued successful completion of work for Telford led to him being appointed ironwork contractor for the Menai [0215] and Conwy bridges [C032] (Telford 1838a, 222).

On visiting the Upton Magna ironworks in 1821, Joshua Field wrote that he 'called upon Mr Hazeldyne, the great ironfounder . . . saw his foundry, the great iron roof being made for a Mr Rennie, and of Mr Hazeldyne's very extensive business of his making all Mr Telford's iron bridges' (Hall 1926). His involvement with Rennie shows he

was appreciated by the other great engineers of the day, while his expertise with bridgework also led to other contracts, such as on James Rendel's Laira Bridge, Plymouth in 1826–7 (Perkins 1979, 12–3). It was his collaborations with Telford, however, that guaranteed Hazledine's place in history. Indeed, so closely was he connected with these enterprises that William Provis found it necessary to inform the readers of the Shrewsbury Chronicle, shortly after Hazledine's death in 1840, that Hazledine had only made the ironwork for the Menai Bridge, not built it (Perkins 1979, 12)!

## The triumph of the design

Sir Henry Parnell's vision of the Holyhead Road Commission as a model for future improvements to roads of national significance was frustrated by the coming of main line railways. Since by 1838 it was possible to travel from London to Liverpool or Manchester by train, the rationale for spending public money on the line of the road from Dunchurch to Merseyside had disappeared. While the means of administering the Holyhead Road had precedents in Scotland, within England and Wales it was a unique project. The scale of imagination displayed by Parnell and Telford was scarcely matched by the modest programme of bypass construction undertaken in Britain in the 1920s and 1930s. Indeed it was not until motorway construction began in the late 1950s that it was in any sense equalled.

Towards the end of his life, Telford said that, of all his achievements, it was for the Holyhead Road that he would wish to be remembered (Smiles 1874). It had presented enormous challenges of planning, engineering, logistics, administration, and creativity. Telford did not rise to them alone, for he had a fine engineering and management team, but the project drew on all of the skills he had acquired throughout his career. As a young stonemason he had learned the value of good materials and thorough construction. From the 1790s he had managed large projects, particularly in canal construction, and dealt with contractors and the division of labour. As a civil engineer, he saw the potential of new materials and methods to extend the capabilities of his profession. In addition to these qualities he was undoubtedly in the right place at the right time and had the finance to implement his designs.

Telford's ideas sat well within artistic aspirations of his age. He had an 'instinct for the grandiose' and could combine 'design experiment with harmonious proportion' (Quenby 1992, 21 and 72). Although his own poetry may not be memorable (Telford 1971), he was deeply aware of the cultural importance of his constructional work at a time when the value of good architecture was held in high regard amongst the other arts. At a time when the Classical Revival and the Romantic Movement were flourishing, by combining the two Telford believed that engineers should fit their constructions to the landscape, not only in structural but also in aesthetic terms. He was willing to use relatively untried materials such as cast-iron or techniques such as the suspension principle at a time when industrialised production was making these available.

## 4 Typical structures of the road and their survival

by Jamie Quartermaine, with contributions by Jo Bell and Richard Newman

### Introduction

The Holyhead Road was a remarkable engineering achievement. The reason for its success was the consistent application of Telford's design. His aim was to create a road so well engineered that the traveller could pass on it at speed and his construction was the forerunner of modern road engineering. Steep gradients, sharp bends, and boggy ground were avoided. Gone were the unsurfaced, waterlogged, and potholed tracks of the preceding turnpikes (Smiles 1874, 257). In part this reflects the uniform and consistently applied approach to the road's construction, by contrast with the turnpikes which were a product of piecemeal construction and maintenance. It also reflects the considerable finance available for the construction of the road, however, as considerable engineering works were required to achieve the improved line which facilitated the comfort of the traveller. These works included substantial embankments and cuttings to overcome the gradients and bends and incorporated well-founded, cambered surfaces with an effective system of drainage. There were also revetment walls to support any undercut slope and dvke (side) walls to define the extent of the road and keep off stock.

This chapter discusses the nature of Telford's road and the accompanying structures which were required for its maintenance and operation. Each of these features as defined by Telford is characterised and compared with its turnpike predecessors. The features investigated include the road surface, the drainage of the road, embankments and cuttings, retaining and dyke walls, and the depots where materials for road surfacing were stored. There were also bridges, milestones, and toll houses. Toll houses had their own gates and occasionally turnstiles and weighbridges so that charges could be exacted from the users of the road.

#### **Road surfaces**

#### **Turnpikes**

Before the turnpikes, the principal roads through north Wales had merely evolved. These roads were often quagmires that were ploughed up by the constant passing of laden beasts and were completely impassable in times of wet weather (Dodd 1925, 123–4). The turnpikes provided a considerable improvement, but they did not enjoy sufficient financial resources to be

able to resolve adequately the major engineering obstacles of north Wales. Nor were they up to the demands of heavy traffic between the capitals of London and Dublin. The make-up of the turnpikes varied considerably, reflecting their piecemeal construction. While the best sections required little more than repair and some consolidation to make them into passable roads, the worst sections were simple beds of gravel with insubstantial roadside ditches. They were very susceptible to damage by water erosion resulting in huge potholes or gullies and they required considerable maintenance which was not necessarily forthcoming (Pawson 1977).

#### MacAdam

Later turnpikes were typically based on the designs of John Loudon MacAdam, Telford's compatriot and peer. MacAdam was employed on the Bristol Turnpike from 1816, just as Telford was working on his Welsh roads (Burton 1975, 91). MacAdam's road construction was relatively light. It comprised a bed of broken and angular stones 10in (250mm) thick, each no more than 6oz (160g) in weight set on unimproved subsoil. It omitted the thick foundation of masonry stone that came to be called the Telford base (ICE T/HO.47). Like Telford he knew the importance of drainage and he raised the roadbed clear of the surrounding ground. Two strata of stone were laid, with small angular chips on the top layer which would be compressed by passing traffic to a hard and impermeable surface. MacAdam's name became a byword for road surfacing as this technique was a considerable improvement on its forerunners. Although it required frequent maintenance to keep the surface in good condition, it was cheap to construct and, therefore, much favoured by turnpike trusts (Burton 1975, 91).

#### **Telford**

Telford's road construction differed substantially from that of MacAdam. It was derived from that of Pierre-Marie Jérôme Trésaguet, a French surveyor and road builder of the later 18th century (Trésaguet). Trésaguet's principle was that the natural ground surface underlying the road, rather than its uppermost pavement, should carry the brunt of the weight. This was the rediscovery of an idea known to the Romans that spread across France and then into

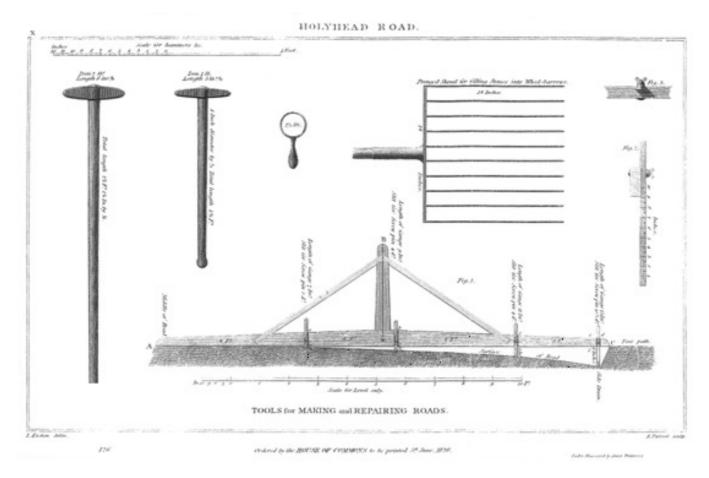


Figure 4.1 Hand tools for 'making and repairing roads', from Telford's Atlas

northern Europe (McWhirr 2002, 660; Collingwood and Richmond 1976, 1-2). Telford may have encountered the principle in Sweden during his work on the Gotha Canal. Whether or not this was so, he provided for a substantial foundation overlain with layers of metalling.

A paving of large, rough stones set on edge to a depth of 6-7in (150-180mm) was laid on a bed of prepared and levelled subsoil (Telford 1838a, 212). Where there was boggy ground the paving was set on 'rows of swarded turf, the one laid with its swarded face down and the other upwards' (PRO WORK 6/89/general conditions), or on a layer of compressed brushwood 6in (150mm) thick. On top of the paving was a layer 5-6in (130-150mm) thick of broken stone, which was of a local hard geology such as basalt or limestone. This was constructed with a marked camber, being 9in (230mm) higher at the crown than at the sides (Fig 4.2). On top of this was laid a thin, coat of 'blinding' gravel 2in (50mm) thick in order to smooth the surface (Telford 1838a, 212). To ensure the consistent adherence to the specifications, the supervisors were supplied with a ring gauge through which the broken stones had to be passed to ensure that the correct size of stone was used (Fig 4.1).

Where the road was embanked the surfaces were compacted 'by means of water, beaters, or an iron roller, or shall be left there a part of the winter to receive the snow and rains' (PRO WORK 6/89). As the top surface was largely impermeable, drainage for the road was provided by the road camber, which allowed run-off to the roadside ditches adjacent to the breast walls (Fig. 4.2); this put a considerable reliance upon the weatherproofing qualities of the top surface, which therefore required regular maintenance. While Telford's constructional techniques provided a much more durable and weatherproofed road surface than MacAdam's, it was also more expensive and was thus not favoured by the turnpike trusts.

#### **Road features**

### Drainage

Telford's initial survey of the Holyhead Road route highlighted the inadequacy of the drainage of the existing turnpikes exacerbated by the high rainfall of the upland terrain. The run-off in these areas was channelled through the narrow valleys where any communications were adversely affected. Telford applied the solutions used in his earlier Scottish Highland roads, which involved a combination of careful siting of the road and a well-engineered design.

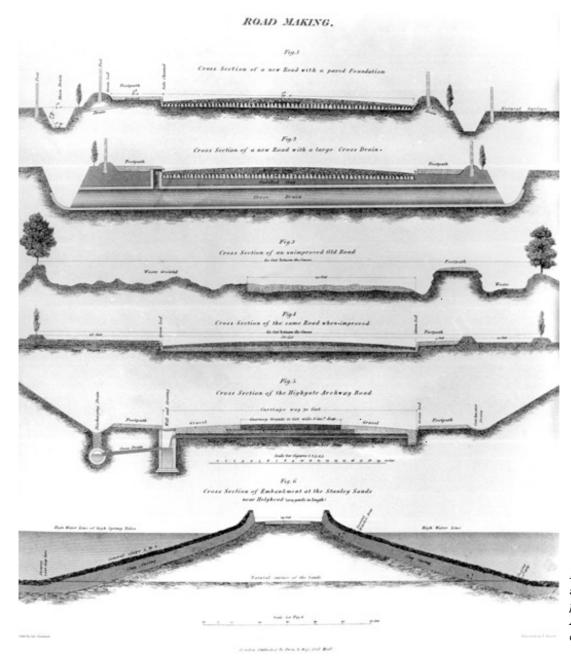


Figure 4.2 Cross section of plans from Telford's Atlas, showing the camber required

As the correct siting of the road was essential, the line was typically chosen to be off the bottom of the valley and set into the slope, with embankments on the downslope side. Where possible, the sunnier south-facing side of the steep valleys was adopted, so that the road would dry out quickly after rain (Trinder 1982, 140). The classic example demonstrating the results of applying lesser principles is the Pentrefoelas to Llandegai turnpike which followed the line of the boggy valley bottom between Llyn Ogwen and Capel Curig. It was described in a later account as 'little less than the bed of a mountain torrent in winter time and even to pedestrians the exploration of it is difficult' (Harper 1902, 253). Perhaps not surprisingly Telford chose to abandon this earlier route and instead took a higher line along the north side of the valley.

The design for the drainage was complex and,

therefore, expensive to construct, but it was effective and provided for the longevity of the road. The road was constructed with a marked camber 9in (230mm) higher at the centre than at the edge (PRO WORK 6/89). The run-off water led into side channels between the edge of the cambered road and the dyke walls (Fig 4.2). It was then fed by cross drains under the dyke walls to side ditches beyond those walls (Parnell 1838, 189–91).

Telford was meticulous about the design of each element. The cross drains were inserted at the discretion of his engineer. They were generally  $18in^2$  (c 1200mm<sup>2</sup>) and paved with flat stones 'which shall go quite across the bottom and at least 4in (100mm) under each side wall' (PRO WORK 6/89). Close-joined or overlapping stone covers ensured that 'there shall not be any opening to admit soil or small stones falling down into the drain' and a projecting drain mouth



Figure 4.3 Embankment at Pont Rhyd-goch in the Ogwen valley [808/1020] (Ken Hoverd)

threw water clear of the wall and its foundation. The side drains were similarly closely specified. Since Telford was concerned that they would not be clogged by material washing into them, they consequently were 'not to be intercepted by points of rock or large stones' (*ibid*). If steeper than 1:25 they were to be part paved. So important were the drains to the life of the road that Telford gave his supervisors the power to check their construction by digging up a stretch of the newly-laid road 'within the distance of 20 yds... at the Expence of the Contractor' (ibid).

#### Embankments and cuttings

The aim of both Telford and the Parliamentary Commission was to create a road that enabled a smooth and speedy journey between London and Holyhead. The terrain presented severe challenges to this aim: the steep-sided valleys and the precipitous drops had already hindered the construction of the turnpikes, which in places were as steep as 1:6.5. Telford's aim was that the road should not have a gradient of more than 1:30 (PRO WORK 6/89), although in practice the terrain in certain sections necessitated a gradient of 1:22. He was also determined that the undulations of the landscape should be evened out as far as possible. This was achieved partly by careful design of the route to follow the gentlest inclines. In upland areas considerable engineering works were necessary. In some cases, this involved the construction of massive embankments, [868/1020] as at Nant Ffrancon [0802] and Pont Rhyd-goch in the Ogwen valley (Fig 4.3). There were also numerous much smaller embankments, as at Lon Isa [229] (Figs 4.4 and 4.14), and occasionally corresponding cuttings, which were required to provide a generally uniform gradient. The latter were made with hand tools or explosives. Traces of the bore holes for plugs of explosive can still be seen at several points, as on Halfway Bridge [0233] adjacent to the datestone (see Chapter 5).

As Telford's road was set on the better drained valley side rather than the valley bottom, it needed to be set into the slope, with a corresponding requirement for an embankment on the downslope side. Where the road ran through flat, poorly drained ground, embankments were used to raise it and thereby minimise the impact of flooding. As with modern road construction, Telford made every effort to match the volume of the embankment with that of the cutting to minimise the quarrying and transportation of materials: lengths of cutting were invariably found in the proximity of equivalent areas of embankment. Occasionally, however, an embankment was needed in a section



Figure 4.4 Lon Isa Embankment [229] (Ken Hoverd)

where no cutting was planned, or vice versa, such as the large embankment over Malltraeth Marsh [0161], and the central organisation of the project made this feasible. Specifications sometimes mentioned that where spoil was produced it was to be taken forward to a point where it could be used for embankments and only occasionally was there such a surplus of spoil that it needed to be spread on neighbouring land (PRO WORK 6/89/Lot 26).

## Retaining and breast walls

Where embankments were necessary, retaining walls formed the lower side of the road structure. By definition they were built beneath the road. In many cases they formed a huge barrier that retained hundreds of tons of earth. The soundness of these structures was of paramount importance: any weakness in the wall would have led to a disastrous collapse of the embankment. Telford specified that the strength of the walls should not rely in any way on the retained soil (PRO WORK 6/89). Consequently the walls were constructed with revetment facing on both sides and internally backfilled to provide the platform for the road (Fig 4.5). The walls were to be 18in (460mm) wide at the top, 'to have a curved batter at the rate of one inch and a half in

every foot from the top' (Parnell 1838, 186-7), and to have a proportionately larger width at the base. The external faces of the walls were to have large facing stones set in good quality mortar.

#### Parapet or dyke walls

The parapet or dyke walls that provided a boundary to the road and controlled the movement of stock were a ubiquitous feature integral to its structure, since they extended to below the foundations of the road and held in the subsurface layers. Walls were preferred to hedges partly for their appearance, but also because water dripping from trees might have damaged the road surfaces (Trinder 1982, 140). They had a generally lower level of specification than the retaining walls, reflecting the fact that they were not structural components. Nevertheless their construction was very precisely defined. They were to be '4ft 6in high above the side drains, ... 2ft 6in at the foundation and 1ft 6in at the top . . . the face to be made as regular as the nature of the Stones will admit, but they are generally to be laid lengthways through the Wall. None are to be set on edge' (PRO WORK 6/89).

These standard walls were built with whatever stone was locally available, in contrast to the mile-

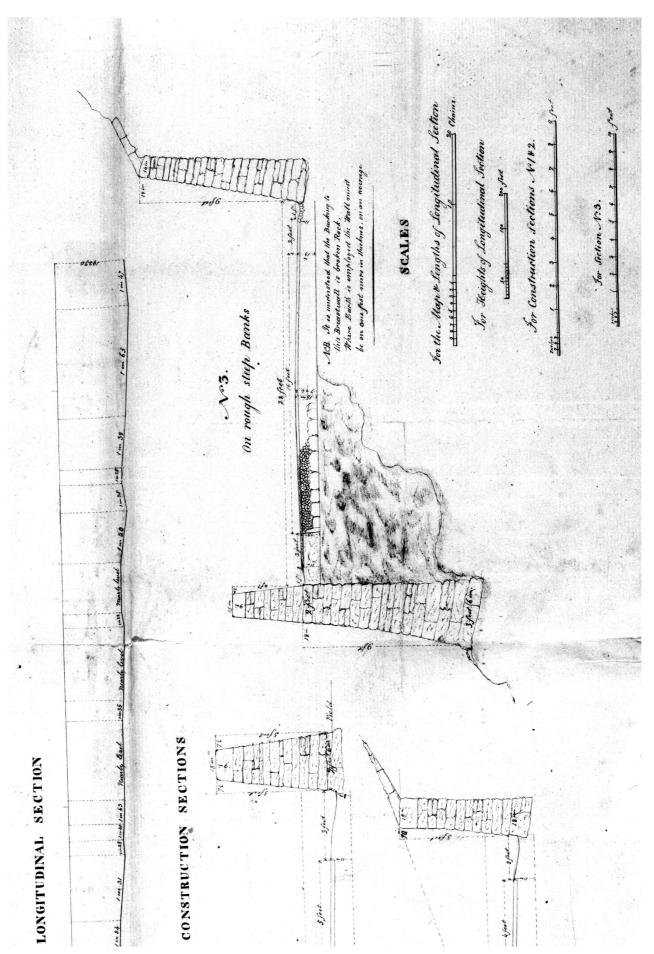


Figure 4.5 Section showing how retaining walls were to be used on steep banks in Lot 3 (Public Record Office)

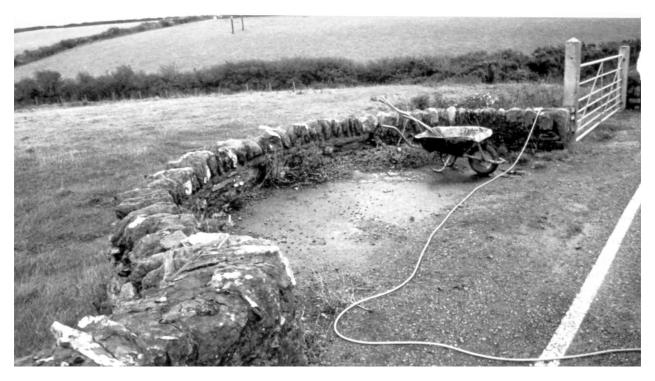


Figure 4.6 Semi-circular walled depot, west of Caergeiliog (OA North)

stones for which stone was specially imported. The different stones available, for example dark slates near Pont Padog [0479] and lighter limestone in Nant Ffrancon, required specific building techniques. The stone gave a distinctive character and appearance to the walls in each area, although the proportions and general design were uniform. The walls were originally intended to be of dry-stone construction only, but they suffered severely from pilfering and vandalism. A Parliamentary Report of 1815 noted that coach passengers often amused themselves by pushing stones from the parapet wall down the steep hill (BPP 1814-15 III.355). As a consequence the walls were mortared in the 1830s (Trinder 1982, 140).

#### **Depots**

Since it was intended from the outset that the road would be in use during the period of construction, Telford allowed for this in his design. Following the construction of a section of road, he preferred to let it weather over the first winter, during which time the surface became compacted in use. His workforce then returned in the spring to fill the potholes and replace surfaces with top dressing where necessary. To allow both for this finishing stage and ongoing maintenance, he provided for the roadside storage of surfacing or 'blinding' stone in small depots (LUAU 1999, 34), which were walled rectangular or sub-circular bays set out from the road edge. Depots were not incorporated within the design of Telford's roads in Scotland and are characteristic of the Holyhead Road. The plan was that they should be no more 'than a quarter of a mile apart, so as to admit of moving the materials in barrows' (Parnell 1838, 192).

Depots were specified to be '12yds long, and the two dyke walls each 2yds and a half at the bottom' and each were intended to hold 24 cubic yards of stone. They were to be paved with sandstone flags and to have an earth bank built up around the outside. If the depot was on an embanked section of road, the embankment was extended outwards to accommodate it (Fig 4.4). The specifications described a splayed plan where the width of the depot at the front was greater than that at the back - a design intended to help in quantifying the volume of the contents (PRO WORK 6/89).

In addition to the splayed, rectangular type, there were rectangular depots without splays and considerable number of semi-circular depots which were typically 5.4m long by 2.9m in depth (LUAU 1999, 30; Fig 4.6). The distribution of the three types was generally scattered throughout the length of the road, although the splayed type was more common in the western third of the route. Depots were constructed in the same way as the road boundary. They were for the most part built of dry-stone walling. In some more localised areas they were constructed with quickset hedges, but in one section in the Ogwen valley there are surviving depots bordered by slate fencing (Fig 4.7).

## Small bridges

Telford's reputation as an engineer was enhanced by the magnificence of the major bridges on the Holy-



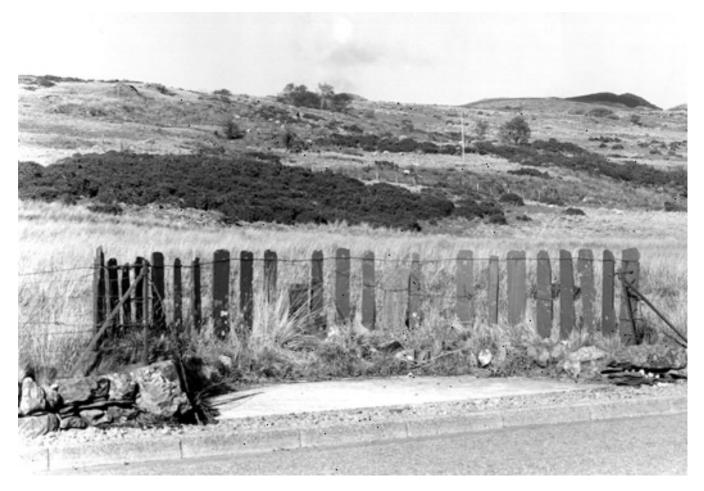


Figure 4.7 Depot bordered by slate fencing in the Ogwen valley (Ken Hoverd)

head Road - the Menai [0215], Conwy [C032], Waterloo [0379], and Halfway [0233] bridges. For the great majority of stream and river crossings along the route, however, his bridges were as far as possible built to a standard design that was functional and robust but not particularly impressive. Telford did not provide separate specifications for the ordinary bridges along the road, which were built as part of the normal contracts (PRO WORK 6/89). He had employed this system on his Highland Roads (Hume 1980, 156 and 171). This had resulted in bridges of the same workmanlike, inexpensive, practical vernacular style.

The early turnpike bridges varied enormously, but are epitomised by the bridge at Rhydllanfair [0805] dated by a datestone of 1780 (Fig 4.8). This was an elegant, but narrow and fairly slender construction, with the road surface only just above the crown of the arch. The bridge had a very pronounced humpbacked profile. Such a bridge was unacceptable to Telford as it was too narrow, of insufficient strength to take the proposed traffic and most importantly its hump-backed profile slowed and impeded the passage of carriages. Telford constructed the arches of his bridges with a strong almost semi-circular arch. On either side of the bridge, the road surface was raised by an embankment. The body of the bridge

was built up to ensure that there was a level road surface over the top of the arch. The overall appearance was of a substantial but very squat structure. This small bridge design and proportions were fairly standardised, usually single- or double-arched with a span of 12ft or 15ft (3.3m or 4.5m). Like the embankments and cuttings, the principles of bridge construction were hardly radical, but the good quality of construction demanded in specifications ensured longevity and low maintenance. One of the better specified small bridges was that of Pont Padog [0479], which replaced an existing but ruined bridge downstream (BPP 1824 IX.281). The specifications not only incorporated a detailed description, plan, and elevation drawings (Fig 4.9), but also defined the source of the rock, the level of dressing, and the internal make-up of the bridge. This was a conventional Telford type, with a low-set arch in the base of the river gully (Fig 4.10). It had abutments that incorporated a substantial batter set straight onto the rock. Upon these an arch 50ft (15.2m) wide was constructed of hammer-dressed voussoirs (Parnell 1838, 180). A string course was specified directly above the crown of the arch, while the wing walls and the parapet were constructed with coarsely dressed and mortared masonry. The smaller bridges were seldom graced with individual names, but in each



Rhydlanfair turnpike bridge built in 1780 and subsequently bypassed by Telford's road (OA Figure 4.8 North)

case the specifications included small measured drawings where such structures were required.

Some of Telford's larger bridges, such as the Halfway Bridge [0233] (Fig 5.10), were of the same basic design as the smaller bridges, but with a much larger span; for example, the span of Halfway Bridge was 21m. This was one of the finest examples of Telford's wide-span bridges. As demonstrated by a datestone, it was built in 1819 from rough-coursed limestone with freestone voussoirs, stone-on-edge coping, and incorporated a string course. It survives relatively intact below road level. Although the parapet wall has been largely rebuilt, it retains the appearance of a Telford-designed wall.

Telford was concerned about minimising risk to the bridges in times of flood. By examining the depth and volume of the water passing underneath a bridge, he could design the height accordingly. The size of the embankment was adjusted as necessary and was also used to create a gentle inclination of the roadway over the bridge (Parnell 1838, 176-8). The specifications also addressed the construction of the approaches. It was important that the road should follow a straight line through and beyond the bridge, rather than turning sharply just as the bridge was reached. The expressed reason for this approach was the safety of the bridge rather than of the users (PRO WORK 6/89).

Although the Holyhead Road bridges were a dramatic improvement on the early turnpike bridges, the principles of this bridge design had been established long before the construction of the Holyhead Road was conceived. Earlier and contemporary county bridges were being built on exactly the same principles. A notable example is the Chirk Bridge [1000], dated to 1793 by a plate on the bridge. It was built by Telford in his position as County Surveyor for Shropshire. This design was comparable to the bridges on the Holyhead Road, with a strong, semi-circular arch and a flat embanked road surface (Fig 4.11). A further example, but not by Telford, is the Capel Curig bridge [0810] (Fig 2.3), built as part of the Llandegai to Pentrefoelas turnpike (1802–8; Moore-Colyer 2001, 155). This had a substantial semi-circular arch built into the sides of a narrow gorge, with a similar flat embanked road surface.

The one major difference between Telford's bridges and many others built around the same time in north Wales lay in their context. They were built as part of an integrated road scheme rather than as one-off repairs or replacements. Consequently they were built with regard to the maintenance of road levels and the avoidance of steep gradients, which could influence their design. For example, in his report to the Parliamentary Select Committee in 1816, Telford in describing the need for a new bridge at the

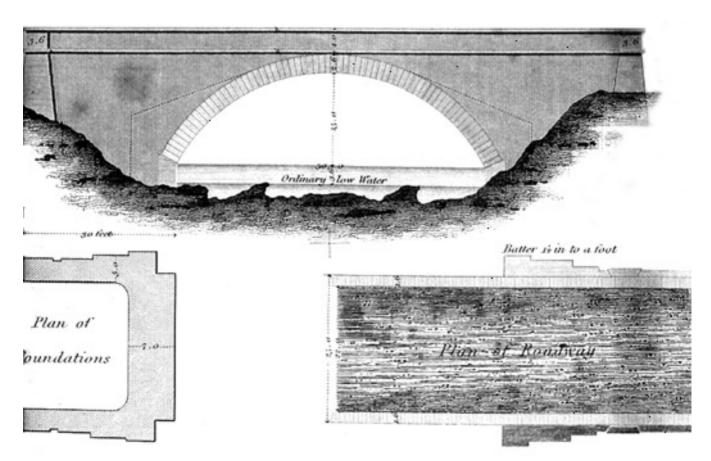


Figure 4.9 Telford's specifications for the small bridge at Pont Padog in the 1820s (Parnell 1838)



Figure 4.10 Pont Padog bridge on the Holyhead Road (Ken Hoverd)

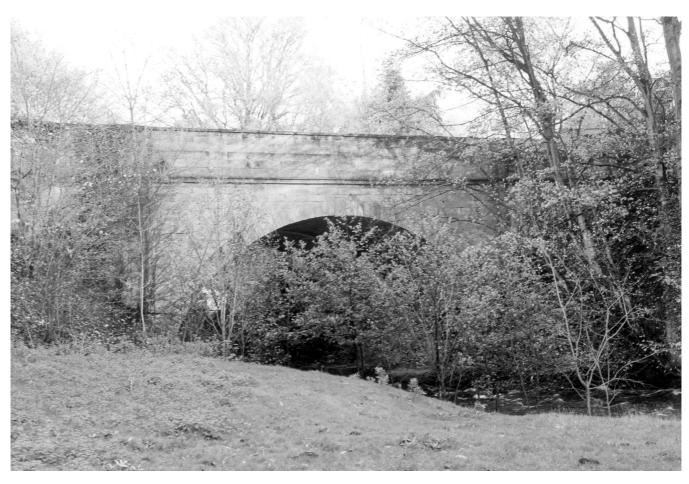


Figure 4.11 Chirk Bridge built on the turnpike road in 1793, showing Telford's flat, embanked surface with a strong semi-circular arch (OA North)

eastern end of the Glyn Conwy improvement commented 'the bridge over the river is imperfect, and the hill beyond it steep, being one in ten, and so confined it can only be eased by rebuilding the bridge and making it higher' (PRO MT 27/70).

Building bridges as part of an integrated road scheme also allowed for some design branding and attention to aesthetics. Although the bridges were built by different contractors and are generally vernacular in style, Telford attempted to ensure that their appearance was regulated by specifying that the arch, side walls, and where relevant, coping of the wing walls were made of 'good hammer dressed limestone laid in regular courses' (PRO WORK 6/89). Even so, as with his Highland bridges, it was only the largest most important bridges that exhibit 'any real sophistication of design' (Hume 1980, 156).

#### **Milestones**

Telford's road involved much sophisticated engineering in order to provide for the smooth, fast passage of the traveller, but much of this was not visible to the road user and was obscured below the parapet wall. It was not possible to see the massive embankments, the

retaining walls and the monumental bridges. The Waterloo Bridge [0379] (Fig 6.5), for example, can only be seen properly by crawling through undergrowth to get down to the river's edge. Telford, however, was keen to provide his road with visible markers that gave it a clear identity. He went to great pains to design a milestone that would provide an adequate marker in with his engineering achievements commenting that 'I never saw a proper milestone that I could copy. I looked for three years all over England trying to find one as a pattern and after all I could not find one that looked like a decent milestone' (BPP 1830) X.131).

Since Telford wanted a milestone that could be seen clearly and read from the window of a moving carriage, it needed to be high and have large, clear lettering. His milestone specification (Fig 4.12) provided for a large pillar of a hard limestone quarried from Red Wharf Bay, Anglesey (BPP 1828) IX.217). It was to be 6ft 11in (2.1m) in height, of which 2ft (0.61m) were to be buried foundations. Consequently the pillar stood 4ft 11in (1.5m) above the road surface (Parnell 1838, fig 4). It was designed to have a shallow, triangular head and raking, chamfered sides, with a cast-iron plate set into a recess at the top of the pillar. The inscriptions were in raised script and defined the distances in miles

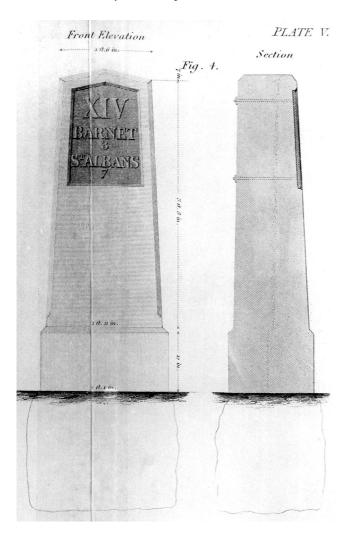


Figure 4.12 Milestone specification for the Holyhead Road from Parnell (Parnell 1838)

and furlongs from Holyhead and the nearest staging inns in either direction (Fig 4.13). These usefully reveal which inns were intended as principal stopping places at the time of the construction of the road. Starting from Holyhead, these were at Mona, Bangor, Capel Curig, Cernioge, Corwen, Llangollen, and Chirk.

#### Toll houses

Despite the major Parliamentary investment in the construction of the road, revenue was still required for ongoing road maintenance. This was exacted from the users by means of toll houses and gates. The houses were generally regularly spaced along the route, typically at about 5 miles (8km) apart, although occasionally some were as little as 2½ miles (4km), as between Caergeiliog [0004] and Stanley [0001] toll houses. On some of the more remote sections, however, the separation increased to 10 miles (16km), as between the toll house at Bethesda [0245A] and Capel Curig [0060]. Any intermediate toll house would have been at Llyn Ogwen, but there is no evidence for such a structure either on the ground or on the first edition Ordnance Survey map, nor is there a specification for it.

The shorter separation between some toll houses reflects in some instances the subsequent addition of a toll house to gather tolls from local traffic. For example, at Betws-y-Coed [0068] heavy slate carts were found to be using and eroding a short stretch of the road without paying tolls (BPP 1844 XXXI.273). There are substantial differences in the income from the toll houses along the route, which reflect the variable amounts of local traffic (BPP 1839 XXIX. 589). For example, it was noted that the toll house at Ty Isaf [0112], between Corwen and Llangollen could not bring in enough income to maintain the local sections of the road. This implies that local, nonpaying traffic was causing unacceptable levels of wear. Yet from the Parliamentary Reports (BPP 1839 XXIX.589), Corwen consistently had one of the highest incomes of all the toll houses. This suggests that there were several turnpikes converging with the Holyhead Road at or near Corwen, such that some sections of the road were heavily used by local traffic, while other nearby sections had much less local traffic.

The design of the toll house was, as with every other element of road furniture, closely specified. Telford insisted that toll houses should not only be clearly visible, but that they should provide good quality accommodation in order, as argued by Sir Henry Parnell (1838, 194), that they attracted honest toll keepers. Without them revenues would quickly diminish. Telford had two very different designs for toll houses (Telford 1838a; PRO WORK 6/89): a single-storey style used on the mainland, and a distinctive house with a two-storey octagonal tower, which was used exclusively on Anglesey. As the longest section of new road on the whole route was in Anglesey, it was perhaps for this reason that it was provided with this characteristic design.

The single-storey style comprised a cross-shaped building with an angled porch extending out from its central toll room. The angled shape provided side windows with which to see approaching traffic and a central door through which to collect tolls. The specification for the single-storey toll house is exemplified by one at Lon Isa [0034], which had a cross-shaped plan with the toll room and angled porch at the front (Figs 4.14 and 4.15). There was a kitchen at the rear and two bedrooms in the side bays. The house was heated from a central flue, with fireplaces in the kitchen and toll room. Although the building has been subject to some alterations since construction, with the addition of a porch to the toll room and an extended kitchen, the original form of the structure is still clearly evident.

The octagonal towered toll house was a more dynamic design, epitomised by the Llanfairpwllgwyngyll toll house [0197]. This had an L-shaped plan, with the kitchen to the back and a bedroom to the side. Projecting from the corner was a twostorey octagonal tower with a colonnade extending



Figure 4.13 Milestone 44 on the Holyhead Road (Ken Hoverd)

around it. The toll room was in the base of the tower and again, by virtue of the angled design, the windows allowed views of approaching traffic (Fig 4.16). Unlike its single-storey counterpart, it had to have three separate flues in order to provide heating for the whole house. The specifications for this house are comprehensive, covering everything from the type of masonry to the Baltic fir for the timberwork. It also provided for the design of the garden and a privy 'to be built with proper roof, dome, and seat' (Parnell 1838, 195–6; Fig 4.17).

#### Gates and turnstiles

The essential item of furniture for a toll house was inevitably the gate itself. In keeping with the rest of his road scheme, Telford gave this element a very distinctive design (Parnell 1838, fig 4; Fig 4.18). This comprised a wrought-iron frame supported by quarter-circular plates at each hinged corner, from which radiate bars supporting the rest of the gate's frame. The radiating bars give the appearance of rays of sunshine and hence they are called 'sunburst' gates. The specifications also show that for each long road gate there were smaller pedestrian gates of similar design on either side. There is a further reference in the specification for the Lon Isa toll house [0034] that there should also be 'two turnstiles; the posts and rails to be of sound oak' (PRO WORK 6/89).

#### Weighbridges

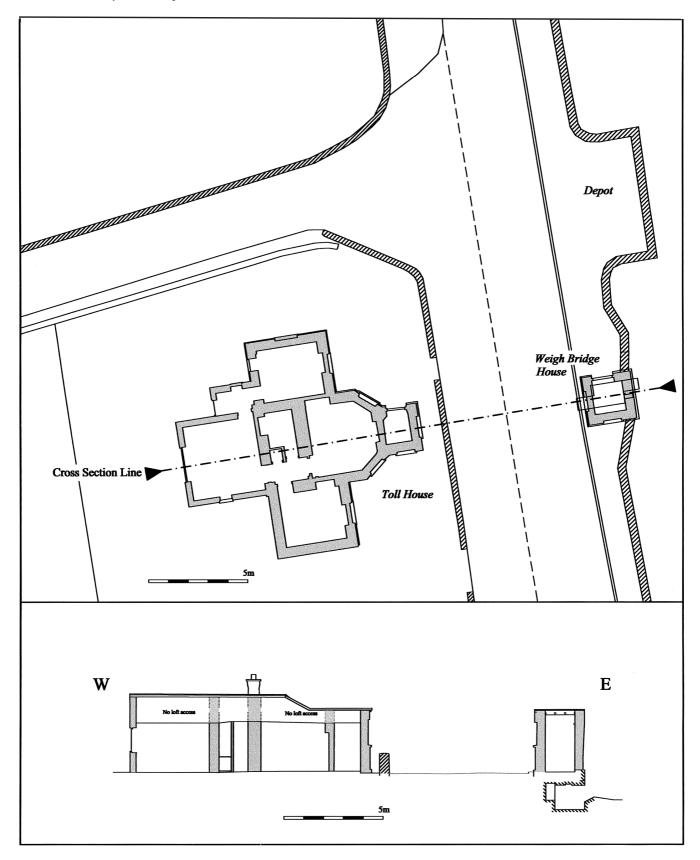
The amount of wear inflicted on the road was proportional to both the numbers of vehicles using it and their overall weight. Concern about the weights of vehicles was frequently commented upon in Parliamentary Reports, for example, that of 1849 (BPP 1849 XXVII. 111) which highlights damage to the road from the cartage of heavy stone for railways around Bangor and on Anglesey. The response to the need for exact tolls appropriate to the amount of wear caused by the vehicles was to construct weighbridges at key locations along the route. The Eddowes Salopian Journal (10 March 1824) records the installation of weighing machines at Lon Isa [0231] and Ty Isaf [0112] in that year, and records the toll from a weighing machine at Chirk Gate [0844]. Within the Lot 40 specification the Ty Isaf weighbridge [0601] is described as:

. . . a small building to be erected for lever and weights of a Weighing Machine, with a passage thro it for the public footpath . . . On the side of the road next the Machine House a Pit is to be sunk for a Weighing Engine, the sides to be walled round . . . and the machine to be carried from Bangor and fixed in its place, exactly similar to that lately put down at Lon-Issa near Llandegai (PRO WORK 6/89).

No further information is supplied about the mechanism, although it must have consisted of a bridge platform onto which the vehicle would drive, with a system of weights and pivots below (Rutland LHS 1982, 112). The weighbridges are known to have continued in use until after 1843, as new cast-iron platforms were installed for both the Lon Isa and the Ty Isaf weighbridges in that year (BPP 1843 XXIX.291).

### Conclusion

Telford's Holyhead Road was clearly an improvement on the earlier road system, as demonstrated by the reduction of mail delivery times between London and Holyhead. Prior to the road improvement in 1808 the journey took 38 hours, while in 1836 the mail service took 26 hours 55 minutes. Telford and



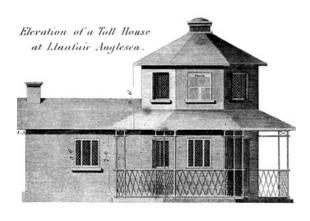
Figure~4.14~~Plan~and~cross-section~on~Lon~Isa~toll~house~and~weighbridge~(OA~North)



Figure~4.15~~Lon~Isa~toll~house~(OA~North)



Figure~4.16~~Llanfairpwllgwngyll~toll~house~(OA~North)



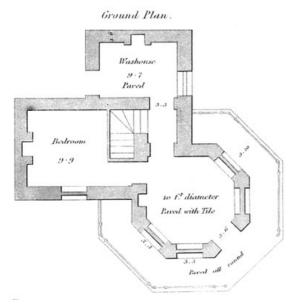


Figure 4.17 Llanfairpwllgwngyll toll house; elevation and plan from Parnell's Treatise (Parnell 1838)

his supporters considered that the Holyhead Road was revolutionary in its time, but the preceding turnpikes, although often criticised, were also a dramatic improvement when compared with their forerunners. By 1800 stage coaches could at last travel on the turnpikes from Shrewsbury to Holyhead, although with uncertain times, and by several roads to Aberystwyth, Barmouth, and Tywyn, on routes where previously only horses could travel. It could be argued, therefore, that the turnpikes had a greater impact upon the communications of north Wales than Telford's road.

In structural terms, there were some notable similarities between Telford's road and the turnpikes. The turnpikes were often substantially embanked or cut down from the natural ground level. In 1774 Dr Johnson described the turnpike road at Penmaenmawr on the Chester road as 'a way, lately made very easy and very safe. It was cut smooth and enclosed between parallel walls' (Harper 1902, 204), which was not dissimilar to Telford's road. As with the Telford road, the turnpikes made use of depots to hold road-building materials. The later turnpikes also used county stone bridges, often similar in design to Telford's bridges with arches of 10ft or 15ft (3.3m or 4.5m) span, such as that across the Afon Llugwy at Capel Curig [0810]. Telford's toll houses also demonstrate similarities with those of both earlier and contemporary turnpikes. The multi-angled plan of the mainland toll houses on the Holyhead Road is not dissimilar to one on a turnpike near Betws-y-Coed [068A], which has the same angled porch, and even to the Hendre Isaf toll house [0340], which was on the Pentrefoelas -Llangefni turnpike. This was subsequently reused by Telford. With the notable exception of the major monuments, such as the Menai Bridge, the evidence would suggest that Telford's designs were for the most part adapted and developed from contemporary best practice and were only rarely truly innovative.

Although some of the principles of the design were not unique to Telford, the consistency and quality with which they were applied sets the Holyhead Road apart from the turnpikes that preceded it. The

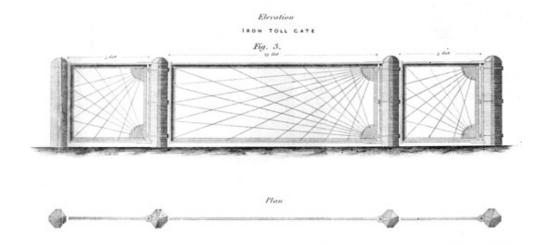


Figure 4.18 Specification for a sunburst gate from Telford's Atlas



Figure 4.19 Line of the 1802–1808 turnpike through Nant Ffrancon showing the meandering course of the road through and around prominent crags (Ken Hoverd)

turnpikes on the line of the Telford Road were a product of many disparate programmes of construction and also erratic maintenance. Certainly some stretches of the Holyhead route had been much improved before Telford's arrival. There were, however, undoubtedly other sections that were far from adequate. Gauging an opinion as to the actual condition of the roads prior to Telford's road is typically very difficult, as the roads were either improved by him or by subsequent works. There are limited sections of the Pentrefoelas to Llandegai turnpike (1802–1808) in the Ogwen valley, however, which have not been subsequently improved. The most notable is that surviving beneath Telford's Nant Ffrancon embankment. This section, like Telford's, was heavily embanked in places, but can also be traced following a very circuitous route around outcrops. In places it was fairly steep and was very exposed along the side of the steep-sided Ogwen river

gully (Fig 4.19). The section of the same turnpike between Llyn Ogwen and Capel Curig [0907] was embanked to cross through an area of boggy ground. The principles of construction are again not dissimilar to those employed by Telford in crossing Malltraeth Marsh [0161]. The embankment was not sufficiently raised to prevent flooding in winter, however, and consequently proved inadequate.

In general it would appear that turnpike roads came close to revolutionising travel, but a lack of consistent design and resources prevented them from being truly effective. It is in this respect that Telford's road was able to surpass so dramatically those that preceded it. By virtue of the commission from Parliament, Telford was able to establish an integrated road scheme and a consistency of approach that ensured that all the earlier roads, constructed in piecemeal fashion, were brought to a uniformly high standard. This could not have been

achieved without the resources to go with it. The benefits of innovatory governmental funding enabled him to implement massive engineering solutions to deal with the major topographical obstacles of north Wales. Instead of the steeply sloping and exposed roads of the inadequately funded turnpikes, Telford was able to build large embankments, major bridges, and well-founded road

surfaces to produce a communications system of unsurpassed quality and character. The greatest impact of this approach was that the consistency of slope, alignment, and surface meant that dramatically quicker travel became possible.

## 5 Survey of the road

## by Jo Bell and Jamie Quartermaine

## The survey

The fieldwork survey of Telford's Holyhead Road (LUAU 1999) was undertaken in nine sections (Table 5.1) in a south-easterly direction from Holyhead via Betws-y-Coed and finished at Chirk Bridge. A survey was also undertaken of the Conwy to Bangor section of Telford's Chester Road, which was constructed at the same time as the Holyhead Road and follows the line of the modern A55. The survey recorded over 670 monuments relating to Telford's road and the bypassed turnpikes. The information gathered within each section of the road is summarised below and the sites referred to are shown on the detailed site maps. Sites are followed by the project number in square brackets. A list of those sites mentioned in the text is detailed in Appendix 4. The lots described in Telford's specifications and discussed below are indicated on Fig 5.1.

## The Holyhead Road

#### 1 Holyhead to Gwalchmai (Figs 5.2 and 5.3)

The survey began in Holyhead, where Telford's starting point for the road was the Eagle and Child Inn at the south end of Market Street, built about 1770 (see Chapter 7). The present route commences south of Holyhead Harbour (SH 2470 8205). It was apparent from this survey that the first part of Telford's road is now badly damaged with only a very short stretch, including milestone 1, surviving south of the railway

station and bridge. In all towns and villages along the route, ongoing changes such as the insertion of private drives and the creation of lay-bys have disrupted Telford's road, but this is particularly noticeable in Holyhead where the original has almost disappeared. The construction of the railway has also adversely affected this section of the road, as it has done elsewhere wherever the two came into contact. Subsequent road improvements have also substantially altered the line of the road and its associated features, although it seems likely that the present roadside walls incorporate some of Telford's materials.

Immediately south-east of Holyhead, Telford's road ran in a south-easterly direction to the west end of the Stanley Embankment (SH 2760 8030), as shown on specifications and the first edition Ordnance Survey map (1890). This section of the road has been entirely destroyed by the construction of an aluminium smelting works. The present A5 now takes a curving route to the west and south-west around the smeltworks. A short, detrunked section of the road [0821] survives between the edge of the smelting works and the new line of the A5. Edged by the railway to the south and sunk into a cutting, this is one of the few bypassed sections of the road. It has been subject to little modern alteration.

The Stanley Embankment [0003] (see Chapter 6) was much affected by the arrival of the railway in the 1840s, as the rail engineers widened the existing embankment rather than build a new one (Sivewright 1986, 14). At the west end of the embankment on the north side of the road, a toll house, toll-gate [0001], and milestone with intact plate [0007] are the first signifi-

Table 5.1 Sections of the A5 road surveyed

| Section | Start                                     | Finish                                    | Telford's lots (see Fig 5.1)  | Miles [km]  |
|---------|---|---|---|-------------|
| 1       | Holyhead                                  | Gwalchmai                                 | A9, A10, A6, A2   | 10.5 [16.9] |
| 2       | Gwalchmai                                 | Menai Bridge,<br>north side               | A3, A4 or A22, A5, A12 and A19  | 11.7 [18.8] |
| 3       | Menai Bridge,<br>north side               | South of Bethesda,<br>south end of Lot 28 | 65, 80, 61, 20, 68, 22, 23, 24, and 28                                    | 9.3 [15]    |
| 4       | South of Bethesda,<br>south end of Lot 28 | Pont Rhyd-goch                            | 59, 1, 2 and 8  | 4.5 [7.2]   |
| 5       | Pont Rhyd-goch                            | Dinas                                     | 9, 60, 25, 77  or  10, 47, 48,  and  3                                    | 11.5 [18.5] |
| 6       | Dinas                                     | Glasfryn                                  | 82, 75, 4, 26, 27, 66 and 35  | 7.2[11.6]   |
| 7       | Glasfryn                                  | Corwen                                    | 35, 67, 36, 37, 38, 62, 11, 57, 43, 58, 13, 55, 44, 56, 49, 29, 63 and 70 | 12.0 [19.3] |
| 8       | Corwen                                    | Llangollen                                | 40, 71, 45, 72, 14, 30 and 31   | 10.3 [16.5] |
| 9       | Llangollen                                | Chirk Bridge                              | 32, 52 and 42   | 6.5 [10.5]  |

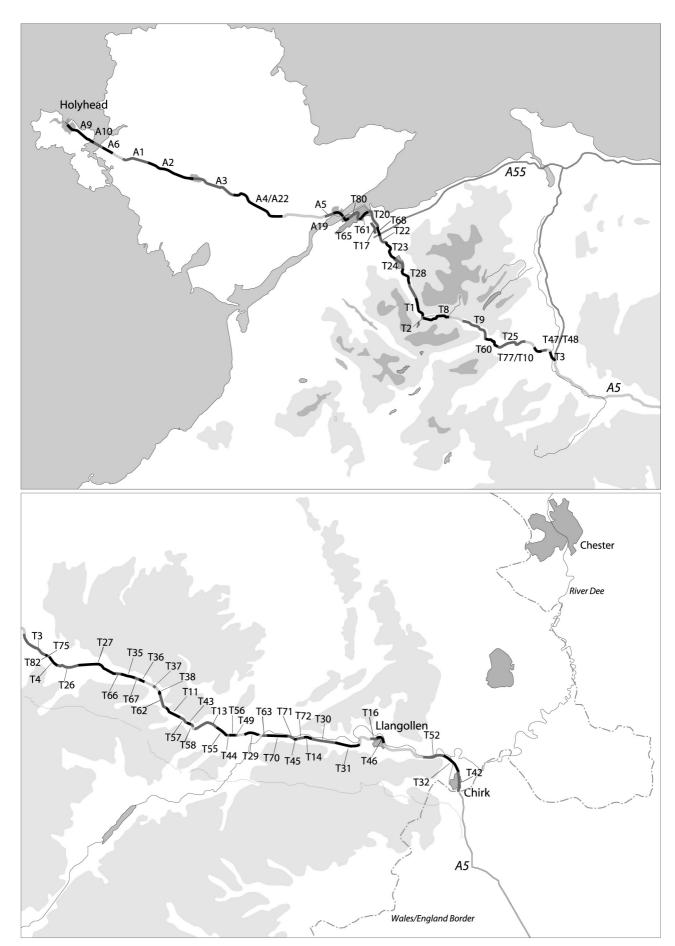


Figure 5.1 Telford's lot numbers, Holyhead to Chirk

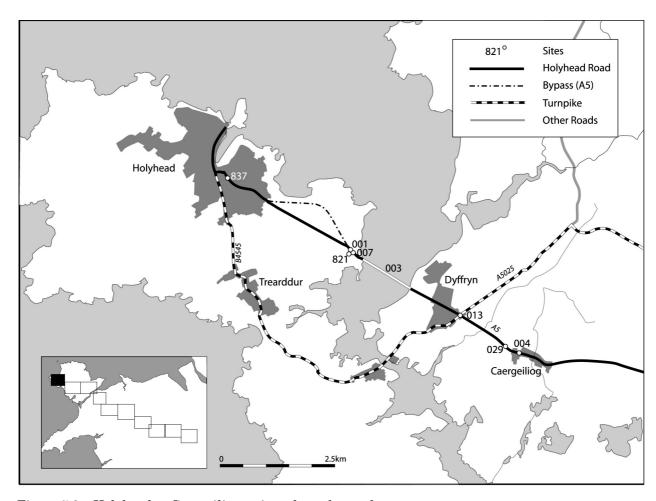


Figure 5.2 Holyhead to Caergeiliog – sites along the road

cant Telfordian features to be encountered. The toll house was relocated in the 1970s, when each stone of the building was carefully numbered prior to dismantling to enable a precise rebuild (Fig 5.4). The toll house is now run as a tea shop. It remains essentially unchanged despite its relocation, although toilets and a laundry room have been added at the rear in recent years. At Caergeiliog [0004] the toll house is now a private residence (Fig 5.5). The fabric has suffered from the removal of the verandah and as a result of heavy pointing. The house has also been extended and modern windows inserted.

Throughout this section of the road, the Telfordian walling has been much disrupted and remains only in short sections, especially on the south side. The depots survive as regular semi-circles, typically up to 5.4m wide and 2.9m deep. One depot [0013] in the valley has had a bus stop built inside it and most are heavily consolidated. From Tre Ifan, the junction of Telford's Lots A1 and A2, the depots are usually of splayed plan.

There is a good stretch of walling, somewhat interrupted, from east of Caergeiliog to Bryngwran. Large-scale embankments or retaining walls were not common in this section, which is mostly level ground. There is no Telfordian walling on the south side between the B5112 junction (SH 365 769) and Gwalchmai. Apart from Milestone 2, removed from near Holyhead, all the milestones in this first section are intact and retain their plates.

## 2 Gwalchmai to the north side of the Menai Bridge (Figs 5.3 and 5.6)

A long stretch of walling [0125] with frequent interruptions survives on the north side from Gwalchmai to the edge of Malltraeth Marsh, but this has been much repaired. In short stretches where the road has apparently been widened, for instance near the Heneglwys Airfield, Telford's walling is completely absent. The toll house at Castle Eden (Gwalchmai) [0077] retains its plan largely intact, although without the verandah roof that skirted the tower. Unfortunately the house has been repointed in a rather heavy and intrusive manner which detracts from its appearance. A sunburst gate, now located at the Museum of Welsh Life at St Fagans, Cardiff, is thought to have originated from this toll house.

The former coaching inn at Mona [0801] was the 'entirely new inn built in the middle of the Island of Anglesey' in 1820-2 (Trinder 1998). It survives as part of a farm and is still occupied (see Fig 7.10). The house, a rectangular five-bay structure on the south side of the road, being in need of some maintenance.

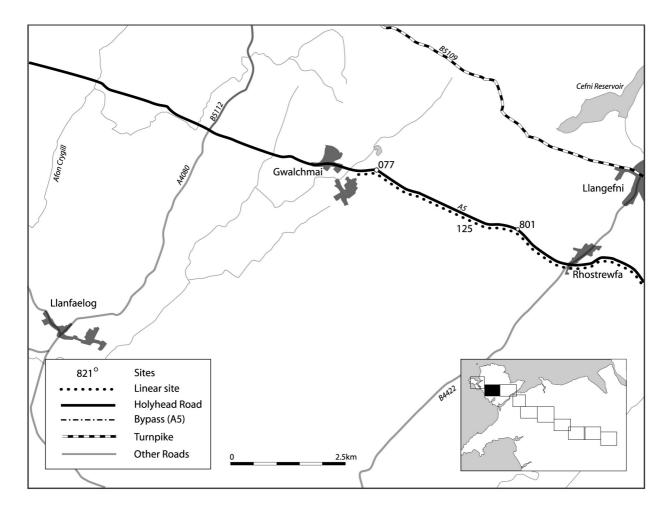


Figure 5.3 Gwalchmai section of the road, Caergeiliog to Rhostrewfa – sites along the road



Figure~5.4~~Stanley~Embankment~toll~house,~showing~stone~numbering~of~the~1970s~(Anglesey~County~Stanley~StaArchives Service)



Figure 5.5 Caergeiliog toll house, now a private residence (Ken Hoverd)

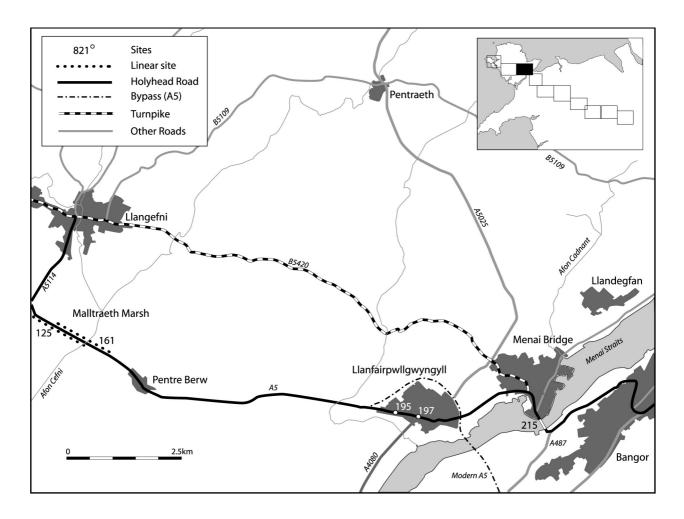


Figure 5.6 East Anglesey section of the road, Rhostrewfa to Menai Bridge

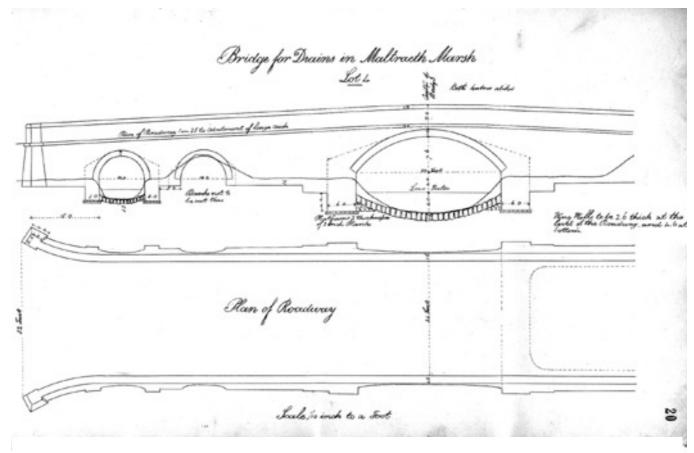


Figure 5.7 Specification drawing for a bridge over the drains in Malltraeth Marsh [0161] (Public Record Office)

The present A5114 was a short spur road to Llangefni built to help assuage the anger of its residents who were bypassed by Telford's new road. Most of the rubble stone boundary walls outside the town are probably original.

Malltraeth Marsh presented Telford with a major obstacle for the construction of the road. His solution was a large embankment to raise the road above the level of the marsh and the construction of large drains to provide the passage of water through the embankment (Fig 5.7). Because of the unstable ground beneath the road across the marsh, hedges were used in preference to stone dyke walls, which could not withstand the vibrations from the heavy traffic (Trinder 1998). Along with all of Telford's embankment and the bridge over the marsh, these have been destroyed by modern improvements to the road, which have converted it to a dual carriageway. West of Pentre Berw is a stretch of well-preserved Telfordian wall. It is dark and weathered and illustrates the difference between these early walls and the paler new sections where stone has been cut by machine. There are semi-circular depots in this section of walling.

A long gap exists between lots before Telford's Lot A5 begins immediately east of Llanfairpwllgwyngyll. It seems most likely that this reflects the loss of specifications rather than a section of road that was not allocated lots. Within this gap, the modern A5 leaves the earlier road to curve northwards and bypass the town, while Telford's road runs immediately south of the town. This stretch of the road, like many others through towns and villages, has little trace of any remaining Telfordian walling or other structures, although a milestone [0195] 'that is now a Listed Grade II structure' survives.

East of Llanfairpwllgwyngyll, Telford's road continues towards the Menai Bridge as the A4080. Along this section the road has been widened and improved in a number of places, with the resultant loss of Telfordian structures. A good section of embankment survives, however. Telford's retaining wall and the decayed dyke wall are substantially intact immediately east of the toll house [0197] up to the modern car park for the Marquis of Anglesey's column. As the road enters the outlying areas of Menai Bridge town, the Telfordian walling is again obscured or absent on the eastern side of the road, but a line of depots survives on the western side. The approach to the Menai Bridge is substantially embanked.

# 3 North side of Menai Bridge to south of Bethesda (south end of Lot 28; Fig 5.8)

The road continues in this section as the A4080. Lot 65, a standard road surfacing specification, includes the area of the Menai Bridge [0215], but not the construc-

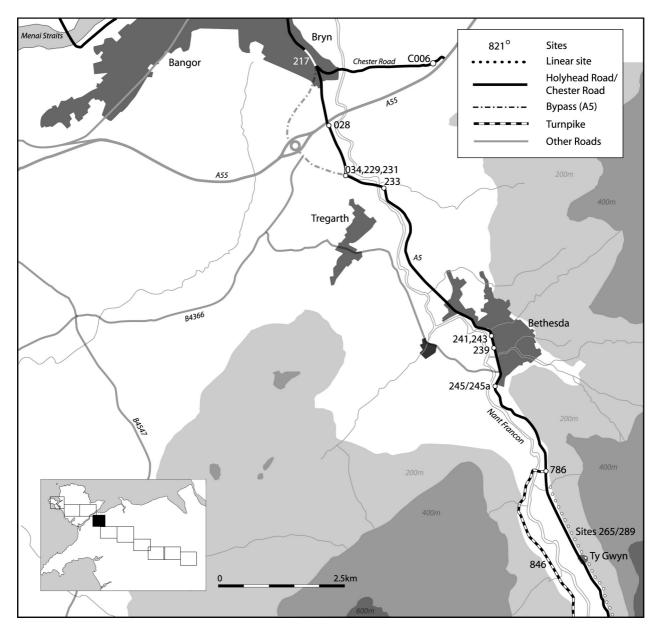


Figure 5.8 North side of the Menai Bridge to the south of Bethesda (Ty Gwyn) – sites along the road

tion of the bridge itself (see Chapter 6). Presumably this was a separate lot for which there are no surviving specifications. The bridge, which is Listed Grade I, was altered in 1938-41 by the replacement of the suspension chains and by the addition of a cantilevered footpath on either side. At this time too unfortunately the Anglesey toll house and the bank on the Caernarfonshire side were removed. The Bridgemaster's House built in the Caernarfonshire abutment is unaltered externally. Two iron sunburst gates in good condition [0215] near the Bridgemaster's House are believed to be original Telfordian features (Fig 5.9). The walling south of the bridge has been disrupted and there are no significant remains of Telfordian structures until south of Bangor.

Bangor like Holyhead retains little trace of the Telfordian fabric on the road within the town apart from the milestones, which are extant but not all in their original positions. There are no lot maps for the road through Bangor, but Telford describes the route as 'going up the high street' (PRO WORK 6/89/Lot 80). There is a surviving milestone on this street. The boundary walls are likely to incorporate some Telfordian fabric, but the specifications for Bangor are concerned mainly with the laying of pavements and road surfacing (PRO WORK 6/90/Lot 68). As Telford was building his road through a developed town on pre-existing roads, it is probable that there were no large sections of walling or other structures in Bangor.

South-west of Bangor, modern road-widening schemes and the construction of a housing estate have destroyed much of Telford's road. A possible survival of pre-Telford road [0217] may be seen in a short, overgrown stretch running parallel to the modern road, where its retaining walls are visible



Figure 5.9 Iron sunburst gate on the north side of Menai Bridge (Ken Hoverd)

(SH 594 715). Telford's road continues southwards as a minor road or track bisected by a recently built section of the A55. The road immediately south of the A55 at this point survives as a surfaced side road. It has been narrowed from its original width and includes one of the most remarkable surviving assemblages of Telfordian features - Lon Isa toll house [0034] (see Figs 4.14 and 4.15). This is now a private dwelling but retains its original plan. It survives in close association with a weighing machine booth [0231], a well-preserved embanked depot [0229] (see Fig 4.4), and a plateless milestone [0028]. This is one of only two toll house and weighbridge combinations surviving on the Holyhead Road, the other being Ty Isaf toll house [0112] and weighbridge [0601] (Fig 5.22). Lon Isa survives the better of the two, with an intact weighing machine chamber beneath the visible superstructure. As well as the very visible toll house and weighbridge, there is a good survival of roadside walling and embanked retaining walls. Collectively it is one of the best preserved sections of Telfordian road along the route. This detrunked section of road rejoins the A5 shortly before Halfway Bridge. On either side of the bridge,

sections of well-preserved Telfordian walling survive on both sides of the road.

Halfway Bridge [0233] was one of Telford's wider bridges. It survives relatively intact below road level, with some leaching from modern pointing and a largely rebuilt parapet wall (Fig 5.10). This retains the appearance of a Telfordian wall. A datestone of 1819 with an adjacent drill or boring mark can be seen in the north parapet wall. At the bridge Telford's road deviates from the earlier one shown on his specification map for Lot 23 (PRO WORK 6/89/Lot 23). The earlier road ran parallel to the west bank of the Afon Ogwen, but having crossed the river with the Halfway Bridge, Telford took an equivalent route on the east bank. Both roads cling to the hillside above the river supported by embankments with retaining walls. There are further substantial walls on the upper side. The pre-Telford road is still in use as a minor road serving a number of farms, one of which, Dinas Farm, may include 18th-century buildings.

Substantial retaining walls support the Telford road on its west side through its curving line. These are essentially Telfordian, built according to his illustrations in Lot 23 for retaining walls 40ft



Figure 5.10 Halfway Bridge; Telford's style of single-arched bridge [233] (Ken Hoverd)

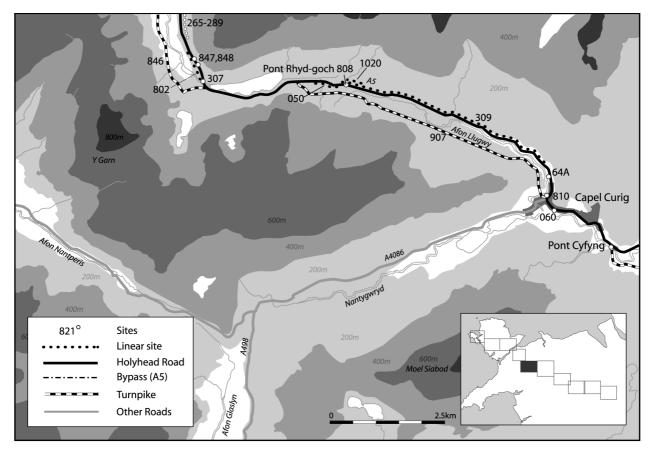
(12.2m) high (see Fig 4.5). The east side of the road was cut into the hillside. The spoil was used in the embankment to the west (PRO WORK 6/89/Lot 1). Since Telford's route from Halfway Bridge to Bethesda was entirely new, the approach to Bethesda was able to take a straight line. This terminated in an arch 10ft (3m) wide [0243] that survives intact on the south-west side, but is concealed by a modern extension on the north-east side, where walkways have broadened the road.

Bethesda, once described as 'a long, long street of the most furiously ugly houses that ever roof was put to' (Harper 1902, 261), was a community that grew up to accommodate workers at the Penrhyn quarry. Within the village Telfordian structures have largely been removed by modern road widening, particularly on the east side. Two bridges, one with an arch 40ft (12m) wide [0239], the second one 20ft (6m) wide [0241], were not accessible during the course of the field survey due to road works, but seemed largely intact. The toll house [0245A] is mostly intact and whitewashed, but has modern windows. Beyond Bethesda, modern road widening has again destroyed portions of Telfordian walling, particularly near Ogwen Bank where large lay-bys have been constructed. A length of relatively wellpreserved wall [0245] with semi-circular depots survives, however.

# 4 South of Bethesda (South End of Lot 28) to Pont Rhyd-goch (Fig 5.11)

As this was the most difficult stretch of terrain for the road, it included the first lots undertaken. In particular, the mountainous section near Nant Ffrancon was Telford's first priority (see Chapter 6) and this fell within Lot 1. Today it is generally well preserved and includes striking examples of Telford's expertise. The section begins near Ty'n-y-maes, which was a staging post for a time, although only the much-altered inn, ruinous coach house, and stables remain [0786]; the road continues in an almost straight line, indicating a stretch of entirely new road, to Ty Gwyn. The road then travels through increasingly rocky and steep crags that rise east of it to Pen-y-benglog Bridge at the west end of Llyn Ogwen [0307] (Fig 5.12). In general the walling and depots on the northern part were poorly





 $Figure \ 5.11 \quad South \ of \ Bethesda \ (Ty \ Gwyn) \ to \ east \ of \ Capel \ Curig \ (Pont \ Cyfyng) - sites \ along \ the \ road$ 



Figure 5.12 Pen-y-benglog Bridge from the south-west [0307] (Ken Hoverd)



Figure 5.13 Pen-y-benglog Bridge from the north-east, showing the span from the earlier turnpike bridge, beneath the 20th-century widening of Telford's bridge (Ken Hoverd)

maintained and on the south were more frequently repaired with obtrusive mortar pointing. Telford built much of his road on the route of another road then in use (PRO WORK 6/89/Lots 1 and 2). The earlier road included several steep gradients, however, and Telford's solution was to engineer a cutting 3 miles (6.4km) long through the mountains with corresponding embankments to raise and level the valley sections, thereby achieving an even gradient of 1:22. Immediately north-west of Llyn Ogwen, the length of the new road was 'to be 28ft above the surface of the present' (PRO WORK 6/89/Lot 1). The result is a testament to Telford's engineering skills. The embankment survives in a largely original condition, although it has been heavily buttressed to stabilise the high walls and to compensate for much heavier modern loadings.

This section is notable for the very large number of depots. Between Ty'n-y-maes and Ty Gwyn there is a semi-circular depot approximately every 50-100m on the east side of the road [0265–0289]. This reflects the greater erosion on steep gradients and the need for more replacement road surface materials.

Immediately north of the Pen-y-benglog Bridge [0307], Telford left the earlier road 'to avoid very inconvenient rocky hills' (PRO WORK 6/89/Lot 2). Tool marks can be seen on rock faces in this area on both sides of the road, together with the point of an iron wedge for splitting rock and an iron bolt. This bridge, a replacement for an earlier one, is built of stone from the rock cuttings (PRO WORK 6/89/Lot 1). It is particularly striking, bridging a steep drop with waterfalls. The south-west face remains virtually intact, but as the east side was widened and refaced in 1928 (LUAU 1999, 34), it no longer has the appearance of a Telfordian bridge. A curious, smaller arch beneath the extended span is not thought to be structural, but was in situ by 1902 (Harper 1902). It is almost certainly part of the earlier turnpike encapsulated within Telford's work (Fig 5.13).

The road continues along the south shore of Llyn Ogwen. Here both sides of the dyke wall have been substantially rebuilt or replaced, truncating Telfordian depots in some cases. The southern wall has been entirely destroyed in places to accommodate parking spaces. The pale, rounded stones used in walling there suggest that worn stones from the lake were used in the original. A straight stretch between Llyn Ogwen and Pont Wern-gof confirms that Telford was again building a new road. The specification map (PRO WORK 6/89/Lot 8) confirms that the former road of Lord Penrhyn ran to the south in the valley bottom west of the Afon Llugwy [0907]. It survives as a low, flat-surfaced, linear earthwork in heathland. The road is preserved in the line of an unsurfaced, embanked footpath that becomes a track at Nant-y-Benglog and rejoins Telford's route

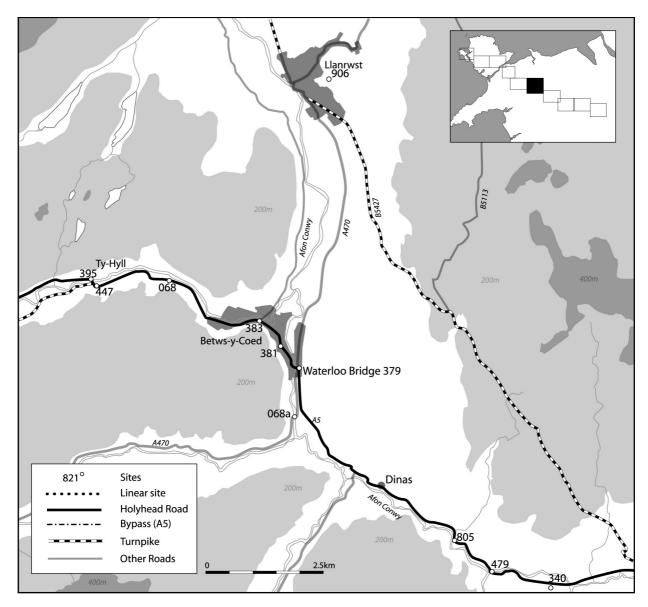


Figure 5.14 East of Capel Curig (Pont Cyfyng) to Pentrefoelas – sites along the road

at Capel Curig. The low-lying situation of the turnpike road made it prone to flooding (Harper 1902, 253) and hence Telford took an alternative route to the north of the river, crossing it at Pont Rhyd-goch [0808].

# 5 Pont Rhyd-goch to Dinas (Figs 5.11 and 5.14)

Telford laid entirely new routes on many parts of this section of the road, bypassing existing roads on the south of the Afon Llugwy and usually taking a higher route on the north side. It was a technically demanding section that required rock cutting and the building of several bridges, but is not generally well preserved. The stretch from Pont Rhyd-goch Bridge [0808] to Capel Curig is entirely of Telford's making. It follows closely the line of the Afon Llugwy. As in many of the wetter areas, Telford built a south-facing route which would catch the sun and help to dry the road.

In this stretch Telford's roadside walling, while unimpaired by modern maintenance, has fallen into extreme decay particularly on the north side. It was originally built as dry-stone walling, but the report of 1836 suggests that this was remedied by a programme of pinning and pointing in that year (BPP 1836 xxxvi.395). The wall is apparently unbonded for much of its length, however, and in such a state of collapse that it generally stands to only 0.3m in height. It is often used as the footing for modern wire fencing. The numerous depots on the north and east sides, especially those immediately north of Capel Curig, are similarly ruinous and many are outlined with slate palings (Fig 4.7).

At Capel Curig, Telford's road rejoins the turnpike route that, west of Capel Curig, survives as a minor road that extends along the south side of the Llugwy valley. A depot and fine county bridge [0810] demonstrate its former status as a well-constructed road predating Telford's by only a decade. It was little



Figure 5.15 Pont Ty-hyll [0395] (OA North)

used by 1892, when the first edition Ordnance Survey map showed it as a track, but it was certainly disused ten years later (Harper 1902, 253). The toll house at Capel Curig [0060] is not well preserved. It is a private house substantially altered by the insertion of modern windows and extensions to the south.

At the Cyfyng Falls, Telford's road again left the turnpike route. The earlier road crossed the river on Pont Cyfyng, curving south through low-lying fields. This route survives as a minor road that is still prone to flooding despite low embankments that raise it above the neighbouring fields. As this is a wet area, Telford's road again took a slightly higher route on the north bank of the river, skirting crags and meeting the turnpike road at Ty-hyll. A very short and uncharacteristic curve in the Telford road west of the Cyfyng Falls has been bypassed by the modern A5, which passes a few metres to the south. At Pont Ty-hyll, the Telfordian bridge [395], unusually a twin-arched structure, has been noticeably repaired in the 20th century, with significant leaching from grouting and conspicuous tie-plates and coping (Fig 5.15). Telfordian cross drains are intact on the south side.

Three short lots take the road through Betws-y-Coed, two of which (Lots 77 and 10) overlap. Little of the Telfordian wall or structures survive in the centre of Betws-y-Coed, but short stretches are present north and south of the railway.

The Waterloo Bridge [0379] is in good condition and is one of the structures which wrote Telford's signature most clearly on the Holyhead Road (see Fig 6.5). The arch ribs were encased in concrete in 1923 and the cantilevered walkways were added in 1929 (Chapter 8). The parapet wall has also been rebuilt, but the bridge remains a great example of Telford's capabilities. It is believed to stand on the site of a pre-existing bridge that Telford mentions only as 'the present Bridge' (PRO WORK 6/89/Lot 3). After crossing the Afon Conwy on the Waterloo Bridge, Telford's road climbs above the river through substantial rock cuttings that provided spoil for the necessary embankments on the south side. The original embankments are largely intact, albeit incorporating modern maintenance work.

## 6 Dinas to Glasfryn (Fig 5.14 and 5.17)

There are relatively low-lying stretches of the road in this section, where a number of small bridges cross the numerous streams. In several lots Telford's specifications do not include a map, which means it is difficult to locate pre-Telford roads. Several very straight stretches suggest that he was forging an entirely new route, but in some cases he was following a then relatively new turnpike road, notably on the line west of Hendre Isaf. An early road



Figure 5.16 Hendre Isaf toll house, a turnpike toll house reused on Telford's road [0340] (OA North)

alignment may be preserved in a succession of footpaths on the south bank of the river, rejoining the Telford route at Padog.

There is a gap between lots from Dinas to Rhydllanfair, but the presence of a milestone and the character of walling show that the road was built or at least improved by Telford. The bridge across the Afon Conwy, Rhydllanfair Bridge [0805], indicates that pre-Telford roads also included some technical achievement, as the bridge is an elegant structure with a span of approximately 15m and a datestone of 1780 (see Fig 4.8). This was bypassed by Telford, however, who built on the north bank of the river and raised his road on relatively low embankments, which have been reinforced in recent years.

The approach to Pont Padog [0479] includes a stretch of much-repaired Telfordian walling and very large embankments on the south, all built of the thin slates characteristic of the area. At the time of the survey in 1999 the retaining and parapet walls were undergoing substantial repairs to remedy the erosion and slippage caused by heavy traffic. These have resulted in the rebuilding of much of the Telfordian walling. The single-span, stone bridge at Padog [0479] (see Fig 4.10) replaced an existing bridge downstream. This is mainly Telfordian in appearance, but has been reinforced in the 20th century by the insertion of 'fish plates', or throughrods which tie the faces of the bridge. It has been

heavily grouted with modern cement mortar that has leached badly.

Just over 1km east of Padog at Hendre Isaf, Telford specified that spoil from nearby rock cuttings was to be used 'partly in filling up hollows, and the rest to be laid on the field side of the lower fence and it was to be regularly sloped so as to make land and strengthen the lower side of the road' (PRO WORK 6/89/Lot 26). It is unusual to find such precise instructions for the dumping of spoil. In this relatively level area, the quantities of rock produced from cuttings were probably surplus to local requirements for embanking. The area was inspected and generally corresponds to Telford's description, although no particular spoil dump could be located. Between Padog and Pentrefoelas the Telfordian walling is clearly distinguishable from the modern concrete-set replacements, which were constructed on the lines of the original walls and even the depots. Road widening and the creation of lay-bys and splayed junctions have had some impact on the walling. At Hendre Isaf [0340] is a fine example of a pre-Telford toll house that was listed as a toll house on the Capel Curig turnpike (Shrewsbury Chronicle 9th July 1813). It is a single-storey, L-shaped lodge of rubble construction, with a shallow pitched, halfhipped roof (Fig 5.16). The part-hipped gable end of the building fronts onto the road and had a central doorway to take the tolls (now replaced by a window).

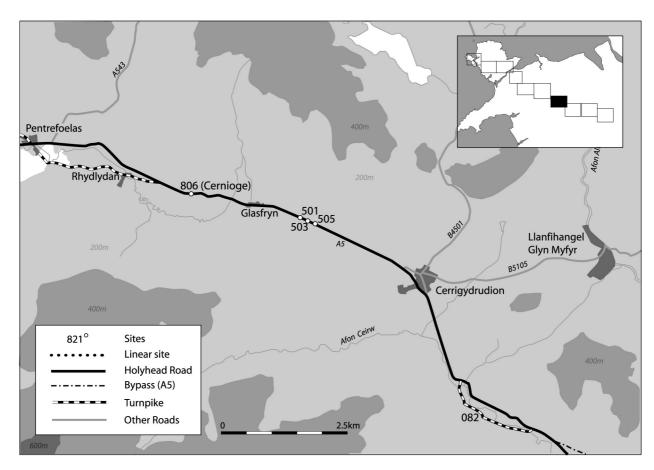


Figure 5.17 Pentrefoelas to Ty Nant – sites along the road

Pentrefoelas was important as the crossing point with an earlier turnpike route that ran up the Conwy valley. The Pentrefoelas Arms predates Telford's road and once had a thriving posting trade. It served as a stage coaching inn from 1839, when it received the coaching licence recently surrendered by the posting house at Cernioge Mawr (see Chapter 7). At Cernioge Mawr [0806], a complex of farm buildings and a private house are remnants of a coaching inn that predates Telford's road. An earlier visitor described the inn at Cernioge as:

. . . the place to which the milestones have been insistently directing, since Corwen. What, the stranger wonders, is this place . . . that it should be thus dignified? Well, here it is, just a farmhouse lying back from the road, with a pond beside it under the trees, a few outbuildings, and an older toll house than the Glasfryn one . . . yet this, in the old days of road travel, was a quite famous inn and posting-house (Harper 1902, 227–8) (Fig 7.8).

The former inn, stables, and other outbuildings survive in good condition. On the north side of the road stands a stable associated with this complex. It has changed little since the early 20th century (see Fig 7.8). In addition to the older toll house, it was noted that there was 'an older toll gate standing close by, and early deserted'. A ruined structure seen east of the farm on the north side of the road corresponds in location to the reported toll house, but has the rough, dry-stone walls characteristic of a stock enclosure rather than a domestic structure. Walling from here to Glasfryn includes semi-circular depots, many surviving only to two or three courses. The building of extra courses above the Telfordian coping stones has raised this walling in places, in particular immediately west of Cernioge. Milestones from Pentrefoelas eastwards usually lack plates.

## Glasfryn to Corwen (Figs 5.17 and 5.20)

Telford frequently gave a single lot number to important structures, such as bridges, or to demanding stretches of road that required rock cutting or embankment. It is unclear why there was a proliferation of short lots on the west side of Corwen, however, and also to the east in the next section of the road. The very straight stretch from Glasfryn to Cerrigydrudion, though suggestive of a completely new route, was in fact already established, requiring only minor improvements by Telford (PRO WORK 6/90). In parts of this section, for instance south of Cerrigydrudion, Telford particularly specified fences to border the road rather than walling. These took the form of a low bank with a hedge, but hedges still form much of the roadside boundary in this area. As in the case of similarly low-lying ground at Malltraeth Marsh in Anglesey, it



Figure 5.18 Modern pre-cast, stone-faced, concrete walling and depot towards Maerdy (Ken Hoverd)

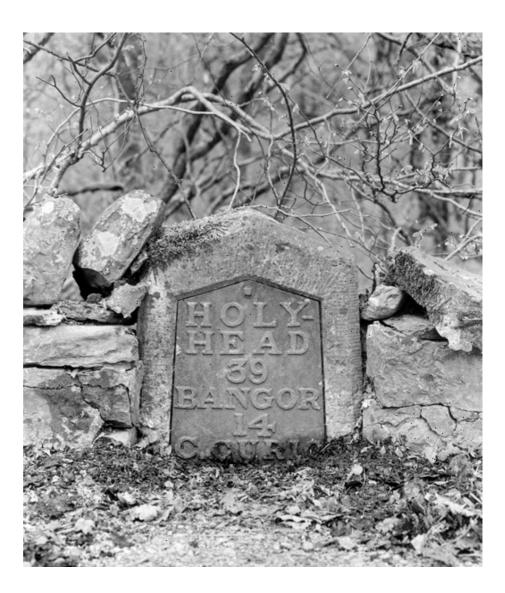


Figure 5.19 Milestone 39, an example of a partially buried milestone (Ken Hoverd)

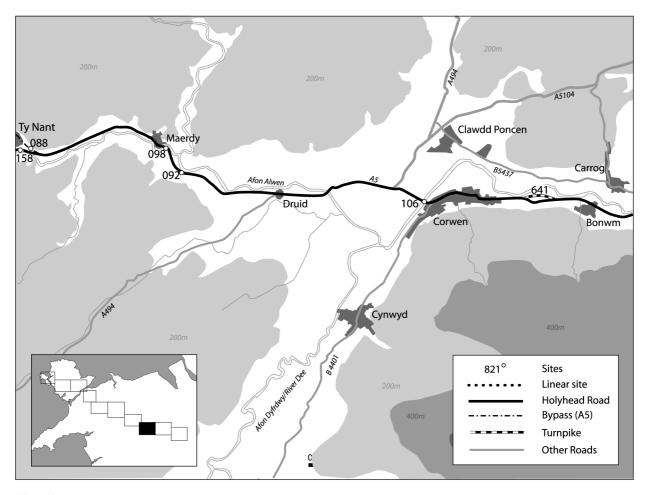


Figure 5.20 Ty Nant to Bonwm – sites along the road

may be that Telford felt that walls would not stand up to heavy vibrations. Remarkably three depots west of Glasfryn [0501, 0503 and 0505] of similar dimensions to stone-built depots are still outlined in hawthorn hedging. It is thought that these depots were never built in stone. While there is some evidence of decayed stone at their bases, this probably served only as packing to moor the quickset hedges. It seems likely that hedge-laying has adhered faithfully to the outlines of depots, which have long been unused. West of these hedged depots, embankments have been reinforced in recent years and the road has been widened in places, resulting in the loss of much walling. Where it survives at all, Telfordian walling is extremely dilapidated, serving only as a footing for hedges.

Since there is a gap in the lots between Pant Dedwydd and Bron-y-graig, it may be that the existing road needed little improvement. There is a further gap between Lots 37 and 38 encompassing Cerrigydrudion. At Hendre Arddwyfaen a former road [0082] bypassed by Telford survives as a tarmac track south of the Afon Ceirw.

South of Ty Nant a curving section of Telford's road [0158] through the Glyn Dyffwys gorge above the Pen-y-Bont Falls is now bypassed by a new line of road. This was a particularly challenging area for

Telford's engineers, since substantial rock cuttings on the north side had to be matched by embankments over 20m high on the south (see Chapter 6). The retaining walls have been repaired, but below the road they are essentially Telfordian features, although now with concrete coping and mortar. The northern stone dyke walls including depots and a square plinth identified as a tank on the first edition Ordnance Survey map (1880) are now decayed. At the east end of this bypassed stretch, a Telfordian milestone [0088] (Fig 5.27) has been relocated from its former position to put it adjacent to the new road. It retains a painted plate and is in very good condition. The stretch of road west to Maerdy includes much deteriorating Telfordian walling, where semi-circular depots are often absent or overgrown. Conspicuous, pre-cast, stone-faced concrete walling panels have been inserted in places (Fig 5.18).

Maerdy Bridge [0098] has a single arch and may have been built by Telford. It still has elements of the original façade, but is much rebuilt and repointed on the north side, while an extension to the south side has obscured the original structure. A toll house [0092] survives at Cymro Gate (SJ 022 439), but has been much altered by rendering and the insertion of modern windows. Beyond it Telfordian walling continues only intermittently and in varying



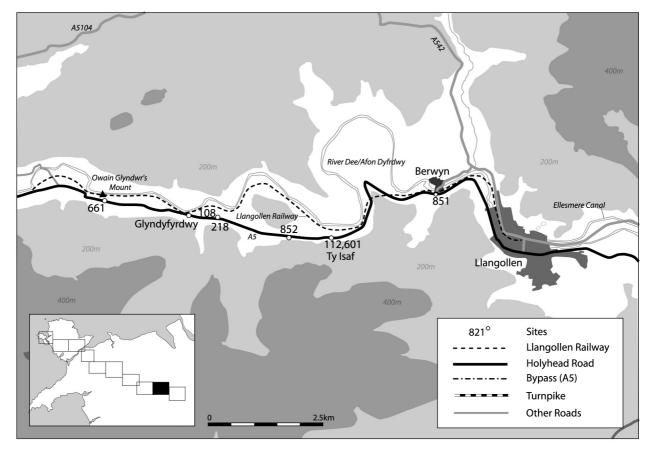


Figure 5.21 Bonwm to Llangollen – sites along the road



Figure 5.22 Ty Isaf weighbridge house [601] (Ken Hoverd)

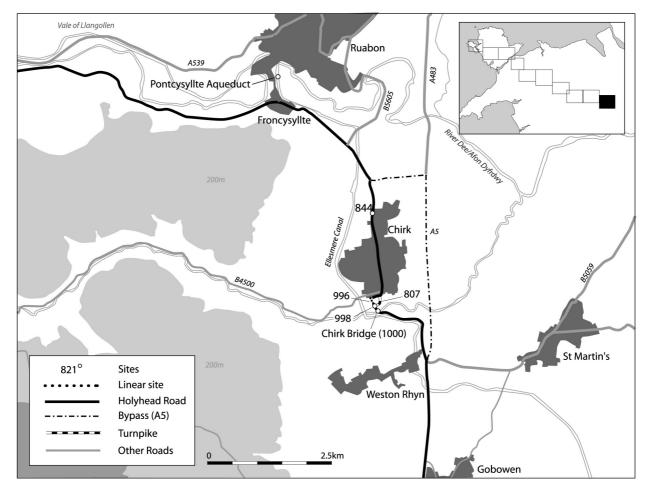


Figure 5.23 Llangollen to Chirk Bridge – sites along the road

condition, although retaining walls about 3m high survive well on the north side. From Druid to Corwen there is very little Telfordian walling, although in some areas hedging may follow the lines of quickset hedges specified by him.

The bridge over the Afon Dyfrdwy (Dee) [0106] is a broad, squat, seven-arched bridge quite unlike other bridges on the route in its form. It was a rebuild by the county authorities of an earlier bridge (Trinder 1998). Its construction of rubble coursing is typical, but the parapet wall has subsequently been rebuilt. Besides being plateless, many milestones in this section are partly submerged beneath the modern road make-up, so that little more than half the stone is visible (Fig 5.19).

#### Corwen to Llangollen (Figs 5.20 and 5.21)

From Corwen the road continues eastward in a series of very short lots, with short gaps immediately east of Druid and between Lots 40 and 71. The terrain does not suggest any reason for this. With numerous depots on the south side, walling east of Corwen survives well until 0.5km west of Llidiart y Parc, where it is interrupted on both sides. A short section of old road south of the town that exists only as a field boundary was disused even by the time of the first edition Ordnance Survey map. Huge embankments survive west of Owain Glyndŵr's mound, but the equivalent revetting on the south side is of modern concrete. A short section of pre-Telford road [0641] west of Plas y Bonwm, shown on Telford's specifications, was later used as a base for the railway, which is now dismantled.

East of Owain Glyndŵr's mound as far as Glyndyfyrdwy, a very good stretch of Telfordian wall on the south side of the road includes more than twenty well-preserved, semicircular depots. The line of an earlier road is seen in private tracks to Carrog-isaf and a building to its east, but is not visible immediately east of the mound. A bridge at Glyndyfyrdwy [0108] has been largely rebuilt. Telford overcame the steep slopes of the nearby older road by building a very large embankment, which is still in good condition. The Telfordian wall has, however, been mostly removed to accommodate pavements and lay-bys. The south side of Telford's road survives well, although a bridge at Plas Isaf [0852] has been completely obscured by concrete rendering.

The Ty Isaf toll house [0112] and weighbridge house [0601] described in Telford's Lot 40 (PRO

Section no. % Surviving Condition Comments 35% Largely gone Splayed depots survive, but the Caergeiliog toll house, Stanley Embankment, and most walling have been substantially altered. Holy Island section almost completely absent. 2 35% Intermittent survival. The toll house at Castell Eden and embankment Largely gone at Malltraeth Marsh are damaged: walling often broken or heavily repaired; drains etc obscured. 3 50-55% Largely intact Nothing in Bangor, but a good section at Lon Isa is reasonably preserved, with walling, embanking, and structures eg Halfway Bridge and bridges in Bethesda. Walling and depots generally well preserved if much repaired. 4 60-65% Largely intact Embankments and retaining walls are good throughout; bridges are 40% Walling badly maintained, probably beyond repair in most places. Capel 5 Partially intact Curig toll house is much altered and the bridges have been repaired. The embankments are good. The walling is much repaired, but often clearly Telfordian. Padog 40% Partially intact 6 Bridge and embankments are visibly reinforced. 7 40% Partially intact Hedge depots survive, but the embankments are sometimes altered. The Ty Nant section is good, but with conspicuous repairs. The walling is much interrupted throughout. 8 Walling and depots are well preserved up to Ty Isaf toll house, which is 35-40% Partially intact less so. East of this, walling and embankments are reinforced or absent in many places. 9 40-45% Partially intact A good stretch survives at Chirk, but elsewhere the walling is

Table 5.2 Features of Telford's Holyhead Road surviving at the time of the survey

WORK 6/90) still stand at Y Bwthyn (Fig 5.22). This is one of two surviving toll house and machine house combinations, but is not as well preserved as that at Lon Isa [0231] near Llandegai. The restored Ty Isaf machine house is used for storage. Consolidation obscures some internal detail although the lower part of the weighbridge house which formerly housed the mechanism was not accessible. The specification for Lot 40 says, however, that the machinery in the two machine houses was identical. It is assumed, therefore, that the well-preserved weighbridge house at Lon Isa echoes the original state of Ty Isaf.

East of the toll house, walling on the south is more degraded, being either absent or substantially repaired. The northern or western side of the road still has a Telfordian retaining wall below the road, but the parapet walls are interrupted and often entirely rebuilt. Between this area (SJ 190 430) and Berwyn is a pair of rock-cut depots [0851]. Intermittent and badly maintained or rebuilt walling continues to Llangollen, although some attempts have been made to remove trees growing into the wall. West of Llangollen a stretch of essentially intact Telfordian dyke wall has been threatened by the trees growing on top, but these have recently been cut down. No Telfordian structures were noted in Llangollen.

# 9 Llangollen to Chirk Bridge (Figs 5.21 and 5.23)

significantly repaired or replaced and the road has been widened.

Immediately east of Llangollen intermittent walling resumes, much of it apparent only as stumps about 0.3m high. Its condition improves towards Froncysyllte, but the walling is nevertheless very insecure and in need of consolidation. On the approach to Froncysyllte the old road appears as a narrow private track with high retaining walls. East of Froncysyllte, Telford's vertical stonework coping has been replaced by horizontal slabs of concrete. For a few metres north of the Afon Bradley, Telford's road leaves the A5 and is seen as a hedged field boundary. Thereafter and on to Chirk Telfordian walling or other structures are seldom seen, as the modern road has been widened.

The final stretch of Telford's road in Wales on the approach to Chirk Bridge [1000] exemplifies Telford's method for the whole road. The steeply sloping, hairpin bend of the previous road was replaced by a straight and massively embanked section running on a far gentler gradient to the west end of Chirk Bridge (Figs 4.11 and 6.1). A plaque records that this bridge was erected by T Telford in 1793 and that it was extended and reconstructed in 1924. The embankment incorporates an arched, stone-constructed drain [0998] set through it. The drain is, however, now in a rather decayed condition. The toll house at Chirk that

Table 5.3 Toll houses on the Holyhead Road and surviving remains

| Parliamentary Report name | Modern name                | Surviving remains | Project no. | Grid reference |
|---------------------------|----------------------------|-------------------|-------------|----------------|
| Stanley                   | Stanley Embankment         | Yes               | 0001        | SH 2707 8035   |
| Cae Geiliog               | Caergeiliog                | Yes               | 0004        | SH 3048 7858   |
| Gwalchmai                 | Castell Eden (Gwalchmai)   | Yes               | 0077        | SH 3984 7610   |
| Nant                      | Ty Nant                    | No                |             | SH 4503 7395   |
| Llanfair                  | Llanfairpwllgwyngyll       | Yes               | 0197        | SH 5314 7154   |
| Lonisa                    | Lon Isa                    | Yes               | 0034        | SH 6018 6936   |
| Tyn-twr                   | Bethesda                   | Yes               | 00245A      | SH 6263 6581   |
| Tyn-y-Lon                 | Capel Curig                | Yes               | 0060        | SH 7212 5799   |
| Bettws-y-Coed             | Betws-y-Coed               | No                |             |                |
| Hendreissa                | Hendre Isaf (Pentrefoelas) | Yes               | 0340        | SH 8501 5125   |
| Cernioge                  | Cernioge                   | No                |             |                |
| Druid                     | Maerdy                     | Yes               | 0092        | SJ 0219 4396   |
| Corwen                    | Corwen                     | No                |             |                |
| Ty-issa                   | Ty Isaf                    | Yes               | 0112        | SJ 1671 4225   |
| Llangollen                | Llangollen                 | Yes               | 0822        | SJ 2190 4180   |
| Whitehurst                | Chirk                      | Yes               | 0844        | SJ 2892 3889   |

Table 5.4 Sunburst gates surviving from the Holyhead Road and at Conwy

| Name                            | Project no. | NGR          | Comment  |
|---------------------------------|-------------|--------------|--|
| Stanley Embankment              | 0001        | SH 2707 8035 | Gate near original location of toll house.   |
| Menai Bridge                    | 0215        | SH 5559 7156 | On the east side of the Menai Bridge.  |
| Cae'r-llo                       | 0901        | SH 8620 6670 | At entrance to farm driveway, with an associated Telfordian turnstile.   |
| Glan yr Afon                    | 0902        | SH 8780 6970 | At entrance to farm drive. Lower sunburst plate has no rivets and may not be original.   |
| Ty Cerrig                       | 0903        | SJ 0225 4595 | In use as field gate. Retains original hanging post, but in poor condition.  |
| Plas Iolyn                      | 0904        | SH 8814 5034 | In farmyard. Gate is in good condition.  |
| Marl Farm, Conwy                | 0905        | SH 7980 7873 | Gate has two cross braces for strengthening.   |
| Cae Melwr                       | 0906        | SH 8070 6070 | In good condition (Fig 5.24).  |
| Maesol                          | 0910        | SH 8538 6673 | Sunburst plates have no rivets. Later cast-iron gate post, with an associated Telfordian turnstile.  |
| Museum of Welsh Life, St Fagans | 0911        |              | Gate originated from Castle Eden toll house,<br>Gwalchmai.   |
| Llangaffo                       | 0912        | SH 446 685   | A pedestrian gate at the entrance of Llangaffo churchyard.   |
| Blists Hill, Ironbridge         | 0913        |              | A wrought-iron gate at Blists Hill, Ironbridge, that came from Capel Curig. Its posts are in slate, but match Shropshire examples that are in sandstone. |
| Rug Castle                      | 0914        | SJ 054 437   | A gate with small radius sunburst plate near Rug Castle.   |
| Conwy Bridge                    | C030        | SH 7850 7750 | At east end of Conwy Bridge. It has an associated pedestrian gate. Probably the only gates still in situ.  |

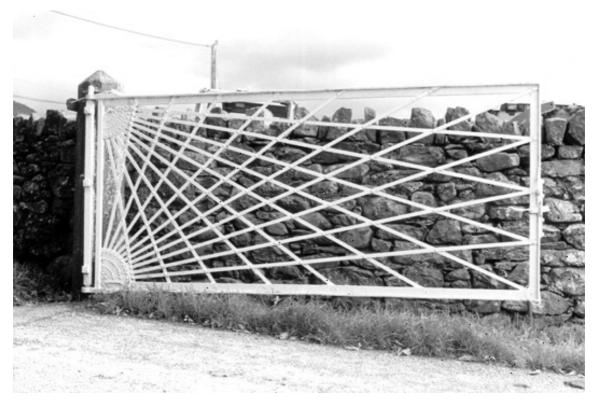


Figure 5.24 Cae Melwr sunburst gate [0906] (Ken Hoverd)

belongs to the turnpike road was later adopted into the Holyhead Road (BPP 1810 IV.33).

# Survival of the Holyhead Road and associated features

As described above, some parts of the road and the associated features that Telford built along the sections survive well, while others have been badly disturbed or destroyed. The proportion of these features and the road that survives has been estimated (Table 5.2), and the survival of features is discussed below.

## The road surface

The Holyhead Road has been subject to considerable alteration to adapt it for modern traffic. This has involved the widening of the road surface from Telford's original width of 18ft (5.5m; PRO WORK 6/89) to the present average width of 40ft (12.2m), where the road surface almost fills the space between the dyke walls. Because tarmac has been laid, there are no exposed original surfaces. There is the potential, however, for the partial survival of historic road surfaces beneath the present road. This is demonstrated by the condition of some milestones. Telford's specification for milestones (see Fig 4.12) required that the height from the top of the stone to the road surface was to be 4ft 11in (1.50m). The observed design of the stones closely matches the specification, but in many cases the height above the road surface is now considerably reduced. The extant height varies between 0.45m and 1.17m, but with some (such as Milestone 39) the pavement tarmac partly obscures the structure itself (Fig. 5.19). This suggests that, if the milestones are still in situ, the road level has been built up in places by as much as 1.04m since the construction of Telford's road. With such a depth of cover the surface of Telford's road may survive.

It was thought that it might be possible to distinguish the work of individual contractors along the road, but this proved not to be the case. Particular attention was paid not only to the junctions of individual lots where differences might have been expected, but also to separate lots known to have been built by the same contractors. Since junctions were often situated at bridges, toll houses, or other sites where a change in technique was probably necessary, any evidence of a joint between the work of separate gangs was obscured. To an extent, the distinction between differing builds may have been obscured by subsequent repair and consolidation work to the road. It may also be the case that the lack of differences between lots reflects the close supervision by Telford's overseers to ensure that the contractors adhered to the specifications.

## Toll houses

Some of the toll houses have survived well. Llanfairpwllgwyngyll [0197] (Fig 4.16), for example, is in



Figure 5.25 Maesol Farm turnstile [0910] (OA North)

excellent condition and has been subject to only minimal alteration. A panel outlining the toll charges set on the first-floor exterior facing the road still survives. As these toll houses were well documented within the Parliamentary Reports (BPP 1824 IX.293; BPP 1830 XV.23; BPP 1835 XXXVI.271; BPP 1845 XXVII.169), it is possible to measure their survival rate. The reports suggest that not all those shown in Table 5.3 were necessarily operational at the same time. The toll house at Caergeiliog [0004], for example, was first mentioned in 1845, suggesting that it was a relatively late addition (ESJ 26 March 1845). There is a record for the construction of the Ty Isaf toll house [0112] dating from 1821 (BPP 1830 X.131), but there is no further reference to it in any of the subsequent toll house lists. This possibly indicates that some of these lists may be incomplete.

During the survey no remains were found of the recorded toll houses of Ty Nant, Betws-y-Coed, Cernioge, and Corwen. The Cernioge toll house was referred to by Harper (1902, 226) who indicated that it was close to the inn and 'deserted' in 1902. Overall there is a 75% survival rate for toll houses.

The wash-houses, or even privies, specified by Telford such as that at Llanfairpwllgwyngyll, were often not apparent at the toll houses. They may have been destroyed during later conversions. There was no evidence for kitchens beside the Anglesey houses, nor do the plans seem to allow for any within the buildings. Indeed no peripheral structures associated with the toll houses were seen at all, apart from the two machine houses at the weighbridges mentioned above (Chapter 4).

## Toll-gates and turnstiles

Considering that the gates were constructed 170 years ago, it was expected that few would survive. Assuming one road gate for every toll house and bridge toll there could have been as many as eighteen road gates along the Welsh section of the route. Remarkably, eleven

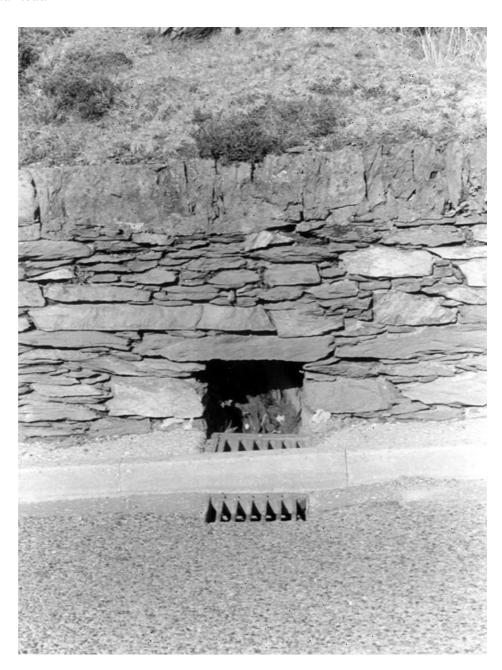


Figure 5.26 Drain from the road to the side ditch beyond the wall, Nant Ffrancon [847] (Ken Hoverd)

survive along with a gate at Conwy Bridge [C032] (Table 5.4). Of these the gates at the relocated Stanley Embankment toll house [0001], the Menai Bridge [0215] (Fig 5.9), and the Conwy Bridge [C032], which has an attached pedestrian gate, are close to their original positions. That from the Castle Eden toll house [0077] at Gwalchmai has been removed to the Museum of Welsh Life, St Fagans, Cardiff [0911]. The remaining survivals are scattered over north Wales where they serve as farm or field gates as, for example, at Cae Melwr [0906] (Fig 5.24). The design of the gates corresponds closely to the specification drawings. They are for the most part unaltered, although some sunburst plates now have their radial bars welded rather than riveted. One at Marl Farm, Conwy [0905], has two strengthening cross bars. At Pont Cyfyng a toll-gate associated with the toll house remained in place until 1890 (Harper 1902, 250).

It is surprising that two wrought-iron turnstiles of

almost identical design also survive, one at Maesol Farm [0910] (Fig 5.25) and the other at Cae'r-llo Farm [0901]. These are of the same basic design as the road gates, yet contrast with the specification for wooden turnstiles. Set adjacent to the gates, they now perform an ornamental function, but remain operable.

#### Walls

A noticeable variation along the route was created by using local stone in the retaining and dyke walls. The appearance of the walls changed with the geology in a striking manner. For instance, the shallow, flat slate used in walling around the Padog area is quite different from the squarer sandstones of the Chirk area. The stone dyke walls mentioned so frequently in Telford's specifications commonly survived. A wall breached in section during road works at Treban

conformed to Telford's requirement for through-stone construction. In addition all Telfordian walls inspected seemed to match closely the measurements and descriptions given in specifications. Overall 19% of the sites in the survey retained sections of dyke wall.

In many places dyke walls had been repaired or rebuilt to such an extent that they could no longer be considered 'Telfordian'. Heavy pointing with concrete mortar often made it impossible to identify Telford's wall conclusively, while elsewhere modern coping or masonry formed a major part of the wall. In these circumstances it was difficult to say where Telfordian walling began and ended. Walling described as Telford's in the survey may, therefore, have included a proportion of modern masonry. Where coping has been renewed, Telford's irregular local stonework was often replaced with massproduced uniform concrete coping blocks. Towns and villages were generally devoid of Telfordian walling - it had usually been so disturbed by the insertion of private entrances and wide junctions as to be effectively destroyed.

Due to the high standards required by Telford's specifications, the fabric of Telford's retaining and breast walls survives relatively well. The revetment walls of many embankments have been subject to modern repair, often with a heavy-handed use of mortar, but usually only in the upper parts. The lower courses are well founded with large stones. They are typically still original (LUAU 1999, 48), although with the application of modern repointing, as seen at the Lon Isa embanked wall and depot [0229] (see Fig 4.4).

## Drains and culverts

As with the original road surface, the side channels have all been overlain or destroyed by subsequent works. Despite the meticulous nature of their construction, the original cross drains were also seldom seen during the survey. They had often been obscured by the raising of the road surface and by vegetation and soil build-up on the other side of the wall. Those that do survive, particularly on embanked sections of road, have either been obscured by later maintenance work, or have been entirely rebuilt.

The best surviving drains were found on the impressively embanked Nant Ffrancon section of the road to the east of Llyn Ogwen, which has multiple cross drains [0847 and 0848] feeding under the walls on both sides of the road. These vary in form and condition, while many have been subject to recent repair. Some conform broadly to Telford's specification and are set into walls which have seen relatively little rebuilding. Consequently these drains may be original in form for the most part (Fig 5.26). They comprise crudely dressed side uprights between 0.3m and 0.5m across with thin slate lintels. The majority of the drain apertures are now below the level of the road surface. This was in part

design, but also reflects the general raising of the road level.

#### **Depots**

Over the 83 miles (133km) of the road covered in this survey, 333 depots were recorded - an average of one every quarter of a mile (0.4km) – but in reality considerable variation was identified in the distribution. Some areas such as the relatively steep Nant Ffrancon section between Llvn Ogwen and Bethesda had a larger density of one depot every 87 yds (0.08km), reflecting greater erosion there and the corresponding need for more surface material. In lower terrains such as that around Corwen, depots were as few as one in every mile, although this may reflect the reduced survival of the Telfordian depots in such areas.

Depots generally conformed to specifications, but in many cases they had lost their shape during subsequent maintenance works. They conformed broadly to three shapes: splayed, rectangular, and rounded or semi-circular. Some fit exactly the splayed plan shown in Telford's specifications. An example is the well-preserved depot next to the Lon Isa toll house [0231] (see Fig 4.4), although this is only 8yds (7.3m) in length rather than the 12yds (10.8m) given in the specification. Others were rectangular or rounded in plan, but there was no clear pattern to their groupings - splayed depots seemed to predominate in the western third of the route.

The depots are no longer functional, but it is significant that they have often been preserved even when the roadside walls have been completely replaced. This is notable around Llangollen where sections of retaining wall have been replaced with modern pre-cast concrete panels and the shape and form of the depots has been preserved in the modern structures. The survival of a depot does not, therefore, necessarily indicate that its component walls are original.

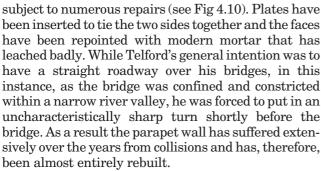
Many depots had been pointed with a thick pink concrete mortar. The mix had been so heavily applied that it gave the impression of rendering. This made it difficult to judge where repairs had affected the make-up of the depot. Most had tarmac or gravel surfacing. None were seen with the stone-flagged floor specified by Telford, although it may have been present under the modern surface. In areas where modern repairs have almost entirely replaced the Telfordian wall, the new wall had not truncated Telford's depots to make a straight line, but had recreated them. Since the present management of the road does not require such frequent depots, it is possible that depots have been respected and rebuilt to avoid cutting new foundation trenches for the walls.

# Survival of small bridges

The surviving bridge at Pont Padog [0479] corresponds very closely to the specification, although it has been



Figure 5.27 Archaeologist Jo Bell recording Milestone 61 (OA North)



The condition of the remaining smaller bridges on Telford's Road is variable, but in general most have been added to and repaired rather than replaced. While the bridges were wide enough for his anticipated traffic, they are not wide enough for modern vehicles and conditions. Many have been widened by the construction of a second bridge span adjacent, and hence the Telfordian fabric is only visible on one side (eg Pont Pen-y-benglog) [0307].

#### **Milestones**

It is surprising that only five of the original 83 milestones are missing along the route of the road. Some of the lost milestones are shown on the current 1:10,000 maps, suggesting these have only recently disappeared. Many of the surviving milestones, for example

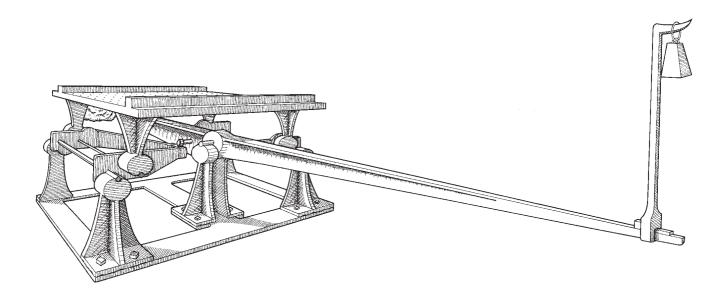


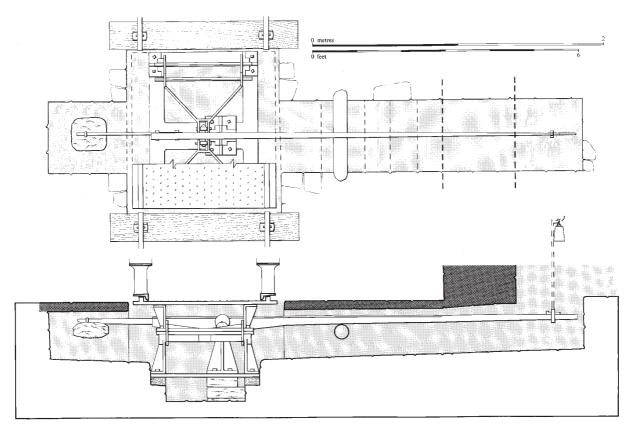
Figure 5.28 Lon Isa weighbridge house (Ken Hoverd)

Milestone 44, remain in good condition (see Fig 4.13). Conversely Milestone 26 is substantially damaged and in need of repair. The plates have fared less well. Of the original 83 plates, 39 are now missing, mainly from the eastern section of the route (LUAU 2000a).

The original appearance of the plates on the milestones may have varied, as a recent analysis of the paint demonstrated that the painting scheme has altered since their original construction (Crick and Smith 2000). There is today a variety of combinations, either black letters on a white background or vice versa depending on the location of the milestone. In general those on the eastern part of the route generally have a white background with black lettering (Fig 5.27), whereas those on the western part have a black background with white lettering. The distribution of the two schemes approximately coincides with the historic counties of Caernarfonshire and Denbighshire, suggesting that each had a different repainting policy.

Analysis showed that the earliest layers of paint on the plates were a black lead-based oil paint which was painted all over. The introduction of white, in the form of a French Ultramarine pigment, occurred only after 1850 when this paint became widely available. The use of an original monochrome scheme suggests a time when travel was more sedate and it was possible to read such lettering from a moving carriage.





Figure~5.29~~Weighbridge~machine~from~Banwen~Ironworks~railway,~similar~to~those~used~on~the~Holyhead~Road~(RCAHM(W))

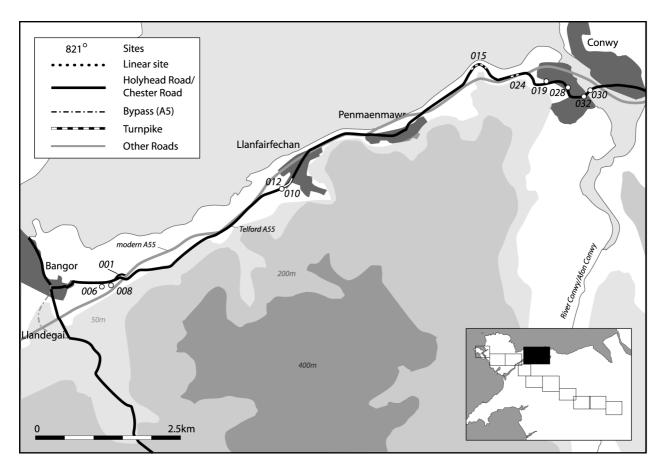


Figure 5.30 The Chester Road, Bangor to Conwy – sites along the road

Measurements of the stones taken in the course of the recent survey demonstrate that they closely matched the specification. There is only a 1.2% deviation between the actual and the design, although most stones are now substantially buried because of subsequent raising of the road surface (Fig 5.19).

A programme of milestone restoration currently being undertaken by the Transport Directorate of the National Assembly for Wales and Gwynedd County Council. This will involve the replacement of lost plates with replicas and the replacement of the missing stones (LUAU 2000b).

# Weighbridges

Two of the three documented weighbridges partially survive at Lon Isa [0231] and Ty Isaf [0601]. None of the iron mechanisms are left, but the engine houses are still in relatively good condition. That at Lon Isa is a small, single-celled, square building (2.4 x 2.4 x 3.2m) constructed on an embankment. It had a door facing north and the windows that face out across the road and look south along its line are now blocked (Fig 5.28). The weighbridge house was set beneath the floor at road level was a small chamber for the weighing machine. As the westward extent of this chamber beneath the road has unfortunately been blocked off, the full extent of the weighing machine chamber is not

known. The Ty Isaf weighbridge house is a two-celled structure, with a slightly longer north to south axis (3.1 x 2.4 x 2.9m). This toll house does not have an exposed chamber below the road level.

From the observed evidence, the working mechanism of the weighbridge is unknown, although it seems very likely that it may have operated in a similar manner to the reconstructed example from the Banwen Ironworks railway (Hughes 1990, 182-4). The Banwen example, which dates from about 1847, is more or less contemporary with the revamped weighbridge machines of the Holyhead Road constructed in 1843 and comprises four pivot points. Lever bars take the weight of the vehicle that partly rested upon a long lever arm. This extended under the track into the engine house where the weights were read (Fig 5.29).

## The Chester Road - Bangor to Conwy (Fig 30)

At the same time as the Holyhead Road was being constructed, Telford was commissioned to rebuild and renew the road from Bangor (or Llandegai) to Conwy as part of the improvements to the Holyhead to Chester route. The road was mainly to follow an already long-established route along the north Wales



Figure 5.31 Tyn-y-Hendre toll house [C006] (OA North)



Figure 5.32 External view of the Bangor Gate [C028] (OA North)

coast that had been put in place by turnpike trusts in the previous 30 years. These turnpike roads had been an improvement on earlier tracks, but they were still often poorly made and drained. The recent survey of Telford's road from Bangor to Conwy examined the survival of the features of his road, much of which coincides with the route of the present A55 (LUAU 1999).

The survival of Telford's Chester Road between Bangor and Conwy was found to be extremely poor in comparison with the other Welsh sections of the Holyhead Road. The present day A55 that runs between these towns is a broad dual- or multi-carriageway which has been much improved in recent years. These improvements have entirely destroyed those sections of Telford's road that were constructed on the same alignment.

Where some sections of Telford's road have been bypassed by the modern road, it was thought that there would be better survival in these locations. Even there, however, on the approach to Conwy and at Llanfairfechan, the survival of features was intermittent and the remaining fabric of poor quality.

One stretch of Telford's road survives on an alignment at the foot of steep outcrops east of Conwy quarries [C024]. At this point, the Telford road leaves the A55 to follow the A547 into Conwy. Between the A55 and the A547 a short stretch of the Chester road survives as an earthwork. The remainder of this short stretch continues as a tarmac track [C001], but retains little identifiable Telfordian fabric. An isolated stretch of road also

survived in the line of the present footpath and cycle path over the northern slope of Penmaenmawr [C015]. This has been resurfaced with tarmac and modern concrete kerbs and its walls mostly rebuilt, suggesting that it has been in recent use.

The embankments which carried the road above boggy ground have seldom survived on the redeveloped A55. The best preserved embankment [C010] was, however, found near Llanfairfechan with an associated milestone [C012]. It runs south-west to north-east for approximately 200m as an earthen feature without walling on either side of the road. The survival rate of Telfordian walls was again generally very poor. Where they survive they are very much altered or repaired by concrete repointing and replacement of capstones, obscuring the Telfordian fabric (for example near Conwy [C019]). In towns or villages the walls were entirely absent. Surviving fragmentary remains are sufficient to establish that rough rubble walls were built in local stone.

Only one milestone was located on the road, although anecdotal evidence suggests that at least one more may have survived. The known, surviving milestone [C012] that lies roughly halfway along the Bangor to Conwy road is very different from those seen on the contemporary Holyhead Road. This milestone, of fine-grained, deep red sandstone, is now visible to a height of 0.7m. As no specification is known for milestones on the Chester road, it is not possible to be certain that it belonged to Telford's road although this seems likely.

Three toll houses were found along the road. One has survived [C030] at the east end of the Conwy suspension bridge. It is unique amongst Telford's toll houses in its mock-medieval architectural style, which echoes the turrets of the nearby castle. There

are the remains of another toll house just beyond the west end of the Conwy Suspension Bridge. This involved the adaptation of one of the towers of the town walls by inserting lancet windows and a door. The third toll house [C006] may be the house described in specifications for Telford's Lot 92, although the specification mentions a porch, which would have projected almost into the road, and a toll house nearby, of which nothing has survived. The Telford toll house is a single-storey building, with the multi-angled plan that allowed toll keepers to keep an eye on approaching traffic from both directions (Fig 5.31). A slate mile-plate [C008] above one window is possibly pre-Telford.

The Bangor Gate [C028] was inserted by Telford's workers through a turret of the city wall. The 19th-century opening incorporates mock-medieval features, including arrow slits and stepped corbels supporting a walkway (Fig 5.32; LUAU 2000a, 22). The Conwy Bridge [C032] was the most attractive of the Telford features on the road. It was built on the same principle as the Menai Bridge and also opened in 1826 (see Chapter 4). Like the toll house, its style is mock medieval, with crenellated towers to respect the castle at the west end of the bridge and walls through which the suspension chains for the bridge were made to pass (Fig 6.8).

Elsewhere on the route Telford's bridges and culverts were not usually visible. They were regularly deployed by Telford on the more mountainous Holyhead route to negotiate water, but were not so commonplace on this coastal route. Depots were also not apparent on the Bangor to Conwy road. Perhaps they were not required, although depots were mentioned in Telford's specifications for the Penmaenmawr section of this road (PRO WORK 6/90).

# 6 The great embankments and bridges

by Jamie Quartermaine, Richard Newman, Edward Holland, and Rick Turner

# Major embankments

The major embankments on the road were Telford's solution to the problem of achieving a maximum gradient of 1:30 for the road while pushing it through the most mountainous area of Wales. It is a testament to both Telford and the substantial parliamentary funding available for the construction of the road that this aim was achieved over almost the entire route. Although where possible the routes were chosen so as to minimise major engineering works, at sites such as Malltraeth Marsh, Nant Ffrancon, Ty Nant, the eastern approach to the Conwy Suspension Bridge, and Chirk, Telford was faced with little alternative but to construct large embankments.

Although they were major, labour-intensive undertakings, these embankments presented little technical difficulty or innovation. They were modelled on a broad range of earlier embankments on both his Scottish roads (eg at Pathhead, south of Edinburgh; Smiles 1874, 251) and his canals (eg on the southern approach to the Pontcysyllte Aqueduct of the Ellesmere Canal). Both Parnell (1838) and the specifications (PRO WORK 6/89 and 6/90) provided no more than a generic design for all embankments both large and small and did not deal with the individual sites. Similarly Telford was concerned in his autobiography (1838a) with the more magnificent or innovative components of his road and for the most part considered embankments hardly worth mentioning. The notable exception, however, was the Stanley Embankment. This was an important structure because it crossed the channel between Anglesey and Holy Island and had to incorporate a flume to allow for the passage of vigorous tides.



Figure 6.1 Aerial photograph showing the Chirk Embankment [996], at the bottom right of the photograph and the Chirk viaduct and aqueduct in the photograph centre (RCAHM(W))

#### Chirk

The easternmost stretch of the road in Wales on the approach to Chirk Bridge [1000] exemplifies Telford's general approach. Here the original turnpike followed a steep route from the town following the line of the valley before turning in a tight hairpin bend and descending, steeply at first, in a curving course (Fig 6.1). It ultimately led to Chirk County Bridge (built by Telford in 1793) across the Afon Ceiriog (see Fig 4.11). This original route was an impractical option, not only because of its irregular steep gradient, but also because of the sharp hairpin bend that would have severely restricted traffic speed. Telford's alternative route was to follow a straight but massively embanked line for the road that provided a more uniform and far gentler gradient down towards the bridge crossing. Accepting the considerable fall in height between the town of Chirk and the bridge, Telford unusually specified a uniform but relatively steep gradient of 1:20, steeper than any other section of the Holyhead Road (PRO WORK 6/90/Lot 42). The road was specified as having a broad road surface 24ft (7.3 m) wide, with fences rather than walls and with sides that sloped down at 34° (1:1.5). The spoil for this massive embankment above



Figure 6.2 The embankment of Telford's road at Ty Nant [158] (OA North)

the valley slope came from a number of sources, but principally from a cutting in the upper part of the embanked line, just south of Chirk. As this evidently provided insufficient material, it was also supplied from adjacent fields. Where this was required, Telford specified that the ground in the borrow pits should be levelled and reinstated.

Although it is now covered in trees, the embankment survives in apparently good condition, with little alteration to either the road or the earthwork despite substantial widening of Chirk Bridge.

## Ty Nant

At Ty Nant (Glyn Dyffwys) Telford was faced with a further major obstacle in the form of a southerly spur of the Mwdwl-eithin hill. If he took the road over the top of the spur, he would either have to cross diagonally in order to achieve the 1:30 standard, which would take the road off the direct line, or he could follow the line of the river and the existing turnpike thus maintaining a level gradient. While the latter would seem the preferable option, this took a route through the very steep-sided Glyn Dyffwys gorge. The gorge provided little natural terracing or gentle incline for the construction of a road to Telford's specification. The pre-Telford turnpike through this pass had indeed been a source of considerable concern. This was highlighted by an accident shortly prior to Telford's improvements, when the mail carriage overturned while rounding an acute bend and the luggage fell over the precipice into an abyss, nearly followed by the guard (Trinder 1998; BPP 1817 III.179).

Despite the difficulties he faced, Telford chose to take his road through the pass and along the line of the earlier turnpike. This entailed the construction of a massive embankment set against the northern side of the gully in order to provide an adequate terrace. The disadvantages of this option were partly the considerable labour and cost involved, but also because it led to a meandering course as the road followed the sinuous line of the river valley. This is why Ty Nant was one of the few sections that has been bypassed in recent years as it impeded modern traffic. Widening the road presented considerable engineering difficulties, however. The modern solution to the engineering constraints was to blast an enormous cutting through the spur for the adjacent Glyn Bends bypass built in the 1990s (Fig 8.4).

Telford's road involved considerable cutting back of the cliff face on the northern side of the gully, with corresponding embankments on the south. These were typically c 6m high, but up to 9m in places. As such they are the highest embankments constructed on the Holyhead Road (Fig 6.2). Despite the scale of the embanked road, the specifications (PRO WORK 6/89 and 6/90) show that this followed a standardised design, with the exception that where the road faced straight onto a vertical rock face, there was no need for a breast wall to be constructed. The revetment walls built onto the steeply sloping valley side, despite the apparent instability of the foundations, survive in generally good condition. The parapet wall, however, now incorporates concrete coping and there are modern drains within the road.

Telford acknowledged the natural beauty of the Glyn Dyffwys gully above the raging Pen-y-Bont Falls by constructing viewing platforms. Stepped out from the embankment walls, they overlooked the majesty of the gully and its falls (Harper 1902, 221). When George Borrow passed here in 1855, he wrote:

Leaving the looking-place I proceeded, and after one or two turnings came to another, which afforded a view if possible yet more grand, beautiful and wild, the most prominent objects of which were a kind of devil's bridge flung over the deep glen and its foaming water, and a strange-looking hill beyond it . . . (Borrow 1862, 154)

Features such as these show how Telford was attempting not simply to provide a pragmatic means of communication, but to construct a monument that was a source of inspiration in its own right.

## Nant Ffrancon Embankment

In deciding to take his road through the heart of Snowdonia, it was inevitable that Telford would be faced with an obstacle that would cause him to compromise his requirement for a maximum 1:30 gradient. This impediment was the Nant Ffrancon Pass, where previous attempts to build a road had had varying success. The earlier road, constructed in the 1790s by Lord Penrhyn on the west side of the valley (see Figs 5.8/5.11 [0846]), was subsequently replaced by a new turnpike between 1802 and 1808 on the opposite, eastern side of the Nant Ffrancon valley (Moore-Colyer 2001, 155). Telford noted that prior to his improvement passengers had to walk up the hill behind their empty carriage and amused themselves by throwing coping stones from the parapet walls into the valley below (BPP 1814-15 III.355). At Nant Ffrancon the 1802-8 turnpike is preserved in part beneath the Telford embankment, allowing an objective assessment of its character. The surviving section crossed the Afon Ogwen by a small arched bridge, Pont Pen-y-benglog [0307], which is now preserved under the Telfordian bridge [0395] (see Fig 5.13). The turnpike route followed a circuitous, narrow terrace revetted with massive stone walls above the river gorge. It then passed through a short cutting and onto a small, low-set embankment following the side of the valley. This disappears beneath and into Telford's embankment. The construction of both the embankment and the cutting demonstrate that the road was the subject of substantial engineering works, but was nevertheless inferior to Telford's. Since the turnpike road did not exhibit any uniformity of gradient, considerable undulations exist even along the embanked section. While some sections were shallower than Telford's road, substantial lengths were markedly steeper. More significantly, however, the meandering, sharply curving, and narrow terrace would have severely restricted and slowed the passage of a carriage, falling far short of Telford's aim to allow for speeds of 8mph (12.8kmph).

Telford's solution was to engineer an embankment 3 miles (5km) long set above the valley side with corresponding cuttings to achieve an even gradient of 1:22. In the length immediately north-west of Llyn Ogwen, therefore, the new road was 'to be 28ft above the surface of the present' (PRO WORK 6/89/Lot 1). Although of large scale and height, the construction compares closely to the general design for embankments outlined in his specifications (PRO WORK 6/89/general conditions, 6). It comprises a road that was for the most part set above the slope. It was supported by a massive retaining wall up to 9m high, part founded on the embankment of the earlier turnpike that was up to 2m high. It is evident that reliance upon the earlier dry-stone embankment resulted in weaknesses within the overall structure, as the turnpike embankment subsequently had to be reinforced with buttresses. The massive retaining walls of large, coarsely dressed masonry contrast with the parapet walls that were constructed of local slate. The road surface has a uniform, low gradient and is relatively straight allowing for faster speeds both then and now. As a concession to the engineering difficulties experienced on this section, however, it is narrower here than elsewhere on the

In response to the high rainfall in Snowdonia, the embankment was provided with large numbers of cross drains under the road surface to divert the water off the mountainside and other drains to take the water from the roadside gutters [eg 0847]. Many of these drains have been lost to modern alterations of the road surface, but within the face of the embankment their former locations are still evident as blocked apertures or by staining on the masonry.

This section is notable for the very large number of semi-circular depots. These were set into the eastern side of the road at intervals of roughly 50-100m [0265–0289]. This probably reflects the greater propensity of the road surface to erosion by water, requiring correspondingly larger amounts of 'blinding stone' to maintain the surface. A complex programme of pinning with rock and earth anchors was completed in 1998 together with the rebuilding of the parapet walls.

## Stanley Embankment

Holyhead, the destination of the road, is on an island separated from the rest of Anglesey by a tidal channel. Like the Menai Straits this channel had a complicated

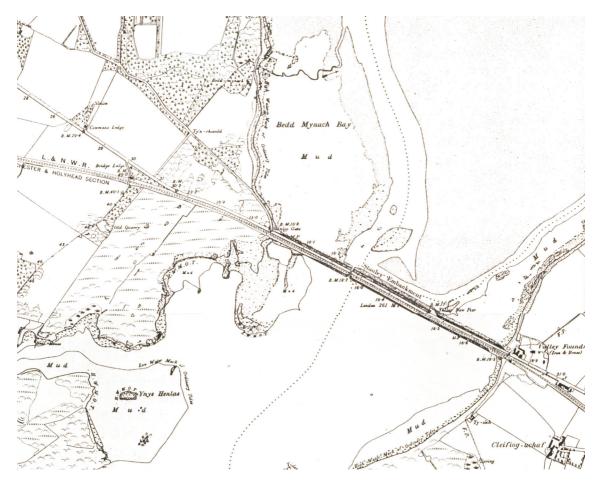


Figure 6.3 Stanley Embankment on the first edition Ordnance Survey map (1890) (National Library of Wales). Reproduced with kind permission of the Ordnance Survey.

tidal regime, with currents flowing in different directions depending on the state of the tide. The original turnpike crossed the tidal channel at its narrowest point on the Four Mile Bridge, but this involved a considerable diversion from the direct route. Showing his usual boldness made possible by the finance available to him, Telford proposed an entirely new crossing by embankment across the Stanley Sands of Beddmynach Bay near the northern end of the channel (Fig 6.3). His justification for the embankment is contained in his preliminary report on the Anglesey Road submitted to the commissioners in 1819 (ICE T/HO.34). Here he argues that it would reduce the length of the road by 1 mile 540yds (2.1km), avoid sundry hills, and save the cost of rebuilding the Four Mile Bridge.

Telford's proposal to construct the Stanley Embankment [0003] across a wide area of sandy foreshore at low tide would entail an earthwork that was 1300yds (1180m) long, 34ft (10.3m) wide at the top, 114ft (34.7m) wide at the base, and as much as 16ft (4.8m) high from the base of the sands (Telford 1838a, 213). This would involve the movement of c 140,000m<sup>3</sup> of sand, gravel and rock (Fig 6.4). This would have been a major undertaking, even on dry land. By taking it across tidal sands, Telford and his contractor faced even greater problems in the provision and construction of a design that would stand up to the erosive powers of storm and tide both during and after construction.

Although imaginative in both scale and vision, Telford's actual design for the embankment was not particularly sophisticated. It was to have a gently sloped face of 3ft (horizontal) to 1ft (vertical) on average that curved up from the base to a 1:1 slope at the foot of the road parapets (PRO WORK 6/89/Lot 10) (Fig 6.4). At its core it was made up of sand, gravel, and any other material that came to hand, deposited in layers directly onto the Stanley Sands. This was overlain by up to 5ft (1.5m) of clay or clayey gravel that was to serve as bedding for a stone facing and also provide protection against the ravages of storm and tide during construction. At the edges of the embankment the underlying sand was excavated to allow for the clay foundation. Set on top of the clay was an undressed facing of rubble stone that was up to 2ft (0.6m) thick and extended up to 20ft (6m) out from the base of the embankment to provide for additional protection from storm damage (PRO WORK 6/89/Lot 10).

In constructing a large earthen barrier across tidal flats, Telford needed to allow movement of the tide through the embankment to the flats to the south-west. At the point where the natural channel crossed the sands, a deeper and wider channel 30ft

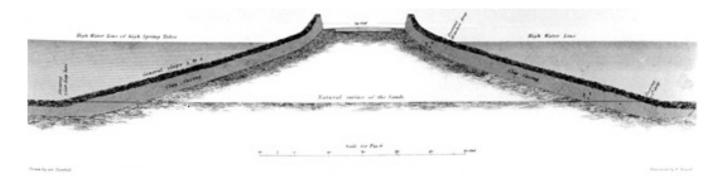


Figure 6.4 Cross-section of the Stanley Embankment from Telford's Atlas

(9.1m) in width was excavated through the rock. The excavations were faced with stone abutments and a large drain arch or flume was constructed over the top (PRO WORK 6/89/Lot 10).

Telford paid homage to the not inconsiderable exertions of the contractor, Messrs Gill and Hodges and Co, whom he credited with having built the embankment over a single season (Telford 1838a, 213). Accounts submitted to the Parliamentary Commission indicate, however, that it took nearly two years and cost a total of £20,834 12s 10d. The work was started with the movement of earth in January 1823. Construction of the stone revetment walls along the sides of the embankment began in July of the same year. By November work had begun on constructing the dyke walls of the road and by May 1824 construction of the drain arch had begun. Interestingly the May account records the construction of a temporary bridge to allow for the opening of the road. The embankment was finally completed in November 1824 (PRO MT/27/17).

While the construction of the railway in the 1840s resulted in the decline of traffic along much of Telford's Holyhead Road, there was a dramatic increase of traffic on the Stanley Embankment, as the railway engineers chose to expand Telford's embankment rather than build anew. After widening the embankment to the south to accommodate the railway line, a sluice mechanism was constructed across the tidal channel to supersede Telford's flume or bridge. A large dividing wall c 3m high was built to separate the rail line from the transport system it had superseded.

This monument to early 19th-century engineering has seen much alteration, not only to accommodate the expansion for the railway, but also to maintain it as the main road to Holyhead during the 20th century. A pedestrian walkway has been constructed on the northern side, the parapet walls have been rebuilt, services have been laid within concrete cases at sea level, and stone gabions were set against the north wall to prevent erosion. Yet despite superficial alterations to the exterior, the underlying core of the embankment and its stone and clay casing are still largely intact.

# Major bridges

# Waterloo Bridge (Fig 6.5)

Apart from the Menai and Conwy Suspension Bridges, the one innovatory bridge, in Wales at least, was the Waterloo Bridge [0370] at Betws-v-Coed (Figs 6.5 and 6.6). This is a cast-iron bridge spanning the Afon Conwy on one of the earliest sections of the road to be improved. Since the opening of the iron bridge near Coalbrookdale, Shropshire, on New Year's day, 1781 (Cossons & Trinder 2002), cast-iron bridges became an increasingly common component of new canals, roads, and primitive railways (Ruddock 1979). Telford was an enthusiastic proponent of this type of construction. Five of the 42 bridges he had built in Shropshire when he was County Surveyor were of this type (Schofield 1958, 40). Telford seems to have perfected his cast-iron bridge design while building roads in the Scottish Highlands. There he employed features and techniques that he had previously used on aqueducts on the Ellesmere and Shrewsbury Canals, including most famously the one at Pontcysyllte (Hume 1980, 164). Indeed the Waterloo Bridge is structurally similar in form to both the Bonar Bridge at the head of the Dornoch Firth, built by Telford in 1812, and the Craigellachie Bridge (Fig 6.7) on the Spey, built by him in 1815. All three were cast at Hazledine's works at Plas Kynaston near Pontcysyllte (Ruddock 1979, 164; Beckett 1987, 140). The Bonar Bridge seems to have inspired a series of similar bridges built by Telford and also cast by Hazledine. As well as Waterloo they include the Esk Bridge at Carlisle and Mythe Bridge at Tewkesbury in 1826 (Ruddock 1979, 164; Bracegirdle and Miles 1973, 86).

After building Bonar Bridge, Telford published the design in the Edinburgh Encyclopaedia of 1812 (Ruddock 1979, 165). This and the employment of William Hazledine on all future similar bridges may explain why there are no detailed design specifications for the Waterloo Bridge. As with Telford's stone bridges there was a tendency to standardise the bridge design as far as possible, largely to save on the costs. The Bonar moulds were used for the arch ribs of Craigellachie, built only three years after Bonar Bridge. As a result of this and the firmer strata at Craigellachie he was able to make considerable savings, building it for only £8,000 instead of the £14,000 for Bonar (Beckett 1987, 143). The Waterloo Bridge had a broadly similar design to that of the Bonar Bridge, although it was somewhat disguised by the elaborate decorative elements of the cast metalwork (LUAU 1999, appendix 3). These consist principally of a dedication commemorating victory at the Battle of Waterloo and the national emblems of the rose, leek, thistle, and shamrock.

The elaborate decoration of the Waterloo Bridge is at odds with the usual appearance of a Telford bridge, which tends to be plain and functional (Bracegirdle and Miles 1973, 78). This peculiarity, however, may be the key to its construction in this form. It was built along one of the most difficult stretches of the road and has a greater span than any of the other bridges along it, with the exception of the two suspension bridges. Even so, there is no obvious structural reason for building a cast-iron bridge rather than a masonry one, unless there was a particular reason for preferring a single arch to a double one in this location. It certainly does not seem to have been cheaper to build and its maintenance is likely to have been more costly; as early as 1838 a contract for £35 was let to Thomas Davies 'for painting the cast-iron bridge over the Afon Conway near Betws-y-Coed' (PRO MT/27/18). The bridge

may, therefore, have been intended as a celebration both of a great British victory and of the design expertise of Telford and his associate William Hazledine. As it was approved as a design early on in the commission of improvements for the Holyhead Road, it could serve both as an advert for the engineering skill being employed and for Telford's enthusiasm for cast-iron bridge technology. Designed in 1815 it was a politically astute move to celebrate Wellington's victory of that year on a road sponsored by the government and intended to ease the conveyance of Parliamentarians from Dublin to London. Together the technology and the decoration served as a symbol of British innovation and superiority.

The bridge was intended to be seen particularly from the eastern approach, although subsequent enclosure and the growth of trees along the river banks now almost obscure this view. Moreover the bridge can barely be glimpsed on approach in a fast-moving, low-slung automobile, whereas it would have been much more obvious to passengers in or on a higher and slower horse-drawn coach. It consequently became a subject of comment to the tourists who came across it. One such wrote in 1838, 'I came to Waterloo Bridge, consisting of a single arch of cast-iron, upwards of 100ft in span; there is an inscription on the main rib, which informs the



Figure 6.5 Waterloo Bridge at Betws-y-Coed [370] (OA North)

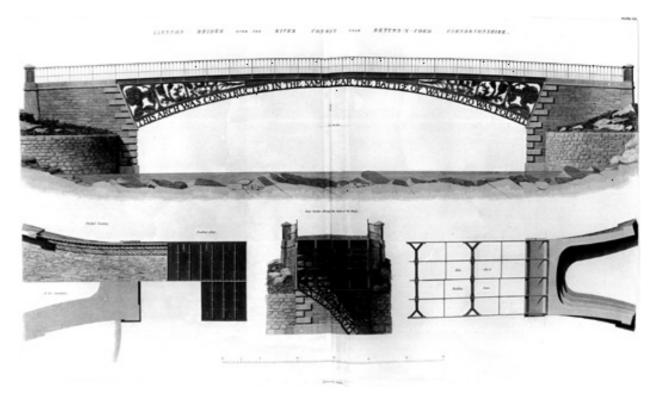


Figure 6.6 Waterloo Bridge [370] from Telford's Atlas

passer-by that it was erected the same year the Battle of Waterloo was fought' (Roscoe 1838, 201). In fact the bridge was not erected in 1815. The ironwork had still not been delivered to the site as late as 25 July 1816, when Telford wrote to Milne, the then Clerk to the Commissioners, 'the cast-iron bridge has been fitted up at the foundry, where I examined it, it is executed in a very perfect manner, Mr Sinclair is attending its being weighed and put into canal boats, five have already been loaded and are on their way to Chester' (PRO WORK 6/69) for subsequent shipment to the limit of navigation of the Conwy (ESJ, 7 August 1816).

#### Conwy Suspension Bridge (Fig 6.8)

The estuary of the Afon Conwy has been crossed by a greater number of different means than most rivers. First, there were the small ferries, then the suspension bridge, followed by the railway, then the modern road-bridge, and finally the road tunnel. All of the structures survive, although the internationally significant suspension bridge was very nearly lost in the early 1960s.

Edward I made Conwy an important medieval town on the north Wales coast. Alongside its towering castle there developed a grid-pattern of streets and a busy trading port with imposing town walls (Forde-Johnston 1977). The Afon Conwy is broad near its mouth, so crossing it presented travellers and traders with a problem. From medieval times, there were regular ferries, but by the end of the 18th century this was seen as an unreliable

service and there were calls for a bridge and better communications along the north Wales coast. All traffic to Ireland via Chester ran along the coast and had to negotiate both the Conwy and the Menai ferries. In an account of 1811 Edmund Hyde Hall remarked that 'the first improvement would unquestionably be the construction of a bridge which would do away with the evils of the ferry' (Hall 1811). This debate eventually resulted in a more direct route for the main London to Holyhead road as demanded by the Irish MPs at Westminster. Though this route bypassed Chester, roads to Holyhead from Manchester, Liverpool and the north-west of England still converged there and then came along the coast through Conwy (Senior 1991). Since the Afon Conwy was navigable to Llanrwst and beyond, any bridge had to be at a high level to allow ships to pass underneath.

The initial plan was prepared in 1802 by the Scottish engineer John Rennie (Rennie 1875). His scheme was for a bridge and a roadway running through the castle. Fortunately this was rejected, and it was not until an Act of Parliament was passed in 1821 that £40,000 of public money was made available to erect a bridge (1\2 Geo IV, 1821). The commission was given to Thomas Telford, who was well advanced with the north Wales section of the London to Holyhead Road. His initial plan for Conwy was to build a 200 ft (61m) cast-iron span, but experience gained at Menai led Telford to change his mind (Chapter 6). His eventual design bears significant similarities to that of the Menai Bridge, but it is notable in the use of a crenellated design for the towers to complement the adjacent medieval castle,

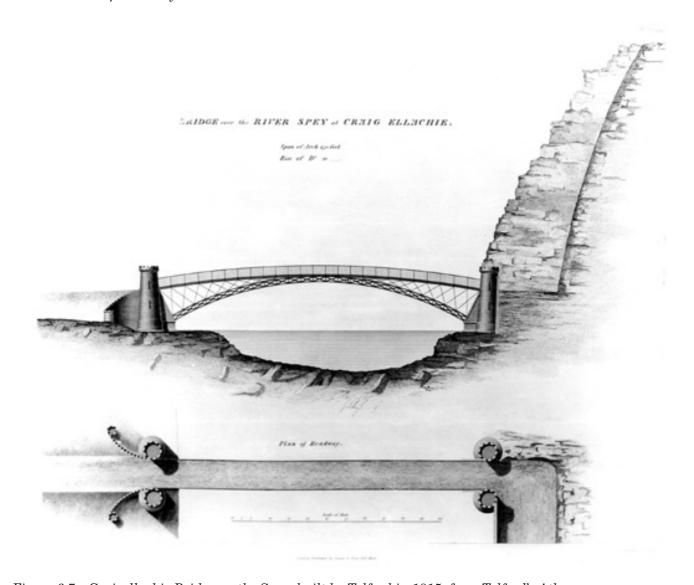


Figure 6.7 Craigellachie Bridge on the Spey, built by Telford in 1815, from Telford's Atlas

in the uncompromising way in which Telford drove the anchor-chains of the bridge through the castle's outer walls and used its bedrock foundation as an anchor for the chain stays.

Work began on 3 April 1822 and with his resident engineer, William Provis, Telford constructed an embankment across much of the estuary from the eastern shore to the rock known as Yr Ynys Tuor y Castell, and the bridge spans from there to the west shore below the castle (Telford 1838a). The total span is 326ft (99.4m), and the suspended deck is carried by two sets of four chains each, slung from 42 ft (12.8m) high piers and then anchored into the rock at one end and the base of the castle at the other. At high tide the clearance above the water is 18ft (5.5m).

Telford opted for pinning the bridge to the castle by anchoring the footings into the lower walls, but this intervention had considerably less impact on the castle than the scheme proposed by Rennie. It is interesting to note that Telford was conscious of the historic context of the bridge and he went beyond pure engineering by incorporating aesthetic detail into the design, such as the castellations, which were in keeping with the castle. In effect Telford made the bridge resemble a huge drawbridge with the paired turrets appearing as castellated gateways echoing the twin towers of the castle above. Subsequent structures encroaching abutting onto the castle have been less successful in persuading the viewer that they could be part of the castle (eg the railway bridge, the modern road bridge, and the visitor centre). Furthermore, construction of the modern road bridge demolished Telford's toll gate at the west end, although parts of the toll house survive built into one of the towers of the town walls.

Conwy Bridge [C032] opened on 1 July 1826 at a total cost of £51,000 (Telford 1838a; BPP 1831 XII.29). In addition the Commissioners had to pay £6,315 in compensation for loss of profit to the ferrymen. The bridge was well received in contempo-



Figure 6.8 Conwy Suspension Bridge [C032] (Ken Hoverd)

rary accounts and was thought to be more appealing than the Menai Bridge. One mid-19th century writer said:

. . . with all the legends of supernatural buildings with which Wales abounds it would not be difficult for the imagination to conceive that the Genii threw these delicate chains over the wide space that divides the castle from the opposite rock, and thus obtained a triumph over the giant who kept the fortress (Bayne n.d., 125).

The original woodblock deck consisted of three tiers of deal planks laid longitudinally, covered by felt saturated in boiled tar, then overlain by 2in (50mm) thick fir planks laid across the width of the roadway. Oak kerbs were laid at the side of the road and the surface was later finished with limestone chippings bedded into pitch as a top dressing. This was replaced in the later 19th century by an arched, iron-plated roadway.

The bridge was progressively strengthened and adapted during the 20th century, including wire cables which were added above the chains in 1903, and a 6 ft (1.8m) wide footway added on the north side in 1904 (National Trust Archive Records). Then, in 1958, the new road-bridge was built to cater for increased traffic. Like the ferrymen before them, this put the toll-keeper out of business and, more seriously, it raised the threat of the demolition of the bridge, which the toll revenue had maintained. A vote in Conwy revealed local support for demolition but, fortunately, campaigns by national amenity societies, as well as personal support from the late Douglas Hague, and others, persuaded the council to provide reserve bridge funds as a contribution to the endowment required for acquisition by the National Trust in 1965 (Girouard 1965). A further appeal drew in donations from all over the world. A major conservation programme has been carried out since then with grant aid from the Historic Buildings Council for Wales and the Council of Europe.

Regular repainting continued until 1989, when 21 layers of paint were removed and revealed high levels of corrosion in the chains, in some cases up to 95%. Further investigation into the structure indicated that the road deck had tripled in weight by being continually strengthened to take additional traffic loads. However, the supporting chains



Figure 6.9 Historical Photograph of Conwy Suspension Bridge (Cadw: Welsh Historic Monument)

had not been similarly strengthened, and were consequently under excessive strain (Latham and Barfoot 1995).

Before any repair work was done, tests had to be carried out to gain a clearer understanding of the damage to the structure. It became evident that for Telford's chains to remain intact, the bridge had to be lightened and, since it no longer carried traffic, the strengthening layers could be removed. In order to assess the effect of doing this, a model was built with the help of the University of Manchester and tested in their wind tunnel at Barton Aerodrome (National Trust Archive Records). This proved that a lighter bridge would still be stable in high winds. The new deck was engineered to include stainless steel supporting beams and a new, galvanised balustrade. Tarmac was lifted, and the water mains embedded in the deck were transferred to the modern road bridge. By reducing the weight by half, the original Telford chains, though weakened, could be retained. Since the redesign of the Menai Bridge, these are now the only complete surviving set in existence.

At the same time, investigations were carried out on the hidden parts of the bridge's structure, and 100mm diameter holes were drilled through rock into the anchor chambers beneath Conwy Castle and immediately outside the toll house [C030], in order to determine if the corrosion had spread to the critical parts of the chains that hold the whole bridge in place underground (Latham and Barfoot 1995). A camera was placed into the chambers, and the backs of the anchorages photographed several metres underground. Thankfully these were in sound condition, though the large amount of concrete that was poured into the chambers at the turn of the century means that part of the chains are now encased and will need closer inspection in the future. Though there is still an unknown element to the structural state of the bridge, the removal of so much weight has made it a great deal safer.

The third area of investigation was the inspection of one of the main chain link-pins for corrosion (*ibid*). A specially designed compression rig was used, which exerted a force of over 200 tons, pulling the chain sections together to enable the pin to be pulled out. Fortunately, it was sound and, whilst removed, it was blast-cleaned and painted for the first time in 170 years. This laborious task will eventually need to be carried out on all 600 pins.

All of the above work formed a five year pro-

gramme, cost over two million pounds and was awarded a Europa Nostra award (Holland pers comm). The result is that the original Telford chains are retained, and the bridge can now be presented how - as we know from photographs - it would have appeared in the later 19th century. During this work, there was a concurrent programme of repair for the contemporary toll house, which is now presented as it might have been in 1891 when occupied by David Williams and his wife Maria. This is the date of the surviving toll board.

The National Trust has attempted to find evidence of surviving original paint. Having found nothing on the Conwy Bridge itself, a link removed a long time ago from the Menai Bridge [0215] was sampled in 2000. This only revealed many layers of grey of different shades. However, an account from 1827 refers to the Conwy Bridge being white '... we then walked over the new Suspension Bridge built at the bottom of the Castle & disagreed with it entirely in feature & character - the one heavy & dark, the other light & painted white.' (National Trust nd). Reports to the Holyhead Road Commissioners indicate that it was also painted regularly in 1829 (BPP 1829 V.103), 1831 (BPP 1831 XII.29) and 1834 (BPP 1834 XL.147) and a contract advertised in The Engineer in 1881 (Professor Paxton (Heriot Watt University) pers comm.) specified a white-lead finish with a tint. The preservation of the Conwy Bridge compares favourably with the sister bridge across the Menai (see below), where the ironwork was replaced with steel and the central chains that ran down the middle were removed to improve the width of the roadway; footways were also added. Consequently, the Menai Bridge retains less of Telford's principal components than does the Conwy Bridge where the links and the chains survive intact.

## Menai Suspension Bridge (Fig 6.10)

This bridge was the culmination of Thomas Telford's achievement in building the Holyhead Road. It was the last element to be approved by the Parliamentary Commissioners (59 Geo III c.48, 1819) and the last link to be finished on the route from London to Holyhead. It is the most commonly illustrated of Telford's great buildings and has dominated previous accounts of the Holyhead Road (eg Rolt 1968 and Smiles 1874) to the detriment of the wider engineering achievement represented by the whole length of the road. It is not the purpose here to describe the history, design, and engineering development of this magnificent bridge. This has been done exhaustively in contemporary documents (Provis 1828; Telford 1838a) and has been regularly reviewed in more modern times (eg Gibb 1935; Maunsell 1946; Paxton 1980). This section will, however, present new information and perhaps some new insights derived from the wealth of primary documentation investigated as part of the project. It will then describe the surviving structure as an archaeological monument that has

been changed both in fundamental and subtler ways from the bridge that was opened with such acclaim on 30 January 1826.

As it was started in 1818, in conception the Menai Bridge [0215] predated that over the Afon Conwy, although in the end they were opened in the same year (Telford 1838a). The Admiralty had insisted that there should be no impairment to shipping because of the importance of the route through the straits. Spanning such a broad expanse of water while maintaining passage for tall-masted ships seemed inconceivable, until Telford demonstrated emphatically how it could be done (Fig 6.11). Because of its superior engineering achievement, the Menai Bridge has received more attention than the Conwy Bridge. At 100ft (30.5m) above the water it is far higher than the Conwy Bridge and at 579ft (176.5m) it is nearly twice as long. It was also 130ft (39.6m) longer than any previous suspension bridge. It demanded less architectural input than the Conwy, however, as the design did not have to blend with a major pre-existing historic building. Perhaps this is why a mid-19th century account was unjustly critical. In The King of Saxony's Journey through England and Scotland written by the physician, Dr C G Carus, in 1844, it is claimed that 'this immense work . . . is totally deficient in all the charms of beauty. It cuts the landscape like a black uniform line' (Carus 1846).

The Menai Straits have presented a formidable obstacle at critical points in British history. The Roman governor, Suetonius Paullinus, completed the conquest of Wales in AD 60 when he captured Anglesey. The island was a Druidical centre, the granary for the local Celtic tribes, and rich in copper ore. On reaching the straits, Paullinus's army was confronted and taunted by a horrifying multitude on the Anglesey shore. The infantry effected a crossing by barge and the specially trained Gaulish cavalry swam the turbulent waters to win a famous victory (Frere 1967, 88). The straits were to provide a barrier in the opposite direction during the campaigns of King Edward I. On two occasions, in 1282 and later in 1295, the Menai Straits were crossed from Anglesey to Bangor by prefabricated wooden bridges made of flat-bottomed boats and a decking of poles and planking, wide enough for a body of troops to cross in column. On the first occasion the boats were made in the Dee Estuary and towed to Anglesey. The bridge was then assembled sufficiently for an English force to mount an attack on 6 November 1282. This turned to disaster as they were ambushed by the Welsh. The defenders destroyed the Bangor bridgehead and forced back the troops as the tide rose, leading to the loss of sixteen knights and 300 infantry. Despite this catastrophe the bridge was repaired and the bridgehead re-established by 3 January 1283. It was used to service the beginnings of the construction of Edward's greatest castle of Caernarfon (Taylor 1986, 62-5). In 1294 the Welsh rose in revolt and captured Caernarfon Castle and much of Anglesey. When in 1295 the decision was

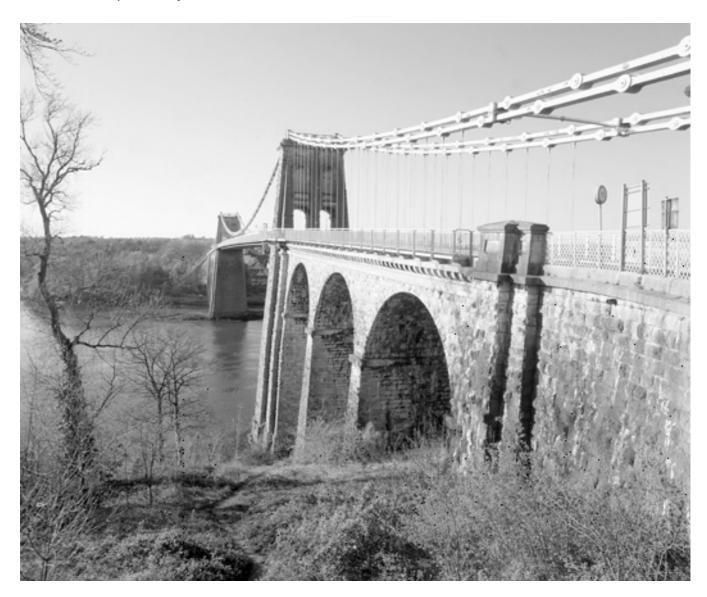


Figure 6.10 Menai Suspension Bridge looking north [251] (Ken Hoverd)

made to build a new castle at Beaumaris to secure the island, a second bridge of boats was constructed across the Menai Straits to support these building works. This included the felling of 2300 oak trees in Cheshire. The components were again assembled in the Dee Estuary. The fate of this second bridge is unrecorded.

Up to six ferries worked regularly across different parts of the Menai Straits. By far the most important was the Porthaethwy-Bangor Ferry leased by Queen Elizabeth I to John Williams in 1594. It subsequently stayed in the hands of his descendants (Maunsell 1946, 166). This crossing could be very inconvenient and dangerous: 180 deaths were recorded at the Bangor and Conway Ferries from 1664 to the opening of the two 19th-century bridges (Harper 1902, 280). The initial moves to build a permanent bridge were made in the 18th century. The first proposal was made by Dr John Campbell (1774) reinforced by one from Lewis Morris (1748). In 1782 a meeting of the 'the Gentlemen of Anglesey'

was held at the inn at Gwyndy to consider the accusations of overcharging, neglect, and delay, not to mention the dangerous condition of the ferry boats (Ramage 1987, 38). Alternatives to the ferry were now being seriously canvassed. Telford's papers contain copies of two proposals. The first was a report submitted by John Golborne of Chester, an experienced river navigation builder, dated 1783. This proposed an embankment crossing the straits at the Swellies that would contain a sealock oversailed by a drawbridge to allow the passage of vessels at different states of the tides. These works were optimistically estimated at £8,019 (ICE T/HO.1). A year later William Jessop, the eminent canal engineer, submitted his report rejecting the embankment as impractical given the rapid tidal currents. Instead he proposed a timber bridge near Cadnant at an even lower estimated price of £7,040 (ICE T/HO.2). Prompted by Jessop's report the question of building a timber bridge was raised in Parliament a year later (Maunsell 1946, 166).

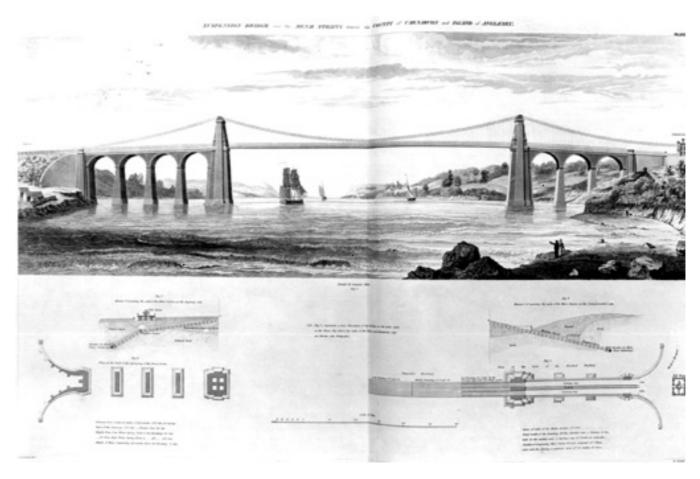


Figure 6.11 Menai Suspension Bridge from Telford's Atlas

These initiatives were not progressed until the Parliamentary Select Committee invited the engineer John Rennie to come forward with proposals in 1801. He produced four designs, two crossing at Ynys y Moch and two at the Swellies, each with single or multiple cast-iron arches. His estimates varied from £260,000 to £290,000 for a single cast-iron arch and were dismissed on grounds of cost (Provis 1828, 3). As part of his original survey of the Holyhead Road in 1810, Thomas Telford was given the opportunity to propose alternatives. His preferred option was a single-span cast-iron arch 500ft (150m) wide at Ynys y Moch at half the estimated cost of Rennie's. To avoid blocking the navigation, he came forward with a design for a suspended centering on which to construct this arch (Provis 1828, plate 11). It was this design that might have interested Telford in the suspension principle. Soon after Telford collaborated with Captain (later Sir) Samuel Brown (1776–1852) on the design of a proposed suspension bridge across the River Mersey at Runcorn (Telford 1838a). During 1816-17, they undertook detailed tests on the strength of different forms of suspension chains, links, and fixings, some of which Brown went on to patent. It was Brown, not Telford, who in 1819 completed the Union Bridge, the first successful large-scale suspension bridge in Britain, at Norham Ford near Berwick-upon-Tweed. The Union Bridge had a span of 361ft (108.3m; de

Maré 1954, 165). Telford had a consummate ability to take and improve new technologies, however, leaving the impression that he was a pioneer and the sole innovator of the techniques used in his great engineering achievements (Hadfield 1993). The Menai Suspension Bridge, which Telford designed in 1818, is therefore regarded as the first great iron suspension bridge ever to be built (Provis 1828, 9-17).

The building of the Menai Bridge stimulated enormous public interest and great celebrations were held at key moments during its construction. In his great book on the bridge, the superintending engineer, William Provis (1792-1870), rather underplays this aspect (Provis 1828). The excitement is better conveyed in a pamphlet - the equivalent of a modern guidebook - written by Dr Pring, who lived about one mile from the site and whose 'curiosity drew him frequently to the spot' (Pring 1828, ii). So popular was the pamphlet that it was in its tenth edition by 1829. The laying of the foundation stone on 10 August 1819 was a quiet affair supervised by Provis. It was only reported in the The Times on 24 September 1819. The construction site attracted many visitors. Some of the workmen took to manufacturing letter-presses, ink stands, and chimney ornaments by cutting and polishing pieces of the limestone used in building the towers, selling them as souvenirs.

The workforce varied from 300 to 400 men depending on the season. On 26 April 1825 the first chain was winched onto the masonry towers by a team of 150 men turning the capstan, with Thomas Telford and the local gentry and vicars in attendance. Pleasure boats decked out in gaudy colours filled the straits below. Three Welsh workmen managed to cross the chain (590ft (179.8m) in length) to become the first people to bridge the Menai Straits in 530 years. The Parliamentary Commissioners granted all 150 workmen a quart of the best ale. On 9 July 1825 the last chain was raised and, 'on fixing the final bolt, a band of music descended from the top of the suspension pier on the Anglesey side to a scaffolding at the centre and played God Save the King to the numerous spectators at either side' (Pring 1828, 22-3). By 24 September 1825 there was enough decking hung to allow safe passage across the bridge, an event that was greeted by a 21-gun royal salute fired at nearby Craig-y-don, seat of Mr O Williams, one of the Parliamentary Commissioners. On 15 and 16 January 1826 Sir Henry Parnell sent letters to Telford agreeing how they should meet to open the bridge (ICE T/HO.108 and 109). At 1.35am on 30 January 1826 the bridge was opened to the public. William Provis met the Royal London and Holyhead Mail Coach as it was about to take the Bangor Ferry and guided it across the new bridge with six of his senior collaborators jammed inside, 'the highmettled steeds mantling their proud crescent necks, as if conscious of the triumphant achievement' (Pring 1828, 29–30).

This first crossing was followed by a more stately procession of coaches in which Thomas Telford (now aged 68) and Sir Henry Parnell modestly took second place to another commissioner, Augustus Fuller. One hundred and thirty vehicles and innumerable horsemen made up this cavalcade. At Telford's request the 5000 people who had come on foot to witness the opening were not allowed to cross at once for fear of damaging the bridge. They were, however, allowed to parade 'along the beautiful platform Road-way, for several hours'.

The poet laureate, Robert Southey, was prompted to write a eulogy to his friend, Thomas Telford, recording his admiration for the construction of the engineer's two greatest bridges:

Telford – who o'er the vale of Cambrian Dee, Aloft in air at giddy height upborne, Carried his navigable road, and hung High o'er Menai's Straits, the bending Bridge; Structures, of more ambitious enterprise, Than Minstrels, in the age of old romance, To their own Merlin's magic lore ascribed (White and Southey 1855)

The opening of the bridge saw the closing of the ferry – 'an event that deserves to be recorded in letters of gold' (Pring 1828, 28). Three-quarters of an hour used to be taken in the irksome task of unloading one coach of passengers and luggage (making an often uncomfortable journey in an open boat) and reloading on the

opposite bank. To buy out the interests of the lease to the private operators of the ferry 'in perpetuity' cost the huge sum of £26,557. The Menai Bridge was the one part of the Holyhead Road project on which Telford seriously underestimated the total costs. In his 1811 proposal he gave an outline estimate of c £70,000. Although the final design was costed at £127,331, the final expenditure reached £231,500 (Maunsell 1946, 167), vastly more expensive than the estimates given in the 1780s.

Lord has shown how special the Menai Bridge was to become after its opening:

Without doubt, the prime example of the bridge as an icon of the new world was Telford's Menai Bridge, opened to the public in January 1826. In numerical terms, with the exception of Caernarfon Castle, it dominated print production of Welsh imagery at both ends of the market. No modern subject approached it in popularity. Thomas Telford became the first of the heroic engineers of the 19th century (Lord 1998a, 42 and figs 48–63).

What survives of Telford's original bridge? By taking an archaeological view of the present structure and considering the documentation for its subsequent alteration and repair, a complex picture emerges. The remains are described under three main headings.

#### Construction features and groundworks

The plan of the bridge (Fig 6.12) published by Provis (1828, plate 1) shows the layout of the construction camps on both sides of the bridge. Quays were built on both sides of the straits and beneath the Anglesey tower, with cranes for unloading materials. The quays on the north and south sides still survive. On the Anglesey side, the main offices and workshops were built to the west of the bridge. They were on the routes of horse-drawn railroads that connected the guays to the end of the bridge abutment. The sites of these buildings survive as earthwork platforms. Alongside the Caernarfonshire quay were stables. Another railroad was contoured into the steep slope up to the end of the southern abutment incorporating a resting and turning place. Part of the line of this railroad survives as a footpath, while the foundations of the stables are likely to remain intact.

The first part of the construction work was begun in 1818. An embankment was built from the Anglesey shore to the small island of Ynys y Moch. The island was levelled and one of the main bridge piers was to be built on it. This embankment was to cause some changes in the flow of the tide and led to the cutting away of other rocks in the channel in 1818. This failed to calm the fears of the port of Caernarfon, which petitioned Parliament. In 1823 Telford was instructed to survey the straits in the vicinity of the Plattens and the Swellies. This led to the formation of the Menai Straits Improvement Committee. These works generated an extensive part of the Telford correspondence that now survives

at the library of the Institution of Civil Engineers (ICE T/HO.52, 54-7, and 64-9). The other major groundworks were the excavation of the tunnels to fix the anchor chains. The rockhead was near the surface on the Anglesey side, but much longer tunnels were necessary on the Caernarfonshire side to pass through unconsolidated deposits to the rock beyond. When the chains were replaced in the 1930s and 1940s, they were made to 'fit as nearly as possible through the old chambers, tunnels and buildings' (Maunsell 1946, 175).

#### Masonry work

The two main towers (or 'pyramids' as Telford called them) were built with hollow interiors subdivided by party walls (Telford 1838a). This technique, which had first been developed for the piers of the Pontcysyllte Aqueduct, allowed the interior to be inspected as the towers rose, as well as greatly reducing the volume of stone in the structure. On the Anglesey side, there was a long, stone-encased embankment and a line of four masonry arches, whereas on the Caernarfonshire side the abutment was much shorter and only three arches were needed for the approach. The limestone was quarried at Penmon on the south-east tip of Anglesey and brought by barge to the quays next to the bridge. The contract for the masonry was won by John Straphen in 1818 (BPP 1819 V.223). Straphen had already won a significant proportion of the major projects in the early years of the building of the Holyhead Road (see Appendix 2 and Chapter 3), but the Menai Bridge proved too much and he had to withdraw before a great deal had been built. Telford had written about work in the Highlands that, 'For bridge work . . . the only real security lay in the skill and experience of the contractor' (Haldane 1962, 123). So Telford turned to his most reliable bridge builder, John Wilson, who had been responsible for building the piers of the Pontcysyllte Aqueduct for the contractor John Simpson (Sivewright 1986, 37) and was working on the Caledonian Canal (Haldane 1962).

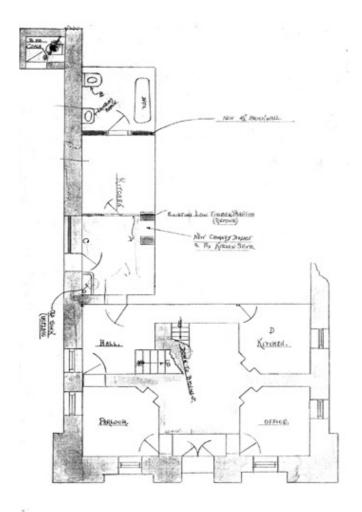
The main masonry work of the bridge remains almost unaltered. The only material change to the main structure was the replacement of the central pier between the two carriageways by a narrower pier with a reinforced concrete core to increase the width of the roadways from 9ft (2.7m) to 10ft (3m) in 1940. At the same time the pedestrian walkways were cantilevered out by casting continuous reinforced concrete beams and a line of concrete corbels onto the existing masonry wall tops (Maunsell 1946, figs 14 and 15). The beams were extended down the Anglesey approach to allow new dyke walls with masonry facings to be built onto the earlier masonry embankment and to replace the pre-existing railings.

The work from 1938 to 1940 also saw the modification of the Bridgemaster's House and workshop that form the south abutment of the bridge (Fig 6.13). The Bridgekeeper's House and toll house on the Anglesev abutment, and the toll-gates and their piers at both ends of the bridge were demolished. William Provis may have had a hand in designing these two houses, for he sent two alternative sketches for the toll house on the Anglesey side on 9 December 1824 (ICE T/HO.74). The style of these buildings conformed neither with the toll houses on the mainland nor on the Anglesey stretches of the road. A surviving ground-floor plan of the Bridgemaster's House shows it to be well appointed, with a basement below and bedrooms above. The first tenants of these houses were two senior workmen, both carpenters, from the bridge's workforce (Provis 1828, 71). Behind the Bridgemaster's House there was a workshop open to the suspension chains as they passed down into the rock-cut tunnels beyond. During the course of the archaeological project, several artefacts relating to the construction and subsequent alteration of the Menai Bridge were found loose in this workshop (Fig 6.14). These comprised one of the wooden pulley blocks used to haul up the original suspension chains, parts of machines for punching rivet holes and cutting iron in the side railings, part of a winching mechanism, an early link from the suspension chain, two gas lamps (ten gas lamps had been provided by de Ville of the Strand, London for the opening in 1826; ICE T/HO.111), and a toll board of the 1930s. The original artefacts can be identified from the illustrations in Provis's treatise on the bridge (Provis 1828, plates 12 and 13). These remarkably evocative objects have now been deposited in Oriel Ynys Môn, near Llangefni on Anglesey, which already had other material recovered from Telford's bridge. Unfortunately the interior of the Bridgemaster's House had been stripped of its original fittings, while the workshop had been rather crudely modified with brick walling and a translucent corrugated roof.

#### The ironwork and the deck

It was the iron chains, suspension rods, and linkages beneath the decking that represented the revolutionary part of the design of the Menai Bridge. These were manufactured by Telford's friend, William Hazeldine, at his Upton Forge in Shrewsbury. Here John Provis, brother of William Provis, undertook the testing of every piece before it was despatched (Provis 1828). All these elements have now been replaced. Wrought-iron is particularly vulnerable to rust and the Menai Bridge is very exposed to the weather and salt-laden air. Originally the metal components were treated in the forge by being immersed still hot into linseed oil, which provided a hard, lacquered finish. This was probably intended as a primer, for Thomas Rhodes, the superintendent for the iron and timberwork, wrote to Telford on 14 March 1826 saying that he was painting the ironwork (ICE T/HO.40). A regular regime of painting must have been initiated, for the

 $Figure~6.12~An~extract~from~a~plan~of~the~Menai~Bridge~and~its~surroundings~in~1826~(Provis~1828,~plate~1)\\ (Anglesey~County~Archives~Service)$ 





Figure~6.13~~Historic~plan~of~Bridge master's~House~(Cadw)~and~view~from~the~south~(Ken~Hoverd)



Figure 6.14 Original artefacts used in the construction of the Menai Bridge, found in the south abutment in 1999 (Rick Turner)

1837 Report to the Commissioners recorded it as being painted for the third time (BPP 1837 XXXIII.227). Advice on this problem later came from an unusual quarter - in the song that the White Knight sings to Alice in 'Through the Looking Glass' (Carroll 1872, 165).

. . . for I had just Completed my design To keep the Menai Bridge from rust By boiling it in wine.

Lewis Carroll may have spent a holiday with Alice Liddell and her family in Llandudno in 1864, when the issue of the condition of the ironwork must still have been live (Eagle and Carnell 1977, 162). Successive reports showed that the main chains and upper parts of the suspension rods remained sound - only the lower connections and linkages beneath the decking showed evidence of damage and corrosion through wear and vibration (for the history of the investigations and tests on the metalwork of the bridge, see Maunsell 1946, 169-70).

It was problems with the deck that ultimately led to the replacement of the original ironwork. Whilst Telford undertook rigorous tests on all the components of his bridge, he could not test a model of the whole bridge in a wind tunnel as might a modern engineer. In a letter to Telford of 30 December 1825 (ICE T/HO.101) Thomas Rhodes commented on the undulations caused by a gale before the bridge was finished. He sketched a design for additional stays radiating out from the base of each pyramid to dampen the oscillations. Subsequent letters refer to damage through the early months of 1826 and the modifications made to the decking (ICE T/HO.101, 114, 115, 124 and 125). Ten years later a severe gale on 23 January 1836 saw the bridgekeeper report on a vertical oscillation of the deck of up to 16ft (4.8m). A real crisis occurred during the night of 6 January 1839, however, when a storm of hurricane force wrecked the deck, leaving portions hanging from the centre chains only. Unable to cross the bridge, the bridgekeeper crossed the straits to the Caernarfonshire side by boat, just in time to stop the London mail coach plunging to its doom (Maunsell 1946, 168). Only five days were needed to get the bridge operational. Parliament voted £9,700 for repairs to be undertaken by William Provis, who introduced important new refinements into the wooden deck to improve its stability (Provis 1842). This was to survive until 1893, when a new steel deck was installed by Sir Benjamin Baker (Maunsell 1946). These three decks were to become successively heavier: Telford's with a dead weight of c 490 tons, Provis's of 623 tons, and Baker's of c 1000 tons. Tests during the early 20th century showed that these new decks were pushing the original ironwork to its limits. Weighbridges were installed at both ends of the bridge to ensure that no vehicle weighing more than 4½ tons (4566kg) was allowed on it. Vehicles





Figure 6.15 (K Hoverd) View along the deck of the Menai Bridge in 1890 (RCAHM(W)) and similar view taken in 2001

had to be spaced at intervals of 50ft (15m) and travel at no more than 4mph (6.4kmph; Maunsell 1946, 170). In 1920 motorised traffic was recorded as two or three times what it had been twelve years earlier. By this date responsibility for the bridge had been transferred from the Office of Works to the newly created Ministry of Transport which commissioned a report from Sir Alexander Gibb and others in 1920. It was this report that ultimately led to the complete replacement of the chains, suspension rods, decking, and walkways between 1938 and 1940 under the supervision of Gibb and undertaken by Dorman Long and Company as the main contractors.

The Ministry of Transport set down three primary conditions for the reconstruction of the bridge:

- 1 that there should be a double carriageway and also two footways 5ft (1.5m) wide;
- 2 that traffic should be maintained throughout the period of reconstruction;
- 3 that the architectural features and appearance of the original bridge should be retained as far as practicable.

How this was achieved is set out in great detail by Maunsell (1946). Consideration was even given to retaining the original chains, but this was impractical. The desire to retain as much of the fabric and appearance of the original bridge shows the high regard in which Telford's design was held (Gibb had published a biography of Telford in 1935). From a distance, the

appearance of the bridge was largely maintained. The line of the deck and the character of the chains and suspension rods were retained, but instead of four sets of four chains the rebuilt bridge has two pairs of more massive chains. The new projecting walkways have vertical rather than lattice railings, but they do help to obscure the massive riveted longitudinal trusses, which stand alongside the carriageway and stop the oscillation of the deck.

The view for those crossing the bridge has changed much more radically (Fig 6.15). The delicate framework formed by the more numerous and less massive chains and the four lines of suspension rods between the tall lattice railings has been replaced by a corridor of steel with its cantilevered footways. Nevertheless Gibb was justified not only in adding his name and that of Dorman Long to a carved plaque on the Caernarfonshire pyramid, set against Telford's name on the Anglesey pyramid, but also by being commemorated for finally freeing the Holyhead Road of its last tolls (Maunsell 1946).

The only surviving fragments of the original ironwork are the lines of lattice railings that bound the south-western approaches to the bridge. These also incorporate two of the sunburst toll-gates, presumably taken from the bridge in 1940 (see Fig 5.9). Two links of the Telford design of chains are in Oriel Ynys Môn, Llangefni, and another can be seen in a rockpool at the base of the Anglesey pyramid. The fate of the remainder is unknown.

# 7 Travelling the Holyhead Road to Dublin

by Rick Turner and Barrie Trinder, with a contribution by David Percival

#### Introduction

Just as a modern road needs petrol stations, cafés, and motels, so the Holyhead Road needed to be serviced by a range of buildings. A network of coaching inns and their stables had developed in the later 18th and early 19th centuries alongside the pre-existing turnpike roads, on which stage coaches plied from Shrewsbury to Holyhead. With the temporary increase in long-distance traffic during the 1820s and 1830s, many of these were to develop, some were to be newly built, but others were bypassed and failed.

Telford designed the Holyhead Road for traffic carrying passengers and to enable horses to haul coaches at trotting pace throughout its length. The nature of public passenger traffic across north Wales had been transformed between 1785 and 1815. Telford's improvements to the road brought significant further reductions in journey times, but these were not as great as in previous decades. The main purpose of the Holyhead Road, however, was to provide a speedy and reliable mail service. The first mail coach had run successfully from Bristol to

London in 1784. In 1786 the Postmaster General, John Palmer, approved a new design, the 'Patent Mail', as the standard for the Post Office (Fig 7.1; Honour 1994, 6). This vehicle was manufactured by John Besant and following his death by his partner John Vidler and other members of the Vidler family until 1835 (Honour 1994, 6). It was designed to take four passengers inside and six on top. Broster, the writer of a guide to the City of Chester in 1782 noted that both the Irish and the north Wales posts arrived and departed 'at an uncertain hour' (Broster 1782, 60–1). It was also acknowledged in Shrewsbury that the timings of coaches serving Wales were uncertain.

Since mail coaches were run to very strict timetables, each journey was recorded on a time bill. The coaches required regular changes of horses to ensure their speed and reliability. These were undertaken at a coaching inn at the end of each stage. Three of these time bills from 1815, 1827, and 1836 show the evolution of the route through Wales. In 1815 the mail coach was despatched with a 'time piece' from the Post Office at Holyhead, ran a stage of 12½ miles (20km) to Gwyndy, a further 12½ miles (20km) to the

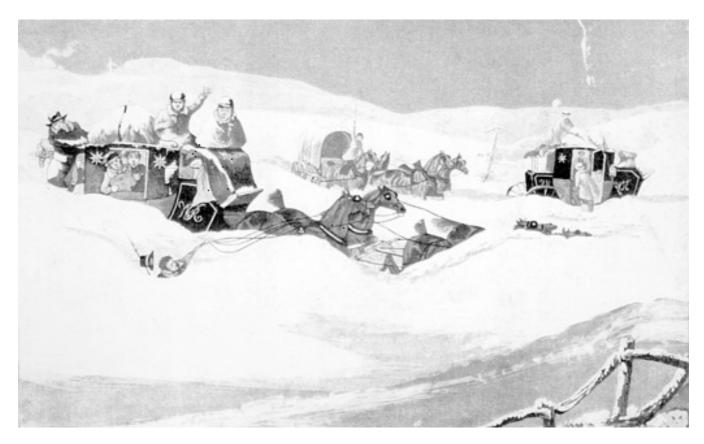


Figure 7.1 The Holyhead Mail Coach caught in the snow (Heritage, Royal Mail)

Bangor Ferry, where 40 minutes was allowed to make the crossing, a further 17 miles (27km) to Capel Curig, 10 miles (16km) to Rhydllanfair, 5 miles (8km) more to Cernioge and 13 miles (21km) to Corwen. At Corwen the timepiece was transferred to the coach passing in the opposite direction and 40 minutes was allowed for a meal. The coach's next stage was 10 miles (16km) to Llangollen, then via the Whitehirst Gate near Chirk to Oswestry, then via Nesscliffe to the Post Office in Shrewsbury. This total distance of 110 miles (177km) was timetabled to take seventeen hours (Heritage, Royal Mail, POST 10/7).

In 1827 the coach left Holyhead at midnight with stages at Mona, the Penrhyn Arms, Bangor (where five minutes was allowed for coach business), a short stage to an inn at Tynamus (Ty'n-y-maes), and on to Capel Curig, Cernioge, and Corwen (where 30 minutes was allowed for breakfast). The next staging points were Llangollen, Oswestry, Nesscliff, and arrival at Shrewsbury, a distance reduced to 107 miles (172km) and timetabled to take 11 hours 50 minutes (POST 10/203). The ends of the stages were the places identified on the milestones. By 1836 no significant time savings were made in Wales except by reducing the time for breakfast, this time at the Penrhyn Arms, Bangor, to 25 minutes, but nearly three hours were saved on the remainder of the journey to London (Watson 1917, 142–6). This may have been due to the new design of mail coach built by Joseph Wright (Fig 7.2) following pressure from Sir Henry Parnell and his select committee for the Post Office to end Vidler's monopoly.

Contractors appointed by competitive tender undertook the servicing of the mail coach at the end of each stage. These contractors were normally the tenants of the principal inn at each of the major towns, but the tendering process may explain why the business moved to different inns in towns such as Bangor, Corwen, and Llangollen during the life of the Holyhead Road. The contractor was allowed a maximum of five minutes to change the four horses, though, with practice, this could be reduced to one and a half minutes. The foot of the Time Bill for March 1827 reads:

The Time of working each Stage is to be reckoned from the Coach's Arrival and any Time lost is to be recovered in the course of the Stage. It is the Coachman's Duty to be as expeditious as possible and report the Horse-keepers if they are not always ready when the Coach arrives, and active in getting it off. The Guard is to give his best assistance in changing, whenever his official duties do not prevent it (Heritage, Royal Mail, POST 10/203).

The mail coach was one of three principal types of coach operating on British roads. Operated by the Post Office, as well as mail it carried only four passengers inside and six outside and was exempt from tolls. Something of the thrill of being an outside passenger on one of these coaches is captured in Thomas De Quincey's essay The English Mail Coach (de Quincey

1912). The stagecoach was operated by private contractors and ran to published timetables. It could accommodate up to eighteen passengers inside and out (Fig 7.2). The post coach could be hired from posting inns with a driver or postillion and was pulled by two or four horses.

The principal inns at each town served the stagecoach. They provided a rapid change of horses and allowed the passengers, both riding within and on the coach, the opportunity to have a meal or stay the night. They were booking and boarding places for passengers starting their journeys. Given the brevity of the stop taken at each stage, travellers were normally presented with a cold buffet and cheeses and pastries on view in a special, glazed cupboard. In the coffee room or dining room the tables were laid in readiness to serve a meal immediately. The main bedrooms were well appointed and were often given heraldic names such as the Moon, Star, Crescent, or Paragon (Richardson 1934, 20), which is a long-standing tradition in English inns. Parcels and mails were loaded and unloaded at the inns, while by tradition coach drivers and guards were fortified against exposure to the cold by draughts of fiery spirit. A letter from Thomas Rhodes, superintendent of works at the Menai Bridge, recorded that in March 1826 'the Coach Man driving the Chester Mail in the morning of the 1st inst was intoxicated and that he drove against a wall at Aber and broke the splinter bar and some of the harness, and this was probably the principal cause of the horses stumbling on the bridge' (ICE T/HO.131).

The Frenchman, Baron D'Haussez, affirmed in 1833 that 'Among the wonders of English civilisation the inns should be mentioned. In many of the larger towns they are magnificent and they are good and well supplied in the smallest. In the greater part of them the servants are in livery, and in all their attendance are prompt and respectful' (D'Haussez 1833, 75). An analysis of coaching traffic on the Holyhead Road in 1829 acknowledged that there were three principal classes of traveller: people going to or from Ireland on business whose principal concern was speed; Irish people going to the spas at Malvern, Cheltenham, and Bath; and tourists visiting north Wales. This last class were to influence the development of the roadside communities long after the first two had disappeared (Evason 1984, 86–93).

Finally, and probably of greater importance, was posting or private-hire coaching. A posting inn offered two- or four-horse coaches driven by a postillion or saddle horses. At the Raven and Bell, next door to the Lion Hotel in Shrewsbury, a four-horse coach cost 2s per mile, a two-horse coach, 1s per mile, and a saddle horse 6d per mile plus the cost of fodder (Shrewsbury Chronicle, 13 April 1802). A writer in 1879 recalled that the Talbot in Shrewsbury in the 1820s had an immense business in posting, providing as many as a dozen sets of four horses, as well as numerous pairs in a single day (ESJ, 19 Feb 1879). In 1828 it was estimated that 830 pairs of horses were employed in



Figure 7.2 The Shrewsbury to Chester stage coach from the mid-nineteenth century (Ironbridge Institute Library)

the posting trade between Shrewsbury and Oswestry. Many of them hauled coaches that continued across north Wales to Holyhead (Shrewsbury Chronicle, 4 Dec 1829).

Some families travelled in their own coaches, while others of lesser means might ride their own horses. These travellers also made use of posting inns, even hiring changes of horses to speed their journeys. Even an inn of relatively modest size, like the Britannia in Shrewsbury, had stabling for up to 150 horses in 1834 (ESJ, 12 Nov 1834). Despite its popularity Bagwell has estimated that travelling post, even if the traveller had his own carriage, was at least twice as expensive as travelling by stagecoach (Bagwell 1974, 54).

Lord William Lennox, who travelled with his wife and a maid from London to Dublin in his own coach (Watson 1917, 127-8), recorded an example of these costs, shown in Table 7.1.

The only long-distance freight services to use the whole length of the Holyhead Road across north Wales were stage vans. As they were advertised infrequently, it is difficult to assess their significance. In 1822 the well-established carrying firm of Crowleys was operating vans from Holyhead to London. These would take any kind of goods and provided free insurance for everything but cash, jewels, glass, plate, bullion, and watches. No overall timings were advertised, but the 150 miles (241km) from Shrewsbury to London were covered in 24 hours, not very much slower than stage coach timings. The

Wonder, a stage coach from Shrewsbury to London took sixteen hours to make this journey (see advert from Ironbridge Institute Library). Otherwise the freight traffic carried along the road was of local or regional significance. Throughout its length, the rebuilding and maintenance of the road created a demand for stone supplied from numerous quarries. Occasionally Telford's reports reveal surprising activities. Since it seems that the opening of the Menai Bridge stimulated the import of Irish pigs on the hoof, in 1826 the Commissioners found it necessary to build low walls to protect hedges between the bridge and Bangor from the burrowing snouts of pigs being driven along the road (BPP 1826 XI.97).

There were three areas where freight traffic was particularly heavy. From Chirk Bank westwards to Corwen and beyond, great quantities of coal from mines on both sides of the border, limestone, and lime were carried along the road, the effects of which troubled Telford's successors through the 1840s (BPP 1826 XI.97; BPP 1828 IX.217; BPP 1830 XV.77; BPP 1841 XII.259). Nevertheless the road was scarcely a major factor in the economy of the north Wales coalfield. The Ellesmere Canal and later the Shrewsbury and Chester Railway were of much more significance in the conveyance of minerals to distant customers.

Between Bangor and Capel Curig the Holyhead Road formed part of one of the most celebrated 'improved' landscapes in Britain. From 1782 Lord

Table 7.1 Costs of travelling by private coach from **London to Dublin** 

| Posting London to Holyhead, 4 horses          | £38 | 11 | 4  |
|---|-----|----|----|
| Postboys                                      | 9   | 6  | 10 |
| Turnpike gates                                | 5   | 9  | 1  |
| Ostlers                                       | 1   | 2  | 6  |
| Expenses on road, meals and beds for 5 nights | 5   | 8  | 0  |
| Steamboat                                     | 3   | 3  | 0  |
| Carriage and shipping                         | 2   | 12 | 6  |
| Money to steward and sailors                  | 1   | 7  | 6  |
| Total   | £67 | 0s | 9d |

Penrhyn developed a variety of new economic activities, the most celebrated of which was the quarrying and dressing of roofing slate (Trinder 1982, 96–8). Richard Ayton in 1812 described the area as 'this newly civilized district' (Ayton 1814, 26-7). Other features of the region included the establishment of Port Penrhyn, where writing slates were manufactured and placed in wooden frames produced at a water-powered sawmill. There was also a pencil factory, a mill using flints from Hampshire to produce materials for the Herculaneum Pottery in Liverpool, and a celebrated model dairy with Queensware Vessels. In 1809 carts from Shrewsbury and Bridgnorth were regularly using the turnpike road to collect fish landed at Port Penrhyn, where a curing house was under construction to preserve fish that were not sold (Hall 1811, 97). Lord Penrhyn's kinsman, Thomas Pennant, described his achievements in the late 1790s as follows:

The quarries are now the source of a prodigious commerce. When his lordship first came to the estate, not a thousand tons were exported; the country was scarcely passable; the roads not better than very bad horsepaths; the cottages wretched; the farmers so poor that in all they tract they could not produce more than three miserable teams. At present, a noble coach road is made even beyond Nant Ffrancon . . .; about 103 broad-wheeled carts



Figure 7.3 Toll board at the Llanfairpwllgwngyll toll house (Rick Turner)

are in constant employment in carrying the slates down to the port (Rhys 1883, 82).

By 1810 the Penrhyn Railway had been completed. This enabled slate to be conveyed to the coast more cheaply than was possible by road. Some road carting continued, however. In the course of the 19th century the route of the Holyhead Road became the main street of the quarrying settlement of Bethesda (BPP 1845) XXVII.169; BPP 1846 XXIV.309).

On Anglesev the completion of the new line of road provided a stimulus to the coal mines on Malltreath Marsh. A great increase in this traffic was reported in 1841 by William Provis who complained of the effects on the road of overloaded carts in his Report to the Parliamentary Commissioners (BPP 1841 XII. 259).

An idea of the relative numbers of these different types of traffic can be gained from some statistics compiled for one of the toll-gates in the 1830 Report to the Parliamentary Commissioners (BPP 1830 XV.23), shown in Table A2 (Appendix 1).

The relative value of this trade to the Commissioners can be measured by looking at the tolls charged on the board of the Llanfairpwllgwyngyll toll house (Fig 7.3).

## **Coaching inns**

It was not originally part of the study of the Holyhead Road to make detailed records of the inns that survive along the road. Thomas Telford was responsible, however, for building an entirely new inn at Mona on Anglesey, where his road took a different line from the earlier turnpike. This led to the abandonment of the inn at Gwyndy, which now survives in ruins and has been partly adapted into a farm complex. The Holyhead Road also stimulated the development of new facilities at the inn at Cernioge. David Percival of the Royal Commission on the Ancient and Historical Monuments of Wales undertook the detailed survey of the inn at Mona to complement the recording of the structures of the road by Oxford Archaeology North. Information about the other inns is taken largely from the descriptions in the Lists of Historic Buildings produced by Cadw and from documentary sources. The main inns following a journey from Shrewsbury to Holyhead are described below.

## Shrewsbury

In the last quarter of the 18th century, a consortium of Shrewsbury's innkeepers had established a network of coaching services focused on their town. Principal amongst these was Robert Lawrence, who began the twice-weekly coach service to Holyhead in 1779 from the Raven Hotel in Shrewsbury. By 1780 he had moved to the Lion Hotel - the most prestigious inn in Shrewsbury. Its prominence was to continue under

Isaac Taylor, who operated the last stage coaches from the Lion Hotel to Holyhead until 1843 (LUAU 1999, 56). The main portion of the inn comprises five bays and four storeys, with a Tuscan porch designed and built by William Haycock between 1775 and 1779 and surmounted by a gilded lion which was sculpted in 1777 by John Nelson. Inside is a splendid ballroom of the same period (Fig 7.4) treated in a restrained Adam style (Pevsner 1958, 284) and intended by Ashby to be a place of assembly for county society (Girouard 1990, 142–9; Champion 2000, 50–2).

Between the 1780s and the late 1830s there were usually two or three coach services per day between Shrewsbury and Holyhead. Some ran straight through from London, mostly operated by Shrewsbury-based entrepreneurs - Robert Lawrence's rivals or successors. Including the Royal Mail, there were 21 departures a week from Shrewsbury in 1821 and 28 in 1828.

On 27 March 1843 a presentation of a huge embossed and engraved silver salver was made to the Hon Thomas Kenyon of Pradoe, Shropshire, a famous whip, amateur coachman, and a Holyhead Road Commissioner (Harper 1902, 150-5). The inscription reads 'A token of gratitude presented by the coachmen and guards of the Lion Establishment, Shrewsbury to the Hon Thos Kenyon of the Pradoe... . '. A speaker at the presentation also paid tribute to Isaac Taylor and his 'coaches that had been conducted in a style seldom equalled and certainly never excelled . . . The stimulus given to the trade of the town through the exertions of Mr Taylor, who was never beaten, until steam rose up in array against him' (Evason 1984; ESJ, 29 Mar 1843).

The Talbot Inn in Market Street dominated the posting trade. Purpose-built in 1777 to the design of Samuel Scoltock, some impression of its luxurious nature is provided in the sale of its contents in 1838 (ESJ 21 Feb 1838). The furnishings of 40 bedrooms and 11 sitting and drawing rooms included elegant mahogany four-poster bedsteads clothed with rich moreen and chintz with superior goose feather mattresses, Brussels, Venetian, and Kidderminster carpets, Spanish mahogany dressing and wash tables, Grecian sofas, and rich China ornaments.

#### Oswestry

In 1818 the Oswestry Turnpike Trustees agreed not to object to proposals by the Holyhead Road Commission to take over their portion of the road. This was on condition that the Commission agreed to take on a reasonable proportion of the trust's debts and only if there was an assurance that the route of the Holyhead Road would continue to go through the town of Oswestry (Shrewsbury Chronicle, 13 Jan 1818). This ensured the prosperity of the town's principal inn, the Wynnstay Hotel, built in the centre of the town by the great local landowner, Sir Watkin Williams Wynn, in the late



Figure 7.4 The interior of the ballroom at the Lion Hotel (Ken Hoverd)

18th century. Like the Lion Hotel in Shrewsbury, it has a deep porch of Tuscan columns and contains a handsome ballroom to act as the assembly room for local society (Pevsner 1958; Fig 7.5).

### Llangollen

This town had already developed a coaching and tourist trade by the late 18th century. Interest in the Vale of Llangollen was kindled by the settlement at Plas Newydd in 1788 of Lady Eleanor Butler and the Hon Miss Ponsonby, the celebrated 'Ladies of Llangollen' (Harper 1902, 193). This was sustained from the mid-19th century by the popular ballad detailing the story of Jenny Jones and Edward Morgan. The main inn was the Hand Hotel, in existence in 1788, which is a rambling collection of late Georgian and Victorian buildings alongside the church.

A German prince, Pückler-Muskau, stayed at the Hand Hotel in the summer of 1828. He wrote to his sweetheart about the delights of a Welsh coaching inn breakfast. He was served on a white damask tablecloth, with 'steaming coffee, fresh guinea fowl eggs, dark yellow mountain butter, thick cream, toasted muffins and finally two freshly caught trout with delicate red spots' (Sager 1991, 303). The Hand retains a large courtyard to the rear with a converted coach house and stable blocks giving a good impression of what is now lost from the other inns in use. Pigot and Co's Directory of 1835 also records that the King's Head and the Royal were the main calling places for coaches in the town.

#### Corwen

Pigot and Co's Directory of 1835 does not record a stopping place for coaches at Corwen, but as the Druid Inn, west of Corwen, is mentioned in the Parliamentary Reports for 1824 and 1825 (BPP 1824 IX.293 and BPP 1825 XV.63), Harper (1902) suggests that this was the staging point on Telford's road. This seems odd, as Corwen has the Owain Glyndŵr Hotel (Fig 7.6), which was built as a coaching inn in the mid-18th century. This hotel, which reputedly held the first public eisteddfod in 1789, is a seven-bay, two-and-a-half-storey stone building with a slate roof and twelve-pane sashes. The interior retains a fine staircase but the disposition of the rooms when it was in use as a coaching inn cannot be traced. Wings to the west and rear are quite modern in date and probably replaced an earlier extensive range of stables.

### Cernioge

This inn stands in lonely isolation on one of the bleakest sections of the Holyhead Road. The first recorded licence for an alehouse here was granted in 1772. The site was referred to as the Prince Llewellyn Inn in 1795 (Harper 1902). Sir Richard Colt Hoare changed horses here in 1801 (Thompson 1983, 178), while Thomas Telford stayed here during the course of his survey of the route in 1810, describing it as 'an excellent inn' (Telford 1838a). Provis's notebook (ICE Provis 3) shows the roadside wall curving towards a range of two buildings where the present farmhouse



Figure 7.5 Wynnstay Arms Hotel, Oswestry (Ken Hoverd)

stands (Fig 7.7), at a point where a now demolished toll house stood. The main building is made of local rubble stone with slate roofs and is unusually tall. It is of two storeys and an attic and of three bays containing large sixteen-pane sashes. A central porch was added and it was from here that a harpist played music for Princess Victoria when she stopped for tea in 1832 (Lowe 1927, 485). Unfortunately the interior is much altered, but this building probably once contained the reception and bedrooms for the guests. The kitchens, servants' room, and cellars were adapted from an earlier building now in ruins to the west. A four-hole earth closet with a Gothic doorway stands in the orchard and seems contemporary.

On the north side of the road is a purpose-built stable block set within a stone-walled yard (Fig 7.8). It is of rubble stone with a low, hipped roof. Of two storeys and four bays, it has an external staircase to the south and a later extension to the north. The roof runs down to the rear to cover what appears to be a coach house with a large opening with a flat lintel. The main east elevation has four openings at ground floor, three of which retain their arched heads and wooden Gothic tracery. These gave access to two stables from which the pitched stone floors, drains, and the hay mangers survive. The sockets for six stalls for the horses can be made out. At the height of the coaching era there was stabling for 69 horses, reputedly the best accommodation to be had (Lowe 1927, 486), although this building alone could not have accommodated these numbers. The stone stairs to the south give access to two similar plastered chambers with a nine-pane casement window to the east and what appear to be blind stone fireplaces to the west. These may have been dormitories for the grooms. Within the yard is a large stone watering trough.

There is no documentary evidence that Telford was



responsible for designing or commissioning this stable block, although his assistant, William Provis, appears to have used Cernioge as a base and asked for tenders to be submitted to him there in 1817 (ICE T/HO.22). When George Borrow walked past in 1854, he was told that 'some years ago it was an inn, and a very large one at which coaches used to stop', implying that it went out of business when the stagecoach service was abandoned in 1839 (Borrow 1862, 141-2).

#### **Pentrefoelas**

Although this was not to be a staging point on Telford's Road, the Foelas Arms Hotel was an important posting inn (Fig 7.9). Probably built in 1762 when the first recorded licence was issued to Robert Jones, it was laid out to face the earlier turnpike which ran north-west via Nebo to Llanrwst. It was refronted in 1839-40 by the Voelas estate to face the Holyhead Road. There is a very extensive range of stables and an estate yard with a watermill to the west.

Figure 7.6 The Owain Glyndŵr Hotel, Corwen (Ken Hoverd)



Figure 7.7 The remaining portion of the Prince Llewellyn Inn at Cernioge (Ken Hoverd)





Figure 7.8 Cernioge's stables (Ken Hoverd) and engraving from 1902 showing inn on the left and stables on  $the\ right\ (Harper)$ 

# Capel Curig

An inn was built at Capel Curig at the very beginning of the 19th century by Lord Penrhyn. It was at the eastern end of the new turnpike road he had

constructed from Capel Curig to Bangor. Sir Richard Colt Hoare recorded in his diary in 1810 that many changes had occurred at Capel Curig since his previous visit in 1799, when there was:



Figure 7.9 Foelas Arms Hotel with the old Nebo and Llanrwst turnpike to the right and the Holyhead Road to the left (Ken Hoverd)

. . . no accommodation even for the fisherman or even a pedestrian tourist, but the public zeal of the late Lord Penrhyn has remedied all these inconveniences by establishing a large and commodious inn at Capel Carrig and by rendering the rough places plain. The whole country is now becoming practicable in every direction, and a chaise rolls on with ease and safety where a timid equestrian would not have ventured (Thompson 1983, 247).

In acknowledgement of the new Penrhyn turnpike, the Shrewsbury to Holyhead mail coach ran via Capel Curig from 1805. In 1815 the 'Prince of Wales', a new coach service from the Talbot Inn in Shrewsbury, used this inn as its overnight stop on the way to Holyhead. As such it was to attract some very illustrious clients including the Duke of Richmond, Queen Victoria, and Kings Edward VII, George V, and Edward VIII. When George Borrow arrived here on foot in 1854, he found a:

very magnificent edifice. There I dined in a grand saloon amidst a great deal of fashionable company, who probably conceiving from my heated and dusty appearance, that I was some poor fellow travelling on foot from motives of economy, surveyed me with looks of the most supercilious disdain (Borrow, 1862, 145-6).

It was renamed the Royal Hotel in about 1870. The

present building is used as an outdoor centre and is of an irregular plan with six separate ranges, three of the early 19th century, and three of the later 19th century. The buildings are stuccoed and of two storeys with sashes, some with Gothic tracery. The interior includes a coat-of-arms painted on canvas recording the visit of the Duke of Richmond in 1807.

#### Ty'n-y-maes

The remains of this inn [0780] are incorporated into a T-shaped house that stands along the roadside at the western end of the Nant Ffrancon Pass. It has been rendered in cement and has modern windows. To the rear is a ruinous stable and coach house with a pedimented central bay.

#### Bangor

At the entrance to the town Lord Penrhyn had built the Penrhyn Arms commended by Colt Hoare in 1810 for its bowling green, coffee room, views of the mountains, and the bustling activity of Port Penrhyn alongside (Thompson 1983, 258). Sir Henry Parnell, chairman of the Parliamentary Commissioners, seems to have



Figure 7.10 Mona Inn (OA North)

favoured this hotel for he wrote two letters to Telford from there (ICE T/HO.164 and 165). The port was the terminus of one of the ferries across the Menai Straits.

The oldest and most regularly used ferry was that from Porthaethwy (Menai Bridge) to the west of the town. It was serviced by the Bangor Ferry Inn-later the George Hotel. The inn survived the opening of the Menai Bridge. The original building of c 1770 was much enlarged in the mid-19th century and was converted in 1919 to become Normal College, part of the University of Wales, Bangor. Pigot and Co's Directory of 1835 also recorded the Albion as a posting inn, where George Borrow and his family were to stay in 1854 (Pigot and Co 1835; Borrow 1862).

#### Mona Inn

The Anglesey stretch of the Holyhead Road adopted a direct line across the island and superseded the earlier turnpike opened in 1765. As the new road did not pass through any major town between Menai Bridge and Holyhead, it avoided Llangefni and the well-established coaching inn at Gwyndy. Thomas Telford was, therefore, charged with building an entirely new inn at Mona a halfway point on the island. Unfortunately no specifications or plans of the Mona Inn have been found. The references to the work being carried out there appear in the journal recording the weather and attendance of workmen on the Anglesey Road (PRO MT 27/59) and in the Contractors Account Book for the Holyhead Road (PRO MT 27/17). The journal records various numbers of masons, carpenters, smiths, quarrymen, metallers, labourers, slaters, plasterers, glaziers, and horses at work from late 1820 into the summer of 1822, when it seems the inn opened. The account book records a total expenditure of £2,990 between 11 October 1820 and 3 January 1823. The Anglesey Hunt Club used it as the venue for its meetings in 1822 and 1823 (Williams 1988, 57-8).

The opening of the Mona Inn saw the demise of the coaching inn at Gwyndy, some 5km to the northwest, which now exists as a complex of three ruinous stone buildings partly maintained in use as a farmyard. One building with two massive chimney stacks is most probably the inn itself. The others are coach houses and stables. One has eight and one has three low, segmentally arched entrances. The 1819 Report to the Parliamentary Commissioners (BPP 181 9V.115) includes a claim for compensation from



Figure 7.11 The coach house of the Mona Inn (RCAHM(W))

the owner of the inn at Gwyndy, since his inn that had been specifically built for travellers to Holyhead would be isolated by the completion of the new route across Anglesey. It is significant that the innkeeper at Gwyndy moved to become the first proprietor at

The complex at Mona comprises a double courtyard of buildings on the south side of the Holyhead Road. The focus of the complex is the newly built inn at the centre of the north range (Fig 7.10). Accommodation for grooms, coach houses, and stables constitutes the rest. The inn building is a two-storey, five-bay range built of rendered rubble masonry with strings, a plinth of stone, and a slate gabled roof. There are fifteen-pane sashes at ground-floor and twelve-pane ones at first-floor level, with a central panelled door under a rectangular fanlight with radiating glazing bars. This door opens into a central hallway, with the main reception rooms to either side. A dog-leg staircase with clasping handrail on stick balusters leads to an axial landing, from which access is gained to the bedroom to the front. The lower rubble stone building to the west contains the kitchens and servants' rooms.

To the east is the main gateway into the northern courtyard. This is dominated by a five-bay coach house at the centre of the axial range (Figs 7.11 and 7.12). A rubble stone building with low, dressedstone, segmental arches - its central bay is a through passage into the southern courtyard. The ranges on either side of the coach house are separate stables with lofts above. A stone stair to the east of the coach house gives access to the first floor. To the west, between the coach house and the north range, is a passageway leading to the southern courtyard, which once housed a dovecote at first-floor level.

The west and east ranges are rubble stone buildings, each lower than the coach house. Both had a planked doorway, a small-pane casement, and a hay loft with pitching holes and windows above. Many of the stables retain their hay mangers, which were fed from above through slots. In the north-east corner are heated rooms at both floors, probably for the grooms, and in the north-west corner is a room with a tiled floor and the remains of a boiler for making feed for the horses. All the buildings are served by a broad cobbled pathway with a drain around the edge of the yard. The eastern range has stables that are slightly larger than those to the west. The room at the northern end has a fireplace and a glazed window at both ground and first-floor level. This probably provided additional accommodation for grooms. The southern courtyard contains a group of less formally designed buildings that potentially served an agricultural rather than a hostelry function.

The new inn's success was to be short-lived – the

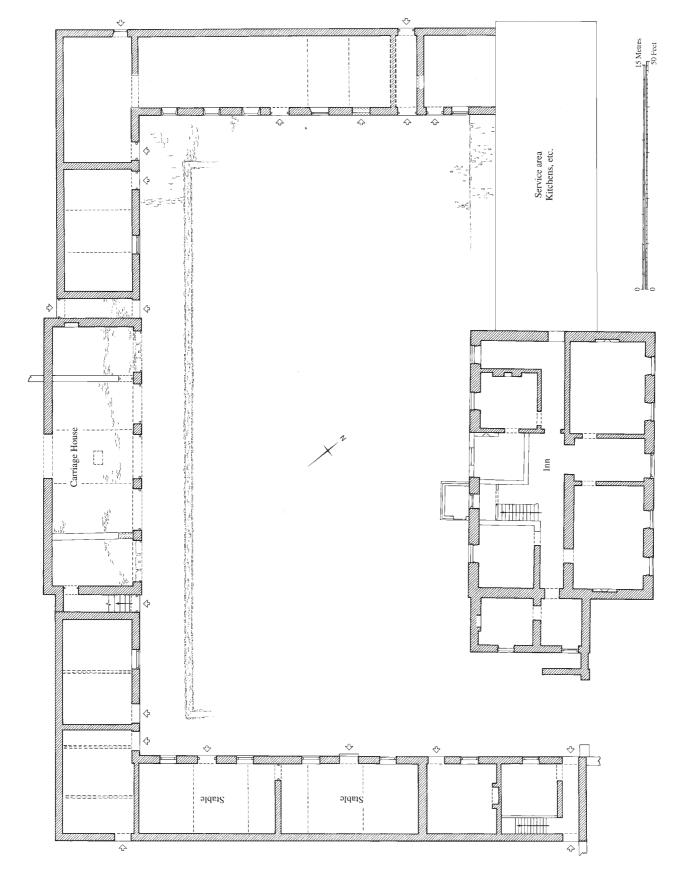


Figure 7.12 Ground floor plan, Mona Inn (RCAHM(W))

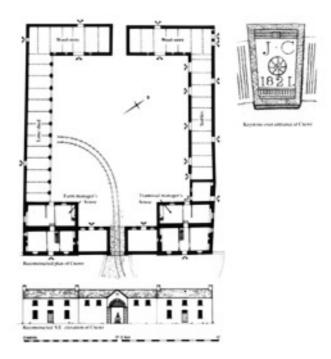


Figure 7.13 The railway depot and farmstead at Cnewr, Brecon Forest Tramroad (RCAHM(W))

opening of the railway across Anglesey in 1848 probably led to its final demise. The census of 1851 shows that the Mona Inn had become Mona Farm (PRO HO107).

The layout of the inn at Mona is reminiscent of model farmsteads of the first quarter of the 19th century (Wiliam 1982, 49-59). It can also be compared to the stabling and depots built to service the contemporary horse-drawn tramroads in south Wales. For instance on the Brecon Forest Tramroad, where John Christie built a depot at Cnewr in 1821. This has the same well-planned layout around a main courtyard. The Farm Manager's and Tramroad Manager's houses add interest to the entrance range (Fig 7.13). The stables at Dowlais and Gurnos, Merthyr Tydfil, built to service the tramroad networks which converged on the great ironworks of the town, were on an even grander scale (Hughes 1990, 184-9).

#### **Holyhead**

The Eagle and Child at the south end of Market Street was built about 1770 and stood alongside the earliest quay for the sailing packets. Its role as the premier coaching inn seems to have been confirmed with the completion of the Admiralty Pier in 1821, when King George IV visited the hotel on his way to Ireland (Watson 1917, 115-17). Thereafter it was referred to as the Royal Hotel. The mail coach house was built alongside it in 1826. Pigot and Co's Directory continued to identify the Royal as the principal terminus for coaches (Pigot and Co 1835). Following the completion of the Railway Hotel in 1880, however, the Eagle and Child was converted into houses (Victoria Terrace) and no trace of the coach house survives. Before the building of the Holyhead Road, other inns had acted as the termini for stage coaches from Shrewsbury. Jackson's Hotel was the terminus of the coach from Shrewsbury in 1803, operated by Jackson, Jebb and Co. Bates's Hotel served a similar function in 1805, while the Hibernian received the coach from the Talbot Inn, Shrewsbury, in 1816.

#### **Holyhead Harbour**

At the turn of the 19th century the old harbour at Holyhead was still a tidal creek. In 1809 there were six sailing packets and two wherries employed in ferrying the mails to Dublin. In 1810 the Select Committee investigated the state of the harbour and recommended that Salt Island should be purchased, a road made to it, and a pier constructed. John Rennie was appointed to construct what became known as the Admiralty Pier, but the work was not completed until 1821, the year Rennie died.

During this period of eleven years, there were continual developments (Fig 7.14). In 1810 a telegraph station was erected on Holyhead Mountain to signal to the harbour when the packet was approaching (BPP 1810 IV.33). This was to ensure that the mail coach was detained, thereby avoiding a delay of a day in carrying the letters. The numbers of sailing packets continued to increase with The Countess of Chichester, a cutter of 102 tons brought into service in 1814 (Watson 1917, 102-4). A revolution in sea travel was now underway. The launching of Henry Bell's steamship *Comet* on the River Clyde in 1812 was to transform coastal shipping. In addition



Figure 7.14 The Admiralty Pier, arch and lighthouse of Holyhead Harbour, with a steam packet leaving the harbour in the early 19th century (National Library of Wales)

paddle-steamer packets rapidly replaced sloops as the main form of cross-channel and cross-estuary passenger transport. Sailing packets were very unreliable, as shown by a report prepared by the Post Office in 1818 (Armstrong and Bagwell 1983, 162) in which sailing times from Howth to Holyhead varied from less than 8 to over 50 hours. Parnell and his Select Committee had recommended to the Postmaster General that he consider steam packets as early as 1815, but the Post Office continued to try to improve its sailing vessels (Watson 1917, 107-8).

In 1820 the 'New Steam Packet Company' brought the *Ivanhoe* and the *Talbot* into service from Dublin to Holyhead. They offered to carry the mail, but without response. Within a year these two steamers were carrying as many cabin passengers, carriages, and horses as the sailing packets, with an average saving of over eight hours per voyage. The Post Office was forced to act. In June 1821 two vessels were brought into service – the *Lightning* (205 tons and 80 horsepower) and the *Meteor* (189 tons and 60 horsepower), costing £10,834 and £8,870 respectively. These were built by Evans of Rotherhithe and powered by Boulton and Watt steam engines. They quickly showed their merit and forced the Ivanhoe and Talbot onto other routes. Their success was sealed when King George IV and his royal yacht were trapped in Holyhead by adverse winds. On 12 August 1821 he decided to sail for Ireland on the Lightning – thereafter rechristened Royal Sovereign King George the Fourth - under the command of Captain Skinner (Watson 1917, 115–17). This event

was commemorated with a triumphal arch or more properly a gatehouse across the entrance to the pier. The arch was designed by the architect Thomas Harrison using his favoured Greek Doric order, with Latin and Welsh inscriptions (Fig 1.6).

Despite high fares passenger numbers began to increase and three new, larger, and more powerful steamers, the Aladdin, Harlequin, and Cinderella were built in 1824. The Royal Sovereign and Meteor were transferred to Milford Haven. These allowed regular timetables to be followed except in the most adverse weather. An inquiry in 1831, however, showed that all was not well. Captain Skinner was a principal witness and his evidence was damning. He claimed that the management of the Post Office was deplorable and that the ships were badly built and not as strong as the sailing packets. The crews were regularly short-handed, while the high fares and bad accommodation were turning the passenger traffic from Holyhead to Liverpool. The numbers of fare-paying cabin passengers had almost halved between 1826 and 1831 (Watson 1917, 136-7). Sir Henry Parnell gave evidence in support of Captain Skinner, arguing that the failure to bring the steam packets up to date diminished the value of the investment made on the Holyhead Road. In October 1832 Captain Skinner was tragically proven to be right when a heavy sea struck his vessel, the Escape, holed the port side and washed his mate and himself overboard to their deaths. To celebrate his 57 years in the public service, an obelisk was erected to his memory above the harbour (Fig 7.15).



Figure 7.15 The monument to Captain Skinner, Holyhead (Ken Hoverd)

The correspondence held in the library of the Institution of Civil Engineers shows Telford's growing involvement with work at the harbour following Rennie's death in 1821. It began at the end of 1821, with the proposal to erect a Watch or Light House at the end of the pier. This was needed in connection with the arrival of steam packets after dark, for which the harbour boat was to be in readiness (Hague 1994, 52-4; ICE T/HO.49). The plan and elevation were signed by the engineer, James Brown (ICE T/HO.50). The correspondence continues with estimates for works to the harbour, which were put under the jurisdiction of the Parliamentary Commissioners in 1823. Details of improvements to Holyhead Harbour undertaken during 1823 and 1824 involved paving the pier and building a Harbour Master's Office and Custom House (Fig 7.16). These were originally identical buildings in ashlar limestone divided into three bays by plain pilasters and with a hipped roof. A graving dock was built on the south side of the harbour during 1825 and 1826. Brown supervised all these works, while William Hazledine provided the iron lock gates, machinery, and crane for the graving dock from his foundries near Ruabon and in Shrewsbury (ICE T/HO.52, 58, 59, 70–2, 75–9, 83, 85, 87, and 93). The machinery was powered by a Boulton and Watt steam engine. Telford and Brown also had to modify the raking, lower courses of the Admiralty Pier because the paddles of the steam packets were being damaged at low tide. Some of this work was done using a diving bell (ICE T/HO.79). In 1825 Brown was in the process of deepening the harbour by laying a railroad into the bottom to remove the spoil (ICE T/HO.85).

A final building added to the terminus was a coachhouse and workshop. On behalf of Mr Vidler, the mail coach contractor, Thomas Baker sent a plan



Figure 7.16 The plan of Holyhead Harbour from Telford's Atlas (1838b)

and elevation to Telford from the Mail Coach Factory in March 1826 (ICE T/HO.132-3). Baker recommended that a well and pump be included to wash the coaches. Work was underway in May that year (ICE T/HO.146) when Brown amended the design by increasing the doors from two to three to improve the handling of the coaches.

Some lower-cost improvements were made elsewhere. Telford was asked to submit an estimate for the erection of a clock to regulate the sailing of the

Figure 7.17 A plan of Howth Harbour from Telford's Atlas (1838b)

mail packets (ICE T/HO.59.86). Holyhead church tower was first suggested as a location. It was eventually erected in a square clock tower with an octagonal louvred belfry on the roof of the Harbour Master's Office on the pier. The Packet Agent's office was provided with gas lamps to make it more conspicuous (ICE T/HO.80–2). In 1826–27, the Liverpool Dock Trustees extended the telegraph system from Holyhead along the north Wales and Cheshire coasts to Liverpool. In ideal conditions,

messages could be relayed along this system in five minutes (Wilson 1976, 69-72).

#### Howth

The destinations of the sailing packets and after 1822 the steam packets was to change over the decades. Despite Huddart and Rennie's report of 1801 recommending the development of Howth, progress was slow. An act of 1805 authorised expenditure of £10,000, but it was not until 1809 that a full design was prepared and work placed under the supervision of John Rennie (Rennie 1875). Eventually in 1818 Howth (Fig 7.17 became the mail station taking over from the Pigeon-house Dock in Dublin. This saved up to five hours on the average sailing times). A road was built from Dublin to Howth to service the new mail station (Watson 1917, 99-110). Telford advised on its repair in 1826 (ICE T/HO.116).

A rival to Howth began to appear, however, when the construction of the east pier at Dun Laoghaire was sanctioned by an Act of Parliament in 1815 (55 Geo III c.152). When King George IV landed there in 1821, the east pier was near completion and the west pier had been commenced. The harbour was called Kingstown in his honour. In 1826 the Post Office instituted a second mail packet service from Liverpool to Kingstown alongside its existing service from Holyhead to Howth. Debate raged over which of these Irish harbours was the better option. Promoters sought to build a railway line from Dublin

to Dun Laoghaire in 1831. This may have been a factor in the Postmaster General's decision to make Kingstown the harbour for all its mail packets in 1834, despite the investment of over £420,000 in Howth (Watson 1917, 140).

The improvements to the harbours, the speed and reliability of the steam packets, and the transfer of passengers from coach to ship probably had as dramatic an impact on the journey time from London to Dublin as the improvements to the Holyhead Road. This reliability of service was also to affect the trade in goods. In 1830 the steam packet owner, Charles Wye Williams, noted that many small Irish traders who in the days of sail had rarely travelled further than their nearest market town, were now making frequent trips to the industrial towns of England with large quantities of eggs, poultry, and butter. They would then return with general merchandise in exchange, for sale in newly opened shops in the villages and small towns of Ireland. He also found that 'it was not necessary in Dublin or any other port in Ireland to have a large stock of goods in hand, for traders could have from any of the manufacturing towns in England within two or three days, even the smallest quantity of any description of goods' (Armstrong and Bagwell 1983, 170-1). So this great civil engineering project, conceived at a time of war and political union and undertaken by the greatest engineer of his day was to bring Manchester cottons and Birmingham metal goods to the heart of rural Ireland.

# 8 The fall and rise of the Holyhead Road

# by Rick Turner and Barrie Trinder

## The decline of the Holyhead Road

There was an expectation that the Parliamentary Commission would recover much of its expenditure on building the road from the tolls gathered from the fourteen toll houses erected along its length in Wales. For a time in the late 1820s and early 1830s, these toll houses were to generate a healthy income. This success was to be short-lived, however, as Telford's great achievement was to be superseded by technological change – the coming of the railways (see Fig 1.7). The opening of the Grand Junction Railway in 1837 from Newton-le-Willows to Birmingham quickly affected traffic on the road. From September of that year, the Dublin mails were conveyed from London to Birmingham by road, thence by railway to Hartford in Cheshire, before being taken through Chester and along the north Wales coast to Holyhead. From 1839 they were despatched by sea from Liverpool, obviating the need for any road transport. In 1844 the Chester and Holyhead Railway was incorporated, with Robert Stephenson as the engineer-in-chief. It followed a route that had been surveyed as early as 1838 by Stephenson's father, George (Sivewright 1986, 14). In 1850 the direct rail route to Holyhead was finally completed with the opening of Stephenson's Britannia Bridge over the Menai Straits.

From 1839 reports to the Parliamentary Commissioners made gloomy reading. In that year the only stagecoach that ran to and from Holyhead was withdrawn. The posting traffic was much reduced, causing a loss of income of over £400 per annum (BPP 1839 XXIX.597). In 1840 it was suggested that tolls should be increased, as there was insufficient income to maintain the road (BPP 1840 XXVIII.465). The road and its bridges were transferred to the Commissioners of Her Majesty's Woods and Forests in 1842. In 1850 the Chief Commissioner questioned the propriety of continued financial support from public funds for a route which now conveyed little more than local traffic (BPP 1850 XXX.107). The following year the inspecting engineer found grass growing in the road on Anglesey, and the Commission concluded 'We are of the opinion that the road is no longer of such national importance as to justify us in applying to Parliament for a grant of public money for its future maintenance' (BPP 1851 XXIX.117).

An industry that the Holyhead Road helped to foster in the mid-19th century was tourism. Though most tourists travelled to the area by train, the road gave access to the mountains of Snowdonia. Resorts developed at Capel Curig and Betws-y-Coed, the latter made famous by the artist David Cox, who settled there in 1859 (Lord 1998b). By the beginning

of the 20th century, it was noted that 'The fine flower of civilization that now makes holiday at Bettws . . . the long, long row of hotels and lodging houses has replaced the original whitewashed granite cottages . . . on the road the waggonettes are plying with their loads to the Fairy Glen or the Swallow Waterfall' (Harper 1902, 234). Tourism stimulated in established towns like Llangollen, Corwen, and Bangor and new hotels were built to house the visitors brought into the region by the railways. In 1854, however, George Borrow set out on a tour through north Wales, which is described in Wild Wales (Borrow 1862, 141–8). On one day he walked 33 miles (53 km) along the Holyhead Road from Cerrigydrudion to Bangor and met only one or two other walkers on the way. Despite the limited influx of tourist traffic, the Holyhead Road remained in a 'frozen' state throughout the rest of the 19th century. The last toll-gate was removed from the road itself in 1892 at Gwalchmai on Anglesey (Harper 1902).

#### The Holyhead Road in the 20th century

#### The first 50 years

Usage of the Holyhead Road was perhaps at its lowest ebb at the dawn of the 20th century. Tolls had been removed from all stretches of the road itself in the previous decade and were only being collected on the two suspension bridges. The railways were carrying all but local traffic and freight. In 1880 the London and North-Western Railway had transformed Holyhead Harbour by developing the Inner Harbour with new and larger port facilities, erecting a new station, hotel, and ranges of warehousing and cattle sheds to assist in the transfer of bulk cargoes (Fig 8.1; Baughan 1980). Holyhead, the terminus of the Irish Mail, one of the most celebrated of British trains, was described at the end of the century as 'but a dependency of the London and North-Western Railway' (Harper 1902, 308).

Yet another technological revolution was to transform the fortunes of the road – the invention of the petrol-powered car and lorry. This had an impact only slowly, but it was to be reflected in an administrative change, when the responsibility for maintaining the road and its main structures was transferred in 1917 from the Office of Works to the newly created Ministry of Transport. It was this new Ministry that took up the challenge of improving the road to meet the new demands of the motor vehicle.

A number of significant improvements were made before the Second World War. These began appropri-



Figure 8.1 Extract of first edition Ordnance Survey 25in map (1890) showing Holyhead Harbour (National Library of Wales). Reproduced with the kind permission of the Ordnance Survey.

The next improvement was to the sections of the Chester Road around the two headlands at Penmaenmawr. This was one significant area where Telford had failed to meet the minimum gradient that he had set himself and at one point it remained at 1:14. In 1935–36, the Headland Tunnel Scheme was undertaken by the engineer, Howard Humphreys. These new tunnels were given distinctive concrete portals, leaving lengths of Telford's road as footpaths (Humphreys 1937).

The most significant episode in this period was the reconstruction of the suspension chains and decking of the Menai Suspension Bridge between 1938 and 1940. These were designed and supervised by Sir Alexander Gibb. One of the three main conditions applied to this reconstruction was that 'the architectural features and appearance of the original bridge should be retained as far as practicable' (Maunsell 1946, 171). Gibb, who like Telford had been president of the Institution of Civil Engineers, had also collected many of Telford's papers in the Institution's Library and written a biography of his hero (Gibb 1935).

#### The second 50 years

Attitudes seem to change after the Second World War. In the 1950s the new proposals presented to improve the crossing across the Afon Conwy would have involved the demolition of the Conwy Suspension Bridge. Only a concerted campaign by conservationists saved the bridge and saw its acquisition as a monument by the National Trust in 1965. Britain had not followed the lead of other major European countries like Germany, Italy, or the USA in building a new strategic network of modern roads, until the late 1950s. Up to this date the existing network of 18th- and 19th-century turnpike roads was improved with more durable surfaces to provide the trunk road network.

Between the wars the Ministry of Transport had undertaken a number of substantial projects, such as the East Lancashire Road and the London North Circular Road, and a limited number of town bypasses. It was only with the development of the motorway network, beginning at the end of the 1950s and accelerating during the second half of the century, that schemes with the ambitions and technological innovations of Telford's Holyhead Road were again attempted by the government.

In England Telford's line became the A5 from London to Weedon in Northamptonshire and then proceeded via Coventry, Birmingham, Wolverhampton, and Shifnal (A45, A41 and A464) to Oakengates, Shropshire, where it became the modern A5 again. West of Shrewsbury the A5 diverged from the Holyhead Road to bypass Oswestry. This trunk road network was superseded by the construction of the M1, M6, and later the M54 and new bypasses around Shrewsbury, Oswestry, and Chirk. In England few stretches can now be recognised as the road built under Telford's instructions. The route has become so dissected that it is hard to follow.

This revolution in road building took some time to affect the Holyhead Road in Wales, where the route through Wales did not join major conurbations, nor provide an arterial road for the supply of major industries. The first significant bypassing of the Parliamentary Commissioners' road in Wales came with the burning down of the teak-lined tubes of Robert Stephenson's Britannia Railway Bridge over the Menai Straits in 1970. This led to the redesign of the bridge, which was reopened in 1980, to create a roadway over the railway (Fig 8.2). New approach roads were built from Llandegai on the Caernarfonshire side and at Llanfairpwllgwyngyll on the Anglesey Road. Lengths of Telford's road were lost by the creation of new junctions.

More significant changes occurred in response to growing freight traffic between Ireland and the United Kingdom, stimulated by the entry of both countries into the European Community. At the end of the 1980s the European Union initiated the creation of the Trans-European Road Network to provide a strategic transport scheme between its member nations. To contribute towards this initiative the British government decided to improve the A55 along the coast of north Wales to the port of Holyhead to create the easiest access for Irish traffic to the motorway system. The greatest engineering challenge was the crossing of the Conwy Estuary. Telford's causeway had provided the basis of the eastern approach to Stephenson's Railway Bridge and the controversial new bridge built in 1958. Since that date Conwy Castle and its town walls had been designated part of a World Heritage Site by UNESCO. Only two options were available for crossing the Conwy: a fourth bridge to be sprung from alongside the castle causing further losses to the historic borough and its town walls or a tunnel under the river taking the road to the north of Conwy. Despite the considerably increased costs, but supported by an intensive campaign by conservationists led by the Chief Inspector of Ancient Monuments for the Department of the Environment, Arnold Taylor, the public inquiry opted for the tunnel option (Times obituary 14 November 2002). This was to provide a civil engineering challenge to match those overcome by Telford and Stephenson in the past (Fig 8.3). The tunnel was opened in 1990 without compromising the fabric or the views of the castle and town walls. Conwy was now transformed from a nearly continuous traffic jam into one of Wales's most attractive historic towns.



Figure 8.2 The Britannia Bridge following its conversion to road and rail carriage (Rick Turner)



Figure~8.3~~The~Conwy~Road~Tunnel~under~construction~(RCAHM(W))

The opening of the tunnel provided the opportunity to improve and largely reconstruct the line of Telford's Chester Road past Penmaenmawr and Aber to Llandegai, leaving very few of Telford's features intact. This was part of the development of a major dual carriageway from Chester. The road was directly financed by the Welsh Office, which had taken over the Ministry of Transport's responsibilities in Wales. The completion of the A55 from Llanfairpwllgwyngyll across Anglesey to Holyhead was undertaken as a Design, Build, Finance, and Operate scheme in which a private consortium, A55 UK Highways Limited, undertook to design, build, and maintain the new road for a 30-year period (Welsh Office 1998). In return they received annual payments from the government based on the traffic flows recorded using the new road for that period. This approach represented a return to the basis of operation of the turnpike trusts and so takes the history of the Holyhead Road almost full circle.

Like Telford's road before it, the new A55 across Anglesey adopts an almost entirely new line. It crosses the original road at four points, resulting in the loss of some of Telford's features. The original road has been transformed by the enormous reduction in traffic, however, making it a much pleasanter route to drive. Over considerable lengths, this also makes it easier to appreciate the road that Telford built and makes the conservation of roadside walls, milestones, and other structures a more practical and much safer proposition. The entry into Holyhead had already been disrupted by the construction of Anglesey Aluminium Works in the early 1970s, while the approach to the harbour had been rebuilt by the LNWR by 1880.

Despite the major changes that have taken place, the Holyhead Road, which was classified as part of the A5 in the early 20th century, remains remarkably unaltered across mainland Wales from Chirk to Llandegai. Road widening to the west of Corwen and Betws-y-Coed and around the southern shores of Llyn Ogwen has destroyed Telford's road. Where the road passes through the towns along its route, it is hard to trace any of Telford's distinctive features (Chapter 5). For 56 miles (90km) it is, nevertheless, remarkable how much the modern road respects the boundaries and principal structures of the original road and how many individual features, walls, depots, milestones, drains, toll houses, and minor bridges have been retained.

Only one major improvement, the Glyn Bends, was undertaken in the 1990s (Fig 8.4). This bypassed the remarkable Glyn Dyffwys or Ty Nant embankment, one of Telford's proudest achievements. Modern trunk road standards are set out in the *Design Manual for Roads and Bridges*, volumes 10 and 11 (Highways Agency 2000). To fulfil these standards, the Welsh Office proposed a number of other significant improvements to the Holyhead Road – at Pont Padog and the Halfway Bridge and by bypassing Corwen and Bethesda. It was the environmental assessment of these improvements that was to

transform the appreciation of Telford's original construction and reinforce its importance.

# The industrial archaeology of the Holyhead Road

Most biographers of Thomas Telford include a chapter on the Holyhead Road and focus on its principal structure, the Menai Suspension Bridge (Gibb 1935; Rolt 1958). These have tended to rely heavily on Telford's own autobiography (Telford 1838a), Provis's account of the building of the Menai Bridge (Provis 1828), and the Parliamentary Commissioners Reports (see Appendix 1), all widely published. Only Harper (1902) really combines an account of a tour of the road and a detailed description of its features with the history. He also wrote other books on the Great North Road (Harper 1922a) and the roads from London to Dover (Harper 1922b) as part of a nostalgic interest in stage coaching.

Scholarly interest in the Holyhead Road began to revive in the 1960s. In 1964 Mervyn Hughes published an article examining the novel administrative arrangements set up by the Holyhead Road Commission (Hughes 1964). In 1973, TICCIH (the International Congress for the Conservation of the Industrial Heritage) held its first congress at Attingham Park, near Shrewsbury, on the route of the road. Their first field excursion travelled to the Menai Bridge along the A5 returning via Conwy. In the same year the toll house from Shelton outside Shrewsbury was rebuilt at the Blists Hill Open Air Museum, Ironbridge, alongside a stretch of road built to Telford's specification (Fig 8.5). Also in 1973 the toll house, milestone, and turnpike gate alongside the north side of the Stanley Embankment in Anglesey was moved to accommodate a roadwidening scheme.

The Ironbridge Gorge Museum and the Telford Development Corporation developed the Telford Collection, now housed in the museum's library. The collection includes almost every published work containing significant material on Thomas Telford, in addition to microfilms of Parliamentary papers and many manuscript sources. This project led to seminars and publications that included several papers relevant to the study of the Holyhead Road (Penfold 1980b).

The recognition that road improvements would lead to the loss of important components of the Holyhead Road came later. Cadw and the Highways Directorate of the Welsh Office had come to a pioneering agreement in 1988 that the Highways Directorate would pay for the archaeological assessment and resulting fieldwork arising from their trunk road schemes. This agreement was developed into an ongoing four-stage approach with:

- 1 initial appraisal of route options;
- 2 desk-based assessment of the preferred route;



Figure 8.4 The eastern approach to the Glyn Bends cutting (Ty Nant) where it diverges from the original line, showing the relocated milestone [088] (Ken Hoverd)



Figure~8.5~~The~Shelton~toll~house,~Blists~Hill~Open~Air~Museum~(Ken~Hoverd)

- 3 a field evaluation of sites identified in the assessment:
- 4 a mitigating survey and excavation of sites to be lost in advance of construction.

This approach came to be adopted across the United Kingdom and is enshrined within the *Design Manual for Roads and Bridges*, volume 11 (Highways Agency 2000).

Those processes were followed in advance of the A55 Aber and A5 Glyn Bends Improvements of the early 1990s, although the investigations were limited to traditional archaeological sites. It was only during the desk-based assessment of the Pont Padog Improvement that the Gwynedd Archaeological Trust came to the conclusion that the most important archaeological site to be affected by the new route was the Holyhead Road itself (Davidson and Flook 1994).

There was very considerable opposition to the improvements that were proposed at Pont Padog, Bethesda, and Halfway Bridge. These works lay partly within the Snowdonia National Park and partly on land owned by the National Trust. As a result of this opposition, the Highways Directorate commissioned the A5 (T) Trunk Road, Llandegai to Chirk Route Study: Future Management and Improvement Strategy prepared by SGS Environmental in 1996. This intensive study included an assessment of the historical and archaeological importance of the road (SGS 1996, 34–8) based largely on information and advice provided by Cadw. In the section entitled 'Next Steps' they concluded:

Given the historical interest of the route, an important future study for the route would be a systematic route study and cataloguing of all surviving features associated with the Telford design. This would provide a reference document for use when considering and undertaking future highway improvement projects as well as valuable information relating to any future development of the A5 (T) as a heritage route.

This strategy recognised that the historical status of the road should be highlighted, but because of the importance of the route, its trunk road status had to be maintained, though many off-line and on-line improvements were to be dropped or reviewed. It also required the Department to develop a management strategy for the whole route consistent with already published guidance. Any improvement schemes would continue to be designed in accord with the route strategy.

One of the recommendations for the establishment of the management strategy was that a comprehensive historical survey of the route should be jointly undertaken by Cadw and the Highways Directorate. It was this survey undertaken by the Lancaster University Archaeological Unit (now Oxford Archaeology North) in 1998 and 1999 that provided the basis for this research report and which now underpins the management of the road.

The strategy was given further weight in July 1998, when the Welsh Office published *Driving Wales Forward: A Strategic Review of the Welsh Trunk Roads Programme* (Welsh Office 1998). This concluded that the A5 across mainland north Wales should not be developed as a strategic route and should not form part of the core network. The management strategy was recognised as being broadly welcomed and the removal of several off-line improvements from the roads programme was confirmed.

At a time when the roads programme across Britain was proceeding at a great pace, this was a remarkable outcome. Protestors had failed to stop controversial schemes such as the A34 Newbury Bypass and the A46 Batheaston Improvement, which damaged or destroyed important archaeological and nature conservation sites. The improvements of the A5 would have had to have been built within landscapes of great national beauty and considerable ecological and historic interest. They would have damaged and dissected what was one of the greatest civil engineering achievements of the 19th century. Telford had built his road so well that in 1997 it was concluded that the traffic could be made to fit the road rather than the road improved to fit the traffic. The Holyhead Road would remain a living and working industrial monument.

# Implementing the management strategy

Responsibility for the Holyhead Road and its practical management falls on many organisations. Where the route remains a trunk road it is the direct responsibility of the Transport Directorate of the National Assembly for Wales. The responsibility for the maintenance of the sections of the road which have been detrunked, for example through Chirk and Bangor and now for much of the original route across Anglesey, falls to the relevant unitary authority. In the case of the Menai Suspension Bridge, its maintenance has been included within the responsibilities of A55 UK Highways Limited, the consortium who has designed and built the new A55 across Anglesey.

These organisations only have responsibility for the roadway, the bridges, embankments, and cuttings that the road passes over and through, those boundary walls which are deemed to be highway rather than property boundary walls, and some of the street furniture particularly the milestones. Other key elements of Telford's road have been sold or have passed into private hands. These include all the toll houses, the two weighbridge houses, the turnpike gates, great structures such as the Conwy Suspension Bridge now in the hands of the National Trust, and lengths of the road which have been bypassed, most notably the embankment at Glyn Dyffwys. The destination of the route, Holyhead Harbour, is now owned and managed by Stena Line



Figure 8.6 Modern revetment wall retaining an original depot (Ken Hoverd)

Ports, who have responsibility for maintaining the Admiralty and South Piers and the associated buildings designed by Telford and Thomas Harrison. These now lie rather isolated in an expanding and thriving modern port. Finally some of the network of inns built to service the horse-drawn traffic have become modern hotels, while the Mona and the Prince Llewellyn Inns have become farm complexes and the Eagle and Child has been converted into a terrace of houses.

Statutory protection of many of the features along the route should ensure their long-term survival. Scheduling parts of the road under the Ancient Monuments and Archaeological Areas Act 1979 has had a limited application following the recommendations of the study. This can only be applied to stretches of the road or of the preceding turnpike roads that are no longer in use, such as the Glyn Dyffwys embankment, the earlier turnpike at the head of the Nant Ffrancon Pass (Fig 2.2), or major structures no longer fulfilling their original purposes, for example, the Conwy Suspension Bridge and Telford's Graving Dock at Holyhead Harbour (Figs 6.8 and 8.1).

Much greater use can be made of listing as buildings of special architectural and historic interest under the Town and Country Planning Acts. The listing resurvey in Wales began in 1984 and is due to be completed in 2005. About half of the communities through which the Holyhead Road passes had been resurveyed before this survey was undertaken. Some critical communities, such as Llandegai, were undertaken whilst the survey was in progress and the remainder will be informed by the survey's results. A list of recommendations to add buildings missed by the earlier survey or of the revision of the grading was prepared and has been reviewed by Cadw.

Listing does not provide comprehensive protection for all surviving Telfordian features. For example, two toll houses - those at Llanfairpwllgwyngyll [0197] and Lon Isa [0034] - have been listed Grade II\* as the best preserved of the two styles, five others have been listed Grade II [0112, 0340, 0822, C006 and C030], while seven [0001, 0004, 0060, 0077, 0092, 0245A and 0844] have not been listed, as they were too altered at the time of the survey. Assessment has been more straightforward with milestones. If the milestone retains its cast-iron plate, it is listed. If not it has been omitted from the list. A full list of surviving milestones is given in Appendix 3. A number of structures have been listed at the higher grades indicating that they are of national importance. For example, the Menai and Conwy Suspension Bridges are Listed Grade I, Mona Inn, the Waterloo Bridge, the Harbour Master's Office, and George IV Arch Grade II\*. Some bold decisions have been taken, for example, to list the revetment walls at the Nant Ffrancon and Glyn Dyffwys Passes, although this offers protection to the masonry walling but not to the earthworks and rock-cut features. It has not been possible to list the long lengths of boundary walling and the depots spaced about a quarter of a mile apart, features that most easily indicate to modern travellers when they are driving along a well-preserved stretch of the original road.

This study has also led to the better protection of more ephemeral remains of the Holyhead Road. By following up a number of leads from local people, a total of thirteen large wrought-iron gates and two pedestrian gates in Telford's distinctive sunburst design have been located. Where they are still in use, they have been added to the list of historic buildings (see Table 5.4). Two gates, one from Gwalchmai or Castell Eden and one from Capel Curig, are in museum collections, the former at the Museum of Welsh Life and the latter, with its slate gateposts, at Blists Hill Open Air Museum, Ironbridge. This project was also instrumental in having all the surviving original components and tools from the building of the Menai Suspension Bridge deposited with Oriel Ynys Môn in Llangefni and in placing John Provis's notebooks in the library of the Institution of Civil Engineers in London.

Protection only provides the first stage in developing the management strategy. It identifies those component features of special interest and provides a legal framework within which changes to the historic fabric or its repair can be properly assessed. Maintenance and the promotion of the importance of the roadway are the second and third stages.

The responsibility for maintenance is again divided amongst different agencies. The National Assembly undertakes routine maintenance through three agents, who may use a range of contractors to carry out specific tasks. Unitary authorities may make use of their direct labour forces or themselves use contractors. One of the prime purposes of the archaeological survey was to provide comprehensive information to all those working on the road so that they can identify all the significant features. Maintaining the modern road while trying to use traditional techniques to conserve these features provides the greatest challenge. It is difficult trying to work safely on a two-lane road with vehicles up to 38 tons in weight and travelling at at least 40mph (64kmph) without very disruptive traffic management measures. Some expedient solutions were developed, particularly the pre-casting of the stone-faced concrete sections to form low revetment or carriageway side boundary walls. These have been used extensively on the eastern half of the route (see Fig 5.18). These sections were used initially to replace the depots, but now the dry-stone walling of the depot is left undisturbed as it can be repaired in relative safety (Fig 8.6). Though the detailing is rather crude, it has meant that the width and much of the character of Telford's road has been retained. Where the repairs are to boundary walls alongside the pavement, all future maintenance will be undertaken using traditional materials and techniques. The constant damage to the stone parapets of bridges presents the same problems of the need for rapid, yet safe repairs. Specification of works will be prepared for this process.

More substantial repairs are undertaken by site-specific contracts. The National Assembly for Wales has undertaken two large contracts to strengthen and consolidate major revetment walls. The first was completed in 1998 at the Nant Ffrancon Pass (see front cover) and won the Historic Bridges Award from the Institution of Civil Engineers. At the approaches to Pont Padog, the second also mixed modern engineering solutions and conservation repairs to provide a very sympathetic outcome.

The emerging and evolving practices for the proper maintenance of the Holyhead Road need to be consolidated into a manual and general specification of works to accompany the relevant information derived from the survey. This would form part of all contract information, so that there is proper guidance for those carrying out the work. The preparation and issue of this manual must be a priority for the implementation of the management strategy.

The final stage is the promotion of the importance of the greatest road of its day. Some initial steps have been taken. In 1997 brown heritage signs identifying it as an historic route built by Thomas Telford were mounted alongside the road and an explanatory brochure made available to the public at Tourist Information Centres. The Transport Directorate commissioned Oxford Archaeology North to produce a study of all the milestones and a programme for repainting the complete examples, reinstating the missing cast-iron plates, and raising, resiting, and perhaps replicating missing stones. The nearly complete series of all 83 will provide a regular reminder to modern travellers. The sympathetic repair and partial reconstruction of substantial lengths of Telford's boundary walls and depots will emphasise his signature.

There are a number of locations along the Holyhead Road where interpretation panels could be mounted to highlight key features of the road: the lay-by alongside the toll house at Ty Isaf; the now abandoned length of road at the Glyn Dyffwys Pass (Ty Nant); Pont Pen-y-benglog at the head of the Nant Ffrancon Pass; the length of road at Lon Isa; the parking area at the south abutment of the Menai Suspension Bridge; and the toll house, now tea room,

at the north end of the Stanley Embankment seem the obvious locations to complement the National Trust's interpretation of the Conwy Suspension Bridge. It is appropriate that a road that opened up much of north Wales to tourists in the middle of the 19th century should become a visitor attraction in its own right at the beginning of the 21st century.

All of these initiatives can support the idea of sustainability, the principle that underlies all the policies of the National Assembly for Wales. The abandonment of any further off-line improvements on the mainland A5 means that there will be no

loss of important landscape in the National Park or of National Trust land. The commitment to maintain what survives of Thomas Telford's original road will ensure that a great civil-engineering achievement of international importance will be conserved for future generations. The encouragement of freight and through traffic to follow the now completed A55 along the north Wales coast will improve the environment of those living alongside the A5. Lastly the road itself can provide an additional incentive for visitors to contribute to the local tourist industry.

#### 9 Reflections on the Holyhead Road

#### by Rick Turner

#### The Holyhead Road in context

The first three decades of the 19th century were to see a battle for supremacy between three different transport systems – road, rail, and water. When the Holyhead Road Commission was formed in 1810, the canal and river navigation network had been largely completed. The turnpike trusts had developed a network of connecting main roads radiating out from all the major cities and towns in Britain. With a burst of new Acts in the 1820s, they penetrated further into the rural districts. Travellers and the despatchers of freight had a real choice of transport, dependent on their requirements for speed, cost, and destination.

Three years after the Holyhead Road was finally finished, the Liverpool and Manchester Railway opened in 1829. By the end of the next decade, the railway network had developed to such an extent that almost all the traffic for which the road was built, the Royal Mail, Government officials, upper-class travellers, and high-value, lightweight freight had transferred to this new means of transport. Telford had recognised the threat from the railways towards the end of his life and had urged the development of steam-powered wagons (Dalgleish 1980). The road's commissioners had considered building a light railway along the road from London to Birmingham, and even across the Menai Bridge to try to regain the lost traffic (BPP 1849 xxvii.iii)

The Holyhead Road was the first major road to be built under direct government sponsorship since the Roman period. The project management and financial arrangements had been developed for the Highland roads - although these depended on private finance to match government funding - and for the Caledonian Canal, both projects built under Telford's supervision (Haldane 1962). The Caledonian Canal was built to allow the safe passage of naval ships from the west to the east coast of Scotland, avoiding the hazardous voyage through the Pentland Firth. The Holyhead Road was also conceived for strategic reasons to provide reliable communications between London and Dublin and to service the new United Kingdom Parliament at Westminster, formed by the Act of Union between Britain and Ireland in 1801. Designed when Britain was at war with France, fear of the threat that Irish nationalists might provide a foothold for an invading French navy delayed construction until the war had been won. The Holyhead Road seems indeed to be almost a celebration of that victory with its Waterloo Bridge (Fig 6.5) and columns to heroes of the battle (Fig 1.5).

Other countries affected by the same transport

revolution undertook some public road building as well as many private initiatives. The Holyhead Road can be compared with the National Road in the USA, a 'truly national project, conceived on Roman lines, finally built by federal government through the heart of the country' (Taylor 1964, 22). It started at Cumberland, Maryland, the terminus of the private Frederick Turnpike from Baltimore and continued steadily westward reaching Wheeling, West Virginia, in 1818 and Columbus, Ohio, in 1833. By the middle of the century, the road had reached Vandalia, Illinois, a distance of over 1080km (677 miles), when plans for any further extensions were abandoned:

Begun in the early days of the turnpike enthusiasm, its construction was continued through the canal building boom and for two decades into the railroad era. Then for half a century it suffered neglect until with the coming of the automobile it became a part of National Highway No.40. Its sturdily constructed stone bridges, though built for oxcarts and stage coaches, safely supported the motor driven traffic of the gasoline age. And its remaining taverns, which had in the dull days of the later 19th century become commercial hotels, country stores or private residents, came to life again as taverns, inns and tourist homes (Taylor 1964, 22).

The study by Schlereth of part of this route through Indiana is perhaps the only equivalent archaeological and historical project to that undertaken on the Holyhead Road (Schlereth 1985).

The conception, design, and building of the Holyhead Road, the development of Holyhead, Howth, and Kingstown harbours, and finally the railway to Dublin extended over nearly 30 years. As Watson (1917) has shown, this was not a smooth and concerted process. Sir Henry Parnell and his fellow Commissioners were concerned to provide the infrastructure necessary to ensure speedy and reliable communication between London and Dublin and stimulate the Irish economy. In John Rennie and Thomas Telford, they found engineers of the highest quality, very energetic and willing to provide innovative solutions to the great problems that they faced. Set against them were the Treasury and the Post Office. These two were much more conservative and reluctant to accept new technologies, such as the steam packets and more efficient mail coaches. This single project must have formed a significant proportion of government expenditure in the second and third decades of the 19th century. It was expected to recover its costs through income from tolls, paying passengers using the packets, and increased charges on mail sent to and from Ireland. The relatively short life of the Holyhead Road as a main transport link meant that this expectation was far from being realised. The Parliamentary Committee that had oversight of the works was happy, none the less, that the expenditure had brought equivalent public benefits.

#### Standards of travel

In his essay The English Mail Coach, Thomas de Quincey mused on the speed and grace of this form of transport (De Quincey 1912). His reveries revolved around the then unprecedented speed and glory of its motion, the interplay of the coach's lamplight with the darkness of the empty roads, and the beauty and power of the horses selected for the mail service. He was struck by the central organisation of the Post Office and how it overcame the distances, the weather, and other obstacles to provide a national system of communication. What impressed him most was the 'awful political mission' which the mail-coach service fulfilled in distributing the news of the great triumphs and tragedies of the Napoleonic Wars through the country to rich and poor alike, effectively binding the nation together. Saying which, it was perhaps appropriate that during the Easter Rising of 1916, the Irish Republican Brotherhood seized the General Post Office in Dublin and read a proclamation declaring the establishment of a republic from its front steps (Beckett 1966, 438-41).

Travel by mail coach provided the ultimate in speed for the period - the mail coach from London-Holyhead averaged just under 10mph (16kmph) in its heyday (Watson 1917, 129-30). The transport of the mail was run almost as a military operation, with the time allowed for the changing of horses brought down to only one and a half minutes (Chapter 7). The journey by stage coach must have resembled air travel between the wars: conditions were comparatively luxurious and it was necessary to construct inns (or landing strips) at frequent intervals often in relatively deserted country to service the coach (or aeroplane). Both forms of transport were only accessible to the rich, while providing the speediest and most reliable delivery of the mail. Something of the clash of cultures inherent in both these means of transport is found in a quotation from Sir Richard Colt Hoare's diary in 1806, '... joined the Great Irish Turnpike ... Cernioge a single post house. People (like the country) rude and uncivilised: roads infested by herds of beggars and children turned to begging by incessantly following the carriage for great distances' (Thompson 1983, 240).

#### The modern journey

The rebirth of the Holyhead Road has been much more egalitarian with the use of private cars, vans,

and lorries for both local and long-distance traffic. In the route study undertaken in 1995 (SGS 1996), a speed limit of 50mph (80kmph) was considered on the A5 through the National Park, although this was dropped as the police felt that it would have been difficult to enforce. This represents, however, a reasonable average speed for the length of the A5 in Wales – about five times that achieved in 1830. The sea crossing has been revolutionised by the use of giant new catamarans that halve the journey time of the traditional ferries from three to one and a half hours. This is a quarter of the time taken by the best of the first steam packets.

Technological innovation over the past two centuries has dramatically reduced the travelling time between the British and Irish capital cities. The mail and single business travellers now go by air and a journey from the centre of London to the centre of Dublin can be achieved in about two and a half hours. In 1830 if the weather allowed a punctual sea passage, a mail coach and steam packet passenger would achieve the same journey in 36 hours. Before there was any improvement to the Holyhead Road. the scheduled time for the mail coach was 45 hours and 30 minutes, while the average passage for the sailing packets in 1814 between Holyhead and Dublin ranged from 17 hours west-east to 20½ hours east-west (the difference due to the prevailing winds). On many occasions either the coach or packet failed to complete its journey to any timetable (Watson 1917, 101–8).

The sea voyages and crossing of the Menai Straits and Conwy Estuary have become very much safer for travellers, although travelling on the road has become more dangerous as speeds increase. The desire to keep disruptions to the journey as short as possible seems unchanged. The time it took to change four horses at the end of a stage is about equivalent to the time it takes to fill a car with petrol. The coaching inns had to provide the modern equivalent of fast food - only 20-30 minutes were allowed for coach passengers to have breakfast, 45 minutes for dinner, and 15 minutes for tea.

#### Conservation and continuity

As innovation has probably reached its limit in reducing the journey time by road and sea, it is perhaps appropriate that government should now be taking conservation of this vital routeway so seriously. Statutory protection of component features, either by listing as historic buildings or in very special circumstances by scheduling as ancient monuments has its limitations. It only identifies the better preserved and discrete structures and fails to offer protection to the more damaged and linear elements. In some places conservation-area status has been applied to linear monuments such as canals and could feasibly be applied to the road. Consideration is being given to classifying transport routes of



Figure 9.1 The detrunking of roads, such as that at Ty Nant [0158], enables the opening up of sections of once busy roads for the leisurely use of visitors to discover the significance and history of the Holyhead Road. (Ken Hoverd)

international importance as World Heritage Sites. Coulls has, for example, developed criteria for assessing railways (Coulls 1998). Consideration was also given to nominating Brunel's Great Western Railway for World Heritage site status. This is another potential route that could lead to the statutory protection of Telford's road.

Statutory protection is only the beginning, however, especially where the majority of the road remains in government hands. The key to survival and continued use of Thomas Telford's Holyhead

Road will be positive management through better informed programmes of maintenance, as well as projects to target specific types of structures or lengths of the route. This would be in addition to much wider awareness and understanding of the importance of the road in the history of transportation and communication (Fig 9.1). When the next technological innovation, the successor to the petrol driven vehicle, arrives, these initiatives will ensure that what remains of the road today will still remain

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#### Institution of Civil Engineers (ICE)

- ICE Provis 1 Provis Notebook No. 1 Holyhead Road 1821
- ICE Provis 2 Provis Notebook No. 2 Land and Damage No. 2
- ICE Provis 3 Provis Notebook No. 3 Land and Damage No. 3
- ICE T/HO Telford's Notebooks
- ICE T/HO.1 Letter from John Golborne re practicability of bridging the Menai Straits (26 April 1783)
- ICE T/HO.2 Report of William Jessop, 13 January 1784, re-making of a road over River
- ICE T/HO.3 Treasury Chambers to Thomas Telford with instructions for Telford's guidance in making a survey of Holyhead Road and asks Telford to undertake it (4 May 1810)
- ICE T/HO.9 Draft of letter from Telford to Mr Milne: findings of his survey of the Holyhead Road, Bangor to Cernioge (4 October 1815)
- ICE T/HO.22 Estimate for Lot 15 of the Holyhead Road by William Provis (July 1817)
- ICE T/HO.29 Letter from John Stanton (contractor) to Telford complaining of the price for a
- ICE T/HO.34 Draft report on road through Anglesev (1819)
- ICE T/HO.40 Letter from Thomas Rhodes to Telford (1826)
- ICE T/HO.47 Pamphlet: Road-making on Mr McAdam's System annotated in the margins by Telford (27 September 1819)
- ICE T/HO.49 Correspondence re the proposed erection of a watchhouse upon Holyhead
- ICE T/HO.50 Plan and elevation of the proposed watch house in parapet wall of Holyhead Pier
- ICE T/HO.52 G Harrison (Treasury Chambers): instructions to Telford to survey Menai Straits in the vicinity of the Plattens (26 June 1823)
- ICE T/HO.54 Letter from John Wilson to Telford. Contains details of Menai Strait velocities and details of dressing of internal stones of the pyramid (23 December 1823)

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- ICE T/HO.56 Report by Telford on proposed improvements of Menai Straits at and near Swilly Rocks (10 March 1824)
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- ICE T/HO.66 William Provis to Telford: re cutting away of Caernarvonshire Point (18 July 1824)
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- ICE T/HO.71 H Evans (Harbour Master) to local commissioners: re need for extending the shelter provided by the harbour (24 November 1824)
- ICE T/HO.72 Estimate of probable cost of building the Custom House on Salt Island (30 November 1824)
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- ICE T/HO.75 Letter from A Milne to Telford requesting that Telford consults with Customs Officer at Holyhead and submits plans and estimates (29 December 1824)
- ICE T/HO.76 Estimate for building and harbour improvements at Holyhead (1825)
- ICE T/HO.77 Letter from J Brown to Telford sending estimates for completion of Holyhead Harbour works (20 January 1825)
- ICE T/HO.78 Letter from J Brown to Telford, who has heard from Mr Hazledine that the lock

- gates are ready for Holyhead, and that the works there are ready for the installation (31 Mar 1825)
- ICE T/HO.79 Letter from J Brown to Telford: the graving dock is ready for coping, but the lock gates are still in Chester. They are laying the foundation stones of check pier with a diving bell (13 Jun 1825)
- ICE T/HO.80 Letter from A M Robertson to Telford: sends copy of letter from G H Freeling requesting gas lamps for designating Packet Agent's Office (18 August 1825)
- ICE T/HO.81 Copy of letter referred to above (15 August 1825)
- ICE T/HO.82 Letter from J Brown to Telford: will comply with order to connect pipe to main for Packet Agent's Office gas lamp. He has begun deepening of the harbour (22 August 1825)
- ICE T/HO.83 Letter from A M Robertson (Whitehall) to Telford sends copy of letter from N M Goddard (GPO) to G H Freeling suggesting fixing of permanent wood blocks on bottom of graving dock (26 August 1826)
- ICE T/HO.85 Letter from J Brown to Telford expressing progress in deepening the harbour, and has laid the railroad into the bottom of the harbour. The lock-gate parts are now at Holyhead, but now await machinery for opening and closing them (24 September 1825)
- ICE T/HO.86 Letter from A Milne to Telford requesting that Telford submits estimate for clock in conspicuous position at Holyhead to regulate sailing packets (27 September 1825)
- ICE T/HO.87 Letter from J Brown to Telford: he has consulted Mr Goddard and an eminent ship builder at Liverpool about the blocks for the graving dock. Both lock gates are set in position. Mr Goddard wishes to get a PO Steam packet and a sailing vessel into the dock as soon as possible (15 October 1825)
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- ICE T/HO.115 Letter from Thomas Rhodes to Telford: discovery of broken roadway bars (10 February 1826)
- ICE T/HO.116 Aird of Dunleary to Telford: re walls on Howth-Dublin road (15 February 1826)
- ICE T/HO.124 Letter from Thomas Rhodes to Telford: re damage to suspension rods (20 February 1826)
- ICE T/HO.125 Letter from Thomas Rhodes to Telford: re work on replacing bent rods (28 February 1826)
- ICE T/HO.131 Letter from Thomas Rhodes to Telford: progress report. Chester Mail delay due to intoxication of coachman (14 March 1826)
- ICE T/HO.132 Letter from Thomas Baker to Telford: sends plan of coach house and workshop that Mr Vidler proposes to erect at Holyhead (18 Mar 1826)
- ICE T/HO.133 Ink plan and elevations referred to above
- ICE T/HO.146 Letter from J Brown to Telford. Acknowledges plan for coach house. He has begun work on the Custom House and look out (8 May 1826).
- ICE T/HO.164 Letter from Sir Henry Parnell to Telford: re financial state of works in progress (20 July 1826)
- ICE T/HO.165 Letter from Sir Henry Parnell to Telford: expressing satisfaction with Menai Bridge (24 July 1826)
- ICE T/HO.176 Estimate of the money required to complete the following works after payment of the sums certified 25 November 1826: John Provis (19 January 1827)
- ICE T/HO.189 List by Telford of costs for Lots 13 and 15 (n.d.)
- ICE T/HO.196 Menai Bridge: ink elevation of railing (n.d.)
- ICE T/HO.197 Holyhead Harbour Map (n.d.)
- ICE T/HO.199 Names and extent of trusts between Holyhead and Shrewsbury (n.d.)
- ICE T/HO.205 Holyhead Road: Chester Branch: surveyor's notebook (n.d.)

#### Parliamentary Acts relating to turnpikes between 1752 and 1782

25 Geo II c.22 (1752) Setting up of the Shrewsbury-Wrexham turnpike

- 29 Geo II c.68 (1756) Welshpool-Oswestry-Wrexham turnpike
- 30 Geo II c.69 (1757) Wrexham-Holywell turnpike
- 32 Geo II c.55 (1759) Mold-Conway turnpikes
- 3 Geo III c.43 (1763) Llangollen turnpikes
- 3 Geo III c.44 (1763) Halkyn Mountain-Cornsillt turnpike
- 5 Geo III c.56 (1765) Porthaethwy Ferry-Holyhead turnpike
- 7 Geo III c.67 (1767) Radnor turnpikes
- 9 Geo III c.45 (1769) Greenfield–Henllau turnpike
- 9 Geo III c.46 (1769) Denbigh-Mold turnpike
- Welshpool turnpikes 9 Geo III c.56 (1769)
- 9 Geo III c.77 (1769) Tal-y-Cafn–Pwlhelli turnpike
- 17 Geo III c.100 (1777) Bala and Dolgellau turnpikes
- 22 Geo III c.105 (1782) Wrexham-Barnhill turnpike

#### Parliamentary Acts relating to the Holyhead Road

- 5 Geo III c.56 (1765) Turnpiking of the road across Anglesey from Bangor Ferry
- 55 Geo III c.152 (1815) The setting up of the Holyhead Road Commission, with responsibility for the road from London to Holyhead
- 59 Geo III c.30 (1819) The consolidation of the six turnpike trusts under the control of the Holyhead Road Commission
- 59 Geo III c.48 (1819) Authorised the Menai Bridge and Anglesey Road
- 1 Geo IV c.70 (1820) Renewed the powers of the commissioners named in the 1815 Act in the **English Section**
- 1/2 Geo IV (1821) Authorised the Conwy Bridge under the commissioners
- 4 Geo IV c.78 (1824) Vested the Menai and Conwy Bridges with the Commission and authorised further expenditure
- 7/8 Geo IV c.35 (1828) Authorised further expenditure
- 5/6 Wm IVC.21 (1837) Imposition of fines for damages to the road
- 3/4 Wm IIc.43 (1842) Transferred responsibility for the London to Holyhead road to the Commissioners of Her Majesty's Woods

#### Post Office archives (Heritage Royal Mail, Freeling House, London)

- 1809 10/9/276 Letter from F Freeling re a contractor on the Shropshire-Holyhead mail
- 1815 16/32/65 Letter from F Freeling re suggestions of new post routes to Ireland

POST 10/7 Time bills for the Holyhead–London mail coach

POST 10/203 Time bills for the

London–Holyhead/Holyhead–London mail coach

POST 42 Postmaster General's Reports

#### Newspaper sources

Eddowes Salopian Journal (ESJ)

7 August 1816

10 March 1824

12 November 1834

21 February 1838

29 March 1843

26 March 1845

19 February 1879

North Wales Gazette

8 August 1811

Shrewsbury Chronicle

**26 November 1785** 

13 April 1802

8 September 1808

9 July 1813

14 May 1817

13 January 1818

15 May 1826

13 July 1827

4 December 1829

The Times

24 September 1819

14 November 2002

#### Appendix 1

# Extracts from Parliamentary Reports

#### **Anglesey Section**

### 1810 Report of the Select Committee (BPP 1810 IV.33)

Maps show harbour and the new road at Holyhead; the latter extends from the Eagle and Child to just east of the churchyard by Black Rock and lighthouse to the proposed new pier.

## 1811 Report of the Select Committee (BPP 1810–11 III.801)

This includes complaints that the proposed new road in Anglesey avoids the inns.

### 1811 Report of the Select Committee, Appendix 2 (BPP 1810–11 III.801)

This shows the road in Holyhead, which starts at the Eagle and Child Inn.

# 1819 First Report of the Select Committee (BPP 1819 V.115)

People in Llangefni object to being left off the line of the proposed new road, as does the proprietor of an inn at Gwyndy which was built specially for the road – he deserves compensation. Reconstructing the present road across Anglesey would be such a large charge that a brand new road is no more expensive; the estimated cost of the proposed new Anglesey Road, including Stanley Embankment, is £352,000. The maps show old coal pits where the new road crosses Malltraeth Marsh and also the location of the Bangor Ferry.

#### 1822 Report on inspection in March 1822, 2 April 1822 (BPP 1822 VI.345)

The steam packets *Royal Sovereign* and *Meteor*, built on the Thames, began to work on the Holyhead to Howth crossings in the course of the last year.

#### 1824 First Report of the Commissioners under 4 Geo IV c.74, Appendix B, Telford's Report, 6 May 1824 (BPP 1824 IX.293)

A new 18-mile (28.9km) road in Anglesey is completed in spring 1822, since when the Stanley Embankment, 1300yds (1188m) long and 16ft (4.87m) high has been completed. A new graving dock on the east side of the entrance to Holyhead Harbour is under construction. One hundred vessels have been seen in the harbour.

# 1824 Provis: Annual Report of the Commissioners (BPP 1824 IX.281)

An embankment across Stanley Sands was

completed last summer; it saves 2 miles (3.2km); a new toll house was constructed at the west end. A branch road to Bodedern and the new toll house at Gwalchmai was completed.

### 1825 Second Report of the Commissioners under 4 Geo IV c.74 (BPP 1825 XV.63)

The coping of the parapet on the walls of the Stanley Embankment is completed.

# 1826 Provis: Annual Report of the Commissioners (BPP 1826 XI.97)

Milestones have been erected across Anglesey.

### 1828 Provis: Annual Report of the Commissioners (BPP 1828 IX.217)

Rev John Griffith of Cym-y-nod reopened an old parish road behind the Caergeiliog toll house. Then solicitors had it closed again.

### 1829 Sixth Report of the Commissioners (BPP 1829 V.103)

New stone walls on the embankment at Malltraeth Marsh have been completed.

# 1829 Provis: Annual Report of the Commissioners (BPP 1829 V.73)

New fences were constructed on Malltraeth Marsh.

### 1830 Select Committee Report (BPP 1830 X.131)

An entirely new inn has been built in the middle of the Island of Anglesey upon the new line of road. Stanley Embankment (1144yds (1.04km), 156,271yds³ (142,894m³) earth and 25,754yds³ (23,549m³) rubble stone) has been completed and is now in a perfect state. The graving dock has been completed with a Boulton and Watt engine.

# 1830 Seventh Report of the Commissioners (BPP 1830 XV.23)

The south pier at Holyhead Harbour was nearly finished.

# 1831 Provis: Annual Report of the Commissioners (BPP 1830–31 IV.369)

Willows planted on Malltraeth Marsh have been damaged by cattle. Cross walls between the road fences and the side ditches have been constructed to prevent them having access to the road.

# 1832 Ninth Report of the Commissioners (BPP 1831–2 XXIII.573)

Mona Inn is mentioned as a landmark on the Anglesey section of the road.

### 1832 Provis: Annual Report of the Commissioners (BPP 1831-2 XXIII.597)

Ellis Williams, Inspector on Anglesey, was dismissed for forging receipts and imprisoned for twelve months.

# 1833 Provis: Annual Report of the Commissioners (BPP 1833 XVII.427)

The branch roads to Llangefni and Bodedern on Anglesey were in good repair.

### 1835 Twelfth Report of the Commissioners (BPP 1835 XXXVI.271)

Part of the stone facing on the eastern slope of Stanley Embankment has been paved since the previous report.

# 1836 Provis: Annual Report of the Commissioners (BPP 1836 XXXVI.395)

The paving of Stanley Embankment continues.

### 1839 Provis: Annual Report of the Commissioners (BPP 1839 XXIX.589)

Quicksets were planted on the roadsides over Malltraeth Marsh as vibration from the coaches had crippled the walls. Check bars were needed to prevent vehicles using parish roads that avoided the Nant and Llanfair gates.

### 1841 Eighteenth Report of the Commissioners (BPP 1841 XII.259)

On Anglesey there was a great increase of traffic within the past year from collieries at Malltraeth Marsh. Carts overloaded with two tons of coal were on one pair of wheels.

# 1844 Twenty-first Report of the Commissioners (BPP 1844 XXXI.273)

There was more sinkage of the road on Anglesey near Berw collieries.

### 1851 Twenty-eighth Report of the Commissioners (BPP 1851 XXIX.117)

On Anglesey the grass is encroaching on the road.

#### Menai Bridge

### 1810 Report of the Select Committee (BPP 1810 IV.33)

Includes a picture of Rennie's proposed bridge over the Menai – one iron arch of c 450ft (137m) span between circular castellated piers, with a six-arch viaduct on the Caernarfonshire side and ten arches and an embankment on the Anglesey side. The bridge would have been 150ft (45.7m) above the spring tide: cost £268,500. Another design was proposed with two arches on either side of a central cast-iron arch, but this was more expensive. Rennie preferred the former. A proposal for

another site for the bridge with three cast-iron spans, one of 350ft (106.6m) and two of 200ft (60.9m). Rennie wrote 'cast iron arches made according to my design of 1791 which I communicated to Dr Hutton in 1795'.

# 1825 Second Report of the Select Committee (BPP 1825 XV.63)

Pieces completed since last report include the approach roads to the Menai Bridge.

### 1826 Third Report of the Select Committee (BPP 1826 XI.47)

Work completed since last report include the Menai Bridge, which was opened on 30 January 1826.

### 1827 Fourth Report of the Select Committee (BPP 1826–7 VII.81)

Menai Bridge 'has now been travelled upon for more than twelve months without obstacle or interruption and the public have acquired a perfect confidence in its stability'.

### 1830 Report of the Select Committee (BPP 1830 X.131)

John Provis, resident engineer in north Wales, has charge of the suspension bridge. On one occasion the top of the mast of a brig touched the bridge and the device for raising the flag was knocked off.

#### 1837 Fourteenth Report of the Select Committee (BPP 1837 XXXIII.195)

The Menai Bridge was to be painted – this is the third time since it was coated.

# 1839 Sixteenth Report of the Select Committee (BPP 1839 XXIX.597)

Severe gales caused damage to the Menai Bridge on 6 January last; £39,700 was voted by the House of Commons for repairs. The flooring of the bridge was being strengthened. On 6 January, parts of the Menai Bridge carriageway were hung on one side only and the bridge was closed to traffic. Fortunately spare suspension rods were in store and the bridge was opened after only five days; the old ferries had been used in the meanwhile. An entirely new platform was being built under William Provis, brother of John Provis.

### 1840 Seventeenth Report of the Select Committee (BPP 1840 XXVIII.465)

All of the gale damage to the Menai Bridge has now been repaired at less than the estimate of £39,700; it was superintended by William Provis.

# 1841 Eighteenth Report of the Select Committee (BPP 1841 XII.259)

On the Caernarfonshire side of the bridge a birch planted in 1826 is now 42ft (12.8m) high.

#### Menai Bridge to Llandegai

# 1817 First Report of the Select Committee (BPP 1817 III.179)

The Bangor Ferry to the Bangor section of the road is 90ft (27.4m) lower than the old road.

# 1819 Sixth Report of the Select Committee (BPP 1819 V.223)

Improvements already completed include:

a new road at 1:36 from the Bangor Ferry to Bangor, 1 mile 1188yds (2.69km). Contractor: Straphen and Stanton;

a new section, 1435yds (1.32km) from near Bangor to Llandegai, and a new junction with the road to Chester;

a section of road from opposite Port Penrhyn across the deep dingle to the Llandegai improvement, which is 1249yds (1.14km) long, and included a bridge and high embankment.

#### 1824 First Report of the Commissioners under 4 Geo IV c.74, Appendix B, Telford's Report, 6 May 1824 (BPP 1824 IX.293)

Formerly, the Bangor streets were ill-paved and no care whatever has been taken of them. Under 55 Geo III c.152, the Bangor streets have been improved and there is now a new road to the ferry.

# 1824 Provis: Annual Report of the Commissioners (BPP 1824 IX.281)

The street pavement in Bangor has been neglected by the parish and been repaired. The clayey sides of each ascent from Afon Cegin have been removed and replaced by broken stones.

### 1826 Third Report of the Commissioners (BPP 1826 XI.47)

Work completed since last report includes the eastern approaches to the Menai Bridge.

# 1826 Provis: Annual Report of the Commissioners (BPP 1826 XI.97)

The new road from the east end of the Menai Bridge to opposite the Bangor Ferry Inn was opened at the same time as the bridge. From opposite the Ferry Inn to Bangor, low walls have been built by the Commissioners at the base of the hedges in order to protect the hedges from droves of pigs.

### 1828 Fifth Report of the Commissioners (BPP 1828 IX.227)

The Bangor streets have been improved but are still deficient.

# 1830 Provis: Annual Report of the Commissioners (BPP 1830 XV.77)

A subscription is being raised in Bangor for lighting the streets. Fences between Bangor and Llandegai are needed to protect them from droves of pigs.

### 1831 Provis: Annual Report of the Commissioners (BPP 1830-31 IV.369)

House fronts in Bangor have been set back, which is a considerable improvement. 241yds of wall have been built between Bangor and Llandegai at the expense of Mr Pennant.

### 1834 Eleventh Report of the Commissioners (BPP 1834 XL.147)

The streets of Bangor now have kerbs.

### 1835 Twelfth Report of the Commissioners (BPP 1835 XXXVI.271)

The road through Bangor is narrow, crooked and destitute of lights. Low stone walls at the base of hedges have been built in the last year from Bangor to Llandegai.

### 1836 Provis: Annual Report of the Commissioners (BPP 1836 XXXVI.395)

There has been no improvement in Bangor. The toll-gate west of Penrhyn Arms is administered by Caernarfon trustees, and must be removed in May next.

#### 1837 Fourteenth Report (BPP 1837 XXXIII.195)

The toll-gate near the west end of Bangor belonging to the Trust of Caernarfon road, so long complained of, was removed in May last.

# 1838 Provis: Annual Report of the Commissioners (BPP 1837–38 XXXV.135)

Oil lamps now light Bangor streets.

# 1839 Provis: Annual Report of the Commissioners (BPP 1839 XXIX.589)

The toll-gate in Bangor town has been removed.

#### 1844 Rennie and Page Report (BPP 1844 XXXI)

Reports respecting the harbours of Holyhead and Port DinLlaen in the House of Commons, 9 August 1844, show that the claims of Port DinLlaen were taken seriously. These include plans for a proposed breakwater, and evidence of a number of ships which already use it as a harbour of refuge; however, there are no shops or other facilities. Port DinLlaen could be served by two railways, that from Birmingham and the extension across north Wales of the Great Western route to Worcester.

It would not be possible for railway trains to cross the Menai Suspension Bridge. The journey time from Port DinLlaen to Kingstown may be less than that from Holyhead, although the distance is greater; trials are therefore needed to assess comparative times. Rennie argues, therefore, that the huge expense of improving Holyhead Harbour will not be justified.

# 1845 Twenty-second Report of the Commissioners (BPP 1845 XXVII.169)

There has been an increase of slate cartage from Coetmor to Bangor.

#### 1846 Twenty-third Report of the Commissioners (BPP 1846 XXIV.309)

Coetmor slate traffic is beginning to cause wear. Around Bangor there is much damage caused by carriage of heavy materials for the Chester and Holyhead Railway.

#### 1849 Twenty-sixth Report of the Commissioners (BPP 1849 XXVII.111)

There is much damage from cartage of heavy stone for railways around Bangor and on Anglesey.

#### Llandegai to Capel Curig

#### 1815 Report (BPP 1814-15 III.355)

Coach passengers normally walk up the hill to Llyn Ogwen and amuse themselves by pushing stones off the parapet wall down the hill.

#### 1817 First Report of the Select Committee (BPP 1817 III.179)

Improvements already made include the Ty-Gwyn-Llyn Ogwen section, instead of the very dangerous old road. At the waterfall at the Llugwy where a very dangerous precipice is avoided, a 30ft (9.1m) bridge (Pont Pen-y-benglog) has been constructed over the top of a chasm in which the Ogwen flows at the top of the valley.

#### 1819 First Report of the Select Committee (BPP 1819 V.115)

This speaks of the 'present road' and 'the new road' between Ogwen and Capel Curig. The 'present road' is on the south side of the valley, on morrassy, hilly ground, up to 1:9, and as narrow as 12ft (3.6m). There is no protection against falling into bogs. The 'new road' on the north side has good exposure to the sun. Ty'n-y-maes-Ogwen Bank; a very narrow section of road with pieces of rock across it, on which a mail coach has lately been overturned.

#### 1819 Sixth Report of the Select Committee (BPP 1819 V.223)

Improvements already completed include the section: Ty-Gwyn, across Afon Ogwen to the west end of Llyn Ogwen, 1 mile 1094yds (2.61km): contractors Straphen and Stanton: 'an arduous and very expensive work, which may be expected with reasonable attention to endure for ages'. The gradient does not exceed 1:22.

Improvements under contract, in progress and in a great state of forwardness: from the present road at Lon Isa (1 mile (1.6km) south of Llandegai), a new line crosses Afon Ogwen and passes along the north side in a more direct course, upon drier ground, which is more exposed to the sun. This is to meet the present road near Ogwen Bank, 3 miles 189yds (5.98km), including one arch of 60ft (18.2m), one of 40ft (12.2m), and one of 10ft (3m). The old line runs between the railroad and the gulph (sic) of the Ogwen and afterwards by a circuitous hilly route. A

section from the east end of Llvn Ogwen along the north wide of the valley to Capel Curig, 4 miles 314yds (6.72km).

#### 1822 Sixth Report of the Select Committee, 25 February 1822 (BPP 1822 VI.1)

Works completed on a considerable distance along the rugged base of Ogwen Bank.

#### 1824 First Report of the Commissioners under 4 Geo IV c.74 (BPP 1824 IX.293)

Improvements include a new road from Capel Curig to Llyn Ogwen and a new road from Llyn Ogwen to Ty Gwyn. The section from Ty Gwyn to Ty'n-y-maes has had new fences. From north of Ty'n-y-maes, a completely new road extends for 3 miles (5.77km) down the Ogwen valley, which it crosses by a new bridge. Half a mile south-east of Llandegai, to the west of Penrhyn Arms, is a completely new road with 40ft (12.2m) embankment over Cegin. A new toll house has been established at Hendre Isaf. Improvements by Commissioners include the installation of two sets of wrought-iron toll-gates and one weighing machine.

#### 1824 Provis: Annual Report of the Commissioners (BPP 1824 IX.281)

Protective work on bridge over Llugwy at Hendre-Rhyd-Gethen (SR 678 605) was completed.

#### 1825 Second Report of the Commissioners (BPP 1825 XV.63)

Sections completed since last report include a road at Ty'n-y-maes and a toll-gate at Llandegai.

#### 1828 Provis: Annual Report of the Commissioners (BPP 1828 IX.217)

A new toll house needed at Capel Curig in place of the one which is ruinous.

#### 1829 Provis: Annual Report of the Commissioners (BPP 1829 V.73)

Work has started on a new cottage for the foreman at the west end of Llyn Ogwen.

#### 1830 Provis: Annual Report of the Commissioners (BPP 1830 XV.77)

A cottage for the foreman at Llyn Ogwen is completed.

Last July a slip occurred from Benglog Mountain which blocked the road. A temporary roadway was made over the top of the debris, and it was wholly cleared within a fortnight. Turf mounds at the roadside between Ogwen and Capel Curig are decaying and should be replaced by stone walls.

#### 1836 Provis: Annual Report of the Commissioners (BPP 1836 XXXVI.395)

Llandegai-Capel Curig: the old walls have been pinned and pointed – formerly without mortar. The new contract to do this on the Pentrefoelas section has been completed as far as Betws-y-Coed.

### 1843 Twentieth Report of the Commissioners (BPP 1843 XXIX.291)

New cast-iron platforms for weighing machines have been established at Ty-Isaf and Lon Isa.

# 1844 Twenty-first Report of the Commissioners (BPP 1844 XXXI.273)

The Cernioge–Bangor traffic is light, except for slate from Coetmor to Bangor. A landslip between Ogwen and Ty'n-y-maes occurred on 8 October, but was quickly cleared.

#### Capel Curig to Cernioge

# 1817 First Report of the Select Committee (BPP 1817 111.179)

Improvements already made include the section from Betws-y-Coed across the Conway, along the face of Dinas Hill to Rhydllanfair in place of the most dangerous section along the whole line. There were also improvements from Rhydllanfair to near Glyn Conwy avoiding several very steep hills.

### 1819 First Report of the Select Committee (BPP 1819 V.115)

Along the rocky precipices of Dinas Hill was one of the few sections where costs exceeded estimates. The next improvement was at Cernioge,  $4\frac{1}{2}$  miles (7.24km) down the valley, to include Pont Padog Bridge.

# 1819 Sixth Report of the Select Committee (BPP 1819 V.223)

After passing Capel Curig, there was an improvement adjacent to the great waterfall of the Llugwy and from thence to near Betws-y-Coed, a length of 1 mile 1133yds (2.64km): contractor; Straphen and Stanton. A further improvement was the Betws-y-Coed-Rhydllanfair section, 3 miles 1166yds (5.89km), with the steepest gradient 1:22: contractor Straphen and Stanton. Llynnon Bridge, was built with iron provided by William Hazledine. The Rhydllanfair-Glyn Conwy section, distance 946yds (865m), was by contractor Straphen and Stanton.

After the toll bar near Capel Curig an improvement commenced near the upper bridge over the Llugwy, then passes down the north side of that river and crossed it to join the west end of the great waterfall variation, 1 mile 1400yds (2.88km); there was one two-arch bridge, each arch of 35ft (10.6m) span.

# 1819 Appendix to Sixth Report of the Select Committee (BPP 1819 V.223)

From Betws-y-Coed, a new road has been completed along the rocky and precipitous face of Dinas Hill and across a succession of rugged dingles to Rhydllanfair for a distance of 3 miles 1166yds (7.05km). This includes a new bridge across the Afon Conway.

#### 1824 First Report of the Commissioners under 4 Geo IV c.74, Appendix B, Telford's Report

#### (BPP 1824 IX.293)

Formerly, Pont Padog was in ruins and there was a 1:6 descent down Dinas Hill. The old road west of Betws-y-Coed crossed the river at Pont Cyfyng. The whole road from Capel Curig to Cernioge was notorious for upsets of coaches and broken springs.

Improvements under 55 Geo III c.152 included 5 miles (8km) of completely new road from Cernioge to beyond Pont Padog, with a gradient no steeper than 1:26. The Rhydllanfair–Betws-y-Coed section was an entirely new road 4 miles (7.7km) long avoiding Dinas Hill. The old road from Llugwy waterfall to Pont-y-Cyfyn was abandoned and a new route built from Pont-y-Cyfyn to Capel Curig. Improvements by Commissioners include the descent into Hendre-Rhys-Gethen, near Betws-y-Coed. The Pont Padog to Capel Curig section had its low sides raised.

## 1824 Provis: Annual Report of the Commissioners (BPP 1824 IX.281)

A short section of the new road was completed near Betws-y-Coed. East of Betws-y-Coed, the county bridges have become dangerous.

### 1825 Second Report of the Commissioners (BPP 1825 XV.63)

Pieces completed since last report include the Ponty-Cyfyn to Capel Curig section.

### 1826 Third Report of the Commissioners (BPP 1826 XI.47)

Work completed since the last report includes a short section west of Betws-y-Coed and also the rebuilding of walls at Maes Mawr.

# 1826 Provis: Annual Report of the Commissioners (BPP 1826 XI.97)

Breast walls and parapets have been built from half a mile west of Rhydllanfair. The rebuilding of the small bridge opposite Rhydllanfair is in progress.

# 1827 Fourth Report of the Commissioners (BPP 1826-7 VII.81)

A piece of road at Rhydllanfair has been completed since last year.

### 1828 Provis: Annual Report of the Commissioners (BPP 1828 IX.217)

New toll houses are needed at Betws-y-Coed and Cernioge in place of the present ruinous ones.

# 1829 Provis: Annual Report of the Commissioners (BPP 1829 V.73)

New toll houses have been built at Capel Curig and Betws-y-Coed with wrought-iron gates.

# 1830 Report of the Select Committee (BPP 1830 X.131)

Betws-y-Coed Bridge (Waterloo Bridge): 'having the national emblems, the rose, thistle, shamrock and leek in the angles, it becomes a public and lasting

testimonial of the action which so splendidly terminated the war'.

### 1833 Provis: Annual Report of the Commissioners (BPP 1833 XVII.427)

On bogs between Hendre Isaf and Cernioge, the ground has been consolidated and dry-stone walls have been taken down and rebuilt with mortar.

### 1836 Provis: Annual Report of the Commissioners (BPP 1836 XXXVI.395)

Llandegai to Capel Curig walls were pinned and pointed; these were formerly without mortar. A new contract to do this from here on to Pentrefoelas has been completed as far as Betws-y-Coed.

## 1838 Provis: Annual Report of the Commissioners (BPP 1837–8 XXXV.135)

A new check bar was needed between the iron bridge over the Afon Conway and the new road to Penmachno which brings a great number of slate carts on to the Holyhead Road; they use it for 3.75 miles (6.04km), and do considerable injury to it, but the carts pay no tolls.

### 1841 Eighteenth Report of the Commissioners (BPP 1841 XII.259)

West of Cernioge the road is in excellent condition.

### 1845 Twenty-second Report of the Commissioners (BPP 1845 XXVII.169)

The Cernioge to the Menai Bridge section is in excellent order.

#### Cernioge to Corwen

### 1817 First Report of the Select Committee (BPP 1817 III.179)

Improvements already made include, at 'Cerrig-y-Druidon', a road which is nearly level avoiding the old one over the hill through the village.

### 1817 Third Report of the Select Committee (BPP 1817 III.203)

Last autumn the mail overturned in Glyn Dyffws while turning at an acute angle and fell against the parapet; it knocked a considerable quantity of coping from the top and broke the coachman's leg. The guard was saved by throwing himself on the other side of the coach, the luggage went into the abyss about 100ft (33m) below. Had there been any roof passengers they would have perished.

# 1819 First Report of the Select Committee (BPP 1819 V.115)

At the south end of the new road at Cerrig-y-Druidon the present line falls into a soft bog, which is liable to flood.

# 1819 Sixth Report of the Select Committee (BPP 1819 V.223)

Improvements already completed include the section 780yds (713m) long at Cerrig-y-Druidon, contractor Straphen and Stanton. A new road has been built which avoided Ceirw bridges, with stone walls, 1 mile 592yds (2.57km), contractor J Roberts. The west end of Glyn Dyffwys, and through that confined rocky pass, has had breastwork up to 40ft (12.2m) in height, including a new bridge of 60ft (18.3m) span, for an overall length of 2 miles 731yds (4.64km); contractor Straphen and Stanton.

## 1819 Appendix to Sixth Report of the Select Committee (BPP 1819 V.223)

At Cerrig-y-Druidon an angle has been cut off and a hill avoided; sections 780yds (714m) in length were fenced by stone walls. There were extensive improvements from the west end of Glyn Dyffwys, through that confined rocky pass, with breastworks of stone and lime masonry, upwards of 40ft (12.2m) in height and protected by a parapet. From the east end of the pass there was a new uniform descent to a new bridge with a span of 60ft (18.3m), which avoids hills on the old road, and was fenced by stone walls.

# 1822 Report of the Select Committee, 25 February 1822 (BPP 1822 VI.1)

Works in hand include sundry variations to remove hills and hollows between Cernioge and Cerrigy-Druidon.

#### 1824 First Report of the Commissioners under 4 Geo IV c.74, Appendix B, Telford's Report (BPP 1824 IX.293)

To the west of Corwen along a straight section to the Druid Inn, with sides so low that a coach could not travel on them. There is a 1:7 incline and bend at the Druid Inn. A section west of the Afon Ceirw to Cerrig-y-Druidon, across a bog, is so narrow that coaches could not pass.

#### New under 55 Geo III:

the Druid Inn bend was cut and the gradient eased to 1:30. To the west of the Druid Inn is another new section and remaining portions are in progress up to Glyn Dyffwys. Five miles (8km) to the west of Corwen a new road was made through the romantic pass of Glyn Dyffwys by which the hills at Maes Mawr have been avoided. A new road is in progress from Glyn Dyffwys past Ty Nant to near 'Disgarthissa'. At Disgarthissa the new road reduces the gradient to 1:30; a road avoiding Ceirw bridges is complete, and the section east of it is in progress; a new section has been built south-east of Cerrigy-Druidon;

a new section avoids the hill at Cerrig-y-Druidon; a new section to the north-west of Cerrig-y-Druidon; the Clwst-y-Blaidol hill has been cut off.

#### Improvements by Commissioners:

a quarter of a mile of new road between Corwen and Corwen Bridge has been built; the low sides have been raised from Rug Bridge to Druid Inn;

175yds (53.3m) of new road have been built at Hendre-y-ddwyffaen;

the low sides of a bog south-west of Cerrig-y-Druidon was raised:

Three-quarters of a mile (1.448km) of new road from Cerrig-y-Druidon to Clwst-y-Blaidol has been constructed.

### 1824 Provis: Annual Report of the Commissioners (BPP 1824 IX.281)

A bend near Druid Inn west of Rug Bridge has been straightened. Corwen Bridge has been rebuilt by county authority using county funding.

# 1825 Second Report of the Commissioners (BPP 1825 XV.63)

Pieces completed since last report:

past Druid Inn;

from Glyn Dyffwys past Ty Nant to Disgarth-issa avoiding Ceirw bridges;

the approach to Cernioge Inn.

### 1826 Third Report of the Commissioners (BPP 1826 XI.47)

Work completed since last report includes the rebuilding of walls between the two bridges over the Afon Ceirw.

# 1827 Fourth Report of the Commissioners (BPP 1826–7 VII.81)

A piece of road at Rug has been completed since last year.

### 1828 Fifth Report of the Commissioners (BPP 1828 IX.227)

A road in the pass of Glyn Dyffwys, west of Corwen, 'forms a striking feature' and remains in a perfect state.

### 1829 Sixth Report of the Commissioners (BPP 1829 V.103)

A short piece at the west end of Corwen Bridge has been completed in the past year.

# 1829 Provis: Annual Report of the Commissioners (BPP 1829 V.73)

A new toll house at Cernioge has been constructed a quarter of a mile east of the old gate.

### 1836 Provis: Annual Report of the Commissioners (BPP 1836 XXXVI.403)

A new contract to repoint walls as far as Pentrefoelas has been completed as far as Betws-y-Coed.

#### Corwen to Chirk Bridge

### 1819 First Report of the Select Committee (BPP 1819 V.115)

This urges a new line through Llangollen west of the church at the back of the inn. There was a new improvement on Rhysgog Hill, after which are 3 miles 1 furlong (5.03km) to Owain Glyndŵr's Hill along a very crooked and narrow stretch.

# 1819 Sixth Report of the Select Committee (BPP 1819 V.223)

Improvements already completed include a road around the north of Owain Glyndŵr's Hill, 984yds (900m) long, (contractor: Gill and Co), and around Rhysgog Hill, avoiding 60ft (18.28m) of height, with stone walls, length 2 miles 379yds (4.26km; contractor: T Evans).

# 1819 Appendix to Sixth Report (BPP 1819 V.223)

Beyond Corwen the road now goes around Owain Glyndŵr's Hill instead of crossing over it (this is a section 984yds (900m) long). There is a stone retaining wall on the south side. The road was widened and protected from precipices (2 miles 379yds (4.26km).

### 1822 Third Report of the Select Committee (BPP 1822 VI.345)

Works completed include sundry improvements and variations between Owain Glyndŵr's Hill and Rhysgog Hill, and variations on the south side of Llangollen Church, by which the crooked and inconveniently narrow streets of that village are avoided.

Works in hand include the Pontcsyllte–Chirk Castle Gardens, cutting angle at Whitehurst Gate, a widening from Chirk Castle Gardens and Chirk village, and making the very considerable embankment from the village to Chirk Bridge.

#### 1824 First Report of the Commissioners under 4 Geo IV c 74, Appendix B, Telford's Report (BPP 1824 IX.293)

Formerly there was a 1:9 rise from Chirk Bridge to village with an acute bend at Whitehurst toll-gate. West of Biddulph's Lime Kilns, an earthen bank, only 18in high, gave protection from a fall of 100yds (91.4m) into the Dee.

#### New under 55 Geo III:

a new road from Chirk Bank to the village;

a new road from the top of the first descent beyond Chirk village to Biddulph's Lime Kilns, avoiding two valleys and hills;

a new road to cut off the hill opposite the Pontcysyllte Aqueduct; the next two miles (3.84km) have been widened and protected with stone walls;

a new road in a straight line at the back of Llangollen Church avoiding the narrow town streets;

a new road from the woollen manufactory at Rhysgog Hill:

a new road to join that over Rhysgog Hill with that over Owain Glyndŵr's Hill;

a new road avoids the summit of Owain Glyndŵr's Hill:

a half mile section avoids the bends east of Plasyn-Bonini;

a new toll house at Ty Isaf between Llangollen and Corwen.

#### Improvements by Commissioners:

two miles (3.84km) of low sides east of Pontcysyllte have been raised;

a protecting wall along the Dee ¾ mile (1.44km) west of Llangollen;

stone walls instead of hedges on Revd Bean's land at Carog;

half a mile (795m) of new road and fence along the Dee between Bonini and Corwen;

a weighing machine has been installed at Ty Isaf.

# 1824 Provis: Annual Report of the Commissioners (BPP 1824 IX.281)

Stone walls have replaced hedges on the estate of Revd Edward Beans. A new road avoiding the hill east of Llangollen is being built. Opposite Pontcysyllte a variation to avoid a hill is being built. Trees are being planted on the lower part of each slope of Chirk Embankment.

### 1825 Second Report of the Commissioners (BPP 1825 XV.63)

A branch road to the Chester Road at Irishman's Bridge has been completed since the last report and has been opened, by which the hill is cut off opposite the great Pontcysyllte Aqueduct and a new piece commenced by which the steep hill east of Llangollen will be wholly avoided. From Owain Glyndŵr's Hill a new piece is in hand to complete the line to Corwen and a short piece east of Corwen Bridge has been finished.

# 1826 Third Report of the Commissioners (BPP 1826 XI.47)

Work completed since the last report includes the west end of Owain Glyndŵr's Hill, the hill east of Llangollen, and the toll house west of Chirk.

# 1826 Provis: Annual Report of the Commissioners (BPP 1826 XI.97)

The Commissioners are improving the road through Corwen town and a new road west of Owain Glyndŵr's Hill has just opened. The side of the hill,  $2\frac{1}{2}$  miles (4.81km) west of Llangollen keeps slipping down. A new road at the east end of Llangollen has been finished by the Commissioners under 4 Geo IV c.74 Act and is in use except for a short distance at the west end. At the Chirk end the road is very dirty; when farmers cannot work on the fields they use carts for carrying coal.

# 1828 Fifth Report of the Commissioners (BPP 1828 IX.227)

The Chirk village to the Gardens section of road is preserved, with a footpath on the proper side. The section from Chirk Gardens through Llangollen and over Rhysgog Hill to the toll-gate, 11 miles (21.17km) long, is new and perfect. The Owain Glyndŵr's Hill improvement was among the first performed about 20 years ago.

### 1828 Provis: Annual Report of the Commissioners (BPP 1828 IX.217)

A new toll house is needed at Black Park near Chirk, as coal carts damage the road near Chirk.

### 1829 Provis: Annual Report of the Commissioners (BPP 1829 V.73)

The road is being forced out of shape by slippage on Rhysgog Hill.

# 1830 Provis: Annual Report of the Commissioners (BPP 1830 XV.77)

A quickset fence on the lower side of the road near Owain Glyndŵr's Hill has been much eaten by rabbits. There is very heavy wear from coal carts between Black Park and Chirk Bank.

# 1831 Provis: Annual Report of the Commissioners (BPP 1830–1 IV.369)

A new toll house and bar at Black Park, on the site of the old one, has been erected by Commissioners under 4 Geo IV c.74. Three new toll houses have been built, one enlarged, and three others repaired and six new gates erected in this district by Commissioners under 4 Geo IV c.74.

# 1832 Ninth Report of the Commissioners (BPP 1831–2 XXIII.573)

New breast walls are needed on the downward side of road near Ty Isaf.

### 1832 Provis: Annual Report of the Commissioners (BPP 1831–2 XXIII.597)

Near Llangollen a wall has been built to protect the road from the action of the Dee. A new weighing machine has been installed at Ty Isaf.

### 1833 Tenth Report of the Commissioners (BPP 1833 XVII.437)

There is much coal and lime carriage up the Dee Valley, west of Llangollen. After crossing Rhysgog Hill there is a space near the toll house (ie Ty Isaf) where a wall to protect the precipice is needed.

# 1834 Eleventh Report of the Commissioners (BPP 1834 XL.147)

The Chirk to Corwen section and on to Bangor is in a perfect state. A toll bar has been established near the top of Rhysgog Hill.

# 1836 Provis: Annual Report of the Commissioners (BPP 1836 XXXVI.395)

The Ty Isaf toll-gate is mentioned in the text but not in the 1835 list. Kerbs have been installed in Corwen. The Whitehurst gate has been replaced by the New Whitehurst gate.

# 1839 Sixteenth Report of the Commissioners (BPP 1839 XXIX.597)

Walls are being repaired and pointed from Chirk Bridge to Milestone 72. The pointing will be completed for the whole route.

### 1841 Eighteenth Report of the Commissioners (BPP 1841 XII.259)

The Chirk–Vron Lime Works section is still far from satisfactory, though it is better than it was; higher tolls are necessary. Between Vron and Llangollen the traffic is much lighter and the road is in better condition. Much stone has been laid this year from Llangollen to Corwen. For  $2\frac{1}{2}$  miles (4.8km) west from Corwen the coal traffic is considerable but the traffic is lighter beyond.

# 1843 Twentieth Report of the Commissioners (BPP 1843 XXIX.291)

New cast iron platforms for weighing machines have been established at Ty Isaf and Lon Isa.

### 1844 Twenty-first Report of the Commissioners (BPP 1844 XXXI.273)

The act only allows one toll between Llangollen and Corwen, which is not enough for maintenance. Much of this section suffers from being shielded from the sun by the mountains to the south.

### 1845 Twenty-second Report of the Commissioners (BPP 1845 XXVII.169)

The Chirk-Vron section is being worn by coal and lime cartage. The Llangollen to Corwen section is better than for some years. The heavy traffic wears down the soft stone but no harder stone is available.

# 1849 Twenty-sixth Report of the Commissioners (BPP 1849 XXVII.111)

Many heavy materials are being conveyed from Chirk Bridge to Whitehurst for the Shrewsbury and Chester Railway.

### 1850 Twenty-seventh Report of the Commissioners (BPP 1850 XXX.107)

There has been an improvement on the wear of the road near Chirk now the traffic for the Shrewsbury and Chester Railway has ceased. Large quantities of coal are still carried between Llangollen and Corwen.

#### Managerial and Technical Policy

# 1810 Second Report of the Select Committee (BPP 1810 IV.33)

From 1 January to 27 March last, 85 days, the mail was 1 to 5 hours late on 71 occasions from Shrewsbury – Holyhead. On 75 days from Holyhead to Shrewsbury there were the following accidents to

the Mail Coach:

17 April 1809 the coach overturned near Corwen; 22 June 1809 a shackle broke between Holyhead and Corwen;

14 September 1809 a shackle broke between Oswestry and Llangollen;

30 September 1809 two shackles broke between Corwen and Cernioge;

7 December 1809 a hind spring broke between Capel Curig and Rhydllanfair;

14 December 1809 a shackle broke between Rhydllanfair and 'Capel Cerig'.

### 1815 Report of the Select Committee (BPP 1814–15 III.355)

This argues that the Shrewsbury to Holyhead section is actually getting worse under the turnpike commissioner.

#### 1817 First Report of the Select Committee (BPP 1817 III.179)

The recommendations of 1810 and 1811 brought no results, but after the Committee of 1815 set forth the extreme danger to which everyone who travelled the road was exposed, £20,000 was voted, and the act, 55 Geo III c.152 (1815), was passed to appoint Commissioners. It lists the improvements already made and that at least 45 minutes have already been saved on the journey time.

# 1817 Fifth Report of the Select Committee (BPP 1817 III.245)

William Provis: the opening of the Dee Valley, 3 miles (5.77km) east of Llangollen, was taken as fixed point in determining the route.

# 1819 First Report of the Select Committee (BPP 1819 V.115)

'Parliament . . . recognised the principle that the communication between England and Ireland was of sufficient importance to justify the expenditure of public money in enabling the Mails and the Carriages of individuals to travel through Wales without being exposed to be broken in pieces at every step, or to the danger of falling over steep precipices against which the road was not in the smallest degree protected'.

# 1819 Sixth Report of the Select Committee (BPP 1819 V.223)

It is aimed that the mail coach will run at overall average speed of 8mph including stoppages.

The greatest dimension of stones used in top dressing should be  $1\frac{1}{2}$  inches.

The 1819 act, 59 Geo III c.48, authorised the Commissioners to build the Menai Bridge and the road across Anglesey, and another act, 59 Geo III c.30, vests the Shrewsbury to the Bangor Ferry section with 15 Commissioners instead of turnpike trusts. Act I Geo IV c.70 renews the power of Commissioners of 1815 (55 Geo III c.152) concerning the London to Chirk section.

# 1824 First Report of the Commissioners under 4 Geo IV c.74, Appendix B, Telford's Report (BPP 1824 IX.293)

Until the last five years, the Shrewsbury to Holyhead section was one of the worst roads in the kingdom. It had seven turnpike trusts, and limited revenues, with no qualified surveyors. Act 59 Geo III c.30 consolidated six trusts from Shrewsbury to Bangor into one and vested them with fifteen commissioners; this was passed in May 1819 with effect from 1st August 1819. It was divided into three districts:

Shrewsbury to Chirk Bridge; Chirk Bridge to Cernioge; Cernioge to Bangor Ferry.

The principle was established that horses may easily and rapidly trot over the whole road, either ascending or descending, with a loaded coach. The steepest portion remaining is 1:17 to the west of Betws-y-Coed.

# 1824 Provis: Annual Report of the Commissioners (BPP 1824 IX.281)

The whole of 1823 was a severe season for roads; there was much frost early in the year, and the summer and autumn were very wet. Putting on stones and scraping off dirt provided constant employment on the old part of the road.

#### 1825 Second Report of the Commissioners (BPP 1825 XV.63)

Shifnal Trust: labourers on this road were very aged and infirm and from the parish workhouse. This was 'quite at variance with the just application of the Road funds'.

The Shrewsbury to Holyhead section 'present perfect state of this road' shows benefit of the consolidation of turnpike trusts. The Shrewsbury to London section ought to be so treated. 'From Chirk to Holyhead, a distance of 83 miles (133km), the whole road is perfectly hard, smooth and clean, notwithstanding the very unfavourable weather for roads.

### 1826 Third Report of the Commissioners (BPP 1826 XI.47)

Protecting walls should be pointed with dry mortar and should be provided where only hedges or earth mounds protect the road in precipitous places. 'This great length of road in North Wales continues to be maintained by the Commissioners in a perfect state. The merits of the substantial plan on which it has been constructed become every year more apparent'.

# 1827 Fourth Report of the Commissioners (BPP 1826–27 VII.81)

All the road is in a good state except for the first 20 miles (32km) and Towcester to Daventry. Since last year much fencing has been replaced with stone walls. From Chirk along the Parliamentary Road to

Holyhead the surface of the Road is uniformly hard and smooth, constant attention being bestowed in maintaining it in perfect order'.

## 1828 Fifth Report of the Commissioners (BPP 1828 IX.227)

The footpath should be on the south occupying the shaded part, allowing the driving way exposure to the sun and the winds.

### 1830 Report of the Select Committee (BPP 1830 X.131)

'Between Holyhead and Chirk Bridge is a distance of 83 miles 1320yds (135km). The whole may be fairly considered a new road, as the short pieces of the old road retained were entirely remade. The whole of the roadway is constructed with a substantial rubble stone pavement, carefully hand-set, and covered with a coating 6in thick of properly broken stone. There are in all cases where found necessary breast and retaining walls of stone, with numerous side and cross drains, all constructed in a most perfect manner. The whole is protected with stone walls; those upon precipices built with lime mortar, most of the others pointed with it. There are several considerable bridges, also numerous cuttings and embankments in that mountainous country. One in particular at the village of Chirk is 50ft (15.2m) in height. Four miles (6.43km) of branch roads have been made. The toll houses and gates are on a new construction as are the milestones, and sufficient recessed depots for stones have been made in every part of the road. An entirely new inn has been built in the middle of the Island of Anglesey upon the new line of road'.

# 1830 Seventh Report of the Commissioners (BPP 1830 XV.23)

Much work on toll houses and gates in North Wales and pointing walls – grant received last year.

#### 1831 Eighth Report of the Commissioners (BPP 1831 XII.29)

The Chirk to Holyhead section has been carefully examined and is in a very perfect state. Telford praises John Provis 'whose regularity and perseverance keep everything in order'. Walls are of necessity being pointed.

In 1815, the Mail took 41 hours 12 minutes to get from London to Holyhead. Now it does the journey in 28 hours 6 minutes.

# 1835 Provis: Annual Report of the Commissioners (BPP 1835 XXXVI.331)

The coaches using the road between Shrewsbury and Holyhead are: *Wonder, Nimrod, Hawk, Tourist, Stay, Accommodation,* and *Chester.* 

# 1837 Provis: Annual Report of the Commissioners (BPP 1837 XXXIII.227)

Acts of 5/6 Wm IV c.21 imposing fines for removal of stones from walls without permission of surveyor

have done much for their protection. Printed notices have been circulated.

# 1839 Provis: Annual Report of the Commissioners (BPP 1839 XXIX.589)

Commuted tolls from coach operators:

Wonder £682 19s 02d

Nettle £52

Royal Oak £52

Accommodation £72 16s 00d.

# 1842 Nineteenth Report of the Commissioners (BPP 1842 XXIV.309)

Responsibility for the road from Shrewsbury to Bangor Ferry transferred to Commissioners of Her Majesty's Woods, and 3/4 William IV c.43 did the same for London–Holyhead and the two bridges

### 1843 Twentieth Report of the Commissioners (BPP 1843 XXIX.291)

Recites legislation: 4 Geo IV c.74; 7/8 Geo IV c.35; 3/4 Wm IV c.43; 6/7 Wm IV c.35; 3/4 Vic c.104.

# 1850 Twenty-seventh Report of the Commissioners (BPP 1850 XXX.107)

Chief Commissioner has questioned the propriety of the continued grant for the Shrewsbury to Holyhead road since the railway is now complete.

# 1851 Twenty-eighth Report of the Commissioners (BPP 1851 XXIX.117)

'We are of the opinion that the road is no longer of such national importance as to justify us in applying to Parliament for a grant of public money for its future maintenance'.

#### Toll Houses

#### Shrewsbury Chronicle, 9 July 1813

Toll-gates on Capel Curig turnpike road: Dinas £263

Tyn-y-Lon £263 Betws £300

Delws 2500

Hendre Isaf £220.

# 1810 Second Report of the Select Committee (BPP 1810 IV.33)

List of trusts and toll houses:

Holyhead–Bangor Ferry, 25 miles (40.22km).

Holyhead, Llanynghenedle, Llangefni, Braint Llandegai–Pentre Voilas (Foelas), 30 miles

(48.27km), Hendon Isaf, Betws, Dinas

Pentre Voelas-Cerig-y-Druidon, 5 miles (8km), no gates on mail road

Cerig-y-Druidon-Terfynant, 17 miles (27.35km) (16km), Druid Inn, Llydiart y Gell, Llydiart y Park Terfynant-10th milestone between Oswestry and Shrewsbury, 23 miles (37km), Llangollen, Whitchurch (sic—ie Whitehurst) Lywyn, Gallows Tree, Queen's Head 10th milestone-Shrewsbury, 10 miles (16km), Montford Bridge, Mount

#### ESJ, 10 March 1824

Gates to let on Holyhead Road (tolls quoted for last year less expenses of collection):

Lon Isa Gate and Weighing Machine £219

Bethesda Gate £183

Tyn-y-Lon Gate £83

Betws Gate £264

Hendre Isaf Gate £180

Cernioge Gate (last 8 months only) £189

Druid Gate £304

Corwen Gate and Aravan Road Gate and Weighing Machine £495

Let at Cernioge Inn near Cerrig-y-Druidon

Llangollen Gate £141

Whitehurst Gate, Black Park Toll Bar and Chirk Gate and Weighing Machine (8 months only) £192 Llwyn Gate £253

Queen's Head Gate and Gallows Tree Bank Gate (8 months only) £333

Shelton Gate, Montford Bridge Gate and Wolf's Head Gate  $\pounds 510$ 

Let at Cross Keys, Oswestry

Clerk: J Wyatt, Lime Grove

# 1830 Provis: Annual Report of the Commissioners (BPP 1830 XV.77)

List of gates between Holyhead and Shrewsbury:

Stanley £218 15s 00d

Gwalchmai £131 10s 00d

Ty Nant £201 05s 00d

Llanfairpwllgwyngyll £166 08s 04d

Lon Isa £184 14s 11d

Tyn-twr £176 18s 04d

Betws £174 00s

Hendre Isaf £136 05s 00d

Cernioge £160 08s 04d

Druid £251 08s 04d

Corwen £602 08s 04d

Llangollen £159 00s 00d

Whitehurst £449 10s 00d

Llwyn £594 01s 08d

Queen's Head £407 10s 00d

Wolf s Head £293 04s 11d

Shelton £557 04s 07d

# 1835 Provis: Annual Report of the Commissioners (BPP 1835 XXXVI.331)

Lists gates between Holyhead and Shrewsbury:

Stanley £135

Gwalchmai £127

Ty nant £164

Llanfairpwllgwyngyll £1,616

Lon Isa £158

Bethesda £175

Betws-y-Coed £198

Hendre Isaf £127

Cernioge £188

Druid £304

Corwen £548

Llangollen £158

Whitehurst £269

Llwyn £301

Table A1 The toll house contracts in 1826 and 1830

| Date of Contract  | Site   | Contractor          | Cost |
|-------------------|--|---------------------|------|
| 22 September 1821 | Llanfairpwllgwyngyll                         | William Parry       | £328 |
| 22 September 1821 | Ty-Isa                                       | George Deas         | £400 |
| 25 March 1822     | Stanley                                      | Robert Prichard     | £346 |
| 25 March 1822     | Gwalchmai                                    | Robert Prichard     | £346 |
| 25 March 1822     | Ty nant                                      | William Parry       | £328 |
| 17 June 1824      | Junction of Wrexham Road at<br>Chirk Gardens | Thomas Evans        | £297 |
| 9 August 1826     | Corwen                                       | Thomas Evans        | £244 |
| 9 August 1826     | Llangollen                                   | Thomas Evans        | £239 |
| 31 August 1826    | Pen-r-mynydd                                 | George Deas         | £260 |
| 31 August 1826    | Tre-evan                                     | George Deas         | £345 |
| 2 August 1827     | Conway Marsh                                 | Gill, Hodges and Co | £262 |
| 22 August 1829    | Tyn-y-Lon (1)                                | George Deas         | £272 |
| 22 August 1829    | Tyn-y-Lon (2)                                | George Deas         | £248 |
| 16 September 1829 | Betws-y-Coed                                 | George Deas         | £270 |
| 31 July 1829      | Pen Maen Mawr                                | Gill, Hodges and Co | £242 |

Table A2 Traffic Through one of the Commissioner's gates in 1826 and 1830

|                   | Year ending 1 February 1826 | Year ending 1 February 1830 |
|-------------------|-----------------------------|-----------------------------|
| Carriage and four | 263                         | 150                         |
| Carriage and pair | 827                         | 848                         |
| Chaise and pair   | 406                         | 153                         |
| Gig and pair      | 22                          | 7                           |
| Gig and one horse | 402                         | 617                         |
| Saddle horses     | 2430                        | 2458                        |
| Cart horses       | 1525                        | 2019                        |
| Cattle            | 5477                        | 4929                        |
| Sheep and pigs    | 3885                        | 4944                        |

Queen's Head £307 Wolf's Head £274 Shelton £479

#### ESJ, 26 March 1845

Gates to let on Holyhead Road:
Stanley and Caergeiliog £149
Ty nant £284
Llanfairpwllgwyngyll £238
Lon Isa Gate and Weighing Machine £293
Tyn-twr (June–February only) £73
Tyn-y-Lon £138
Cernioge £120
Druid £228

Corwen Gate and Ty-Isa Gate and Weighing Machine £548
Llangollen £113
New Whitehurst, Black Park, Belmont £300
Llwyn £503
Queen's Head and Gallows Tree Bank £334
Wolf's Head (June– February only) £212
Menai Bridge £995
Conway Bridge £405

# 1826 Third Report of the Commissioners (BPP 1826 XI.47)

Work remaining to be completed: seven new toll houses.

### 1827 Fourth Report of the Commissioners (BPP 1826-7 VII.81)

Four new toll houses and gates set up and three more to be erected.

### 1829 Sixth Report of the Commissioners (BPP 1829 V.103)

Three new toll houses in North Wales have been completed.

### 1829 Provis: Annual Report of the Commissioners (BPP 1829 V.73)

Since the last report, the Commissioners under 4 Geo IV c.74 have built new toll houses at Capel Curig and Betws-y-Coed both with wrought-iron gates. Also at one Cernioge about a quarter of a mile east of the old gate.

### 1830 Select Committee Report (BPP 1830 X.131)

Commission has built fifteen toll houses - generally of four rooms.

'In your experience with respect to roads, do you find that the providing of a comfortable house contributes to the well letting of tolls?' Telford: 'There can be no doubt of it, and that was one of my principal motives for recommending comfortable houses; by making the people comfortable you can get respectable persons to take the tolls'.

### 1830 Seventh Report of the Commissioners (BPP 1830 XV.23)

Much work on toll houses and gates in North Wales and pointing walls. Grant received last year.

### 1831 Eighth Report of the Commissioners (BPP 1831 XII.29)

During 1830, four new toll houses were built, four old ones were repaired and added to, and seven gates were put up.

## 1831 Provis: Annual Report of the Commissioners (BPP 1830–1 IV.369)

Three new toll houses were built, one enlarged, three others repaired and six new gates were erected in Chirk–Cernioge district by Commissioners under 4 Geo IV c.74.

### 1832 Ninth Report of the Commissioners (BPP 1831–2 XXIII.573)

Between Shrewsbury and Chirk, three new toll houses have been built and four repaired and added to, five new gates made, and an old gate and bar repaired.

### 1843 Twentieth Report of the Commissioners (BPP 1843 XXIX.291)

New cast-iron platforms for weighing machines at Ty Isaf and Lon Isa.

#### Appendix 2

#### Principal contracts and contractors on the Holyhead Road

Table A3 Extracts from the 1830 Select Committee Report (BPP 1830.X.131)

Contracts in Wales under £200 are not listed

| Date of Contract | Contractor           | Site                            | Cost   |
|------------------|----------------------|---------------------------------|--------|
| 18 November 1815 | Straphen and Stanton | Ty Gwyn-Llyn Ogwen              | £3,281 |
| 18 November 1815 | Straphen and Stanton | Near River Llugwy               | £1,134 |
| 18 November 1815 | Straphen and Stanton | Near Betws-y-Coed               | £5,035 |
| 18 November 1815 | Straphen and Stanton | Glyn Conway                     | £729   |
| 2 April 1816     | Straphen and Stanton | Llynnon Bridge                  | £1,727 |
| 2 April 1816     | William Hazledine    | Iron Bridge over Conway         | £2,577 |
| 30 July 1816     | Straphen and Stanton | Cerrig-y-Druidon                | £536   |
| 28 August 1816   | Straphen and Stanton | Bangor Ferry – City             | £2,689 |
| 22 June 1817     | Straphen and Stanton | Glyn Dyffwys                    | £1,662 |
| 31 July 1817     | Thomas Roberts       | Capel Curig – Llyn Ogwen        | £3,062 |
| 31 July 1817     | Thomas Roberts       | Near Corwen                     | £3,863 |
| 31 July 1817     | Thomas Roberts       | Near Cernioge                   | £814   |
| 31 July 1817     | Thomas Roberts       | At Ty Gwyn                      | £1,291 |
| 11 August 1817   | Gill, Hodges and Co  | Owain Glyndwr's Hill            | £836   |
| 1 October 1817   | Straphen and Stanton | Glyn Dyffwys – Maes Mawr Facken | £4,355 |
| 1 November 1817  | John Jones           | Near Llandegai                  | £595   |
| 5 January 1818   | Straphen and Stanton | Near Rhyallt                    | £2,050 |
| 24 May 1818      | Thomas Evans         | Upper part of Rhysgog Hill      | £1,812 |
| 24 May 1818      | Thomas Evans         | West of Rhysgog Hill            | £615   |
| 16 August 1818   | Straphen and Hall    | Lon Isa                         | £1,720 |
| 16 August 1818   | Thomas Evans         | Bethesda                        | £1,669 |
| 16 August 1818   | Thomas Evans         | Pont-y-cefn                     | £2,957 |
| 8 November 1818  | Gill, Hodges and Co  | Pandy-Coetmore – Bethesda       | £2,256 |
| 1 August 1819    | Gill, Hodges and Co  | Near Bangor                     | £3,577 |
| 1 September 1819 | Thomas Evans         | Hendre Isaf                     | £2,808 |
| 1 September 1819 | Thomas Evans         | Pentre Voylas                   | £4,311 |
| 1 September 1819 | Gill, Hodges and Co  | Pen-issa-r-nant                 | £1,732 |
| 1 December 1819  | Gill, Hodges and Co  | Caergeiliog, Anglesey           | £4,134 |
| 1 December 1819  | Gill, Hodges and Co  | Llan Buclan, Anglesey           | £5,407 |
| 1 August 1820    | William Roberts      | Cae Moor, Anglesey              | £3,000 |
| 1 October 1820   | George Deas          | Hendre Isaf                     | £255   |
| 10 October 1820  | Gill, Hodges and Co  | Castell Eden, Anglesey          | £4,166 |

| Date of Contract  | Contractor          | Site   | Cost    |
|-------------------|---------------------|--|---------|
| 10 October 1820   | Gill, Hodges and Co | Malltreath Marsh, Anglesey                               | £7,006  |
| 10 October 1820   | Gill, Hodges and Co | Llandisillio, Anglesey                                   | £6,722  |
| 13 October 1820   | George Deas         | Betws-y-Coed   | £660    |
| 13 February 1821  | Gill, Hodges and Co | Tavarn-y-Coed, North Wales                               | £1,881  |
| 13 February 1821  | Gill, Hodges and Co | Afon-no, North Wales                                     | £2,201  |
| 1 Mar 1821        | George Deas         | Ty-Isaf  | £400    |
| 28 Mar 1821       | Robert Jones        | Ketley Hill  | £1,215  |
| 28 Mar 1821       | Robert Jones        | Priorslee  | £2,090  |
| 8 May 1821        | Thomas Evans        | Llangollen   | £365    |
| 10 May 1821       | George Deas         | Cernioge-bach, North Wales                               | £1,119  |
| 10 May 1821       | George Deas         | Clws-ty-blaibb, North Wales                              | £594    |
| 10 May 1821       | George Deas         | Cerrig-y-Druidon   | £258    |
| 10 May 1821       | George Deas         | Cerrig-y-Druidon   | £215    |
| 21 June 1821      | William Hazledine   | Menai Bridge   | £53,050 |
| 23 June 1821      | Thomas Evans        | Near Biddulph's Lime Kilns, Chirk                        | £2,523  |
| 27 August 1821    | Gill, Hodges and Co | Chirk  | £3,957  |
| 22 September 1821 | William Parry       | Llanfairpwllgwyngyll, Anglesey                           | £328    |
| 20 October 1821   | Gill, Hodges and Co | Llan-yn-Gheneddle, Anglesey                              | £738    |
| 1 Mar 1822        | Gill, Hodges and Co | Pen Rhos, Bradmen  | £3,000  |
| 25 Mar 1822       | William Parry       | Ty Nant, Anglesey  | £328    |
| 25 Mar 1822       | Gill, Hodges and Co | Stanley Embankment                                       | £20,834 |
| 25 Apr 1822       | Gill, Hodges and Co | Glan Kwrfa, Anglesey                                     | £1,293  |
| 25 June 1822      | Thomas Evans        | Rhysgog Hill   | £1,017  |
| 26 June 1822      | Thomas Bayliss      | Cosford Brook  | £1,125  |
| 10 August 1822    | Thomas Bayliss      | Summerhouse Hill   | £1,030  |
| 19 September 1822 | John Wilson         | Llanfairpwllgwyngyll                                     | £1,496  |
| 14 July 1823      | Thomas Evans        | Near Llangollen  | £1,150  |
| 14 July 1823      | Thomas Evans        | Chirk Bridge, Gobowen                                    | £4,100  |
| 24 August 1823    | Gill, Hodges and Co | Brymtych, North Wales                                    | £1,100  |
| 21 October 1823   | Thomas Evans        | Near Llangollen  | £1,261  |
| 15 January 1824   | Gill, Hodges and Co | At Talybont, North Wales                                 | £1,206  |
| 1 April 1824      | William Hazledine   | Conway Bridge  | £9,345  |
| 16 August 1824    | Thomas Evans        | Near Llangollen  | £1,700  |
| 2 July 1825       | Gill, Hodges and Co | Building and painting walls, sundry parts of North Wales | £790    |
| 2 July 1825       | Thomas Evans        | West end of Llangollen                                   | £900    |
| 3 November 1825   | Thomas Bayliss      | Summerhouse Hill   | £2,250  |
| 5 January 1826    | Thomas Bayliss      | Llewellyn, Shifnal                                       | £1,900  |
| 25 January 1826   | George Deas         | Rhydllanfair Bridge, North Wales                         | £645    |
| 3 February 1826   | Gill, Hodges and Co | Rug  | £820    |
| 16 August 1827    | Gill, Hodges and Co | Approach to Menai Bridge, Anglesey                       | £202    |

#### 150 Thomas Telford's Holyhead Road

| <b>Date of Contract</b> | Contractor          | Site   | Cost   |
|-------------------------|---------------------|--|--------|
| 16 August 1827          | Gill, Hodges and Co | Pinning and pointing walls, Anglesey           | £467   |
| 12 September 1828       | Gill, Hodges and Co | Cwm-y-nod Marsh, Anglesey                      | £1,844 |
| 22 October 1828         | Thomas Bayliss*     | Shifnal  | £1,037 |
| 22 October 1828         | Thomas Bayliss*     | Knowle Bank                                    | £1,000 |
| 22 May 1829             | Gill, Hodges and Co | Malltreath Marsh, Anglesey                     | £1,000 |
| 31 August 1829          | William Hughes      | Chirk – Gobowen                                | £767   |
| 27 October 1829         | George Edgecomb     | Building and altering toll houses, North Wales | £748   |

<sup>\*</sup>Both were finished by the Commissioners at a total cost of £3,11

#### **Appendix 3**

#### Milestone gazetteer

This gazetteer of the milestones extends from Holyhead to Chirk along the route of the A5. The information used in the gazetteer is drawn primarily from the data gathered during the fieldwork survey carried out by Lancaster University Archaeological Unit (LUAU 1999 and 2000c). The standard Telfordian milestone comprised a dressed pillar of Carboniferous limestone, with a shallow triangular head and raking chamfered sides (see Figs 4.12 and 4.13). A description of additional details for each milestone is given, including the text appearing on each milestone plate. Where the plate was missing, the text has been interpolated and appears in the gazetteer in italics. The height of each milestone above the present ground surface is given in metres.

 Milestone
 01
 Project No.
 0837

 NGR
 SH 2499 8188
 Height
 1.18

Plate Text HOLY-HEAD 1 MONA 12 BANGOR 24

Comment A standard Telford milestone set into a mortar-bonded stone wall on the road adjacent to A5,

opposite the Mount Hotel, still painted with a black ground and white letters.

 Milestone
 02
 Project No.
 0838

 NGR
 SH 2635 8107
 Height
 n/a

Plate Text HOLY-HEAD 2 MONA 11 BANGOR 23

**Comment** Milestone not located, although this section of A5 has been rerouted.

 Milestone
 03
 Project No.
 0007

 NGR
 SH 2761 8033
 Height
 0.9

Plate Text HOLY-HEAD 3 MONA 10 BANGOR 22

**Comment** A standard Telford milestone, relocated and set in concrete.

 Milestone
 04
 Project No.
 0009

 NGR
 SH 2910 7949
 Height
 0.98

Plate Text HOLY-HEAD 4 MONA 9 BANGOR 21

**Comment** A standard Telford milestone in original location.

 Milestone
 05
 Project No.
 0079

 NGR
 SH 3041 7862
 Height
 1.04

Plate Text HOLY-HEAD 5 MONA 8 BANGOR 20

**Comment** A standard Telford milestone, almost completely obscured by ivy.

 Milestone
 06
 Project No.
 0039

 NGR
 SH 3194 7843
 Height
 0.81

Plate Text HOLY-HEAD 6 MONA 7 BANGOR 19

**Comment** A standard Telford milestone set in front of a wall that retains an arched surround.

 Milestone
 07
 Project No.
 0051

 NGR
 SH 3304 7808
 Height
 0.93

Plate Text HOLY-HEAD 7 MONA 6 BANGOR 18

**Comment** A standard Telford milestone in original location.

 Milestone
 08
 Project No.
 0051A

 NGR
 SH 3502 7755
 Height
 1.16

Plate Text HOLY-HEAD 8 MONA 5 BANGOR 17

**Comment** A standard Telford milestone in original location.

 Milestone
 09
 Project No.
 0059A

 NGR
 SH 3655 7694
 Height
 0.71

Plate Text HOLY-HEAD 9 MONA 4 BANGOR 16

**Comment** A standard Telford milestone in original location.

 Milestone
 10
 Project No.
 0071

 NGR
 SH 3802 7645
 Height
 1.17

Plate Text HOLY-HEAD 10 MONA 3 BANGOR 15

**Comment** A standard Telford milestone in original location.

 Milestone
 11
 Project No.
 0075

 NGR
 SH 3966 7618
 Height
 1.06

Plate Text HOLY-HEAD 11 MONA 2 BANGOR 14

**Comment** A standard Telford milestone in original location.

 Milestone
 12
 Project No.
 0093A

 NGR
 SH 4108 7552
 Height
 0.9

Plate Text HOLY-HEAD 12 MONA 1 BANGOR 13

**Comment** A standard Telford milestone in original location.

 Milestone
 13
 Project No.
 0111

 NGR
 SH 4257 7496
 Height
 0.76

Plate Text HOLY-HEAD 13 MONA BANGOR 12

**Comment** A standard Telford milestone, located opposite Old Coach House.

 Milestone
 14
 Project No.
 0127

 NGR
 SH 4398 7440
 Height
 1.05

Plate Text HOLY-HEAD 14 MONA 1 BANGOR 11

**Comment** A standard Telford milestone in original location.

 Milestone
 15
 Project No.
 0155A

 NGR
 SH 4514 7362
 Height
 1.16

Plate Text HOLY-HEAD 15 MONA 2 BANGOR 10

**Comment** A standard Telford milestone in original location.

 Milestone
 16
 Project No.
 0839

 NGR
 SH 4653 7287
 Height
 n/a

Plate Text HOLY-HEAD 16 MONA 3 BANGOR 9

**Comment** Milestone has been removed and is presently stored at Gaerwen Highways depot.

 Milestone
 17
 Project No.
 0165B

 NGR
 SH 4784 7197
 Height
 1.03

Plate Text HOLY-HEAD 17 MONA 4 BANGOR 8

**Comment** A standard Telford milestone in original location.

 Milestone
 18
 Project No.
 0171

 NGR
 SH 4947 7185
 Height
 0.98

Plate Text HOLY-HEAD 18 MONA 5 BANGOR 7

**Comment** A standard Telford milestone in original location.

 Milestone
 19
 Project No.
 0187A

 NGR
 SH 5105 7190
 Height
 0.83

Plate Text HOLY-HEAD 19 MONA 6 BANGOR 6

**Comment** A standard Telford milestone in original location.

 Milestone
 20
 Project No.
 0195

 NGR
 SH 5265 7164
 Height
 0.94

Plate Text HOLY-HEAD 20 MONA 7 BANGOR 5

**Comment** A standard Telford milestone built into a modern wall.

 Milestone
 21
 Project No.
 0707

 NGR
 SH 5419 7167
 Height
 1.16

Plate Text HOLY-HEAD 21 MONA 8 BANGOR 4

**Comment** A standard Telford milestone in original location.

 Milestone
 22
 Project No.
 0811

 NGR
 SH 5549 7178
 Height
 0.98

Plate Text HOLY-HEAD 22 MONA 9 BANGOR 3

**Comment** A standard Telford milestone set into wall at rear of pavement.

 Milestone
 23
 Project No.
 0812

 NGR
 SH 5660 7179
 Height
 0.84

Plate Text HOLY-HEAD 23 MONA 10 BANGOR 2

**Comment** A standard Telford milestones set in short rebuilt wall.

 Milestone
 24
 Project No.
 0813

 NGR
 SH 5752 7186
 Height
 1.16

Plate Text HOLY-HEAD 24 MONA 11 BANGOR 1

**Comment** A standard Telford milestone moved from original location.

 Milestone
 25
 Project No.
 0814

 NGR
 SH 5867 7239
 Height
 1.21

Plate Text HOLY-HEAD 25 MONA 12 BANGOR 0M

**Comment** A standard Telford milestone moved from original location.

 Milestone
 26
 Project No.
 0815

 NGR
 SH 5941 7136
 Height
 0.2

 Plate Text
 HOLY-HEAD 26 BANGOR 1 C.CURIG 13M-3F

**Comment** A standard Telford milestone, which has been broken diagonally 100–200mm above

ground.

 Milestone
 27
 Project No.
 0028

 NGR
 SH 5999 6995
 Height
 1.43

 Plate Text
 HOLY-HEAD 27 BANGOR 2 C.CURIG 12M-3F

Comment A standard Telford milestone, dilapidated and chipped. Located along a section of disused

road.

Milestone28Project No.0034aNGRSH 6085 6875Height0.69Plate TextHOLY-HEAD 28 BANGOR 3 C.CURIG 11M-3FCommentA standard Telford milestone in original location.

Milestone29Project No.0036NGRSH 6148 6742Height0.98Plate TextHOLY-HEAD 29 BANGOR 4 C.CURIG 10M-3FCommentA standard Telford milestone in original location.

Milestone30Project No.0038NGRSH 6256 6639Height1.2Plate TextHOLY-HEAD 30 BANGOR 5 C.CURIG 9M-3FCommentA standard Telford milestone in original location.

 Milestone
 31
 Project No.
 0251

 NGR
 SH 6322 6508
 Height
 0.93

 Plate Text
 HOLY-HEAD 31 BANGOR 6 C.CURIG 8M-3F

**Comment** A standard Telford milestone set in a concrete gutter.

 Milestone
 32
 Project No.
 0293

 NGR
 SH 6367 6356
 Height
 0.89

 Plate Text
 HOLY-HEAD 32 BANGOR 7 C.CURIG 7M-3F

**Comment** A standard Telford milestone moved from original location.

 Milestone
 33
 Project No.
 0301

 NGR
 SH 6439 6214
 Height
 0.88

 Plate Text
 HOLY-HEAD 33 BANGOR 8 C.CURIG 6M-3F

**Comment** A standard Telford milestone moved from original location.

 Milestone
 34
 Project No.
 0307A

 NGR
 SH 6486 6065
 Height
 0.95

 Plate Text
 HOLY-HEAD 34 BANGOR 9 C.CURIG 5M-3F

**Comment** A standard Telford milestone moved from original location.

Milestone35Project No.0058NGRSH 6632 6028Height0.86Plate TextHOLY-HEAD 35 BANGOR 10 C.CURIG 4M-3FCommentA standard Telford milestone in original location.

 Milestone
 36
 Project No.
 0783

 NGR
 SH 6781 6045
 Height
 0.77

 Plate Text
 HOLY-HEAD 36 BANGOR 11 C.CURIG 3M-3F

**Comment** A standard Telford milestone moved from original location.

Milestone37Project No.0309CNGRSH 6939 6010Height1.08Plate TextHOLY-HEAD 37 BANGOR 12 C.CURIG 2M-3FCommentA standard Telford milestone in original location.

Milestone38Project No.0064NGRSH 7085 5945Height0.59Plate TextHOLY-HEAD 38 BANGOR 13 C.CURIG 1M-3FCommentA standard Telford milestone in original location.

 Milestone
 39
 Project No.
 0064A

 NGR
 SH 7210 5861
 Height
 0.59

Plate Text HOLY-HEAD 39 BANGOR14 C.CURIG 3F

**Comment** A standard Telford milestone set into a rebuilt wall.

 Milestone
 40
 Project No.
 0423

 NGR
 SH 7298 5760
 Height
 1.29

Plate Text HOLY-HEAD 40 C.CURIG 5 FURLONGS CERNIOGE 13M 6F

**Comment** A standard Telford milestone in original location.

Milestone41Project No.0385NGRSH 7428 5728Height1.05Plate TextHOLY-HEAD 41 C.CURIG 1M-5F CERNIOGE 12M-6FCommentA standard Telford milestone in original location.

 Milestone
 42
 Project No.
 0447

 NGR
 SH 7569 5739
 Height
 0.96

 Plate Text
 HOLY-HEAD 42 C.CURIG 2M-5F CERNIOGE 11M-6F

**Comment** A standard Telford milestone in original location.

 Milestone
 43
 Project No.
 0401

 NGR
 SH 7717 5755
 Height
 1.09

 Plate Text
 HOLY-HEAD 43 C.CURIG 3M-5F CERNIOGE 10M-6F

Comment A standard Telford milestone in original location, with a benchmark inscibed below the

plate.

Milestone44Project No.0457NGRSH 7838 5665Height1.09Plate TextHOLY-HEAD 44 C.CURIG 4M-5F CERNIOGE 9M-6FCommentA standard Telford milestone in original location.

 Milestone
 45
 Project No.
 0381

 NGR
 SH 7963 5604
 Height
 0.985

 Plate Text
 HOLY-HEAD 45 C.CURIG 5M-5F CERNIOGE 8M-6F

**Comment** A standard Telford milestone moved from original location, with a benchmark inscribed

below the plate.

| Milestone<br>NGR<br>Plate Text<br>Comment | <i>Project No. Height</i> CURIG 6M–5F CERNIOC milestone in original loca                 |  |
|---|--|--|
| Milestone<br>NGR<br>Plate Text<br>Comment | <i>Project No. Height</i> CURIG 7M–5F CERNIOC milestone in original loca                 |  |
| Milestone<br>NGR<br>Plate Text<br>Comment | Project No.<br>Height<br>CURIG 8M–5F CERNIO<br>milestone in original loca                |  |
| Milestone<br>NGR<br>Plate Text<br>Comment | Project No.<br>Height<br>CURIG 9M–5F CERNIO<br>milestone moved from oig                  |  |
| Milestone<br>NGR<br>Plate Text<br>Comment | Project No.<br>Height<br>CURIG 10M–5F CERNIC<br>milestone moved from ori                 |  |
| Milestone<br>NGR<br>Plate Text<br>Comment | Project No.<br>Height<br>CURIG 11M–5F CERNIC<br>milestone moved from ori                 |  |
| Milestone<br>NGR<br>Plate Text<br>Comment | <b>Project No. Height</b> CURIG 12M–5F CERNIC milestone moved from ori                   |  |
| Milestone<br>NGR<br>Plate Text<br>Comment | <b>Project No.</b><br><b>Height</b><br>CURIG 13M–5F CERNIC<br>milestone in original loca |  |
| Milestone<br>NGR<br>Plate Text<br>Comment | Project No.<br>Height<br>ERNIOGE 2F CORWEN I<br>milestone in original loca               |  |
| Milestone<br>NGR<br>Plate Text<br>Comment | Project No.<br>Height<br>ERNIOGE 1M–2F CORW<br>milestone in original loca                |  |
| Milestone<br>NGR<br>Plate Text<br>Comment | Project No. Height ERNIOGE 2M–2F CORW. milestone moved from ori                          |  |
| Milestone<br>NGR<br>Plate Text<br>Comment | Project No.<br>Height<br>ERNIOGE 3M–2F CORW<br>milestone in original loca                |  |

Milestone58Project No.0581NGRSH 9586 4702Height0.75Plate TextHOLY-HEAD 58 CERNIOGE 4M-2F CORWEN 8M-6FCommentA standard Telford milestone in original location.

Milestone59Project No.0591ANGRSH 9707 4593Height0.795Plate TextHOLY-HEAD 59 CERNIOGE 5M-2F CORWEN 7M-6FCommentA standard Telford milestone in original location.

Milestone61Project No.0088NGRSH 9952 4429Height1.23Plate TextHOLY-HEAD 61 CERNIOGE 7M-2F CORWEN 5M-6FCommentA standard Telford milestone moved from original location.

Milestone62Project No.0094NGRSJ 0090 4485Height0.59Plate TextHOLY-HEAD 62 CERNIOGE 8M-2F CORWEN 4M-6FCommentA standard Telford milestone in original location.

Milestone63Project No.0094ANGRSJ 0212 4404Height0.65Plate TextHOLY-HEAD 63 CERNIOGE 9M-2F CORWEN 3M-6FCommentA standard Telford milestone in original location.

 Milestone
 64
 Project No.
 0629

 NGR
 SJ 0355 4355
 Height
 0.65

 Plate Text
 HOLY-HEAD 64 CERNIOGE 10M-2F CORWEN 2M-6F

**Comment** A standard Telford milestone in original location sunken into pavement.

 Milestone
 65
 Project No.
 0840

 NGR
 SJ 0516 4363
 Height
 n/a

 Plate Text
 HOLY-HEAD 65 CERNIOGE 11M-2F CORWEN 1M-6F

**Comment** Milestone not located.

 Milestone
 66
 Project No.
 0633

 NGR
 SJ 0670 4349
 Height
 0.45

 Plate Text
 HOLY-HEAD 66 CERNIOGE 12M-2F CORWEN 6F

**Comment** A standard Telford milestone moved from original location and sunken into pavement.

Milestone67Project No.0637NGRSJ 0819 4340Height0.975Plate TextHOLY-HEAD 67 CORWEN 2F LLANGOLLEN 9M-6FCommentA standard Telford milestone in original location.

 Milestone
 68
 Project No.
 0643

 NGR
 SJ 0980 4341
 Height
 0.8

Plate TextHOLY-HEAD 68 CORWEN 1M-2F LLANGOLLEN 8M-6FCommentA standard Telford milestone moved from original location.

 Milestone
 69
 Project No.
 0841

 NGR
 SJ 1137 4324
 Height
 n/a

Plate Text HOLY-HEAD 69 CORWEN 2M-2F LLANGOLLEN 7M-6F

**Comment** Milestone not located.

**Milestone 70** Project No. 0633C NGR SJ 1265 4300 0.72 Height HOLY-HEAD 70 CORWEN 3M-2F LLANGOLLEN 6M-6F Plate Text Comment A standard Telford milestone set within intact Telford arch. *Milestone* Project No. 0842 71 NGRSJ 1409 4279 Height n/a HOLY-HEAD 71 CORWEN 4M-2F LLANGOLLEN 5M-6F Plate Text **Comment** Milestone not located. Project No. *Milestone* **72** 0669 NGRSJ 1598 4239 Height 1.12 Plate Text HOLY-HEAD 72 CORWEN 5M-2F LLANGOLLEN 4M-6F Comment A standard Telford milestone in original location. *Milestone* **73** 0250 Project No. NGRSJ 1663 4225 Height 0.95Plate Text HOLY-HEAD 73 CORWEN 6M-2F LLANGOLLEN 3M-6F **Comment** A standard Telford milestone set into a rebuilt wall in a layby. *Milestone* 74 Project No. 0675 NGRSJ 1724 4330 Height 0.73 HOLY-HEAD 74 CORWEN 7M-2F LLANGOLLEN 2M-6F Plate Text A standard Telford milestone in original location. Comment **Milestone** 75 Project No. 0679 NGR SJ 1868 4318 Height 1.02 Plate Text HOLY-HEAD 75 CORWEN 8M-2F LLANGOLLEN 1M-6F Comment A standard Telford milestone in original location. 76 *Milestone* Project No. 0685 NGR SJ 1980 4276 Height 0.85 Plate Text HOLY-HEAD 76 CORWEN 9M-2F LLANGOLLEN 6F **Comment** A standard Telford milestone moved from original location. **Milestone** 0685A 77 Project No. NGR SJ 2079 4275 Height 1.16 HOLY-HEAD 77 LLANGOLLEN 2F CHIRK-B 6M-5F Plate Text Comment A standard Telford milestone in original location. *Milestone* **78** Project No. 0689 NGRSJ 2347 4147 Height 0.97 Plate Text HOLY-HEAD 78 LLANGOLLEN 1M-2F CHIRK-B 5M-5F **Comment** A standard Telford milestone in original location. **Milestone 79** Project No. 0689A NGR SJ 2479 4114 Height 1.01 Plate Text HOLY-HEAD 79 LLANGOLLEN 2M-2F CHIRK-B 4M-5F A standard Telford milestone set within a Telford arch. Comment *Milestone* 80 0689B Project No. Height NGRSJ 2638 4102 0.97 Plate Text HOLY-HEAD 80 LLANGOLLEN 3M-2F CHIRK-B 3M-5F **Comment** A standard Telford milestone set within a Telford arch. *Milestone* Project No. 0324 81 Height SJ 2779 4092 NGR0.69 Plate Text HOLY-HEAD 81 LLANGOLLEN 4M-2F CHIRK-B 2M-5F

A standard Telford milestone in original location.

**Comment** 

 Milestone
 82
 Project No.
 0843

 NGR
 SJ 2882 3972
 Height
 n/a

Plate Text HOLY-HEAD 82 LLANGOLLEN 5M-2F CHIRK-B 1M-5F

**Comment** Milestone not located.

Comment A standard Telford milestone erected by Telford as part of an improvement scheme in

1819.

## **Appendix 4**

## Gazetteer of sites referred to in the volume

The following site descriptions are summaries of records held within the primary survey archive for the A5 and A55 survey projects (LUAU 1999 and 2000). The full archive has 676 site entries of which 648 relate to the Welsh section of the A5 Road and 28 relate to the Bangor – Conwy section of the A55 (the site numbers extend up to 1040 for the A5 and C34 for the A55; some numbers were not used). The gazetteer below incorporates only those sites that are referred to in the present volume. All of these are depicted on the site maps (**Figs 5.2, 5.3, 5.6, 5.8, 5.11, 5.14, 5.17, 5.20, 5.21 and 5.23 and 5.30**). A full catalogue of the sites has been deposited with the Archaeology Data Service (ADS).

Project No 0001 Site Name Stanley Toll House

 Site Type
 Toll House
 Telford Lot No
 A9

 From (NGR)
 SH 2707 8035
 To (NGR)
 —

This toll house, now the Toll House Tea Rooms, immediately west of Stanley Embankment, has been rebuilt, whitewashed, and rendered. There are no toll boards, but the main structure remains unaltered and the rebuild is an accurate reconstruction of the Telfordian structure. It has a slate roof and possible original windows. The Telford gate survives, but is not *in situ*. The building was moved from its original location in the late 1960s in order to allow for the laying of a water pipe along the embankment. This involved a move of up to 100m to its present location which is now adjacent to the modern trunk road. The original location was on the southern side of Telford's road, immediately adjacent to the railway line.

Project No 0003 Site Name Stanley Embankment

Site Type Embankment Telford Lot No A10

From (NGR) SH 2758 8030 To (NGR) SH 2846 7984

The Stanley Embankment has been much altered especially by an extension in width to accommodate the railway. This may have been done at the same time as the addition of a pedestrian path on the north side. Although the Telford structure may partially survive, it has now been entirely encased by later repairs, eg the provision of gabions on the north side and concrete consolidation of services. A sluice survives in the centre of the embankment which is a product of the railway phase as is the high wall (c 3m) on the south side. The large embankment built on a natural terrace across the strait is faced with stone and with modern rubble walling on either side to protect against storm damage. The embankment is 1189m long, 4.87m high, and the base is 34.7m wide. The embankment carries the A5 road and the main Holyhead railway. There is a tall rubble masonry wall dividing the two and a smaller rubble masonry wall along the east side of the A5.

Project No 0004 Site Name Caergeiliog

Site Type Toll House Telford Lot No – From (NGR) SH 3048 7858 To (NGR) –

The toll house at the west end of Caergeiliog retains the plan of Telford's building but has been insensitively rebuilt in the west wing with larger stone. There is concrete cladding and pointing, modern UPVC windows in the original openings, asphalt roofing, and plastic gutters. There are also a modern archway with a wrought-iron gate and an extension to the rear of the west wing.

Project No 0007 Site Name Stanley Embankment

Site TypeMilestoneTelford Lot NoA9From (NGR)SH 2710 8033To (NGR)-

A standard Telford milestone relocated and set in concrete. It comprises a dressed pillar of Carboniferous limestone, with a shallow triangular head and raking chamfered sides.

| Project No | 0013        | Site Name      | Valley |
|------------|-------------|----------------|--------|
| Site Type  | Depot       | Telford Lot No | A6     |
| From (NGR) | SH 29527922 | To(NGR)        | _      |

A semicircular depot that presently contains a bus stop (concrete) which sits on concrete flooring.

| Project No | 0028         | Site Name      | Bangor |
|------------|--------------|----------------|--------|
| Site Type  | Milestone    | Telford Lot No | T68    |
| From (NGR) | SH 5999 6995 | To (NGR)       | -      |

A standard though rather dilapidated and chipped Telford milestone located along a section of disused road. It comprises a dressed pillar of Carboniferous limestone with a shallow triangular head and raking chamfered sides.

| Project No | 0029         | Site Name      | Caergeiliog |
|------------|--------------|----------------|-------------|
| Site Type  | Depot        | Telford Lot No | _           |
| From (NGR) | SH 3038 3787 | To (NGR)       | _           |

A depot of Telford's specified splay-type. It is almost intact with some concrete mortaring and capstones slipping at the west end.

| Project No | 0034         | Site Name      | Lon-Isaf |
|------------|--------------|----------------|----------|
| Site Type  | Toll house   | Telford Lot No | T22      |
| From (NGR) | SH 6018 6936 | To(NGR)        | _        |

The toll house is a single-storey building with a slate roof and a plastic gutter. There is no toll board. The house displays some original sash windows with stone sills and lintels built with freestone. There is an arched window in the west elevation (blocked) with relieving arch above. A modern porch can be found in the north-west angle to the rear and the rear part is now pebble-dashed. There is a single chimney stack in the centre of the roof that has a mixture of slate/ceramic ridge tiles. Note that this is the toll house associated with weighbridge [0231] and depot [0229].

| Project No | 0050         | Site Name      | Capel Curig  |
|------------|--------------|----------------|--------------|
| Site Type  | Wall         | Telford Lot No | T8           |
| From (NGR) | SH 6735 6052 | To (NGR)       | SH 7211 5854 |

The original Telford wall has been left largely unrepaired, as seen by its very dark, worn appearance. It is a long section through mountainous terrain which is usually slightly embanked with some rock-cut sections. It follows a wobbly line in parts, suggesting unrepaired slump. As is usual, it consists of rough-coursed local stone generally visible up to 1m above the present road but in many places lower because of the accumulated road surface. There is walling on the line of Telford's which includes much of its fabric, some in dilapidated and patchily repaired condition. This is particularly apparent in the upper (parapet) walling at the north and south extremes where the wall is in a state of collapse and disrepair, with patches of modern repair distinguishable by flat coping stones. The line of the wall is ragged and in places appears to be only two or three courses above the present road surface. The retaining wall has been repointed in places. From a trackway at SH 6995 5990, the wall survives to almost 1m in height above the road for approximately 400m to the north. Modern repairs are clearly distinguished by their regular, machine-cut and edge-set capstones.

| Project No | 0060         | Site Name      | Capel Curig |
|------------|--------------|----------------|-------------|
| Site Type  | Toll House   | Telford Lot No | A8          |
| From (NGR) | SH 7212 5799 | To (NGR)       | _           |

A single-storey toll house of standard plan but with many modern extensions particularly on the south wing. It has multiple extensions to the rear and appears to be a multiple dwelling (name Tyn y Lon) and Tollgate Cottage on the map. The exterior is rendered and pointed with a slate roof and modern windows with fake bull's-eye panes. There is an intact multiple central chimney. The toll house was built on a steep bank.

| Project No | 0068         | Site Name      | Betws-y-Coed |
|------------|--------------|----------------|--------------|
| Site Type  | Depot        | Telford Lot No | _            |
| From (NGR) | SH 7740 5744 | To (NGR)       | _            |

A standard rectilinear Telford depot.

| Project No | 0068a    | Site Name    | Lledr Cottages |
|------------|----------|--------------|----------------|
| ari m      | 7D 11 TT | 77 1C 1T 137 | mo.            |

 Site Type
 Toll House
 Telford Lot No
 T3

 From (NGR)
 SH 7976 5438
 To (NGR)

A toll house on a section of turnpike near the Holyhead Road. The toll house is clearly of a similar style (frontal elevation at least) to Telford's toll houses, since it has a similar multi-angled protruding porch. It has roughly dressed blocks in the front elevation and stone lintels and sills to the windows. The internal walls measure 0.42m thick. There are three rooms, a fireplace, and a chimney stack. The frontal elevation is very near the road. The faces of the internal wall consist of thin flat stone. The roof is missing and the building is in a poor state of repair with ongoing decay.

| Project No 0077 Site Name Caste | ll Eden |
|---------------------------------|---------|
|---------------------------------|---------|

Site TypeToll HouseTelford Lot NoA3From (NGR)SH 3989 7610To (NGR)-

A toll house, retaining its plan with the addition of a conservatory. It has an early stone porch. Window openings are unaltered, but contain modern wood frames and may be rebuilt to some extent. There is a new slate roof on the tower and an asphalt roof on the north wing. The toll house has been heavily repointed.

| Project No | <b>0082</b> | Site Name | Betws-y-Coed |
|------------|-------------|-----------|--------------|
|------------|-------------|-----------|--------------|

Site Type Old Road Telford Lot No T11

From (NGR) SH 9616 4658 To (NGR) SH 9762 4557

This is a section of 'old road' shown by Telford. It lies in gently sloping terrain with low embankments. There are some low retaining walls and embanking up to c 1m, but generally the dilapidated dry-stone walling has been replaced by hedging or wire fencing.

| Project No | 0088         | Site Name      | Tyn y Glyn |
|------------|--------------|----------------|------------|
| Site Type  | Milestone    | Telford Lot No | T13        |
| From (NGR) | SH 9952 4429 | To(NGR)        | _          |

A standard Telford milestone, comprising a dressed pillar of Carboniferous limestone, with a shallow triangular head and raking chamfered sides. It is located at the foot of a modern embankment.

| Project No | <b>0092</b>  | Site Name      | Maerdy |
|------------|--------------|----------------|--------|
| Site Type  | Toll House   | Telford Lot No | T13    |
| From (NGR) | SJ 0219 4396 | To(NGR)        | _      |

A single-storey toll house retaining its plan but with modern window openings, a new slated roof, and a brick chimney. The walls are entirely rendered and a small extension has been built on the south-west wing. There is no toll board and the house has modern fixtures such as lamps on the wall.

| Project No | 0098         | Site Name      | Maerdy |
|------------|--------------|----------------|--------|
| Site Type  | Bridge       | Telford Lot No | T13    |
| From (NGR) | SJ 0189 4440 | To (NGR)       | _      |

A single-arched bridge over the Afon Ceirw that retains a semblance of Telford's design on the north side, albeit very much rebuilt and repointed. It has been doubled in width by an extension to the south so the south side was not inspected.

| Project No 0106 | Site Name | Corwen Bridge |
|-----------------|-----------|---------------|
|-----------------|-----------|---------------|

 Site Type
 Bridge
 Telford Lot No
 T29

 From (NGR)
 SJ 0695 4335
 To (NGR)

An impressive seven-arched bridge over the Dee, retaining its appearance as a rubble-coursed structure with some leaching repointing. It retains the original cutwater wings. A rusting iron plate over the largest arch looks like a nance plate rather than a structural tie, but this seems unlikely. The masonry is roughly coursed and has squared stones with four main arches and an additional lower archway to the south and two very low side arches at either end. The arch to the north appears to be of dry construction. The parapet has been rebuilt and is formed of rough flat copings. The segmental archways comprise roughly shaped voussoirs and projecting hood moulds. A datestone of 1704 is incorporated into the structure, although this probably represents reconstruction work carried out on an earlier bridge.

| Project No | 0108 | Site Name | Pont Glyndyfrdwy |
|------------|------|-----------|------------------|
|------------|------|-----------|------------------|

 Site Type
 Bridge
 Telford Lot No
 T30

 From (NGR)
 SJ 1490 4266
 To (NGR)

A Telford bridge rebuilt with rusticated masonry and heavy pointing; the parapet has also been rebuilt. A nearby wall to east is heavily rendered and has large fishplates. Only the north elevation was seen.

| Project No | 0111         | Site Name      | Mona |
|------------|--------------|----------------|------|
| Site Type  | Milestone    | Telford Lot No | A3   |
| From (NGR) | SH 4257 7496 | To(NGR)        | _    |

A standard Telford milestone comprising a pillar of dressed Carboniferous limestone with a shallow triangular head and raking chamfered sides. It is located opposite Mona Coach House.

| Project No | $\boldsymbol{0112}$ | Site Name | y Bwthyn (Ty Isaf) |
|------------|---------------------|-----------|--------------------|
|------------|---------------------|-----------|--------------------|

 Site Type
 Toll House
 Telford Lot No
 T31

 From (NGR)
 SJ 1671 4225
 To (NGR)
 —

A standard plan toll house, with modern extensions to the rear (south). It was constructed in rough random rubble with freestone dressings and stone lintels and sills to the windows and doors. It has a blocked window in the end of the west wing. It has a double axial chimney stack, a dark grey slate roof with ceramic ridge tiles, and modern windows. It is single storeyed, and has a three-bay plan with a canted central bay housing the entrance flanked by windows. The outer windows have been renewed.

Project No 0125 Site Name Gwalchmai to Malltraeth Marsh

Site Type Wall Telford Lot No A4/22

From (NGR) SH 3910 7624 To (NGR) SH 4539 7349

Terrain includes a number of steep inclines levelled by cutting or embanking as described in the Telford specifications. It includes many depots mostly rectangular. The wall, which is on Telford's line (excepting usual piercings, eg between depots 0093 and 0095), is entirely absent having been replaced by wooden fencing. In other places the modern road surface almost obscures the walling. Where present at all, often in short stretches of less than 1m, the authentic Telford wall is very heavily repointed.

| Project No | 0158            | Site Name      | Ty Nant      |
|------------|-----------------|----------------|--------------|
| Site Type  | Wall Embankment | Telford Lot No | T58, T13     |
| From (NGR) | SH 9905 4469    | To(NGR)        | SH 9949 4425 |

A Telford wall consisting of a parapet rebuilt with modern mortar, pointed coping flat or keystone-shaped with irregular blocks. Some drainpipes have been inserted and the wall has concrete mortar in places; however the lower (retaining) part of the structure is substantially intact. The northern part is rock-cut with its spoil probably used in the adjacent embankment. There are some heavily overgrown rough retaining walls with a steep slope at the base. There are vast retaining walls (repointed and rendered) on the southern side. Viewpoints project from the wall at the southernmost curves. It is a section of the old Holyhead road c 400m long that runs along an engineered terrace above the gorge of Afon Ceirw above the Pen-y-Bont falls. The road formation recently cut off by a new cutting through the anticline is 8m wide, with a continuous parapet wall on the outer edge that rises directly from the slightly battered retaining wall, which is generally 5.5m high. The parapet connects with the southern end of the Pont Glyn Diffwys. The parapet is of stone rebuilt in certain sections, but originally with stone on edge coping. This has mostly now been replaced with a stone aggregate concrete coping.

| Project No | 0161       | Site Name      | Malltraeth Marsh |
|------------|------------|----------------|------------------|
| Site Type  | Embankment | Telford Lot No | A4, A22          |

 Site Type
 Embankment
 Telford Lot No
 A4, A22

 From (NGR)
 SH 4571 7332
 To (NGR)
 SH 4650 7290

An embankment across Malltraeth Marsh, made up of material from nearby cuttings. The embankment across the marsh is now devoid of Telford furniture, such as walls or depots, as it has been made a dual carriageway in recent years. While it is possible elements of the original features may survive within the later embankment, none are visible on the surface. The embankment itself was obscured by trees and was flooded which made close inspection difficult.

| Project No | 0195 | SiteName | Llanfairpwllgwyngyll |
|------------|------|----------|----------------------|
|------------|------|----------|----------------------|

Site Type Milestone Telford Lot No – From (NGR) SH 5265 7164 To (NGR) –

A standard Telford milestone, comprising a pillar of dressed Carboniferous limestone, with a shallow triangular head and raking chamfered sides. Built into a modern wall.

| Project No | 0197 | SiteName | Llanfairpwllgwyngyll |
|------------|------|----------|----------------------|
|------------|------|----------|----------------------|

Site Type Toll House Telford Lot No – From (NGR) SH 5314 7154 To (NGR) –

An octagonal two-storey toll house forming a symmetrical composition with single-storey wings to the west and south. Stone walls are rough cast and white washed, with a slate roof and projecting eaves. Central stack on top of the octagon with gable stacks to each wing. It has a slate-roofed veranda supported on seven cast-iron pots linked by railings, with a gate set in front of the doorway in the north-east face. The windows are slightly recessed three-light casements; each face of the upper storey has window-sized recesses; those on the north and east carry toll boards, the north-east recess has a matching threelight casement above the door; the remainder are blank.

| Project No | $\boldsymbol{0215}$ | Site Name | Menai Suspension Bridge |
|------------|---------------------|-----------|-------------------------|
|------------|---------------------|-----------|-------------------------|

 Site Type
 Bridge
 Telford Lot No
 T65

 From (NGR)
 SH 5559 7156
 To (NGR)

Two Telford sunburst gates survive at the east end of the bridge (LB 4049/4050). The bridge comprises coursed rubble Penmon masonry with ashlar facings to the tapered suspension towers or 'pyramids' from which the deck is hung on a system of sixteen chains (originally iron, now steel) with pins. These are carried down at either end to a point deep in the rock. It has four arches on the Anglesey side and three on the Bangor side over tapered piers. The voussoirs have impost bands and a bracket cornice above. The later metal pedestrian walkways are further bracketed out; originally there was just the narrow central pavement. Each carriageway passes under the towers through semicircular arched openings, matched above by paired blind recesses over inscribed tablets. The handrails continue as far as the low tapered piers with pyramidal caps at each end and on the mainland side trellised railings continue to either side and sweep round to terminate in similar piers with panelled recesses. At the mainland end the suspending members are taken into the former bridge house, a low three-storey classical ashlar-faced building with channelled rustication to ground floor. It has a three-bay front facing the bridge with broad and taller end pilasters and arched entries. The central bay is advanced and taller and the flanking bays have twelve-pane sash windows below blind recessed panels; the arches open to a ground floor 'loggia'. It has two-bay side elevations with similar detail. The building ramps down at the rear that is part modernised. Later toll houses were built at either end of the bridge.

| Project No | 0217               | Site Name      | Bangor      |
|------------|--------------------|----------------|-------------|
| Site Type  | Turnpike Road      | Telford Lot No | T17         |
| T Gran     | OTT 00 F / F / 4 0 | m (3.70.75)    | OTT FOR FOR |

From (NGR) SH 8954 7112 To (NGR) SH 5971 7095

A derelict area with young trees between the A5122 and a cricket clubhouse. There is the possible survival of a short stretch of turnpike road, as it is in the right location for a section bypassed by Telford and shown on his plan. There is some tipping, spoil collapse, and general vegetation; this may simply be a waste area dating from the construction of the adjacent industrial estate. It was bordered to the east by a short stone wall.

| Project No | 0218 | Site Name    | Glyndyfrdwy |
|------------|------|--------------|-------------|
| ~          | - ·  | T 10 17 . 37 | TT 0.4      |

 Site Type
 Depot
 Telford Lot No
 T31

 From (NGR)
 SJ 1538 4256
 To (NGR)

Two semicircular depots both somewhat degraded.

| Project No | 0229         | Site Name      | Lon Isa |
|------------|--------------|----------------|---------|
| Site Type  | Depot        | Telford Lot No | T22     |
| From (NGR) | SH 6020 6938 | To(NGR)        | _       |

A standard Telford depot, with splayed ends and side walls. It is embanked and the retaining walls survive in good condition. It is adjacent to the weighbridge house [0231].

| Project No | 0231              | Site Name      | Lon Isa |
|------------|-------------------|----------------|---------|
| Site Type  | Weighbridge House | Telford Lot No | T22     |
| From (NGR) | SH 6021 6938      | To(NGR)        | _       |

A small square building; it has a pitched roof with slate tiles. There is a window on the south and west sides, each with a simple slate cross-lintel and sill; the remainder of the building is of rough-coursed, massive blocks of granite set in a concrete mortar. There are graffiti on the sills from the early 20th century. There is a door on the north side. There is no opening on the east except for a lintelled opening at ground level, leading into the bottom of building where the weigh machine was housed. The building seems in good repair. There is no evidence of machinery *in situ*, but a vertical channel that formerly housed the weigh beam was visible. This is one of only two known surviving weighbridge houses on the Holyhead road.

| Project No | 0233   | Site Name      | Halfway Bridge |
|------------|--------|----------------|----------------|
| Site Type  | Bridge | Telford Lot No | T22            |

 Site Type
 Bridge
 Telford Lot No
 T22

 From (NGR)
 SH 6081 6891
 To (NGR)
 —

A single-span arched bridge of rough-coursed limestone, with freestone voussoirs and a string course above the arch. The roadside wall carries a date-stone carved with '1819' and a drill mark immediately to its left. There is some modern rendering on the arch but this is not conspicuous.

| Project No | <b>0239</b> | Site Name | Pont Glyn Ogwen |
|------------|-------------|-----------|-----------------|
|------------|-------------|-----------|-----------------|

 Site Type
 Bridge
 Telford Lot No
 T24

 From (NGR)
 SH 6259 6629
 To (NGR)

A bridge with a single-span arch of 40ft (12.1m) over Afon Llafar. It is as described in the Telford specifications, but has been much altered. A cantilevered footpath has been added on the east side in concrete, and the side walls and parapet have been brought out accordingly. While visible and apparently intact, the Telford arch has been conspicuously repointed with concrete mortar and does not retain its character.

| Project No | <b>0241</b>  | Site Name      | $\operatorname{Bethesda}$ |
|------------|--------------|----------------|---------------------------|
| Site Type  | Bridge       | Telford Lot No | T24                       |
| From (NGR) | SH 6261 6628 | To (NGR)       | _                         |

A 20ft (6m) bridge in Bethesda, apparently to Telford's specifications. The bridge is in a relatively good condition has been much repointed. It is a rubble-stone, single-arched road bridge that has a string course broken forward over the outer buttresses. It has a rubble-stone parapet with slate edge on coping. The bridge has been widened on the east side with a flat concrete span, but this does not alter the bridge except for the loss of the parapet.

| Project No | 0243   | Site Name       | Pon y Pant Isaf |
|------------|--------|-----------------|-----------------|
| Cita Tura  | Dridge | Tolford I at No | Т9.4            |

 Site Type
 Bridge
 Telford Lot No
 T2

 From (NGR)
 SH 6256 6651
 To (NGR)
 —

A 10ft (3m) arch over the stream at Bethesda, conforming to Telford's specifications and relatively intact (though repointed) on west side. It has been extended on the east side, however, to accommodate a modern walkway with a concrete and steel cantilevered extension that completely conceals the Telford structure. The thickness of the bridge has therefore been extended on the east by c 1.5m.

| Project No | 0245a        | Site Name      | Bethesda |
|------------|--------------|----------------|----------|
| Site Type  | Toll House   | Telford Lot No | T28      |
| From (NGR) | SH 6263 6581 | To (NGR)       | _        |

A former toll house that largely preserves the Telford plan including a central projection on the north façade in which the arched recess for a toll board is still visible. The windows are in the original openings. A modern porch projects to the east.

| Project No | 0265         | Site Name      | Bethesda |
|------------|--------------|----------------|----------|
| Site Type  | Depot        | Telford Lot No | T59      |
| From (NGR) | SH 6354 6383 | To (NGR)       | _        |

The depots in this section were generally in a poor state of repair. This has been maintained by the application of heavy pointing and concrete/tarmac flooring. The depot is semicircular.

| Project No | 0289         | Site Name      | Bethesda |
|------------|--------------|----------------|----------|
| Site Type  | Depot        | Telford Lot No | T59      |
| From (NGR) | SH 6404 6291 | To (NGR)       | _        |

The depots in this section were generally in a poor state of repair. This depot is semicircular and has been maintained by the application of heavy pointing and concrete/tarmac flooring

| Project No | 0307         | Site Name      | Pont y benglog |
|------------|--------------|----------------|----------------|
| Site Type  | Bridge       | Telford Lot No | T2             |
| From (NGR) | SH 6489 6050 | To(NGR)        | _              |

A large single-arched bridge over the Afon Idwal at the west end of Llyn Ogwen. The bridge is as described in the Telford specifications. The south side retains the original façade but the north side has been extended by c 1.5m to allow for the addition of a footpath and has modern cemented mortar and extended abutments. Within the new thickness is a smaller arch, reflecting the survival of the earlier turnpike bridge.

| Project No | 0309         | Site Name      | Capel Curig  |
|------------|--------------|----------------|--------------|
| Site Type  | Wall         | Telford Lot No | T8           |
| From (NGR) | SH 6765 6048 | To (NGR)       | SH 7205 5880 |

A wall generally sloping down to the west in an area of many streams. Where seen the present culvert/bridges are of modern construction. It is an extremely degraded section of Telford wall and is made up of the more rounded rubble masonry, that is characteristic of this area. Includes many  $(c\ 27)$  depots, many almost gone [0311-0375]. In places the wall is visible for only  $c\ 0.2m$  above the present road surface and in many places it is collapsing and carries modern wire fencing on top.

| Project No | 0340         | Site Name      | Hendre Isaf |
|------------|--------------|----------------|-------------|
| Site Type  | Toll House   | Telford Lot No | T26         |
| From (NGR) | SH 8501 5125 | To (NGR)       | _           |

A single-storey L-shaped lodge of rubble construction, with shallow pitched slate roofs; it is half hipped to the north and west. These roofs have deep verges and eaves, the western roof extended forward on the front side to form a veranda-style porch over the entrance; the porch has plain wooden posts with struts. The entrance is to the left of a recessed four-light sash window and has a boarded door. To the left of this is an advanced cross-wing with a recessed six-light window to the road side and a blind window above beneath an overhanging half-hipped roof. Elsewhere there are four-light casement windows with slate lintels. It has a central stack with two-stage chimneys that are rendered below and are of brown brick construction above. These are simply moulded and have weather coursing.

| Project No | 0379         | Site Name      | Waterloo Bridge |
|------------|--------------|----------------|-----------------|
| Site Type  | Bridge       | Telford Lot No | T3              |
| From (NGR) | SH 7985 5573 | To(NGR)        | _               |

An intact iron and stone bridge with modern railings and road surface. It has been expanded to accommodate increased traffic volume, but its distinctive character remains intact. It is a cast-iron road bridge that was built 1815–16. The bridge was originally known as Llynnon bridge and is thought to be the seventh major iron bridge in the world; with a span of 30m it is an impressive example of early iron technology. It is a wide single-span iron road bridge with masonry springing. The segmental arch bears the cast lettering 'This arch was constructed in the same year the battle of Waterloo was fought'. The spandrels contain bold foliate decoration depicting the national emblems, the rose, the thistle, the shamrock, and the leek. At the Betws-y-Coed end is inscribed 'Thomas Telford Engineer' and at the east end are the names of the founder and foreman and the date 1815 in the centre. The arch soffit is reinforced with modern concrete. The simple cast-iron balustrades have been cantilevered outwards in recent years.

| Project No | 0381         | Site Name      | Betws-y-Coed |
|------------|--------------|----------------|--------------|
| Site Type  | Milestone    | Telford Lot No | T3           |
| From (NGR) | SH 7963 5604 | To (NGR)       | _            |

A standard Telford milestone comprising a pillar of dressed Carboniferous limestone, with a shallow triangular head and raking chamfered sides. A bench mark is inscribed below the plate.

| Project No | 0383   | Site Name       | Betws-y-Coed |
|------------|--------|-----------------|--------------|
| Cita Tuna  | Dwidos | Tolford I at No | •            |

 Site Type
 Bridge
 Telford Lot No

 From (NGR)
 SH 7916 5670
 To (NGR)

An early bridge ascribed to Howell Saer by Edward Lhwyd writing in 1699 (Gunther 1945). The present fabric is 17th century, but was widened and rebuilt in the late 18th or early 19th century. It is a five-span rubble bridge roughly 45m in length and originally 2.5m wide, subsequently widened to the north-west by a further 2.5m. The arches are segmental and of varying widths and heights some springing directly from the rock. The central widest span extends across the river proper. It has roughly dressed voussoirs that are slightly inset beneath arch-rings formed of narrower stones. It has low rubble parapets splayed at the approaches and with sandstone slab coping.

Project No 0395 Site Name Pont Ty Hyll (Ugly House).

 Site Type
 Bridge
 Telford Lot No
 T25

 From (NGR)
 SH 7560 5655
 To (NGR)

A bridge built as per Telford's specifications; it comprises two wide segmental arches and has a central pier with pointed cutwater. It has roughly dressed voussoirs that are slightly recessed and has tapering pilasters at the sides; it has been repointed with mortar that has leached. It has a rebuilt parapet on both sides, with flat coping stones and 'fish plates' (modern steel ties holding it together) and buttresses. It has curved retaining walls on the approaches, and rebuilt cutwaters; it retains the character of the Telford original, however. There are several cross drains surviving to the south.

| Project No | 0447 | Site Name | Pont Ty Hyll |
|------------|------|-----------|--------------|
|------------|------|-----------|--------------|

Site TypeMilestoneTelford Lot NoT25From (NGR)SH 7569 5739To (NGR)-

A standard Telford milestone, comprising a pillar of dressed Carboniferous limestone, with a shallow triangular head and raking chamfered sides.

| Project No | 0479 | Site Name | Pont Rhydllanfair |
|------------|------|-----------|-------------------|
|------------|------|-----------|-------------------|

 Site Type
 Bridge
 Telford Lot No
 T4

 From (NGR)
 SH 8395 5148
 To (NGR)

A Telford single-span arched bridge, with arch springs on the natural rock and built as per his specifications. It has modern fishplates, but Telford buttresses. The parapet wall has been substantially repaired and bridge has been repointed with modern mortar that has leached badly.

| Project No | 0501         | Site Name      | Glasfryn |
|------------|--------------|----------------|----------|
| Site Type  | Depot        | Telford Lot No | T35      |
| From (NGR) | SH 9260 5007 | To (NGR)       | _        |

One of three depots close together along the road outside Glasfryn.

| Project No | 0503         | Site Name      | Glasfryn |
|------------|--------------|----------------|----------|
| Site Type  | Depot        | Telford Lot No | T35      |
| From (NGR) | SH 9266 5004 | To(NGR)        | _        |

The second in a series of three closely packed depots east of Glasfryn.

| Project No | 0505             | Site Name      | Glasfryn |
|------------|------------------|----------------|----------|
| Site Type  | Depot            | Telford Lot No | T35      |
| From (NGR) | $SH\ 9273\ 5001$ | To(NGR)        | _        |

One of three depots located to the east of Glasfryn

| Project No | 0601         | Site Name      | Bwythyn |
|------------|--------------|----------------|---------|
| Site Type  | Weighbridge  | Telford Lot No | T31     |
| From (NGR) | SJ 1768 4227 | To (NGR)       | _       |

A small weighbridge house opposite the Ty Isaf toll house, now the Bwythyn toll house. It has a west-facing elevation and modern pointing in pinky-brown cement. It has two wooden doors possibly with new lintels above

on either side of a central dividing wall. It has a replaced grey/purple slate roof and forgeboards. The east-facing elevation has a single door. The north side has the same repointing as the west side. It has a new door lintel. The south-facing elevation has an arched central window. The north-facing elevation has no features and has been completely obscured by modern repointing.

 Project No
 0641
 Site Name
 Corwen

 Site Type
 Old Road
 Telford Lot No
 OFF T70

 From (NGR)
 SJ 0890 4340
 To (NGR)
 SJ 0949 4342

A riverside stretch of road on a level flood-plain. It is the stretch of 'old road' shown on Telford's specifications; the route was apparently appropriated by the railway that ran on a shallow embankment. The embankment (c 2m high) may survive from the road or be a relict of the railway.

Project No 0786 Site Name Ty'n-y-maes

Site Type Coaching House Telford Lot No – From (NGR) SH 6343 6433 To (NGR) –

The ruined remains of the coach house and stables at Ty'n-y-maes. The building has been rendered in cement and has modern windows. There is a ruined stable to the rear.

Project No 0801 Site Name Mona Coach House

Site Type Coach House Telford Lot No A3
From (NGR) SH 4252 7490 To (NGR) -

The Mona coach house survives intact and is in use as a farmhouse. It is a two-floor, five-bay structure; rendering has obscured the stone work. It has sash windows but these are not considered to be original. There is an extension to the west of the main building. There is a range of buildings set around a courtyard, which is shown on the Ordnance Survey first edition map. Evidently stables, they are now in use as farm buildings. It is a purpose-built inn and staging posted designed and constructed by Telford and completed by 1822 (PRO MT 27/17). The inn forms part of a double courtyard of stables, coach houses, and other accommodation subject to only limited alteration. The building is in need of maintenance. There is a milestone immediately opposite the building [0111] that has a blank against the distance from Mona.

Project No 0802 Site Name Nant Ffrancon

Site Type Embankment and Turnpike Telford Lot No T1

From (NGR) SH 64876052 To (NGR) SJ 6460 6119

A section of high sided embankment with a section of turnpike set at its base. The line of turnpike has an undulating surface and is partly overlain by the Telford embankment. The turnpike section is revetted by rough dry-stone masonry, which contrasts with the much better quality revetment of the adjacent Telford revetment walling. The Telford road is up 6m above the surface of the earlier turnpike road. The Telford embankment is up to 9m high, constructed of large, coarsely dressed masonry. It has a series of supporting buttresses, which were clearly later additions. The road has a low, uniform gradient in this section.

Project No 0805 Site Name Pont Rhydllanfair

 Site Type
 Bridge
 Telford Lot No

 From (NGR)
 SH 8280 5240
 To (NGR)

A major road bridge on the line of the pre-Telford north/south turnpike that crosses the line of the A5 near Rhydllanfair. The bridge crosses the Conwy and is of well-constructed mortared, dressed masonry. Like most of the turnpike bridges, it has a very slender construction. The road surface has a humped profile in contrast to the Telford Bridges that have a level road surface and are of a much stronger and substantial construction. The bridge has a 1780 date-stone.

Project No 0806 Site Name Cernioge Mawr

Site Type Coach House Telford Lot No T66
From (NGR) SH 90605050 To (NGR) -

The Cernioge coach house. It is earlier than the Telford road and was formerly the Prince Llewelyn Inn. There is a reference (Harper 1902) to it having been in use in 1795 and that its heyday was in 1836. The inn lost its coaching licence in 1839 when it was taken up by the Pentrefoelas Arms. It is now a private house. It is based on a pre-existing late 18th-century farmhouse that was extended by Telford, and has now been restored to its

original size. On the north side of the road stands a building associated with this complex. This was possibly part of the inn and has changed little since the early 20th century. It is a stable block of the Telford period that has been divided into two plain rooms with slate fireplaces. There is blind arcading on the rear wall from the former stalls. The stable is set within a contemporary walled enclosure. A ruined structure seen east of the farm on the north side of the road may be a remnant of this pre-Telford structure but could not be firmly identified.

Project No 0807 Site Name Chirk Site Type Turnpike Road Telford Lot No

SJ 2902 3725 From (NGR) SJ 2890 3750 To (NGR)

The old road (pre Telford) survives as an embankment, for 200m and then extends as a footpath up to an intersection with the A5 near Chirk Bridge. The footpath is lined with hedges on both sides.

0808 Pont Rhyd -Goch Project No Site Name

Site Type Bridge Telford Lot No T8 SH 6785 6046 From (NGR) To (NGR)

A small Telford bridge in the Ogwen valley, where the A5 crosses the Afon Llugwy. It has a single arch with pilasters constructed at the base of the span and at the terminals of the bridge. The parapet has a different constructional form to that of the bridge base; it has smaller and flat slate stones, whereas the base has squared blocks. The two are separated by a string course. It is entirely rebuilt, using machine-cut stone.

Project No 0810 Site Name Capel Curig

Site Type Bridge Telford Lot No From (NGR) SH 7204 5820 To (NGR)

A narrow short-spanned bridge constructed on a deep section of gorge at Capel Curig. It is a county bridge and predates Telford. It comprises a single-span arched construction of partially dressed rough-coursed stone. It is constructed on a natural rock abutment; it is well constructed and in good condition.

Project No 0821 Site Name Stanley Embankment

Wall/Embankment Telford Lot No Site Type

From (NGR) SH 2721 8049 SH 2737 8043 To (NGR)

A section of Telford road bypassed by the modern A5 road to the north that avoids the aluminium works. This section of road merges with the modern bypass at the Stanley Embankment. The road section is heavily overgrown and there is extant tarmac surfacing and drains exposed through the vegetation cover. The road continues west into the area of the aluminium works, but could not be examined because of access restrictions. There are extant Telford dry-stone walls surviving on the north side; the south side of the road corresponds with the line of the railway embankment and the wall has been replaced by a modern, dressed-stone revetment wall. The base of the road is sunk into a substantial cutting and the base of the road is up to 1.25m below the adjacent ground surface.

Project No 0846 Site Name Nant Ffrancon

Site Type Turnpike Telford Lot No

SH 6341 6430 From (NGR) SH 6499 6037 To (NGR)

The pre-Telford road extending through Llyn Ogwen and Nant Ffrancon, constructed by Lord Penrhyn in the years between 1791 and 1800. It survives as a farm road and extends along the west side of the Nant Ffrancon valley, through Pentre Farm before merging with the A5 at Pont-y-Ceunant.

Project No 0847 Site Name Nant Ffrancon

Site Type Drain Telford Lot No From (NGR) SH 6479 6082 To (NGR)

A drain extending out from the surface of the present-day road and dropping into a stream flowing through a culvert under the road. It has been adapted for the modern road and there may be limited original fabric surviving. It comprises a rectangular aperture in the side walls and a long slate lintel. The construction of the drain is consistent with the rest of the side wall and is seemingly contemporary with the wall or any rebuild of the wall.

Project No 0848 Site Name Nant Ffrancon

 Site Type
 Drain
 Telford Lot No
 T1

 From (NGR)
 SH 6479 6084
 To (NGR)
 —

A drain extending out from the surface of the present-day road and adjacent to site 0847. It is immediately north of a stream and the run-off from it would appear to extend into that stream. It has been adapted for the modern road and there may be little original fabric surviving.

 Project No
 0851
 Site Name
 Berwyn

 Site Type
 Depot
 Telford Lot No

 From (NGR)
 SJ 1989 4316
 To (NGR)

A rock-cut depot on the north side of the road at Berwyn. It has a semi-circular shape and has little dry-stone wall revetment.

Project No 0901 Site Name Caer'r-Llo

Site Type Sunburst Gate Telford Lot No – From (NGR) SH 8620 6670 To (NGR) –

A sunburst gate stands at the entrance to the farm driveway. Next to it is a cast-iron turnstile of similar style, which is also thought to have been taken from the Telford road. The turnstile has four panels, each of which has two iron cross-struts in an 'X' shape secured by a central rivet; it turns on a post and socket. The gate and turnstile are both painted white and, like the gate, the turnstile has flat top and base plates. They are both in good condition, although the quarter-circle sunburst centres on the gate are not riveted but welded, which are later repairs. The gateposts are not original but the hanging post and fixings may be so.

Project No 0905 Site Name Marl Farm

Site Type Sunburst Gate Telford Lot No – From (NGR) SH 7980 7873 To (NGR) –

This sunburst gate is located near Conwy, near the Telford Bangor/Chester road, and is in use as an access gate to Marl Farm. The gate is in good condition, although two substantial cross braces have been added to strengthen the original sunburst bars. The alignments of former gate sockets indicate that the gateposts are not original. The gate was probably taken from a former toll house on the Telford road or even possibly from the bridge at Conwy where one gate remains *in situ*.

Project No 0906 Site Name Cae Milwr

 Site Type
 Sunburst Gate
 Telford Lot No

 From (NGR)
 SH 8070 6070
 To (NGR)

A sunburst gate is in use at the entrance to a multi-period farm complex that is itself of great architectural interest. The gate is painted white and in good condition except for slight rusting on the upper sunburst centre. The catch and probably the hanging post are replacements, while the polygonal slate gateposts are not original.

Project No 0907 Site Name Llyn Ogwen – Capel Curig

Site Type Pre-Telford Turnpike Telford Lot No Te

From (NGR) SH 667 605 To (NGR) SH 7205 5810

A pre-Telford road that runs south of the A5 along Nant Francon, between Llyn Ogwen and Capel Curig. This is a line south of the Holyhead road starting opposite Glan Denau at SH 6680 6055 and running east and south-east along existing tracks and paths to a curve at SH 7175 5897, then curving around Creigiau'r Gelli and meeting a surfaced track at SH 7199 5845. From there it runs south into Capel Curig and meets the Holyhead road at SH 7205 5815. It is an important remnant of the former turnpike that now survives only as an earthwork. Its location and form make a marked contrast with the Telford road immediately to its north. While this early road is only slightly embanked and lies in the flood-prone valley of the Afon Llugwy, the Telford road is raised higher above the waterlogged ground. The Telford road also includes bridges and drains (notably Pont Rhyd-Goch) to keep it relatively dry.

| Project No | 0910          | Site Name      | Maesol |
|------------|---------------|----------------|--------|
| Site Type  | Sunburst Gate | Telford Lot No | _      |
| From (NGR) | SH 8538 6673  | To (NGR)       | _      |

A sunburst gate in use at the entrance to Maesol farm. The gate is painted white and is in generally good condition. Both sunburst centres have no rivets and appear to have been subject to later repairs. The two hinges are original but the hanging post is very ornamental with a finial and is probably not original. The main gatepost is of cast iron and of later date. Adjacent is a turnstile similar to that at Cae'r Llo, with four panels and two cross struts in an X shape secured by a central rivet. Both gate and turnstile have top and base plate surviving.

| Project No | 0911          | Site Name      | St Fagans |
|------------|---------------|----------------|-----------|
| Site Type  | Sunburst Gate | Telford Lot No | _         |
| From (NGR) | _             | To(NGR)        | _         |

A sunburst gate is displayed at the Museum of Welsh Life, St Fagans, Cardiff, CF5 6XB. It originated from Gwalchmai on Anglesey. The gate was not visited during the present survey.

| Project No | 0996         | Site Name      | Chirk Embankment |
|------------|--------------|----------------|------------------|
| Site Type  | Embankment   | Telford Lot No | T42              |
| From (NGR) | SJ 2890 3744 | To (NGR)       | SJ 2903 3724     |

In a steep sided, narrow valley of the river Dee through which the former road took a steep and winding course. Telford was not able to eliminate the bends, but built this enormous embankment to carry his road to the north end of Chirk bridge. The embankment survives in apparently good condition, with some trees. Although the bridge, immediately to the south [1000] has been widened, the embankment seems not to have been, as evidenced by an original arched drain which runs through the bottom [098] to carry a mill leat to the river. Telford here allowed a gradient of 1:20, and specified that where ground had to be cut down the topsoil should first be removed and later replaced.

| Project No | 0998          | Site Name      | Chirk Bridge |
|------------|---------------|----------------|--------------|
| Site Type  | Millrace/Leat | Telford Lot No | T42          |
| From (NGR) | SJ 2902 3726  | To (NGR)       | _            |

A mill-race described in Telford's specs for Lot 052: two stone-built structures have been identified:

- 1 A vaulted stone drain running through the full width of the embankment to the north of Chirk bridge. On the east side the opening is constructed with voussoirs in pale grey sandstone, with distinct tool/pick marks to face. The opening appears to have led to a square stone-built structure that is quite degraded. The base of the drain/leat is full of debris to the base of the arch. On the west side the opening is blocked off with corrugated iron sheet. Some voussoirs of the drain are still partially visible, however, and there are waterwings constructed of freestone blocks which are in a poor state of repair.
- 2 The line of the race is visible to the west of the access track on the west side of the bridge running into the river as an open gully with some loose freestone blocks visible. Immediately adjacent to the wall is the top of a vertical limy mortar-bonded freestone structure, probably an arched drain or culvert, with the top of a side wall to the leat partially exposed on the south side.

| Project No | 1000         | Site Name      | Chirk Bridge |
|------------|--------------|----------------|--------------|
| Site Type  | Bridge       | Telford Lot No | T42          |
| From (NGR) | SJ 2905 3725 | To (NGR)       | _            |

A single-span county arched bridge in fine dressed sandstone. It is different in character from the Holyhead Road bridges in Wales, which had to use rubble masonry. Some leached repointing is present below the parapet and there are many mason's marks visible on the west side. The east side is a later extension which copies the Telford side. A plate on the east bank indicates that the bridge was built in 1793 by Telford (but not as part of the Holyhead Road) and was widened in 1924.

| Project No | 1020         | Site Name      | Pont Rhydbock |
|------------|--------------|----------------|---------------|
| Site Type  | Embankment   | Telford Lot No | Т9            |
| From (NGR) | SH 6792 6046 | To(NGR)        | _             |

The retaining wall of an embankment which lifts the road above the boggy valley of the Agon Llugwy. It is up to 1m high and extends out from Pont Rhydbock [808].

Project No C006 Site Name Ty'n-y-Hendre

Site TypeToll HouseTelford Lot No92From (NGR)SH 6190 7110To (NGR)-

This is the toll house described in lot 92 as Tyn-y-Lon. It is a single-storey stone-built toll house with slate-tiled roof, retaining original stone-lintelled windows and a recess for a toll board on the north wall facing the road. If it is indeed the house shown on lot 92, it does not retain any evidence of the porch shown on the lot specification and the plan has been altered. The north-west wall has milestone C008 set into it.

 Project No
 C008
 Site Name
 Tan-y-Lan

 Site Type
 Milestone
 Telford Lot No
 T64

 From (NGR)
 SH 6190 7110
 To (NGR)

A milestone constructed from a slab of slate and set above the window on the north-west wall of the toll house at Tan-y-lon. The legend reads 'Llanllechid 2½m' The direction is indicated by a pointing hand. If the toll house is that from the lot 92 description then the milestone may be from nearby earlier toll house now no longer visible, but mentioned in the specifications.

Project No C010 Site Name Nant-y-Felin

Site Type Embankment Telford Lot No

From (NGR) SH 6800 7450 To (NGR) SH 6780 7435

An earthen embankment to raise the road level above boggy ground. There was no evidence of walling on either side of the road. Milestone C012 is on top of it.

Project No C012 Site Name Nant-y-Felin

Site Type Milestone Telford Lot No – From (NGR) SH 6780 7435 To (NGR) –

A stone milestone within a row of slate slab fencing stands to a maximum height of 0.07m, although is now partially buried. A datum mark and height were just still visible at time of survey. The stone is rounded to the rear and has radiating incisions around the front 'plaque'. The top has a small cup-like hole in it. The stone indicates Bangor and Conwy are both 7 miles.

Project No C015 Site Name Penmaenbach Point

Site Type Road Telford Lot No T76

From (NGR) SH 7440 7850 To (NGR) SH 7460 7860

A possible stretch of Telford's Chester road surviving in the line of the present cycle track/footpath around Penmaenbach point. It is unlikely to include any Telford fabric as extensive works to build the railway and later A55 (including a substantial road tunnel immediately south) have disrupted it. Access was not possible due to roadworks at the time of field visit.

Project No C019 Site Name Bangor gates at Conwy

Site Type Wall Telford Lot No T76

From (NGR) SH 7735 7810 To (NGR) SH 7795 7760

A length of stone walling c 1km long running along the A547 to Bangor gates at Conwy. This is the north wall of the approach road, heavily rebuilt and frequently interrupted. There is no paving for most of the route, with the exception of the first 200m. It ranges in height from 1.5m to 0.80m. All the wall sections have been heavily repointed and the section bounding the school playing field approaching Conwy has been rebuilt to a height of 2.0m. It now appears entirely modern.

Project No C024 Site Name Slip road of A55

Site Type Wall Telford Lot No T76

From (NGR) SH 7590 7830 To (NGR) SH 7670 7825

A section of former Telford road surviving only in the line of the Bangor road at its western terminus. The road is a modern tarmac track defined by wooden fences and earthen banks no greater than 2.5m in height, with no evidence of a milestone shown here on the first edition Ordnance Survey map. At its eastern end, [C024] it is interrupted by the A547slip road to the A55. At its western end it terminates at a wooden fence beyond which the road seems to have been partly buried. The Telford road line reappears briefly to the west in a lay-by off the

A55. A section of boundary wall at the east end of this feature (on the north side) may be partly original or may reuse Telford fabric, but has been rebuilt in recent years.

Project NoC028Site NameBangor GateSite TypeGatewayTelford Lot NoT76From (NGR)SH 7795 7755To (NGR)-

An archway inserted by Telford's road makers through a turret of the Conwy city wall to allow access for his Chester road (here the A547) to the north of the walled town. An ashlar rounded arch is flanked by square turrets with mock arrow slits. Above the arch corbels support a walkway above which rise the remains of the north-west projecting medieval turret. The width of the turret has clearly limited the possible width of the road, which is here barely 2.5m. It is not clear whether Telford's was the first road to pierce the city wall here or whether a previous road had done so. A smaller arch to the east allows pedestrian access.

Project NoC030Site NameToll House and GateSite TypeToll House and GateTelford Lot NoT76From (NGR)SH 7850 7750To (NGR)-

A toll house of ashlar single-storey construction, rectangular plan, and central room of  $1\frac{1}{2}$  storeys projecting slightly to north and south. The toll house is of a mock-castellated style, with a rounded and crenellated turret at each corner and pointed arch openings to windows and doors in homage to nearby Conwy Castle. It retains the rectangular recess for a toll board above the door, where a facsimile board is now set. Immediately south-east of the toll house stands the original sunburst gate for road traffic and a smaller corresponding gate for foot passengers. Both retain their hanging posts/hinges and latches, as well as latches fixed in the road to hold them open. The two gates have spiked top plates also of iron that are thought to be later additions and are painted white. Cylindrical gateposts of ashlar with conical capstones are original.

Project NoC032Site NameConwy Suspension BridgeSite TypeBridgeTelford Lot NoT76From (NGR)SH 7850 7750To (NGR)-

Telford's famous suspension bridge over the Afon Conwy was built in 1826 and is largely intact. Mock towers of fine limestone ashlar at the east and west ends bear the weight of suspension chains (four chains on both the north and south sides, with an additional modern steel cable on top at each side). The links and pins are believed to be original. At its west end the chains pierce the wall of Conwy Castle and are anchored within its precinct. At the east substantial iron fixings anchor the chains immediately west of the toll house [C028]. Iron cross-bar railings are original (except a single panel at the east-end), but the struts between the railings and chains are thought to be partially replaced. Towers are crenellated with mock turrets, arrow slits, and bartizans in reference to the neighbouring castle. The west end of the bridge sits between the castle's own turrets. The tradition of castellated architecture was later continued in the railway bridge to the south. Curving walls to the immediate east and west have less ornate capstones and may not be contemporary.

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This highly readable and well-illustrated volume will provide the first comprehensive survey of the spectacular Welsh section of Thomas Telford's London to Holyhead Road. The road was perhaps Telford's most significant achievement - crossing the mountainous terrain of north Wales and containing the famous Menai and Conwy suspension bridges.

The book presents the findings of a systematic archaeological survey of the 83 miles of road from Holyhead to Chirk, and its 14 mile spur road to Conwy. This section of the road not only contains the sole surviving archaeological remains of the original engineering schemes, but also includes a fascinating range of associated structures such as toll houses and inns.

The survey integrates archaeological and historical evidence to provide vital new information on one of the most ambitious and influential road building schemes of the 19th century. The results also promote better understanding of the surviving structures, thus informing more sympathetic conservation and future protection. The book will be of interest to both specialist and general readers.

ISBN 1 902771 34 6







