Discovery, Innovation and Science in the Historic Environment

# RESEARCH


Historic England

ISSUE 29

# Welcome...

## ...to a railway themed Research Magazine where we highlight a range of work by Historic England and our partners.

Before we begin to examine aspects of railway heritage, especially of the Stockton and Darlington Railway, David Gwyn begins this special issue with a review of the state of research into England's early railways in general.

On 27th September we celebrate the bicentenary of the opening of the Stockton and Darlington Railway (S&DR), a date for long taken to mark the beginning of the railway age. But why, given that it was not the first railway, not the first to use steam locomotives and not even the first to carry passengers? As Eric Branse-Instone describes, it was the most complex railway the world had seen to date and its proprietors were generous in sharing their knowledge. The company's celebration of its Golden Jubilee in 1875 was therefore perhaps not entirely self-seeking and has been repeated at fifty-year intervals as a national celebration of the railway.

In anticipation of the 2025 Bicentenary, Historic England established a S&DR Heritage Action Zone (HAZ), to carry out research, to undertake conservation work and to guide the future management of the line. One of the first actions was an aerial survey and Dave Knight considers the benefits of analysing both historic and modern aerial photography.

The S&DR had to devise many of the structures which would become familiar features of the railway landscape. Eric describes the bridges along the line, including probably the oldest railway bridge still in operational use. Bev Kerr presents her research into the 1833 Darlington Goods Depot, whilst Marcus Jecock and Caroline Hardie discuss the nearby Darlington Lime Depot.

The railway had a rapid impact. Lucy Jessop describes the growth of Shildon into probably the world's first railway town. Marcus describes the Coal Drops, required by that growth and perhaps the earliest mechanised locomotive coaling plant.

Further extension of the S&DR was similarly transformative and Clare Howard describes the impact on the ancient market town of Bishop Auckland. Marcus considers the increasing sophistication of the bridges along that section of line.

Finally, going beyond the HAZ, John Minnis considers the grandeur of Birmingham's Curzon Street Station, opened in 1838 and showing "just how far railways and the new age they represented had come in merely 13 years since the Stockton & Darlington Railway was opened."

**Giles Proctor, MA (Cantab) Dip Arch, AABC**
Architect, North East and Yorkshire Region, Historic England

**Front cover image:** The restored Darlington Goods Depot, now part of a heritage attraction. © Hopetown, Darlington

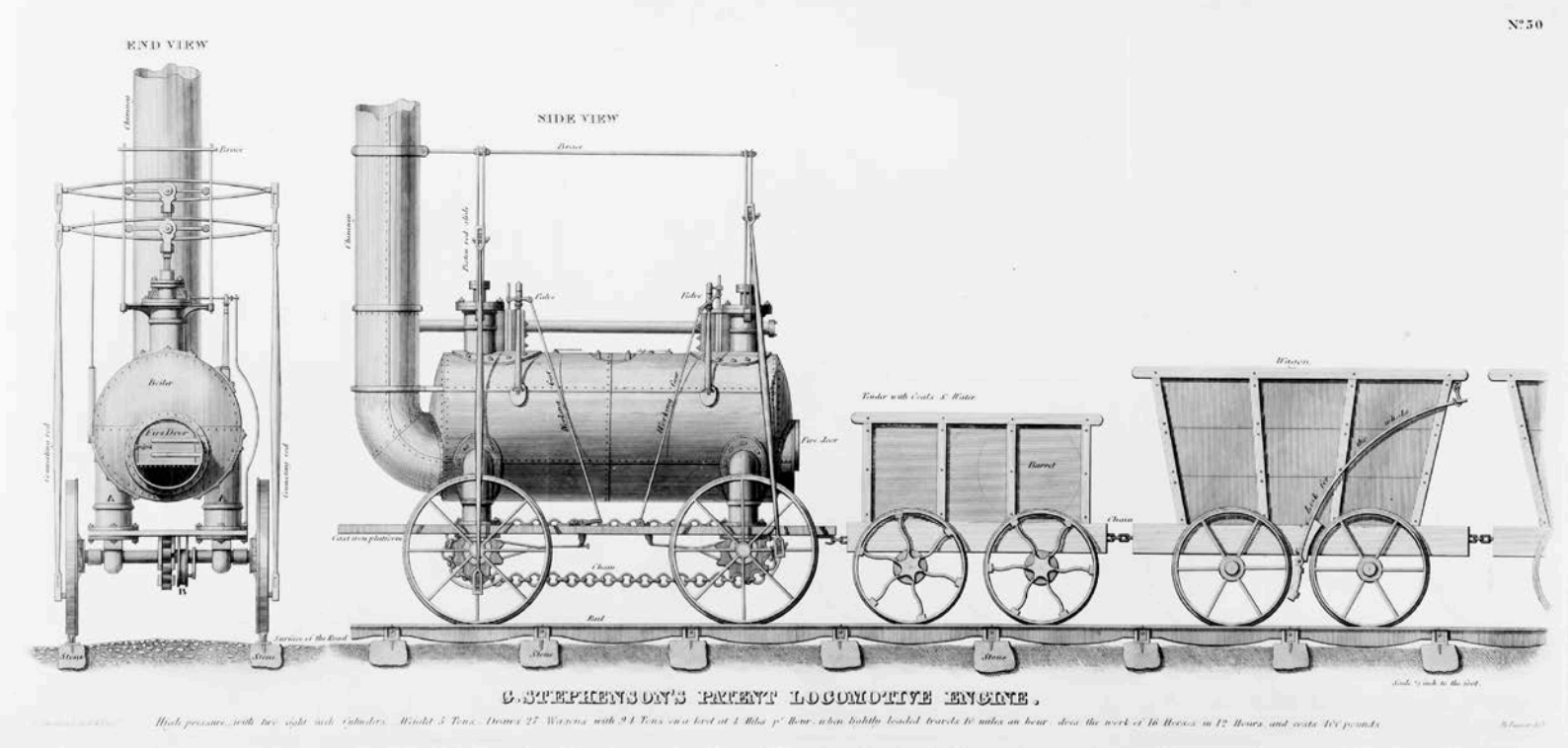
# Contents

# Early Railways in England

## Evaluating the current state of knowledge on the development of early railways.

The bicentenary of the Stockton and Darlington Railway, which opened on 27 September 1825, is an opportunity to re-evaluate what we know of the development of the railway in England up to that date, and more specifically how knowledge and understanding have evolved since 2017, when the present author and Sir Neil Cossons were commissioned by Historic England to review the existing state of knowledge and to summarise the current state of understanding

**Above:** "The opening of the Stockton and Darlington railway 1825", painted by Terence Tennison Cuneo, 1949. Reproduced with kind permission of the Cuneo estate/Bridgeman Images. © National Railway Museum/Science and Society Picture Library




**Above:** Rear and side view of George Stephenson's steam locomotive and railway wagons of the Stockton and Darlington Railway, by William Strickland 1826.
© Library of Congress, https://www.loc.gov/item/2006675893/

## A review of research

The purpose of the 2017 review was to indicate future priorities for research and publication and to offer guidance on potential designation.

It offered an ambitious set of recommendations, which included creation of a comprehensive record of early railway remains in England, proposals for designation, an assessment of sites at risk, including priorities for action, and an authoritative book-length publication on early iron railways, up to and including the Stockton and Darlington, informed by the results of the proposed survey but international in scope.

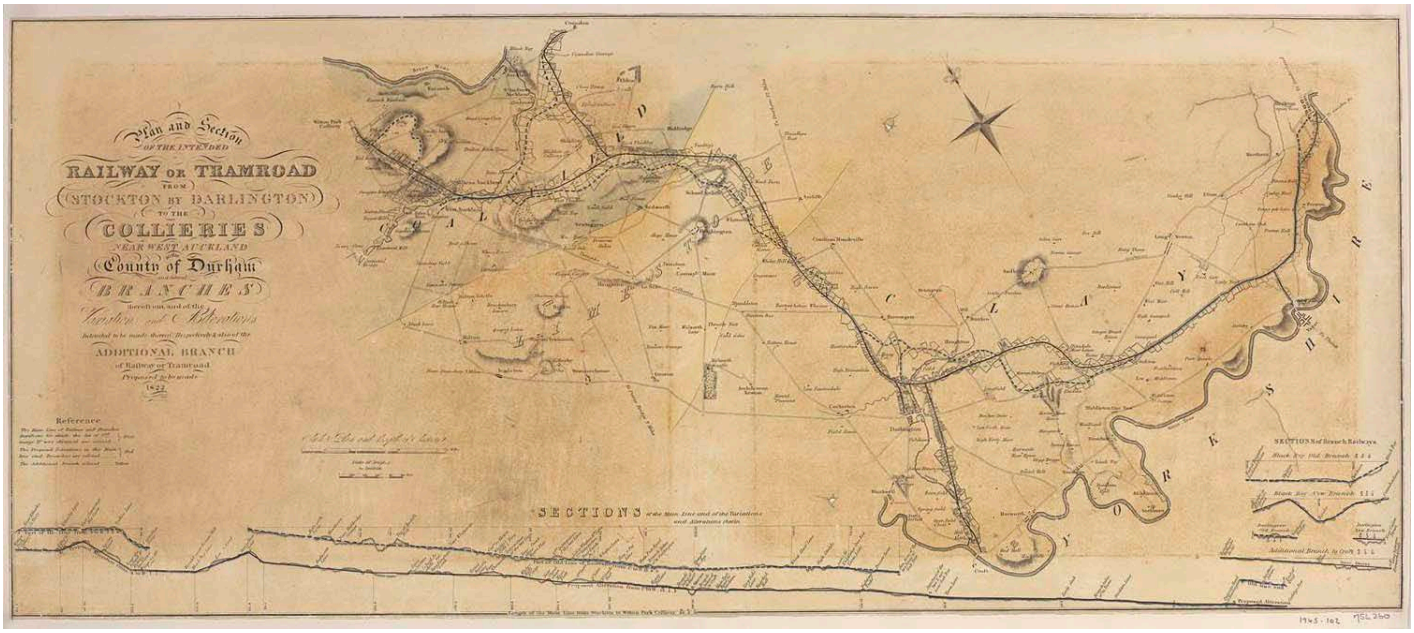
Although so far it has not been possible to inaugurate a national project to create a record of early railway remains, research has been carried out on early stations on the Stockton and Darlington Railway, establishing their function, dates of construction and the evolution of this site type within the context of passenger transport facilities by road, river and canal. Eric Branse-Instone, and Caroline Hardie will present their findings at the Early Railways Conference to be held in Darlington in September 2025, highlighting their significance and role in the evolution of the idea of the railway station as a building type nationally.

## Key publications since 2017

Two book-length studies have since addressed the history of railways in this period in broad terms. Derek Hayes' **The First Railways: Atlas of Early Railways** (The Times, Harper Collins, 2017) is a well- illustrated large-format hardback volume which sets out their development from the seventeenth century Shropshire colliery systems to the early years of locomotive haulage, in Britain, the USA and continental Europe.

The present author's **The Coming of the Railway: A New Global History, 1750-1850** (Yale University Press, 2023) covers a shorter time-span, though it extends well into the classic steam main line era. It demonstrates that practice in other countries initially reflected British experience but soon evolved in ways that suited local circumstances and needs. It also shows that understanding of English railway practice from 1790 to 1830 needs particularly to be compared to, and contrasted with, what was taking place in the fast-industrialising areas of South Wales at this same time.

Dr Michael Lewis' **Steam on the Sirhowy Tramroad and its Neighbours** (Railway and Canal Historical Society, 2020) is a fascinating study of a system in south-east Wales that was for a while the most extensive




**Above:** Plan and Section of the intended Railway or Tramroad from Stockton by Darlington to the Collieries near West Auckland, 1822. Source: Science Museum Group, under creative commons licence https://creativecommons.org/licenses/by/4.0/

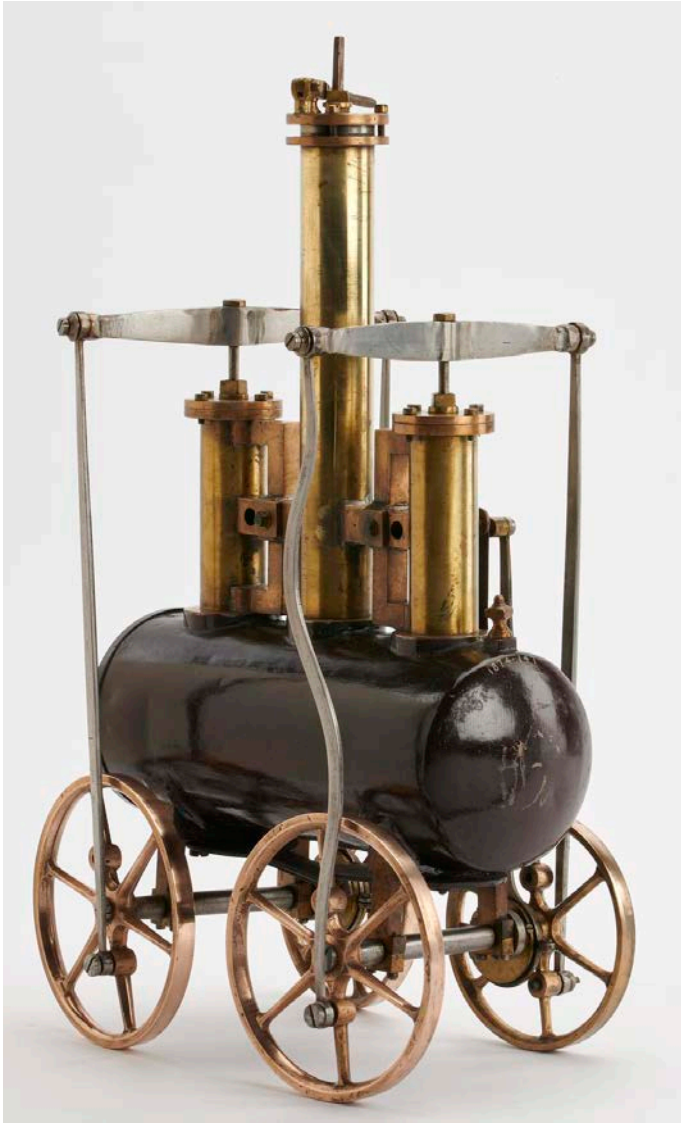
in the world, and which made early use of steam traction, public ownership and passenger transport. It sets out how Wales's transport needs were different from those of England, involving more challenging terrain and carrying iron and limestone as well as coal, but also shows that strong links existed between railway-builders in Glamorgan and Monmouthshire on the one hand and Northumberland and Durham on the other, not least through the Quaker community, and confirms that these two different regions were informed about each other's technical capacity and developments.

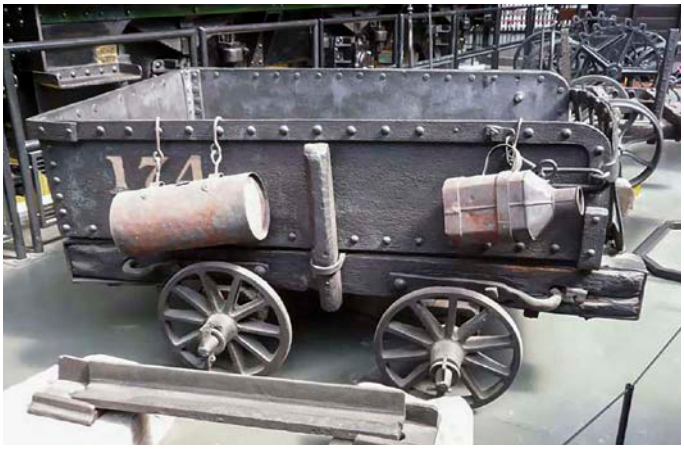
A number of other authors have also recently published on what we might call the transitional period, the ten years or so between the opening of the Stockton and Darlington in 1825 and the general acceptance that railways, not turnpikes or canals, offered the best prospect for a national transport system. One such is Anthony Dawson, author of a number of studies, including **Rainhill Trials (2018), Before Rocket: The Steam Locomotive up to 1829** (2020) and **The Liverpool and Manchester Railway: An Operating History** (2020). Michael Bailey's **Built in Britain: The Independent Locomotive Manufacturing Industry in the Nineteenth Century** (2021) begins with the first exports of railway items in the 1820s, and Robert F. Hartley's **'The Master of these Marvels' – George Stephenson and his Circle of Genius** (2024) provides a punchy, well-researched account of one of the most remarkable figures in British history.

## Conferences and papers

Since 2017 the transitional period and the early years of the successor steam railway have received more attention than earlier years. The quadrennial International Early Railways Conferences are dedicated to the study of 'railways which were pre-main line in concept if not necessarily in date'. However of the eighteen papers published in the proceedings of the 2021 gathering, the only one to consider any aspect of the pre-1830 period was Michael Bailey and Peter Davidson's study of the two 'Killingworth' locomotives, *Billy* and the Hetton *Lyon*. The same authors will shortly be publishing a study of the Stockton & Darlington's *Locomotion No 1* in association with the National Railway Museum and will be presenting their findings at the Darlington conference.

Since 2017 the transitional period and the early years of the successor steam railway have received more attention than earlier years.





**Top:** Model steam locomotive, 1:12 scale, designed by Simon Goodrich, 1826. Source: Science Museum Group, under creative commons licence https://creativecommons.org/licenses/by/4.0/

**Bottom:** Peak Forest Canal Tramway wagon. This is believed to be the oldest vehicle preserved in Britain that runs on a track. Source: Science Museum Group, under creative commons licence https://creativecommons.org/licenses/by/4.0/

Dr Bailey has also recently completed a report on a 12th-scale 1812-built model of a Murray/Blenkinsop locomotive contemporary with those adopted for the Leeds-Middleton colliery line using a rack and pinion system. Dr Ron Fitzgerald is currently preparing his research on the Middleton for publication, and is also undertaking work on some very early models. Much remains to be learnt from contemporary models, some of which reside in collections outside the United Kingdom.

The Darlington conference in September will have a heavy focus on early railways, including a re-evaluation of the Stockton and Darlington and papers on early railways in Scotland, Wales, continental Europe and Asia

## Characterising developments in early railways

It is of course important that we should understand how the earlier phases of the railway in England should have made possible the Stockton & Darlington and its successors. We can certainly approach the bicentenary with a clear sense of how they fit in to the broader patterns of technical, social and political development which took place in the generation after Waterloo but it is also critical not lose sight of the fact that those which predate the Stephensons' innovative railway from the Durham coalfield to the river Tees are important in their own right, not simply as a means to understand how this particular system came into being.

## Conclusion

The many hundreds of miles of railway which existed before 1825 had already transformed England's landscape, economy and society in the tumultuous early years of the industrial revolution. As the 2017 report pointed out, characterising the earliest as 'simple railways', with their rudimentary organic components and unidirectional traffic, and later ones as 'hybrid (experimental) railways' exhibiting some modern characteristics provides a convenient and helpful form of categorisation but runs the risk of reducing them to a curtain-raiser. We now have a much better understanding of the options which engineers could adopt when they came to build or modernise these systems understanding which can inform designation priorities and Heritage Action Zones. However, the 2017 review and the present focus on early railways indicate the need for more research to provide evidence for conservation and protection policies through greater

and more detailed understanding. More remains to be discovered, and the Research agenda for the early British railway produced by Helen Gomersall and Andy Guy in 2010 remains highly relevant.

The opening of the Stockton and Darlington is undoubtedly an important point in the railway's coming of age, when it shed many of its 'simple' characteristics but also moved beyond its experimental phase to offer a mature technology suitable for the first generation of main lines. As such the bicentenary is an appropriate time to reflect on these changes, just as in four years' time we will go on to focus on the Rainhill trials, and the year following on the opening of the Liverpool & Manchester itself – as well as on its transatlantic cousin, the Baltimore & Ohio.

The opening of the Stockton and Darlington is undoubtedly an important point in the railway's coming of age.

## About the author

**David Gwyn, OBE, PhD, FSA**
Independent archaeologist and historian

David is a historian of the industrial revolution and the modern period. He is involved in the heritage railways including serving as a trustee of the Ffestiniog Railway and as chairman of the Bala Lake Railway Company.

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**Above:** The 1925 plaque, now part of a Grade II* listing.
© Historic England

# A Brief Overview of the Stockton & Darlington Railway

Not the first railway, but nonetheless a significant pioneer.

In 1925, as part of centenary celebrations following an international railway congress, the future King George VI unveiled a plaque on a small lineside building that read: "Here in 1825 the Stockton and Darlington Railway Company Booked the First Passenger Thus Marking an Epoch in the History of Mankind". This grand statement is an example illustrating how the S&DR has been cleverly used to market railways every fifty years, drawing on its history as a pioneering railway.

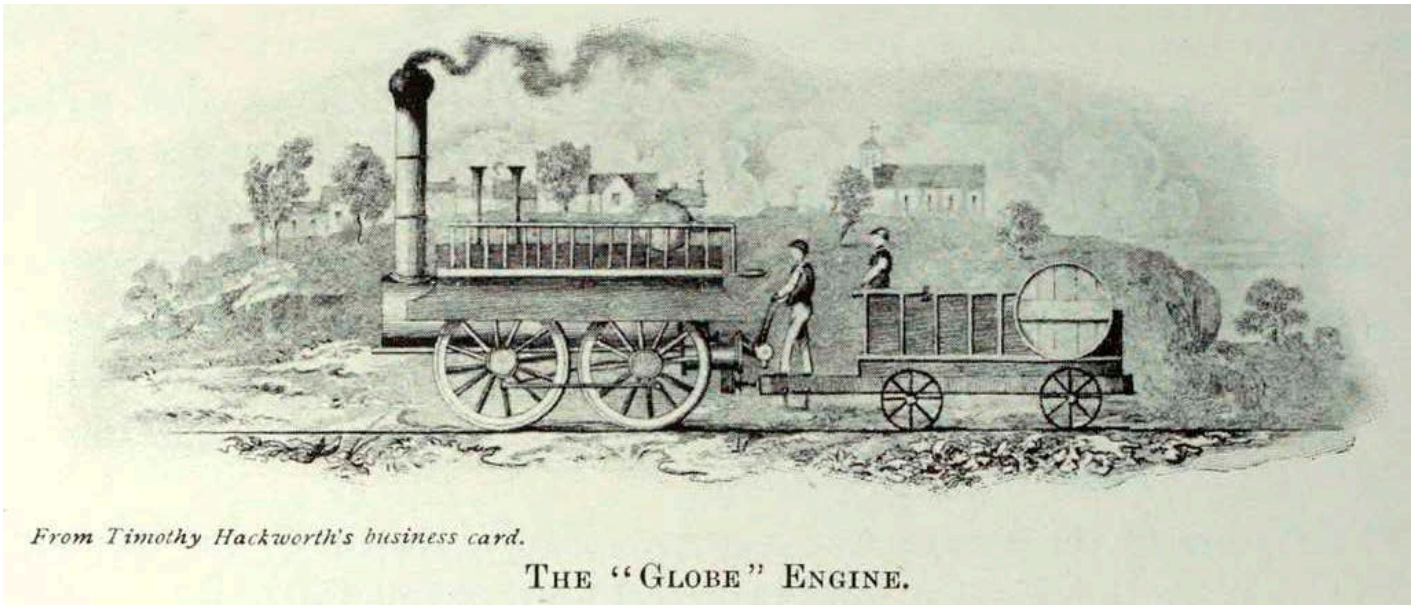
The plaque, was on the building then known as the 'Booking Office' but was not where Percival Tully, the railway's agent, had booked passengers in 1825. The building was constructed the following year as a weigh house, Tully was its first occupant.

Claiming firsts in various aspects of railway history regularly sparks heated debates because so much depends on precise definitions. On opening day, 27 September 1825, the S&DR did indeed run a train, including 600 passengers hauled by a locomotive, giving rise to the oft-cited claim as the first steam-powered passenger railway in the world. However, for the first few years, passenger services were subcontracted to other businesses operating individual stagecoaches hauled by horses along the railway, the S&DR treating the railway as a sort of turnpike road, earning passenger revenue via tolls. The demand for passenger services in this largely rural area took the S&DR by surprise: the principal motivation for the railway was to reduce the transport costs of coal from collieries north and west of Shildon to the small towns of Darlington, Yarm and Stockton. The company focused its limited supply of steam locomotives on hauling heavy freight trains until Timothy Hackworth designed their first dedicated express steam engine 'The Globe' in 1830.

The company then started to take passenger services in-house, only buying out the last stagecoach operator in 1833. By this time the Liverpool & Manchester Railway (opened 1830) had demonstrated how profitable a steam-hauled passenger service could be.

There had also been earlier passenger services such as the horse-hauled Swansea and Oystermouth Railway from 1807. However, it should be remembered that railways are more than just for passengers: freight, both bulk minerals and general goods traffic, was far more prevalent in the 19th century than now. For many railways, freight was more important than passenger services. The S&DR's first authorising Act of Parliament (1821) specified a whole list of goods to be carried by the railway; its second Act (1823) gave general permission for freight transport but specifically added permission for passengers and locomotives. The S&DR was a public railway (authorised by Act of Parliament) meaning that anyone could pay to use it, setting it apart from most earlier colliery railways which were run for the private benefit of their owners. However again, the S&DR was not the first public railway, being predated by the Lake Lock Railroad near Wakefield (opened 1798), and the Surrey Iron Railway (authorised 1801).

## It was a pioneering railway bringing earlier ideas together, adapting them, and sharing the results.




**Above:** Illustration of the SDR's first passenger locomotive from its designer's business card.
Source: https://timelessmoon.getarchive.net/amp/media/the-globe-locomotive-50e26d

## S&DR's place in history

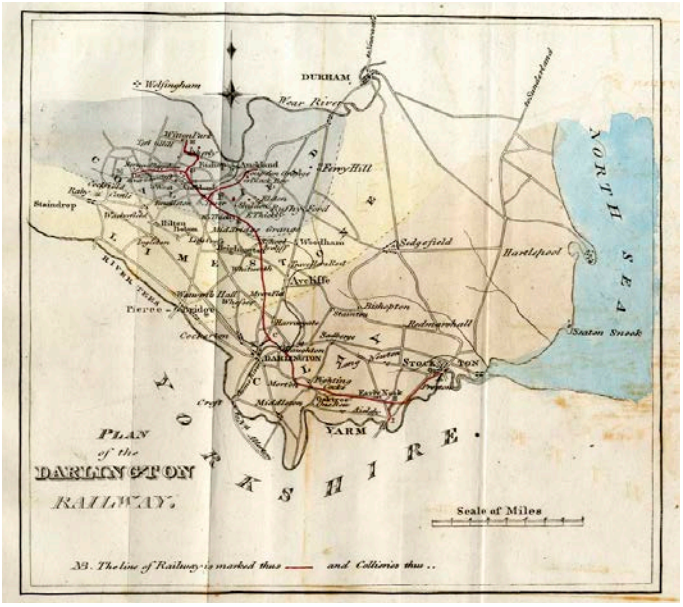
What marks the S&DR out as being so significant was that in the 1820s it was the most complex railway that the world had seen to date: it was improving steam locomotives and developing operating principles via trial and error; it was growing and returning a healthy profit; and most importantly, it was very open to sharing data and experience with visiting engineers and the promoters of other railways. It was a pioneering railway bringing earlier ideas together, adapting them, and sharing the results, influencing the development of other pioneering railways, many of which it learned from in turn from 1830 onwards.

## Planning the railway

The company of the S&DR had been formed in 1818, following years of discussion between businessmen in Darlington, Yarm and Stockton and colliery owners around Auckland to the north and west of the village of Shildon.

The Welsh engineer George Overton designed a horse-drawn railway (the basis of the 1821 Act), but Edward Pease (a retired Darlington wool merchant and major S&DR shareholder) met with George Stephenson around the same time the Act was passed and was persuaded to redesign the railway for steam locomotives.


**Above:** S&DR seal: "At private risk for public benefit" Source: https://picryl.com/media/stockton-and-darlington-seal-af115d Wikimedia Commons licence




**Above:** George Overton's planned railway of 1821 (North of England Institute of Mining and Mechanical Engineers Tracts vol 57 p252). Source: https://picryl.com/media/tracts-vol-57-p252-1821-plan-of-intended-stockton-and-darlington-railway-18d19f

George Stephenson (1781-1848) was a self-trained engineer from Wylam, Northumbria who had been developing steam locomotives at Killingworth colliery since 1814. In 1821 he was engineering his first railway, the Hetton Colliery Railway, the first to be operated by steam and gravity without the need for horses. The S&DR became his second major project, and he went on to engineer many more railways including the Liverpool and Manchester, being dubbed "the Father of the Railways" in 1857.

Redesigning for locomotives required a resurvey and a new Act of Parliament which was passed in 1823. Stephenson straightened Overton's meandering route starting at Witton Park Colliery, using steam-powered rope-hauled inclines to cross ridges at Etherley and Brusselton, with horses used to operate the short stretch across the Gaunless valley between the two sets of inclines. Most of the 26 mile main line (35 kilometres of the 42 kilometre route) was designed for locomotive haulage: starting at what later developed into New Shildon (the world's first railway town), the line ran south-eastwards, passing through what was then open countryside just to the north of both Darlington and Yarm to terminate on the River Tees quayside at Stockton.


**Above:** The S&DR's Locomotion No.1 displayed as a historical artifact at Darlington railway station in the early 20th century. © Historic England Archive, BB057004

Two short branch lines, terminating at coal depots, were also opened in 1825, taking the railway closer to the built-up areas of both Darlington and Yarm. In the first five years lines were opened to more collieries to the west and to a new port further downstream on the Tees, around which the new town of Middlesbrough developed. Edward Pease foresaw the S&DR as the start of a national network with railways extending between Edinburgh and London: The branch line from Darlington to Croft on the North Yorkshire border was later partly reused by the Great North of England Railway and now forms part of the East Coast Mainline confirming Pease's 1821 prediction.

## The S&DR's wider influence

In 1823, to secure a supply of steam locomotives for the railway, Pease helped finance the establishment of Robert Stephenson and Company in Newcastle, the first purpose-built locomotive manufactory, this under the management of George's son who was already a talented engineer. The first of six locomotives delivered to the S&DR, later named 'Locomotion No.1', hauled the opening-day train and had a long working life with rebuilds and modifications before being saved as a historical artefact for public display in 1857 (Bailey & Johnson 2023).

"the great theatre of practical operations on railways."

Perhaps because of Pease's stake in Robert Stephenson & Co., the S&DR's resident engineer Timothy Hackworth was encouraged to share data with visiting engineers and promoters of other railways, both at home and abroad. Described as "the great theatre of practical operations on railways" by Edward Booth of the Liverpool and Manchester, the S&DR clearly influenced the development of many early railways including the Saint-Étienne–Lyon (France 1828), Baltimore & Ohio (USA 1830), and the Liverpool and Manchester (1830), the latter also engineered by Stephenson who learnt from mistakes made with the S&DR.

The S&DR continued to be highly profitable and expanded to become a major component of the North Eastern Railway via merger in 1863. The railway facilitated the urban and industrial growth of Shildon, Darlington, Stockton and Middlesbrough. Remarkably, much of the original 1825 route, even including some original structures, remains part of the national railway network.

## About the author

**Eric Branse-Instone**
Listing Adviser at Historic England

Eric has been assessing historic sites for scheduling and listing for nearly 30 years. He has a particular interest in railways inherited from his father who was a railway engineer and designer of bridges.

## Further information:

Gwyn David, 2023: **The Coming of the Railway, A New Global History 1750-1850**

Cossons N, Gwyn D, 2017: Early Railways: Review and Summary of Recent Research; **Historic England Research Reports Series** 25/2017
https://historicengland.org.uk/research/results/reports/25-2017

Bailey & Johnson, 2023: **"Locomotion No1"**
https://www.railwaymuseum.org.uk/sites/default/files/2023-10/Pages%20from%20LOCOMOTION%20report%20part%201.pdf

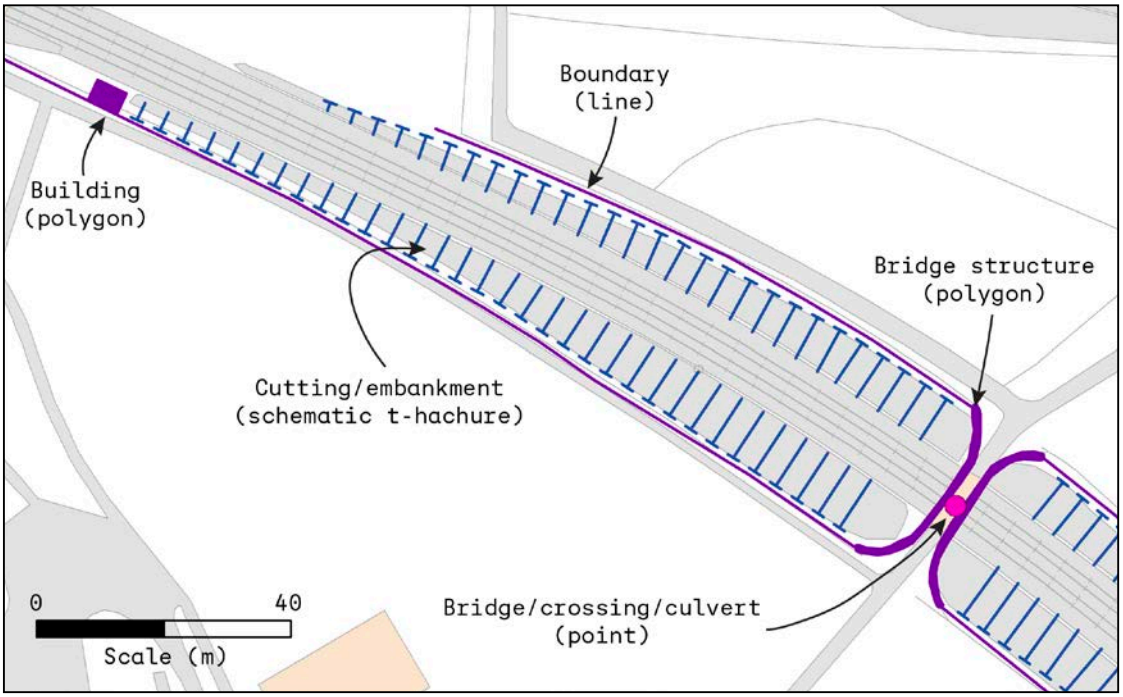
Friends of the Stockton & Darlington Railway website has an online library of reports at
https://www.sdr1825.org.uk/publications-and-research/

as well as transcripts and links to archive documents at
https://www.sdr1825.org.uk/archives/

# An Aerial Perspective of the Stockton & Darlington Railway

Aerial photographs and airborne laser scanning documenting the pioneering railway.

**Above:** A freight train hauling goods north between Darlington and Shildon. EPW029511 SEP-1929




**Left:** Mapping was undertaken in ArcGIS. Features were mapped as either lines, polygons, schematic T-hachures or points. Base map © Crown Copyright and database right 2025. All rights reserved. Ordnance Survey Licence number 100024900; Archaeological mapping © Historic England

One of the first pieces of research undertaken for the Stockton and Darlington Railway Heritage Action Zone was a project which analysed and mapped the heritage assets along the course of the railway visible on aerial photographs and airborne laser scanning data (commonly known as lidar). The project area encompassed a 1 kilometre wide and 66.5 kilometre long corridor following the line of the 1825 railway between Witton Park Colliery and Stockton-on-Tees and the pre-1831 branch lines of Yarm, Black Boy, Croft, Haggerleases, Surtees and the Middlesbrough Extension.

Over five thousand aerial photographs, dating from 1924 onwards, and Environment Agency lidar were used to map the structural elements of the pre-1831 railway and to assess their current condition. The project also placed the railway in its broader archaeological landscape context – mapping all visible archaeological monuments ranging from prehistoric enclosures to Second World War military and civil defence remains.

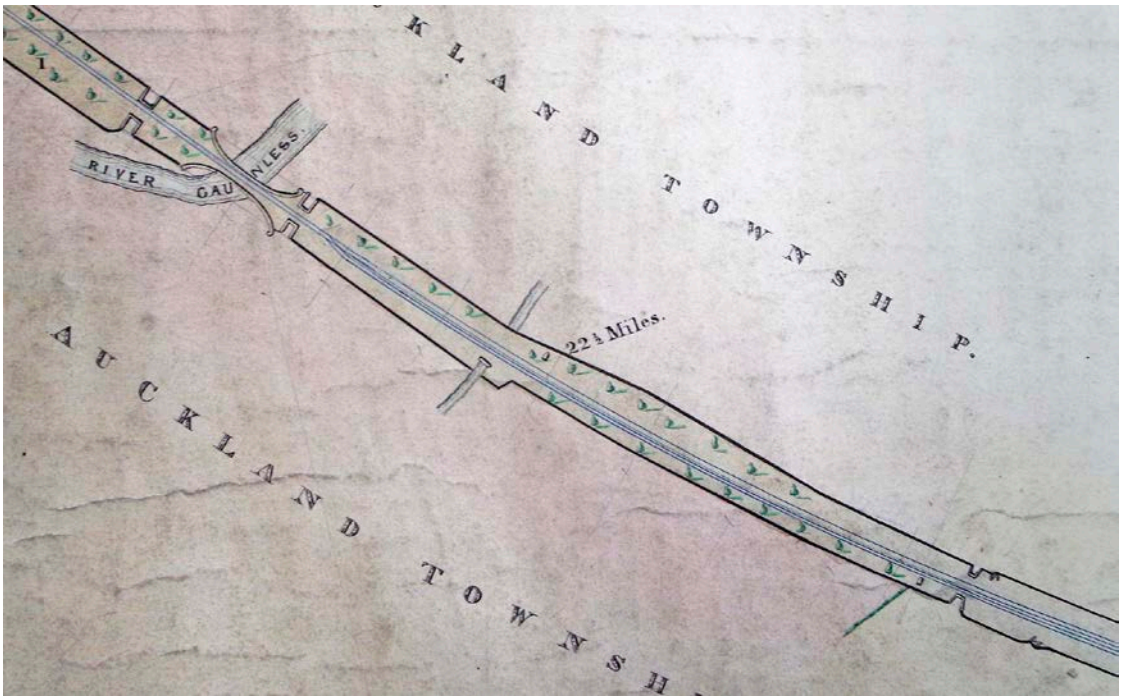
Mapping was undertaken digitally in a GIS and is available to view via Historic England's Aerial Archaeology Mapping Explorer. Additionally, many of the photographs used in the project form part of the publicly accessible archive Aerial Photo Explorer.

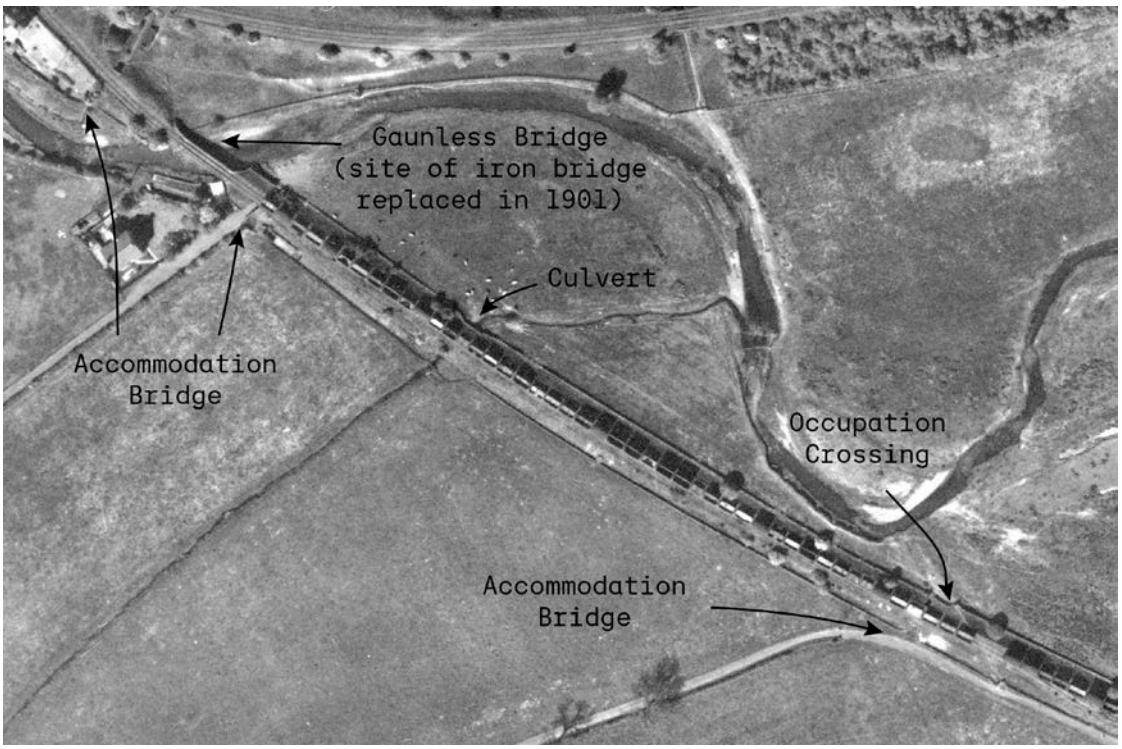
## Aerial sources

The railway infrastructure reached its height by the end of the 19th century and most of this remained largely unaltered until the mid-20th century. This is coincidentally when the first vertical aerial surveys were taken of the railway. 1940s aerial photographs taken by the Royal Air Force captured a unique glimpse of the railway. The clarity of some of this photography allowed such detail as buildings, under- and overbridges, level crossings, occupation crossings, culverts and trackside boundaries to be identified and mapped.

Over five thousand aerial photographs, dating from 1924 onwards, and Environment Agency lidar were used to map the structural elements of the pre-1831 railway.

Over the years the core 1825-31 network underwent many changes including re-routings, extensions and closures. The railway visible on 1940s photography was far more extensive and complex than that built by George Stephenson. To identify those elements which related to the original railway, a series of surveys drawn up by Thomas Dixon between 1838 and 1840 were consulted. These depicted all of the main structural elements of the railway including buildings, boundaries, bridges and crossings. Additionally, the Historic Environment Audit (HEA), undertaken by Archaeo-Environment Ltd, provided an invaluable mapping aid.




**Right:** The Thomas Dixon surveys of the S&DR provide the earliest detailed source of the structural elements of the railway. These aided the identification of features on aerial photographs. Source: Archaeo-Environment Ltd. Reproduced with kind permission of The National Archives, ref. RAIL 1037/453; Detail of RAF/58/B/37 V 5192 17-MAY-1948 Historic England Archive. RAF Photography

**Left:** The Shildon Wagon Works were operational between 1825 and 1984. The left image shows the works during the Second World War – the roofs were camouflaged to disrupt the uniform pattern of the buildings. MSO 31367/O-12901 19-MAY-1943 Historic England Archive. RAF Photography; 34340_013 12-MAY-2025 © Historic England Archive

Most of the aerial photography post-dates the Second World War. Comprising large numbers of vertical and oblique photographs, these helped document the decline of the railway, especially after Dr Richard Beeching's 1963 report 'The Reshaping of British Railways' when significant stretches were closed.

In addition to aerial photographs, lidar data provided a 3D view of the landscape which made it easier to identify earthwork remains such as railway cuttings and embankments. These were not shown on the Dixon surveys and were only intermittently visible on aerial photographs depending on the angle of light. Lidar data can also sometimes reveal the ground beneath tree canopies, which was useful for identifying elements of disused railway now under dense vegetation, notably in Preston Park.

All of these sources were combined to produce a detailed digital map of the remains of the original railway visible from the air. A full assessment was outlined in the Stockton and Darlington Railway Heritage Action Zone Aerial Survey & Mapping Report.

The most recent vertical aerial photography, along with lidar and a series of walkover surveys as part of the HEA, helped chart and contextualise the physical survival of the pre-1831 railway. These have provided a useful tool, not only to provide a better understanding of the railway, but to aid its management and protection going forward.

## The railway on aerial photographs

Most of the aerial photography was not taken to specifically target the railway. Vertical photographs were taken for surveying purposes and many of the oblique images were targeting archaeological or urban sites. The clarity of the photographs also varies greatly, depending on the height of the aircraft at the time of capture (and therefore the scale), the weather conditions and the physical condition of the photograph itself.

The railway was however often fortuitously captured on film. The vertical runs, taken by the RAF, Ordnance Survey and commercial companies, provide broad landscape views of the railway. Despite being relatively small-scale, these were the primary mapping resource, displaying very good levels of detail. Low-level oblique photographs of the Aerofilms Collection provide some of the most illustrative imagery of the railway in use between the 1920s and 1950s. In more recent years, the Aerial Reconnaissance team at Historic England have photographed numerous buildings and structures along the railway, as well as capturing imposing landscapes views.

## Railway condition

Several sections of the original railway had closed long before the first aerial photographs were taken, either as a result of colliery closure or diversion to new railways. The Etherley Incline closed as early as 1843, and the Brusselton West Incline was abandoned in 1858 following the construction of the West Auckland Branch Railway, though the track was maintained for several decades. However, with the exception of the track-bed, much of the infrastructure of these abandoned lines remained intact. Aerial photography shows the Brusselton West Incline being removed by farming and open-cast mining after the Second World War. The East Incline remained in use until 1984, serving the Shildon Wagon Works. The Etherley Incline was largely preserved and is now scheduled in three parts - Belts Gill embankment, summit and upper sections and lower section.

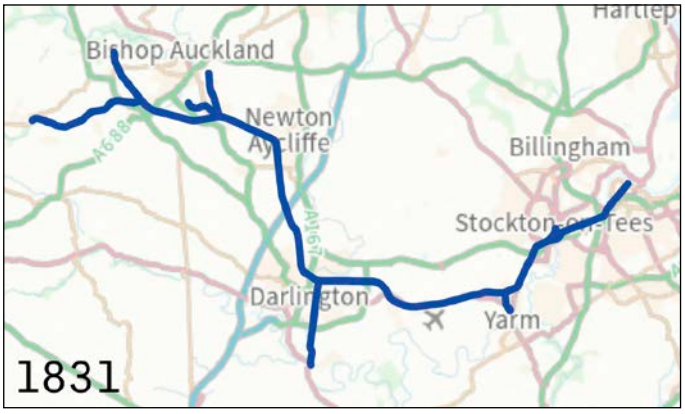
Beeching's report of 1963 resulted in the closure of part of the main-line east of Darlington and the two remaining branch lines: Haggerleases and Croft. The northern section of the Croft Branch Line had already been incorporated into the Great North of England Railway in 1841 (now part of the East Coast Main Line). The part of the line that was closed, to the south, remains moderately intact. Modern aerial photographs reveal that some of the trackside boundaries remain, but crossings have been removed. Other elements are beneath dense vegetation and cannot be discerned on aerial photography. The Haggerleases Branch Line remains almost entirely intact. The track-bed has been removed, but most of the boundaries remain visible, as are the cuttings and embankments and most of the bridges, including the Swin Bridge which is Listed.

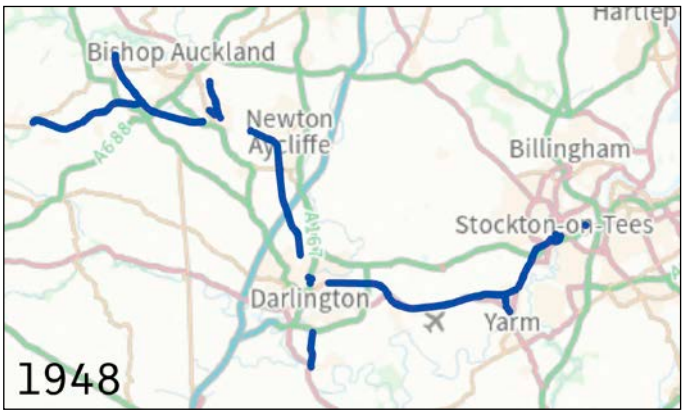
**Top left:** The remains of the Etherley Inclines are clearly visible in the landscape and are now scheduled. 17712/33 13-MAR-2002 © Historic England Archive

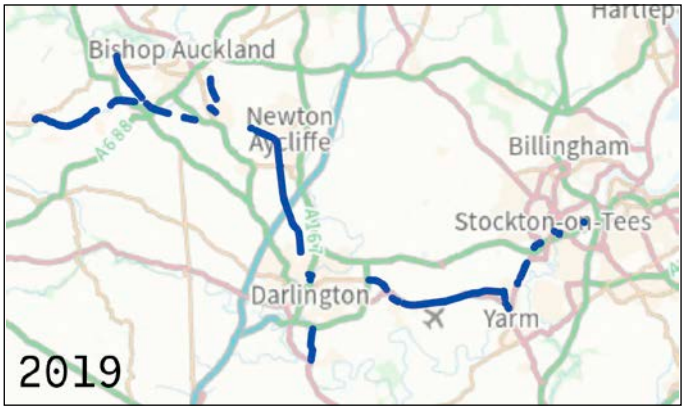
**Bottom left:** St John's Crossing, Stockton-on-Tees (bottom right), became the passenger terminus for the railway. Freight trains continued to the staithes on the River Tees. These buildings are now Listed. EAW043770 05-JUN-1952 © Historic England Archive. Aerofilms Collection

**Above:** Modern imagery is useful for condition assessment of the railway. This section of the Brusselton West Incline shows the 1833 accommodation bridge, boundary walls and excavated sleeper stones. Another underbridge once carried the railway over the road, but this was demolished in 1954. 34340_036 12-MAY-2025 © Historic England Archive

**Below:** Over the years, various parts of the original railway were removed. Where elements do survive, they are often just the earthworks – with many structural elements demolished.

**Above:** The coal staithes at Port Darlington. They remained in use as wharfs following the opening of the Middlesbrough Dock in 1842. The site is now an industrial estate. EAW031997 16-AUG-1950 © Historic England Archive. Aerofilms Collection

Some of the poorest survival of original infrastructure occurs along those sections of railway that remain in use. Along these sections, continued track upgrades, expansion and remodelling has removed most of the original infrastructure, though the earthwork cuttings and embankments and some buildings remain. In many instances, this change can be documented through aerial photography and the attribute data attached to the digital mapping reflects whether a feature remains extant or was demolished.

## Significance and legacy of this research

The aerial mapping provides an important context for the railway – documenting the relationship with the wider landscape and how land-use and the railway itself has evolved and changed. It has helped detail what survives of the original railway as well as providing some context for what has been lost.

Aerial photographs, both historic and contemporary, provide a unique insight into the development and decline of the railway over the past century. When analysed alongside documentary sources and fieldwork, they contribute to a better understanding of a highly significant industrial landscape and of the importance of what survives. The comprehensive mapping sets out the evidence for the railway's dramatic impact on the area and can be used as the basis for further research and for management.

Aerial photographs, both historic and contemporary, provide a unique insight into the development and decline of the railway over the past century.

## About the author

**Dave Knight**
Senior Aerial Survey Investigator at Historic England

Dave has specialised in aerial survey for eighteen years, firstly in the commercial sector, and then English Heritage and Historic England. With a previous background in excavation and survey, he has broad knowledge of English archaeology and has been involved in many aerial mapping projects, working closely with Landscape Archaeology colleagues on multi-disciplinary surveys.

## Further information

Knight D, 2021: 'Stockton and Darlington Railway Heritage Action Zone – Aerial Investigation and Mapping' **Historic England Research Reports Series** 28/2019
https://historicengland.org.uk/research/results/reports/28-2019

Historic England: Heritage Action Zones
https://historicengland.org.uk/advice/heritage-action-zones/breathe-new-life-into-old-places-through-heritage-action-zones/#9986eac8

**Above:** The Skerne Bridge is the oldest purpose-built railway bridge in the world to remain in use. It was often illustrated in paintings depicting the opening of the railway in 1825. Detail of 28985_002 22-FEB-2018 © Historic England Archive

# Exploring New Shildon, England's First Modern Railway Town

How the construction of the Stockton & Darlington Railway brought industry and housing to a small County Durham village.

**Shildon and the railway**

Today we think of the arrival of the railways as transformative for landscapes, places and industries, bringing swift, intense change to the population. So it was for Shildon, a small community in rural County Durham, when the Stockton & Darlington Railway (S&DR) was constructed on its doorstep between 1822 and 1825.

In 2021-23, Historic England researched the buildings and planning of New Shildon, as this newer section of the town was initially known (today the original and new parts of the settlement are collectively known as Shildon), as part of our contribution to the Stockton & Darlington Railway Heritage Action Zone initiative of 2018-23. This research culminated in a Historic Area Assessment.

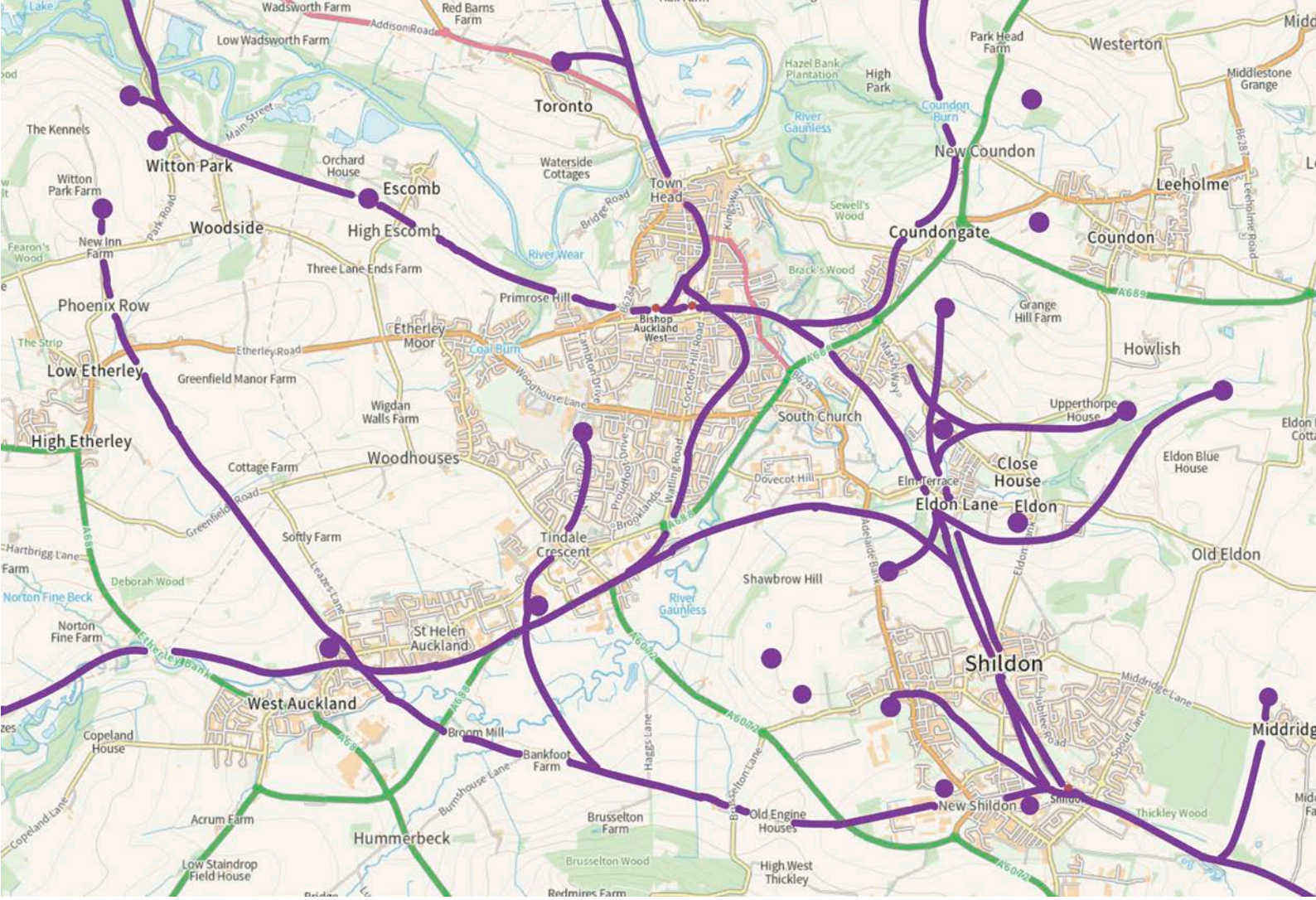



**Figure 1:** 19th-century railways and tramways in the South Durham coalfield. Major mines are marked with a circle. Base map © Crown Copyright and database right 2025. All rights reserved. Ordnance Survey Licence number 100024900

New Shildon plays a central part in the story of the S&DR and railway history in general. Once the home of the S&DR's engineering works, it now houses Locomotion, part of the National Railway Museum, and it is celebrated as England's first railway town. The museum brings visitors to this part of the historic line – much of which remains in railway use – and the town retains buildings which express the history of the railway and of other industries, as well as reflecting national changes in religion, education and housing.

## The origins of Shildon

Before the railway, Shildon was a small linear settlement built on the south-facing scarp of a hill just over 2 miles (4 kilometres) south-east of Bishop Auckland and about 8½ miles (13.5 kilometres) from Darlington. It was a hamlet of 100 or so inhabitants, without its own church or market, and most people's jobs were in the surrounding farmsteads (Figure 2). Its geology made the area suitable for coal extraction and quarrying, activities which boomed during the

Before the railway, Shildon was a small linear settlement built on the south-facing scarp of a hill.


19th century. But coal was heavy to move, and it was carried by road as the Rivers Wear and Tees were unnavigable nearby.

In 1768, and then again in the 1810s, colliery owners and industrialists debated building a canal to connect the coalfields to ports for distribution, but the decision was made in 1818 to construct a public railway, powered by horses, which was expanded to include steam power in 1821-3. The chosen route described a wide arc to the west and south of the village of Shildon at the upper end of the new railway as it headed north-west towards the River Gaunless, Etherley and Witton Park. The terrain to the south was a low-lying marshy landscape, but once drained it provided a plateau where the main line and several branch lines converged. The first buildings in the Shildon area associated with the new railway were constructed by 1825 at two places along the mainline: one was just south of the original village of Shildon (and soon known as New Shildon), and the other was to the west of it at Brusselton, where one of the stationary engines was positioned.

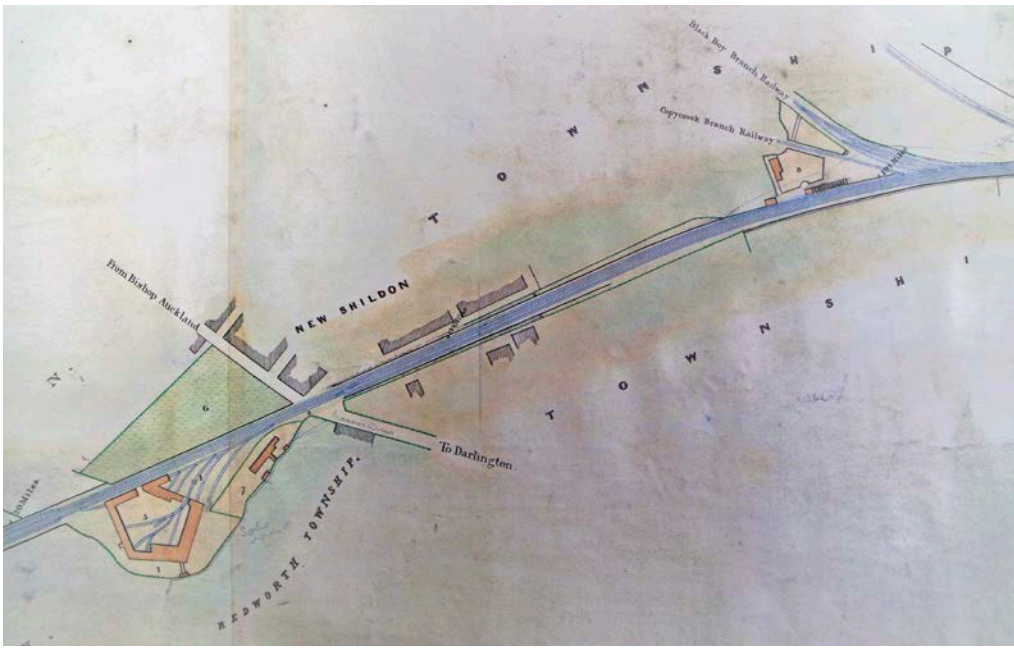
**Figure 2:** Shildon and the surrounding area, map by Armstrong and Jefferys, 1768. Reproduced with the permission of the National Library of Scotland

The decision was made in 1818 to construct a public railway, powered by horses, which was expanded to include steam power in 1821-3.

## New Shildon and the railway

The earliest buildings in New Shildon housed the workmen and engineers constructing the line. Inhabitants included Timothy Hackworth (1786-1850), who joined the S&DR that year as engineer and locomotive attendant at the railway's workshop west of the Mason's Arms, where the new railway crossed the road connecting Bishop Auckland to Darlington. He then set up his own Soho Works to build locomotives in the east of New Shildon, where his house and associated back-to-back cottages of 1833 survive (Figure 3), their sandstone walling typical of early buildings here.

The settlement was soon growing. A map of 1839 (Figure 4) shows the S&DR's Shildon Works to the west, with grey blocks of housing representing the end of streets leading from the road between Bishop Auckland and Darlington. More houses were built within two triangular-shaped areas to the north and south of the railway line, as shown on the Ordnance Survey map surveyed in 1857 (Figure 5).



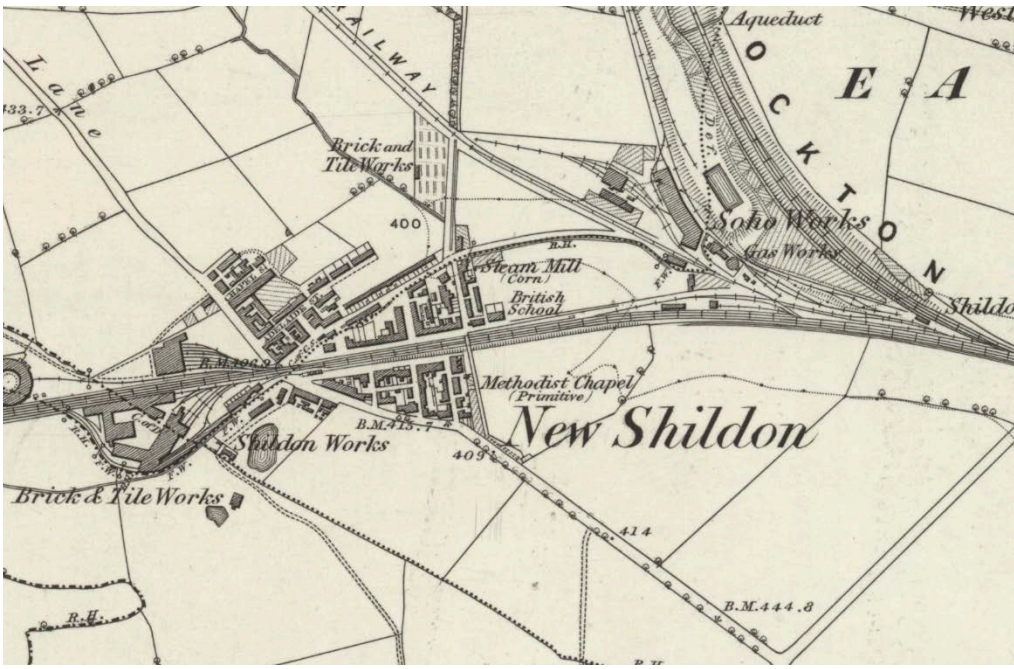




**Figure 3 (top):** Soho House, now two houses, with Soho Cottages beyond. © Historic England Archive, DP289849

**Figure 4 (centre):** Detail of Dixon's plan showing Shildon Works – where locomotives were maintained, then manufactured, before concentrating on wagons – and blocks of houses in New Shildon in 1839. It is marked '5' for 'Engine Manufactory', as is Soho to the east. Reproduced courtesy of The National Archives, RAIL 1037/453

**Figure 5 (bottom):** Shildon in the 1:10560 Ordnance Survey map, surveyed in 1857 and published in 1859. © and database right Crown Copyright and Landmark Information Group Ltd (All rights reserved 2025.) Licence numbers 000394 and TP0024

**Figure 6:** The Soho Shed, originally Kilburn's warehouse, with later chimney. © Historic England Archive, DP289844

The coal industry also drove the expansion of New Shildon.

The railway brought economic opportunities on which entrepreneurs such as Messrs. Kilburn capitalised, building a large warehouse (Figure 6) close to the line for their ironmongery business in 1826. The nearby Soho works leased it in 1842 and later it was bought by the North Eastern Railway (NER, the successors to the S&DR). Now known as the Soho Engine Shed, it is, with the nearby Goods Shed of the late 1850s and Soho House and cottages, one of the group of historic structures managed by Locomotion.

## The importance of coal

The coal industry also drove the expansion of New Shildon. By the middle of the 19th century, a large number of mines operated nearby, their wagons travelling into New Shildon to be formed into trains for onward transport to Middlesbrough. Vast sidings, occupying 16 acres by 1869, filled much of the plateau where Locomotion now stands. A coaling station (see the article here by Marcus Jecock) was first built in 1846-7 to refuel locomotives, its dramatic arches dominating the north side of the line.

Coal extraction then moved into the heart of New Shildon, just to the south of the railway line. Shildon Colliery opened in 1870, connected by rail spurs to the mainline and sidings (Figure 7). Its owner, George Pears, is commemorated by Pears Terrace, the row of stone-fronted brick houses built in the early 1890s which once overlooked the colliery. Further mines operated on the periphery of the town and by the late 19th century as many people were employed in the mines as by the railway.



## Housing and serving the workers and their families

More housing was required to deal with the population increase: over 2,500 lived there in 1851 and by 1891 the combined settlement of Shildon was home to 7,870 people. Station, Victoria, Soho and Mill Streets were built on the north side of the railway in the 1850s and 60s, connecting Soho Works to the east with the S&DR works to the west (Figure 8).

The focus of development moved south of the line in the 1890s to 1910s, off Redworth Road, which with Byerley Road continued to be the main artery connecting old and New Shildon. These brick rows of houses are generally faced with stone on elevations facing a main road. Houses were not large, with either two or three bedrooms and back yards serviced by alleyways, but they accommodated the growing population (Figure 9).

**Figure 7 (top):** A late 19th-century postcard showing Shildon Colliery and sidings, with Station Street.
Reproduced with permission of Lucy Jessop/Historic England

**Figure 8 (centre):** Station Street facing the mainline, with the National School and the first Mechanics Institute, from a late 19th-century postcard.
Reproduced with permission of Lucy Jessop/Historic England

**Figure 9 (bottom):** Aerial view of New Shildon from the south, showing All Saint's church, housing off Byerley Road and industry on the site of Shildon Colliery.
HEA_ 34133_005-NOV-21 Emma Trevarthan
© Historic England Archive

**Figure 10:** One of the surviving long engineering sheds of Shildon Works, shown as Engine House on early Ordnance Survey maps, is now part of the Hackworth Industrial Park.


Schools, chapels and churches were added gradually across the settlement: the original Shildon acquired its Anglican church in the 1830s and New Shildon gained All Saints in 1868-9, while places of worship for Wesleyan and Primitive Methodist congregations were built by 1855. A National School and a Mechanics Institute were erected in Station Street and further schools were built in both parts of Shildon.

## Adapting to 20th-century change

Though the railway industry boomed until the middle of the 20th century, with the NER (later LNER and British Rail) works moving into wagon construction and repair, coal production rapidly declined. Shildon Colliery closed in 1924; it was demolished in 1937 and its site was developed into the Dabble Duck industrial estate. Housing on Dalton Crescent and Ferens Terrace was built to the south-east of it in the late 1940s. Little coal mining remained in the immediate area after the Second World War.

Postwar clearances removed rows of early housing on both sides of the mainline, in some cases replacing them with winding streets of modern houses and in others leaving the space undeveloped. British Rail closed Shildon Works in 1984, causing massive job losses. Many of its vast brick buildings still stand (Figure 10), adapted for other engineering uses and renamed the Hackworth Industrial Park, reminding us of Shildon's railway heritage.

Though the railway industry boomed until the middle of the 20th century, with the NER works moving into wagon construction and repair, coal production rapidly declined.

## Looking to the future

The opening of Locomotion in 2004 and its recent expansion in 2024 brings visitors to Shildon to celebrate all things railway. This year's celebration of Railway 200 and the bicentenary of the S&DR brings our focus back to Shildon and its significance, not just a town of railway and coal but a monument to its people. This research provides a broad understanding of the town's historic buildings and landscapes, and shows how the arrival of the Stockton & Darlington Railway made Shildon a part of the nation's story of industrialisation and its transition into the post-industrial present.

## About the author

**Lucy Jessop, PhD**
**Senior Architectural Investigator, North East and Yorkshire Region, Historic England**

Lucy has worked for Historic England and its predecessor for nearly 20 years, researching the history of buildings and places from the medieval period to the present day. Her particular interest is the design and construction of 17th- and 18th-century houses, and architectural patronage.

## Further information

Lucy Jessop and Richard Pougher, 'New Shildon: County Durham: Historic Area Assessment'. **Historic England Research Report Series** 27/2023, Swindon, 2023.
https://historicengland.org.uk/research/results/reports/27-2023

**Figure 1:** Shildon Coal Drops, photographed in 2001. © Mr Alan Bradley. Source Historic England Archive. Image reference IOE01/03241/01

# The Stockton & Darlington Railway's Coal Drops at Shildon

## The world's earliest mechanised locomotive-coaling plant?

### Introduction

Shildon (or at least that part of it known in 1825 as New Shildon) is the world's earliest railway town (Jessop this issues). New Shildon lay 2 kilometres south of the original village, at the western end of the level section of the Company's main line, i.e. that part over which steam locomotives were able to operate. (The line extended 7 kilometres to the north-west as far as Witton Park Colliery, but the gradients on this section were too steep for steam locomotion and were worked instead by a combination of horses and steam-powered rope-inclines). Accordingly, New Shildon developed rapidly as both an engineering and service hub for the railway. By 1827, two more horse- and incline-powered colliery railways had converged on the town which subsequently became a major marshalling facility where coal wagons were organised into trains for the steam-hauled leg of their journey east to the company's land depots (Jecock and Hardie this issue) and to staithes on the River Tees at Stockton and later Port Darlington (Middlesbrough) for wider export.

The Drops were intended to speed up the turn-round of locomotives returning empty wagons to the Shildon yard before departing with their next train.

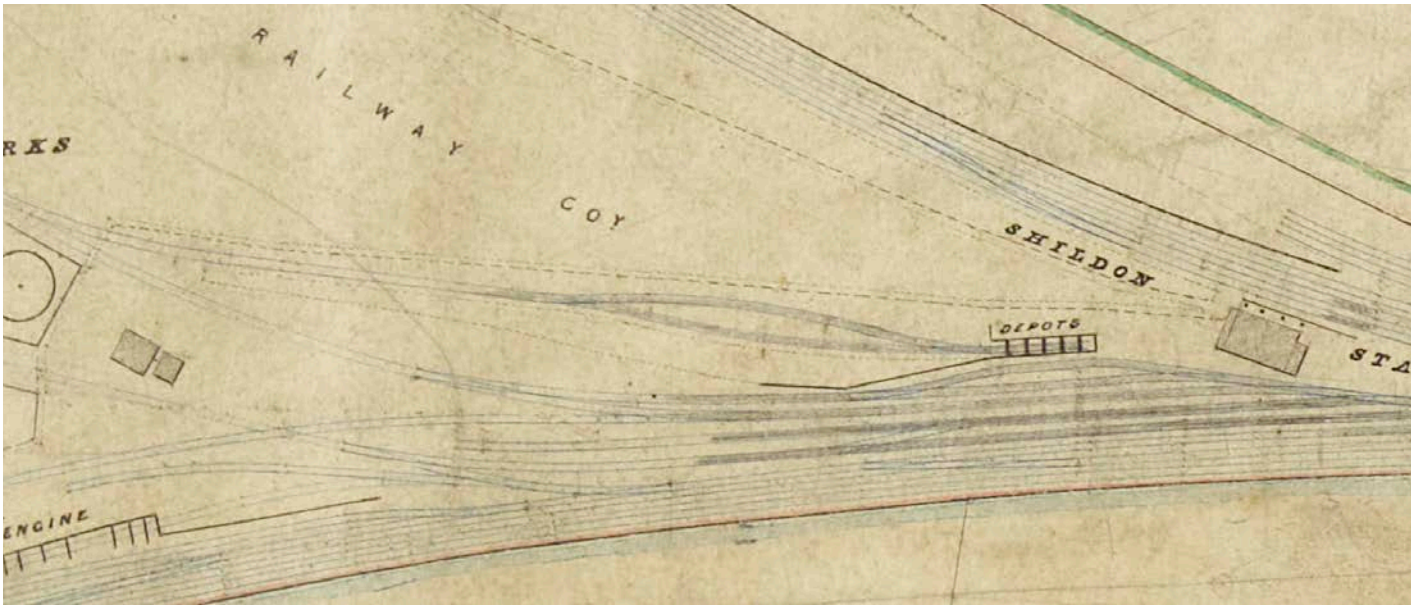
The Company constructed the so-called 'Coal Drops' at Shildon in late 1846/early 1847 (although evidence suggests they were rebuilt/reconfigured several times thereafter). Despite the name, the installation was a device for re-fuelling steam locomotives using gravity to drop coal into engine tenders, not, as is more commonly the case with 'Drops', for dropping coal into wagons pulled by those locomotives. The Drops were intended to speed up the turn-round of locomotives returning empty wagons to the Shildon yard before departing with their next train. Historic England recorded and researched the extant structure (Figure 1) in early 2020 as part of its Stockton & Darlington Railway Heritage Action Zone initiative.

## Description of the standing fabric

As they survive, the Drops consist of an elevated platform or stage, some 6 metres high, approached from the north-west by a ramp. Both ramp and stage are retained by stone arcading composed of 49 narrow, blind, arched recesses which gradually and progressively increase in height and depth towards the eastern stage, where the rhythm of the arcading is broken at regular intervals by four rectangular 'bays', one much wider than the other three. Photographic evidence from the 1920s and 30s, taken only a few years before the Drops closed in 1935 (e.g Figure 4), shows that the three narrow bays were where the fuelling mechanisms were located although the actual timber 'hoppers' and 'spouts' that once stood here have long disappeared. The fourth, wider, bay contained a timber platform which may have been intended as a raised surface, close to tender-height, off which coal could be shovelled if, for whatever reason, a locomotive could not refuel at the gravity-fed spouts.

The Drops lie at the end of a former branch line running down from Black Boy Colliery to the north. Coal wagons hauled up the ramp, discharged their loads through bottom-opening doors into the hopper within each bay where coal was retained until needed by locomotives passing on the 'coaling road' below. Given the steep angle of the approach ramp (about 5 degrees or 1:11), it is perhaps unlikely that wagons coming from the colliery were hauled up onto the stage by locomotive. Instead, since the branch line was also too steep to be worked by locomotives and was rope-hauled, it may be that wagons were allowed to free-wheel the last part of the incline and

**Figure 2:** Extract from John Harris's 1848-9 map of the Shildon Works. The Coal Drops are the stone structure labelled 'Depots' at right of frame. TNA RAIL 1037-464



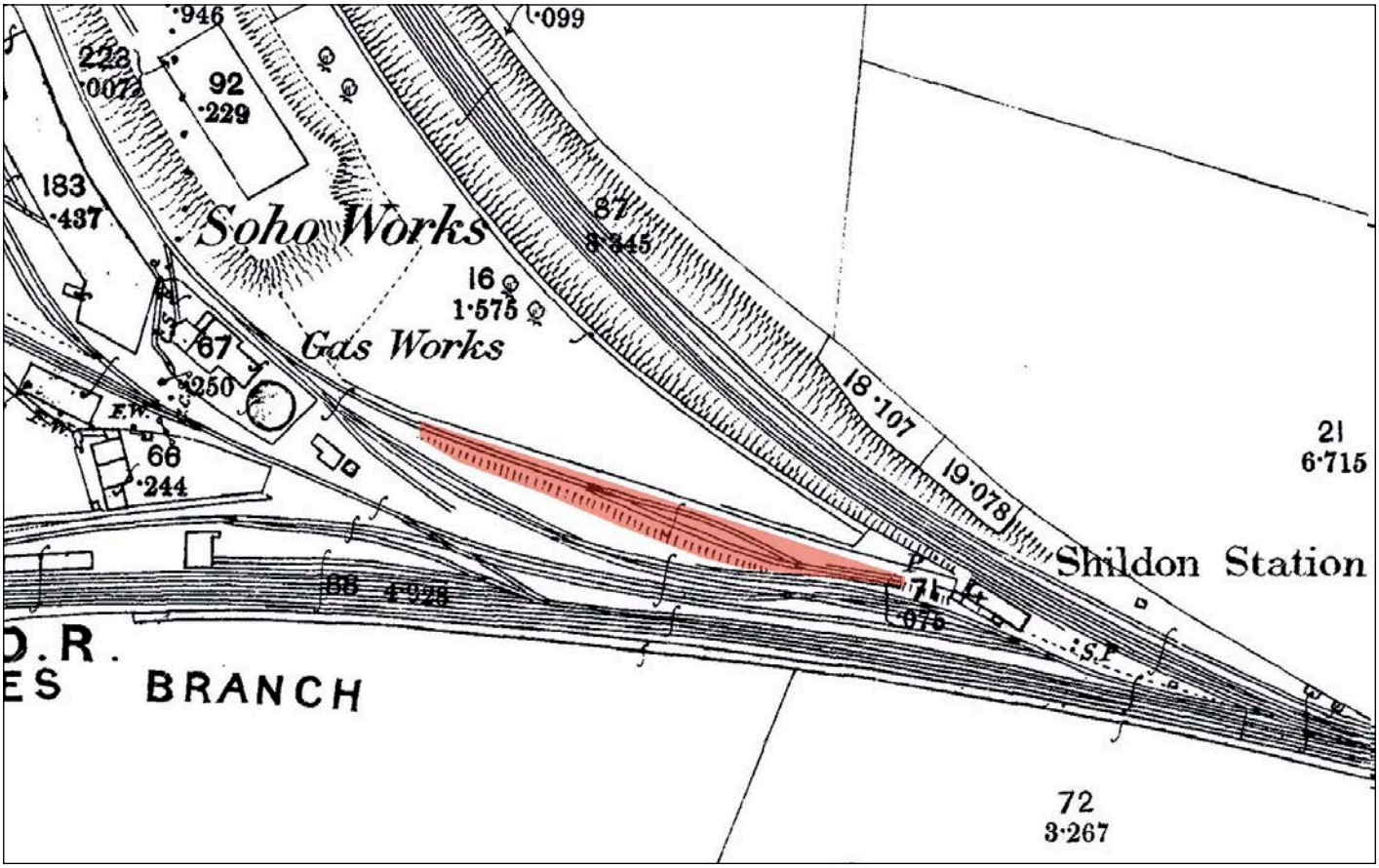



**Figure 3:** Extract from the 1857 OS 1:2500 map (surveyed 1856) with the Shildon Coal Drops highlighted in red. Note the use of hachure symbols which must indicate the high-level stone staging was accessed by an earthen ramp at this time.

climbed the ramp using their own momentum under the supervision of a 'wagon-rider' who judiciously applied the brakes at the correct moment.

There is evidence in the surviving stonework of the Drops for several phases of rebuilding and strengthening, including at least one phase of heightening. Strengthening work is manifested by the buttressing which visibly infills alternate arched recesses and represents a self-evidently successful attempt to stabilise the face of the stone ramp which at some point had started to settle and lean outwards. Early map evidence (Figures 2 and 3) also points to the high-level stage initially being much shorter and approached by an earthen incline (indicated on the OS map by hachuring). However, the principle of using gravity feed to deliver coal to locomotives was present right from the start, as is demonstrated by references to the Drops immediately after construction as 'hoppers' and 'self-filling spouts'.

## Significance and parallels

In the decades immediately after 1825, the sole means of fuelling a locomotive - both on the S&DR and the nascent national UK rail network more generally - seems to have been by teams of men laboriously shovelling coal from lineside bunkers into the engine tender. However, our research at The National Archives uncovered a letter that suggests in October 1846 the S&DR was reviewing its procedures and had come up with a novel plan. It is unclear who exactly came up with the idea. Both men in charge at Shildon – the engineer William Bouch and the works manager Oswald Gilkes - seem to have doubted the need for the Drops, but the idea was supported by Joseph Pease, the Company manager. Designs subsequently drawn up by John Graham, the Traffic Superintendent, had been quickly approved by December; construction must have started soon after and was complete the following year.

Unfortunately, those first plans seem not to survive, and therefore detailed evidence for the original form of the hoppers and spouts is lacking. Indeed, the only evidence for what these features looked like or details on their operation consists of one newspaper report of a coroner's inquest into a fatal accident in 1884 plus the few 20th-century photographs (e.g. Figure 4) of the Drops in use. Nevertheless, using these sources in combination with evidence in the stone fabric such as sockets where horizontal timber beams were once located, we have been able to reconstruct their final form. Their earlier form is unlikely to have been radically different. Wagons on the stage dropped their load of coal into timber hoppers positioned within the bays beneath, where it was retained by a trapdoor pending the arrival of a locomotive requiring fuel. Once the locomotive had parked on the adjacent coaling road adjacent to a hopper, the fireman would clamber up into his tender, pull a lever to open the trapdoor and so allow the coal within to slide gently down a chute into the tender (Figures 5 and 6).

As we have seen, what survives of the Drops today is not what was first built: they were demonstrably reconstructed and extended on occasion and their operation improved. But the general principle of how they functioned – utilising gravity to transfer coal directly between wagons and locomotive tenders without the need for manual shovelling – remained constant. In this, it is likely that whoever it was in the S&DR who first proposed the idea of the Drops in 1846

the only evidence for what these features looked like or details on their operation consists of one newspaper report of a coroner's inquest into a fatal accident in 1884 plus the few 20th-century photographs.


**Figure 4:** LNER 'J21 Class' locomotive (ex-NER 'C Class') no. 99 coaling at the Drops on 4 June 1932.
Unknown photographer © Ken Hoole Collection/Head of Steam – Darlington Railway Museum

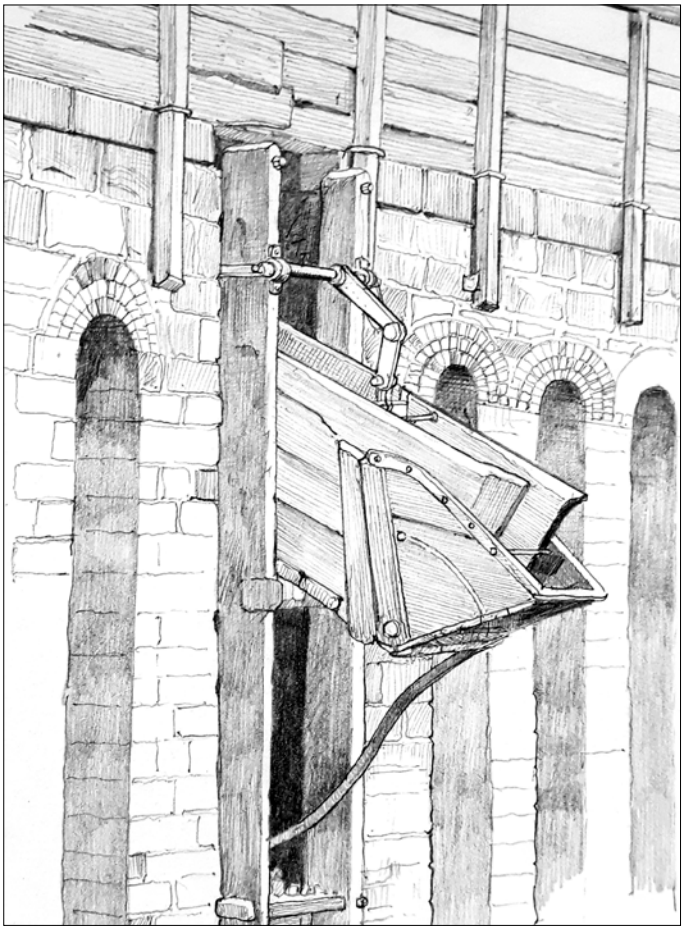


**Figure 5:** Reconstruction drawing of the hopper/chute mechanism, based largely on historic photographs. Allan T Adams © Historic England

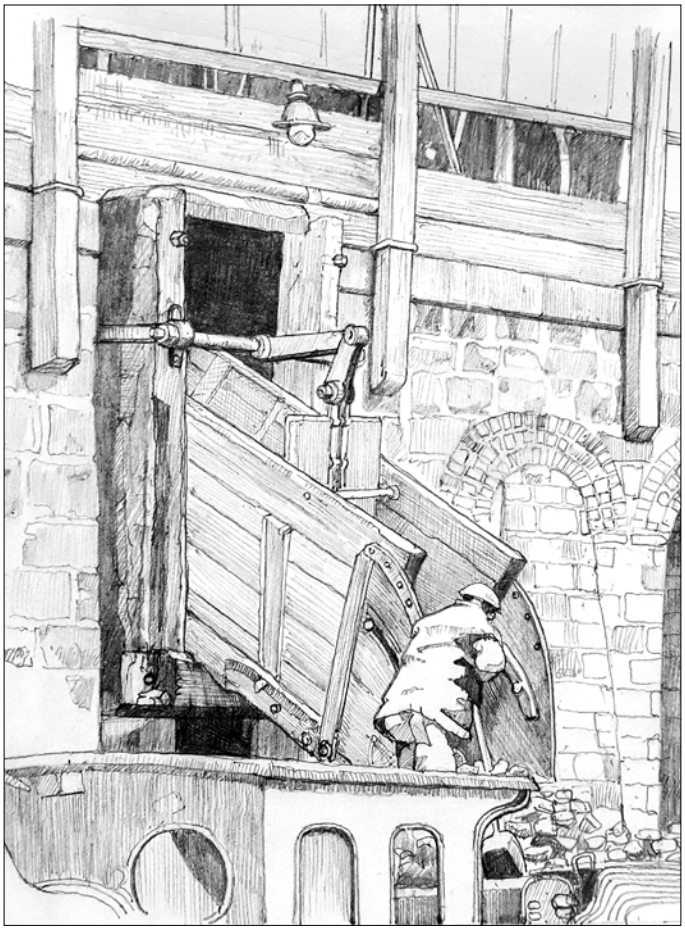


**Figure 6:** Reconstruction drawing of a locomotive taking on coal using the hopper/chute mechanism, based on historic photographs. Allan T Adams ©Historic England

took inspiration from the coal drops that already existed - and had done for a century or more – at coastal coal staithes where they were used to transfer coal arriving by rail into sea-going vessels. These structures were designed to eliminate both the double-handling of coal and to permit gentle transfer (coal in large chunks burned better and was therefore worth more than small nuggets or dust). The coastal coal drops worked by positioning coal wagons with bottom-opening doors above chutes that guided the contents down into the ship's hold (Figure 7) or, alternatively, if the wagons had end doors, by lowering them into the hold on platforms and upending them.

## Impact

The idea of taking an existing technology and putting it to novel use to refuel railway locomotives seems to have been an S&DR first - both nationally and, given the UK's primacy in the development of railways, perhaps globally – but it was not one widely adopted by the S&DR's competitors. For example, in 1851 the London & North Western Railway's engineer, John Ramsbotham, came up with an alternative, some might say Heath Robinson, design for a canted rotating carousel of buckets (Figure 8). The failure of the S&DR's idea to be widely copied is likely because it was conditional on the design of coal wagon a company operated. Wagons at this time came in a multiplicity of

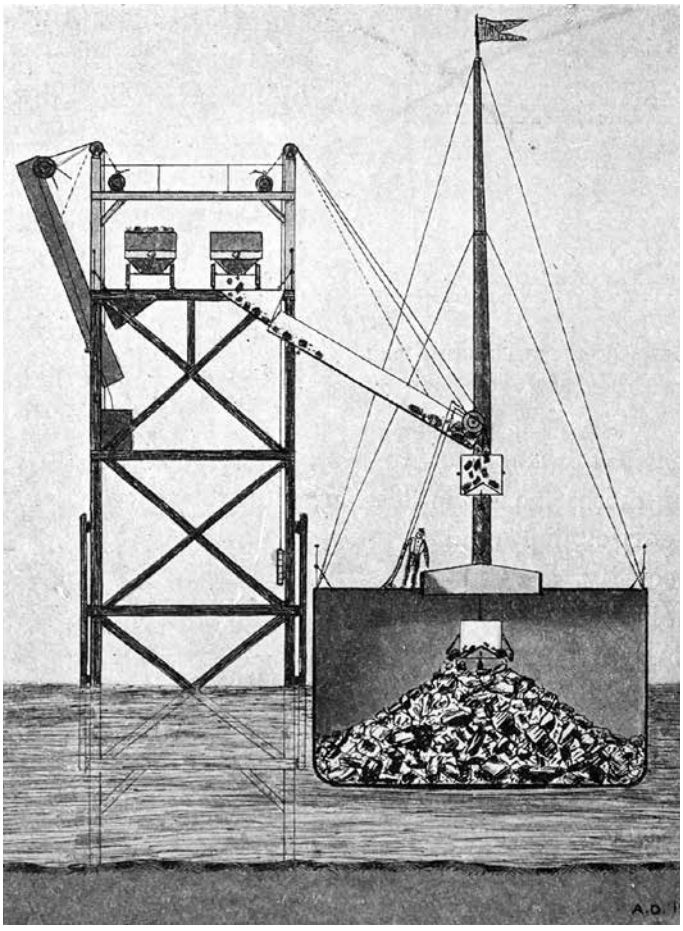
The idea of taking an existing technology and putting it to novel use to refuel railway locomotives seems to have been an S&DR first.

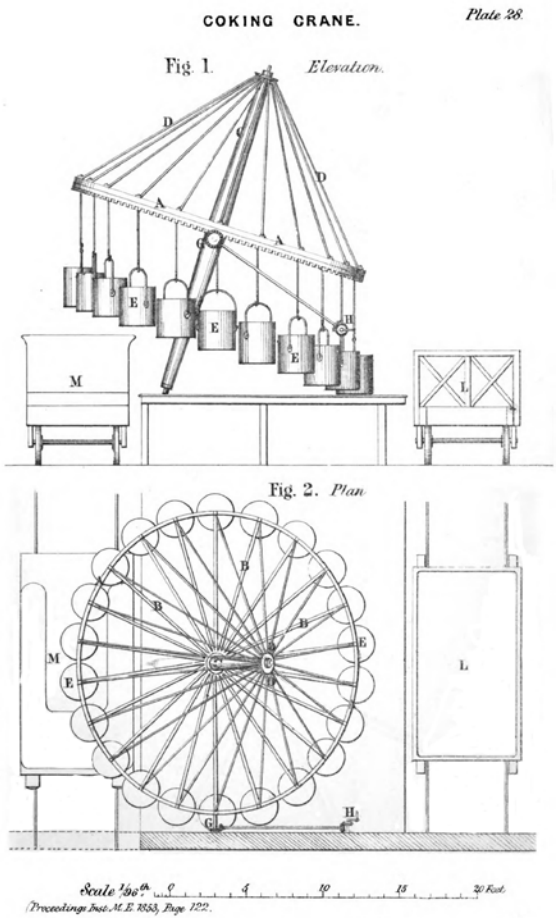
types with a range of door positions (side-opening, end-opening, bottom-opening). Thus, unless the delivery of coal to a locomotive refuelling stage could be guaranteed to come always in bottom-opening wagons, other forms of coaling stage had to be developed. As it was, it was not until 1910 that the principle of gravity refuelling was adopted widely across the UK rail network, but this time it was the entire wagon that was upended into hoppers (Figure 9).

The Shildon Drops were already listed at Grade II prior to the HAZ, but following the research reported here that listing has been upgraded to II*. What at first sight seemed a very unassuming monument type, has been shown to be a major development in the way steam locomotives were refuelled on Britain's early railways.

**Figure 7 (below left):** A coastal coal drop from 1905. Source: Kirsopp, John Jr (1912) 'Coal-shipment and the laying out of staithe heads' in NEIMME Transactions Volume 59, fig 63 pp 237 (Newcastle upon Tyne: North of England Institute of Mining and Mechanical Engineers).

**Figure 8 (below right):** The canted, rotating carousel of buckets designed by John Ramsbotham for the LNWR and installed at Manchester London Road (later Manchester Piccadilly) Station (Ramsbotham 1853, plate 28).






What at first sight seemed a very unassuming monument type, has been shown to be a major development in the way steam locomotives were refuelled.

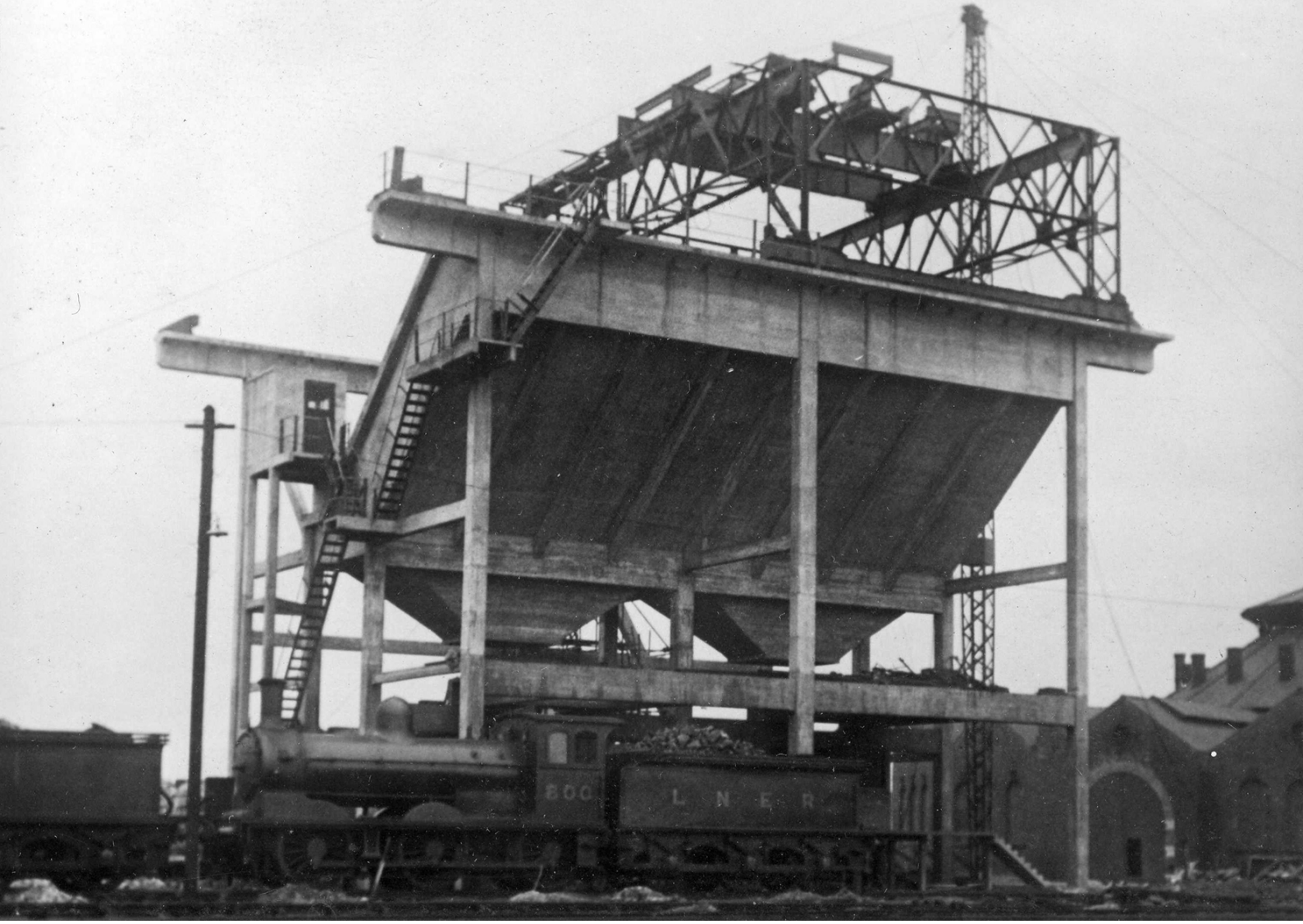



**Figure 9:** The mechanised coaler at Darlington Bank Top in 1939. In this 20th-century design of locomotive coaler, a rotary tippler grasped entire wagons and emptied them either into an underground hold from which a conveyer transferred coal to overhead hoppers, or directly into the hopper itself. Unknown photographer © Ken Hoole Collection/Head of Steam – Darlington Railway Museum

## About the Author

**Marcus Jecock, FSA**
**Senior Archaeological Investigator and Coastal Lead.**

Marcus is a landscape archaeologist who has investigated and surveyed archaeological landscapes and historic building remains of all periods and types, including industrial sites, for Historic England and its predecessor organisations for almost 40 years. He also managed the research element of the S&DR Heritage Action Zone.

## Further information

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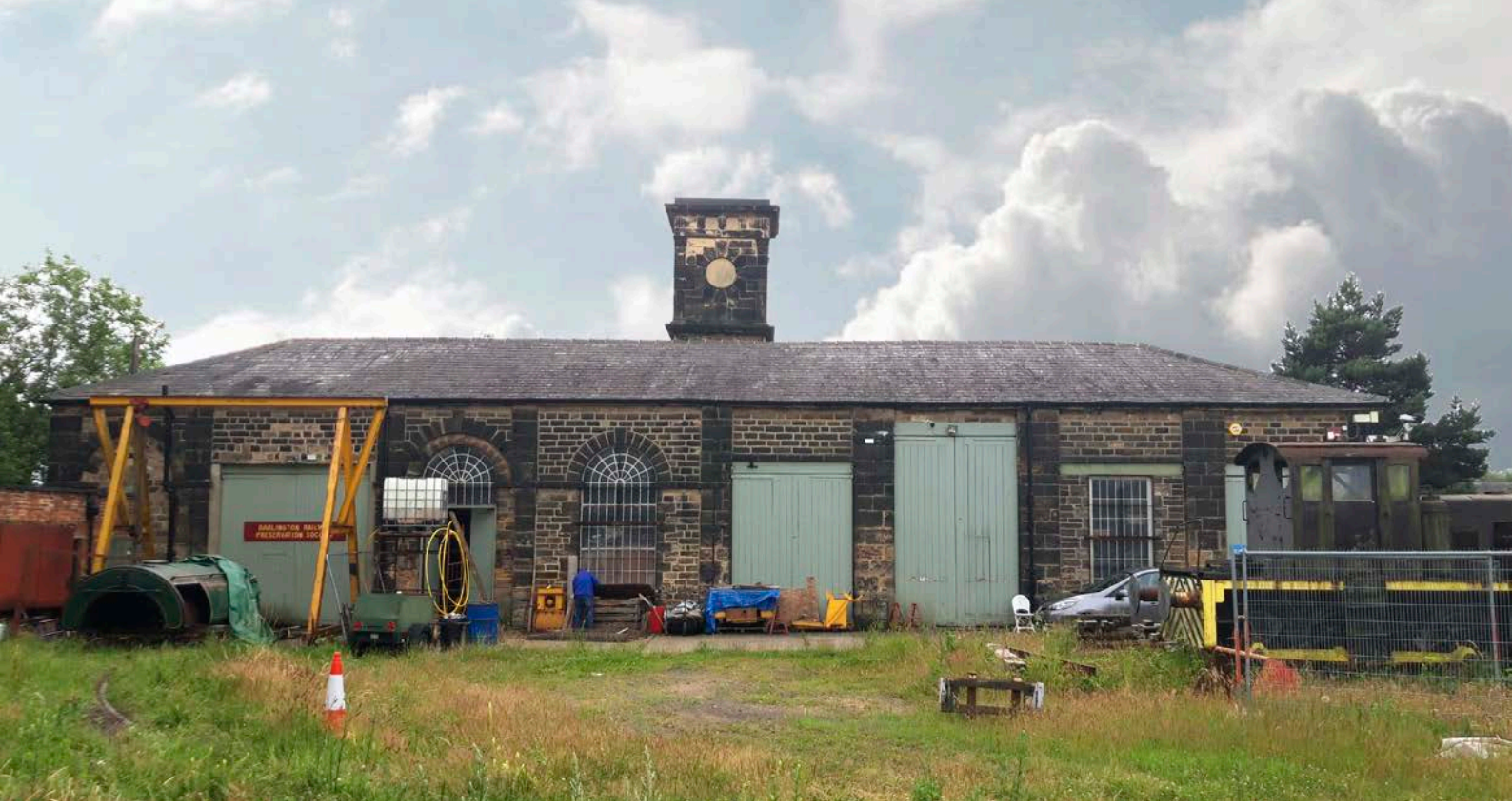
# Protecting Railway Heritage: One of England's Early Goods Depots

Researching the goods depot in Darlington to inform protection and its place in regeneration.

Amongst the research projects undertaken by Historic England as part of a Heritage Action Zone, was the investigation of the Grade II* listed S&DR Railway Goods Depot in Hopetown, Darlington. It was built in 1833, just eight years after the inaugural opening of the S&DR, and research has shown the Goods Depot to be the earliest surviving single-storey railway goods depot in England, and key to understanding the development of this building type.



**Above:** The S&DR Goods Depot's north elevation. © Historic England

**Below:** In use as a museum and workshop by the Darlington Railway Preservation Society (DRPS), the interior presented a number of survey challenges.
© Historic England

## Project aims and methodology

Purcell Architecture Ltd were commissioned to undertake the study in advance of the building's restoration as part of Darlington's emerging 'Railway Heritage Quarter'. The investigation aimed to provide a robust analysis and understanding of the building's history, development, function and significance through building survey and archival research, and an assessment of its influence in terms of railway building typology.

The Goods Depot had been added to Historic England's 'Heritage at Risk Register' in 2019 due to its poor state of repair and the precarious nature of the clock tower. However, it presented another challenge when survey work commenced in 2020 – functioning as a museum and a railway engine repair shop, the quantity of equipment and railway paraphernalia within the interior created its own hazards for photography and fabric analysis.

The Goods Depot is key to understanding the development of building type.

## Present form

Lying to the south of the railway line and constructed in sandstone rubble with freestone dressings, the building comprises eight bays, is two bays deep, and covered by a pair of hipped roofs. Perhaps the most notable feature is the clock tower which rises above the valley roof.

The building's south elevation gives a good indication of its original appearance during the early days of the S&DR. Particularly notable are the elegant arches, some higher than others, with rock-faced voussoirs and keystones. Heavy piers articulate the building's corners, whilst piers separate each bay. The north elevation, executed in a similar style, has seen various phases of alteration including the insertion of openings, which in 2020 contained timber double doors.

## The original form (1833)

Designed by Thomas Storey, the S&DR chief engineer, the Goods Depot was constructed to handle the increasing volume of goods transported by the S&DR, replacing the earlier merchandising station of 1827 built on the other side of North Road which was converted into a passenger station. The survey established that Storey's original building was only a quarter of its present size, being of four bays and a single range deep. Unlike later goods sheds, it was entered through its long elevation. Fabric analysis showed that rails from the north entered through alternate bays – trucks entering through the higher arches, while the lower arches (containing windows) lit the unloading bays.


**Above:** The south elevation. © Historic England Archive DP169016

**Below:** The first phase of construction – the trucks passed through the bay to the right. © Historic England

## Extension to the west (before 1839)

The survey also showed that almost as soon as the building had been constructed, it was extended to the west by a further four bays, also defined by rusticated piers and arched openings. However, subtle differences are apparent; the second phase of the south elevation is not symmetrical, there are differences in bay widths and tooling changes, all evidencing a slightly separate phase of construction.

## Further expansion (1839-40)

As the volume of goods transported by the S&DR increased, so too did the pressures on the Goods Depot. John Harris, who succeeded Storey, extended the Goods Depot to the north between 1839-40, retaining all, or part, of the north elevation as an internal wall, and also adding the clock tower. Although considerably altered, fragmentary evidence shows that the broad architectural language followed that of the south elevation, with a number of minor differences; the rusticated piers are slightly narrower and the open arches with rail access now have shoulders, suggesting that Harris was responding to a modest increase in wagon gauge which required a more comfortable clearance.

As the volume of goods transported increased, so too did the pressures on the Goods Depot.

The clock tower is the building's strongest Classical feature and an unusual addition to a goods depot - a reminder that railway architecture was in its infancy. It contained the S&DR's chiming master clock and was supported internally by a north-south spinal wall. The tower was a significant enhancement, serving as a landmark, and a visual and audible reminder of the S&DR's importance, underscoring its role in the burgeoning industrial landscape In practical terms the clock was also part of rationalising how time was kept across the railway network.

**Above:** Detail of the pier between bays 5 and 6 of the western extension. © Historic England

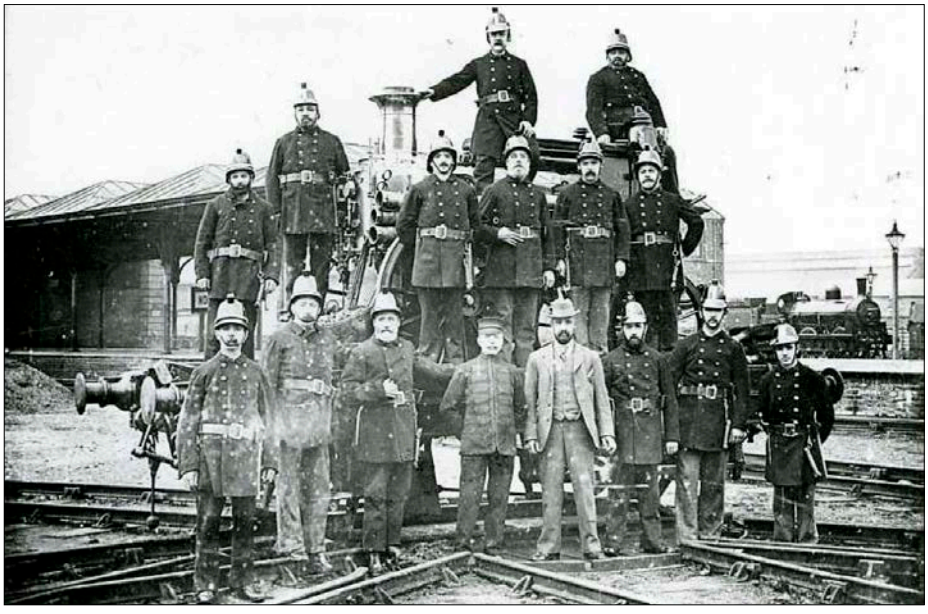
**Right:** The shouldered arches of the north elevation indicate a subtle change in design. © Historic England

**Above:** The Clock Tower taken during the initial measured survey by the Historic England Geospatial Survey Team. © Historic England.

## Change of use (1854-1896)

Following the S&DR's merger with the North Eastern Railway (NER) in 1863, the Goods Depot's use declined, its role likely superseded by the NER's Goods Station which was located on the north side of the railway line. Although the exact date is unknown, it appears to have ceased to function as a goods depot by 1896 when cartographic evidence indicates a loss of direct rail access. That a deal of care was taken in its conversion, including the infilling of the tall arches with inner arches and radial windows, suggests an earlier rather than a later date. It is known that by 1913-14, the building had been repurposed as a railway-owned fire station. Changes to the building included internal subdivisions, with the western half seeing the installation of a chimney and range and a tongue-and-groove ceiling, all suggesting an attempt to provide basic home comforts for on-call members of the railway fire brigade.

**Right:** North Road Station fire crew pose by their tender, possibly late 19th century. (Ken Hoole Study Centre)



Ordnance Survey maps indicate that all rail tracks had been removed by 1939.

## Into the 20th Century

Evidence for the function of the Goods Depot during the first half of the 20th century is rather meagre, but Ordnance Survey maps indicate that all rail tracks had been removed by 1939. By 1948 D. Boyd & Sons, agricultural buildings specialists, occupied the building and around 1951 it was converted into a road motor repair depot, with further significant alterations including the removal of part of the original 1833 north wall. Following a period of vacancy, the building became the home of the Darlington Railway Preservation Society (DRPS).

## Influence on the building type

With railway architecture in its infancy, engineers looked to existing building types for inspiration. For example, the 1830 Liverpool Road Station in Manchester is the earliest surviving railway goods warehouse in England. The design takes its cue from canal warehouses, and although also entered through its long elevation, it is built against the railway embankment and set over multiple storeys. Wagons were manhandled into the building via turntables, and goods were transferred for trans-shipment using gravity hoists. This contrasts significantly with the design of Storey's Goods Depot, replacing the earlier merchandising station of 1827 built on the other side of North Road which was converted into a passenger station.

Whilst the lateral entry of wagons shown at Darlington and Manchester were not adopted as a standard model in later goods shed designs, the Goods Depot was pioneering in handling the transfer and trans-shipment of goods over a single level. Unfortunately, issues over the increasing size of wagons and the need for more efficient goods handling led to the building's eventual abandonment. However, lessons learned from its design flaws were as influential as those elements that proved effective, ensuring its contribution towards the development of the building type.

**Right:** North elevation of the Goods Depot 1948 prior to its conversion in 1951. (Ken Hoole Study Centre)

## An exciting future

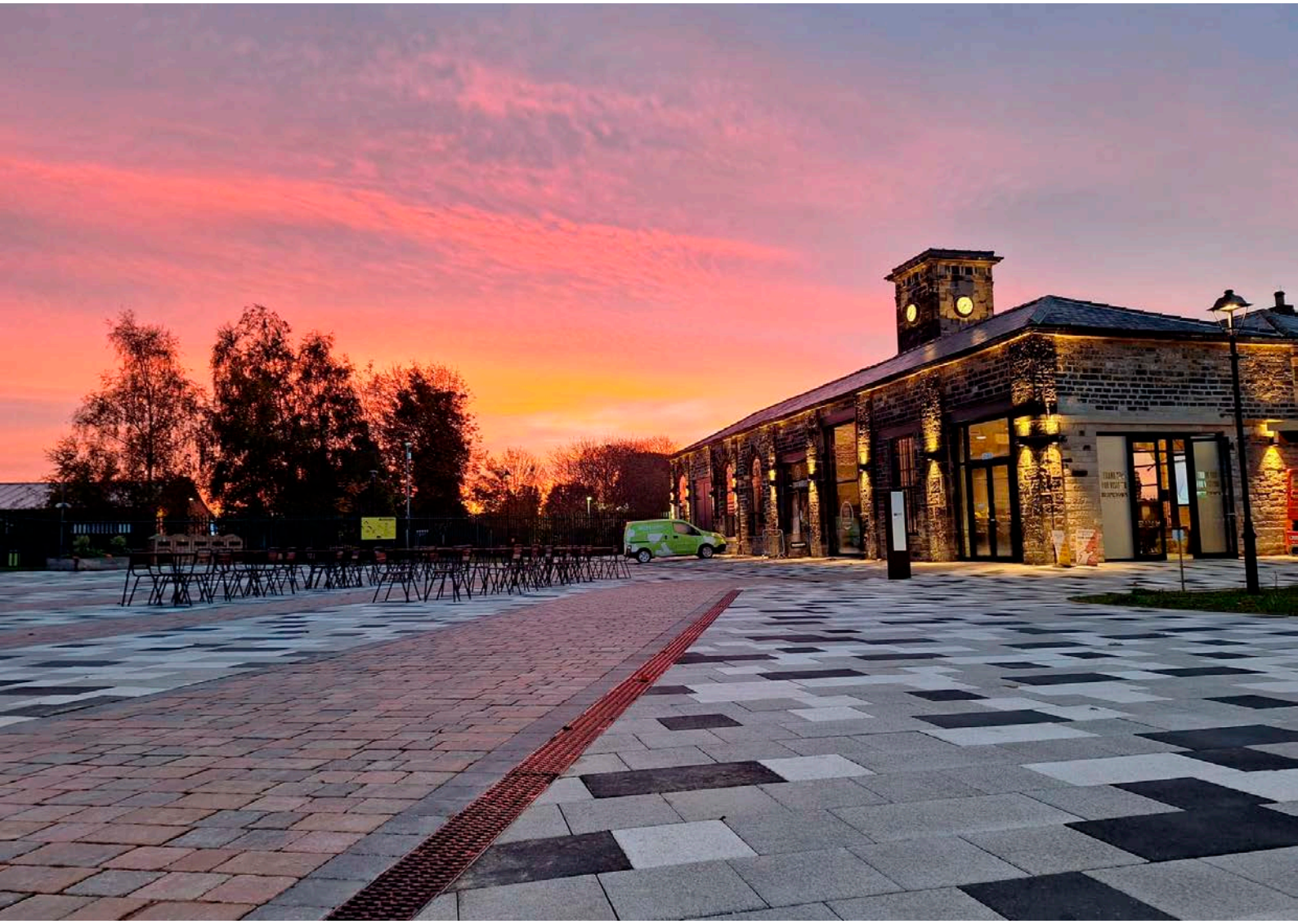
The S&DR Goods Depot is a building of considerable historical and architectural significance. Its role in the early years of the railway, its subsequent evolution, and its impact on the development of railway architecture make it an important piece of industrial heritage. The building's significance extends beyond its architectural and historical value; it is a symbol of the transformative power of the railway, a reminder of the ways in which this revolutionary mode of transportation changed the world.

Restored with the help of Historic England funding, the Goods Depot now forms an impressive gateway into the award-winning heritage attraction within Darlington's Railway Heritage Quarter, Hopetown. Containing an orientation space, cafe and interpretation space, the building can now be fully appreciated by everyone.

The project has not only increased our understanding of the building and the building type; its subsequent restoration and reuse is also an outstanding example of the power of heritage as a catalyst for social and economic regeneration.

The building's significance extends beyond its architectural and historical value; it is a symbol of the transformative power of the railway.

**Below:** The restored Darlington Goods Depot, now part of a heritage attraction. © Hopetown, Darlington



## About the author

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Bev Kerr is based in York and has over 15 years of experience working in the Heritage Sector. She has also held posts at Purcell Architecture and the Council for British Archaeology, having degrees in the fields of both archaeology and built heritage. She is a member of the IHBC and CIfA, Winter Conference secretary for the Vernacular Architecture Group, and an examiner on the MA course in Building History at the University of Cambridge.

## Further Information:

Purcell Architecture Ltd, 2021: The Stockton & Darlington Railway Goods Depot, Darlington: Historic Building Investigation and Assessment of Significance, **Historic England Research Report Series** no. 19-2021 https://historicengland.org.uk/research/results/reports/19-2021

Visit the Goods Depot, Head of Steam Museum and Carriage Works: Hopetown Darlington: https://www.hopetowndarlington.co.uk/

Look inside the Goods Depot: https://my.matterport.com/show/?m=1rFJEnas1hZ

The official website of the 200th anniversary S&DR200: https://www.hopetowndarlington.co.uk/

# The S&DR Darlington Lime Depot

A rare survival of a once common building type.


**Figure 1:** The Hopetown Lane frontage of the Lime Depot as it was in 2019.
© Archaeo-Environment Ltd

## Introduction

When the Stockton & Darlington Railway (S&DR) opened for business in 1825, the company expected to deliver almost as much of the coal and lime it transported locally as the amounts it sent for coastal export via staiths on the River Tees. To facilitate this 'landsale', as it was known, the company constructed depots at road crossings along its line. There, wagons with bottom-opening doors were run onto elevated stages with clear space between the rails and their contents dropped into a series of open-fronted bays beneath the tracks for bagging and sale to local businesses and the general public.

The extant Darlington Lime Depot building at Hopetown Lane opened between 1840 and 1847, apparently to replace or augment earlier facilities that existed further south. It is now the sole surviving example of a building type once common on the S&DR and more widely and has been listed at Grade II since 2006. In 2019 Historic England commissioned Archaeo-Environment Ltd to record and investigate the building further (Figure 1) as part of its S&DR Heritage Action Zone initiative (HAZ).

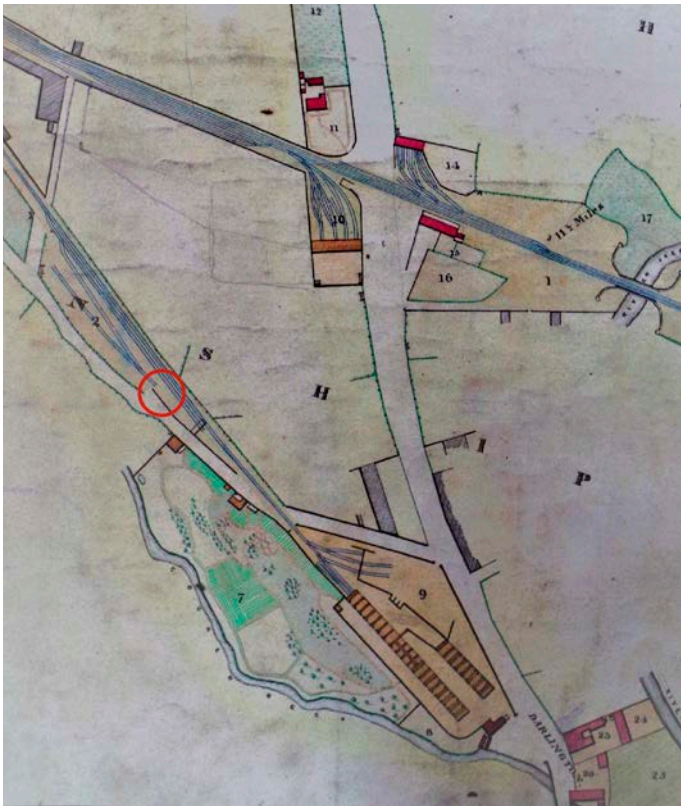

**Figure 2:** The 1839 Thomas Dixon map showing the Darlington Coal and Lime Depot (no.9 on the plan) and site (circled) of the soon-to-be-built replacement Hopetown Lane Lime Depot (TNA RAIL 1037/456).

The company expected to deliver almost as much of the coal and lime it transported locally as it sent for coastal export.

## History

Although we lack definite evidence, the early coal and lime depots at Darlington were almost certainly co-located alongside each other as was typical on the S&DR; this arrangement is known at Heighington, Eaglescliffe (Yarm) and Stockton, for example, to name just three other depots. The first Darlington depot comprised an enclosed yard at the end of a short 0.6 kilometre-long branch which left the S&DR main line at Hope Town and terminated adjacent to Darlington High Northgate for easy access by the public. It is shown and named on the earliest series of detailed maps of the S&DR that we have, surveyed by Thomas Dixon in 1839. In the key that accompanies the Darlington sheet (Figure 2), the number '9' is identified as simply 'Coal Depots and Yard', but it is likely the three short sidings depicted at the northern end of the yard functioned at this time as 'lime drops'.

The red circle added to Figure 2 is the position of the extant Hopetown Lane lime depot building. On this 1839 map, we can see a rail spur approaching the plot where the building was later to stand suggesting that construction was planned but not yet started. The depot is shown, however, on a subsequent plan of 1847 by Joseph Sowerby, giving us a build date of between 1839/40 and 1847. The new installation thus spatially separated out the handling of the two bulk cargoes, coal and lime.

A programme of expanding or replacing depots took place after the S&DR amalgamated with the North Eastern Railway (NER) in 1863. As part of this programme the coal-handling side of the 1825 High Northgate depot was replaced with larger facilities on the other side of the River Skerne (Ordnance Survey 1898).

This was certainly more conveniently situated to service the expanded rail network created by the merger, but a replacement depot may also have been needed due to increasing commercial demand for both coal and lime: coal, for example, was used not just as a fuel but increasingly to manufacture town gas; lime was needed for mortar and as an agricultural fertilizer, but also as a purifying agent to scrub sulphur dioxide from town gas and stop it smelling when burned. The Darlington Gas Works had opened in 1830 but was taken over by Darlington Corporation in 1854; the Works stood just the other side of the River Skerne from the lime depot (Thomas 2020).

The Hopetown Lane Lime Depot seems to have been used for its original purpose for only about 30 years. By the mid-1870s the building had been repurposed and adapted for light industrial uses that have included welding, blacksmithing, storage, and as a garage. In recent years it has lain vacant and is now boarded up to prevent vandalism.

The Hopetown Lane Lime Depot seems to have been used for its original purpose for only about 30 years.

## Architectural description

The Depot is a two-storey structure constructed of brick with sandstone ashlar dressings, all beneath a slate roof. It is built into higher ground, with two storeys facing Hopetown Lane but only a single storey to the rear. The ground floor is subdivided into four bays or cells by internal brick partitions. Each bay was originally self-contained, although doorways were later inserted between them to facilitate the building's re-use; each has a cobbled floor, now mostly concreted over. The ground floor seems to have been designed to be open fronted as the existing double doors are secondary. However, since quick lime reacts violently with water to produce slaked lime it is inconceivable that there would not have been some means of protecting the contents from the weather right from the start, at the very least perhaps a tarpaulin sheet that could be dropped down to keep out wind and rain, otherwise lime could not have been stored here for any length of time.

At first-floor level, a rail spur entered the north-west end of the building through an arch in the gable, allowing lime wagons with bottom-opening doors to be brought in and their contents dropped into the cells below. A corresponding blocked arch in the south-east gable appears to be decorative only, and the wagons must therefore have left the building the same way they came in. Inside the building the rails were carried on two large waybeams, supported on sandstone pads set into the tops of the brick dividing walls. There was open space between the rails and lime attendants standing on timber flooring either side of the track (Figure 3) would have manhandled the wagons into position and operated levers to open the bottom doors and allow the lime to fall through into the cells below.

**Figure 3:** Interior of the first floor looking towards the blocked south-east gable wall. The broad floorboards are original and mark where the wagon attendants stood; the narrower floorboards in the centre are modern infill of the formerly open space between the rails carried on waybeams. © Archaeo-Environment Ltd

Although the first-floor frontage of the depot is now boarded and pierced by windows, there is evidence that it originally consisted of a series of louvred timber panels (Figure 4), set between cast-iron columns with decorative capitals (Figure 5) that supported the roof beams, thus affording the attendants ventilation but also some protection against the weather.

Subsequent to the Archaeo-Environment report, Historic England has commissioned a reconstruction drawing showing how the building may have looked and operated; this is reproduced here at Figure 6.

**Figure 4 (top left and top right):** Sawn-off dowels and the shadow of louvres in the timber jambs of panels in the openings between the cast-iron columns. © Archaeo-Environment Ltd

**Figure 5 (right):** One of the cast-iron columns holding up the roof between panels of louvres. © Archaeo-Environment Ltd

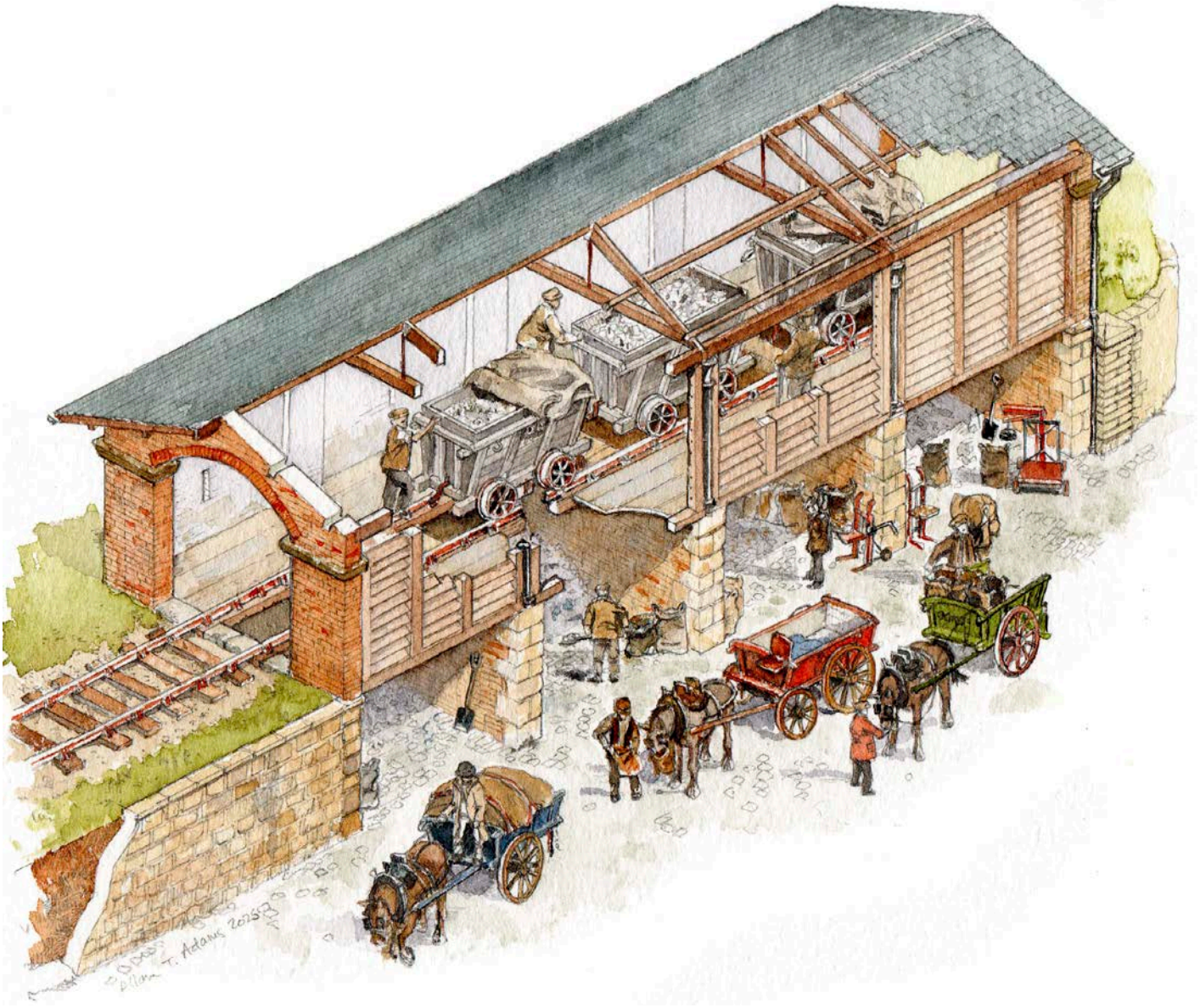

**Figure 6:** Cutaway reconstruction drawing showing how the Lime Depot was designed to operate.
Illustration by Allan T Adams © Historic England.

## Significance and national context

Coal and lime depots are a specialised type of goods-handling facility that existed on the S&DR from the first year of operation. The company did not construct dedicated depots for handling more general forms of goods traffic until 1826, opening what it called its 'Merchandising Warehouse' in Darlington in 1827 (Archaeo-Environment Ltd 2016, 12). This stood on the other side of High Northgate to the first Darlington Coal and Lime Depot. Unfortunately, the building is no longer extant, but it did survive long enough to serve as the prototype for the Goods Warehouse that the Liverpool & Manchester Railway erected a few years later in 1830 at their Liverpool Road station in Manchester, which is recognised for its historic importance by being listed at Grade I (NHLE 1282991). The Darlington Merchandising Warehouse was converted into a passenger station in 1833 when goods handling transferred to the newly built Goods Shed (Kerr, this issue), and was demolished in 1864.

All this illustrates how fundamental the S&DR was to the development of the modern railway in Britain in so many ways. What the company trialled was copied widely – undoubtedly being improved upon by other railway companies in the process and subsequently - but many ideas originated with the S&DR (see also Branse-Instone, this issue).

## The importance of the Darlington Lime Depot

Nationally, lime depots are underrepresented in heritage records, with only one example other than the Hopetown Depot listed specifically for its association with lime: that which the NER constructed at Goathland Station, North Yorkshire, in about1865. Many more examples of coal depots that employed gravity to deposit coal into bunkers are listed, but even where historical map evidence suggests these originally existed in tandem with lime-handling facilities, it is only the coal bunkers that have survived and are today designated (for example, the Maiden's Walk Coal Drops in Gateshead (NHLE 1248565). Hopetown Lime Depot has recently been purchased by Darlington Borough Council, and it is hoped a sympathetic future use may be found for it that preserves its historical importance as well as showing off surviving original features identified by a programme of careful research and recording.

Nationally, lime depots are underrepresented in heritage records, with only one example other than the Hopetown Depot listed specifically for its association with lime.

## About the authors

**Marcus Jecock, FSA**
Senior Archaeological Investigator and Coastal Lead.

Marcus is a landscape archaeologist who has investigated and surveyed archaeological landscapes and historic building remains of all periods and types, including industrial sites, for Historic England and its predecessor organisations for almost 40 years. He currently leads on coastal archaeology at Historic England.

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Caroline is an archaeologist who has written extensively on the Stockton & Darlington Railway including Conservation Management Plans and Statements of Significance for many of its historic buildings and structures. She has also written guided walk books and a bicentenary celebratory book on the S&DR. She has produced a series of podcasts on the railway, Tales from the Rails. She is a Trustee and editor for the Friends of the Stockton & Darlington Railway

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Thomas R, 2020: 'The Manufactured Gas Industry, vols 1-5,' Portsmouth: **Historic England Research Reports Series**182-2020 (available at https://historicengland.org.uk/research/results/reports/182-2020)

# Early Bridges of the Stockton & Darlington Railway

## Bridging solutions in stone and iron.

As part of the Heritage Action Zone project for the Stockton & Darlington Railway (S&DR), Listed Building and Scheduled Monument assessments were carried out along the 1825 main line. This provided an opportunity to compare the designs of bridges revealing new insights into their histories which had been missed by previous assessments undertaken in isolation. Along the original route of the S&DR, a dozen bridges dating to the 1820s and 1830s were inspected including the monumental and innovative along with several previously thought to be much later and ordinary but now shown to be of special interest.

**Left:** Bonomi's 1825 Skerne Bridge still carrying trains after 200 years.
© Historic England Archive DP175627

## Skerne Bridge

When the S&DR opened in 1825, its most impressive stone structure was the bridge over the River Skerne on the northern outskirts of Darlington. Remarkably this remains in use as part of the national rail network and has carried trains constantly over the last 200 years. George Stephenson had planned to build an iron bridge here. However rising prices of iron prompted Stephenson to suggest in October 1824 that the County Durham Surveyor of Bridges, the architect Ignatius Bonomi, should be asked to design a masonry structure to span between the abutments that had been started that summer (Skeat 1973, p76). The company had asked Stephenson twice earlier in the year to consult Bonomi over the bridge: they readily took up this suggestion, perhaps relieving their nervousness about trusting Stephenson's cutting-edge approach for such a vital bridge, and duly commissioned Bonomi for a design which appears to have been produced in just a week. Construction started the following spring, and the final bills were paid for the completed bridge in June 1825.

The expectation in 1824 was that the line would transport about 10,000 tons of coal a year, but by mid-1828 over 50,000 tons had been carried in the previous 12 months, with traffic continuing to grow, nearly all of it passing over Skerne Bridge. The earthwork embankments supporting the track and the bridge's abutments started to fail: in 1829 the S&DR's Inspector of Masonry, John Carter, added curving wing walls to either side of the bridge to support the embankments (Boyle, 2017). The current wing walls, built of rock-faced rusticated stonework contrasting with the smoothly finished stone of Bonomi's original bridge, are thought to be later strengthening works, quite possibly concealing Carter's wing walls which may remain embedded in the enlarged embankments behind.

The expectation in 1824 was that the line would transport about 10,000 tons of coal a year, but by mid-1828 over 50,000 tons had been carried in the previous 12 months.

## Not the world's first iron railway bridge

Although Stephenson did not build an iron bridge over the Skerne, he did build a smaller one to cross the River Gaunless near West Auckland. This has been claimed as the world's first iron railway bridge but is pre-dated by the Pont y Cafnau (1793) and the Afon Cynon bridge, Aberdare (1811) both built in South Wales for plateways (early railways with rolling stock guided by flanged plates instead of edge rails). Gaunless Bridge was not designed to carry locomotives – it is on the short, horse-drawn level section of line between the Etherley and Brusselton inclines and was bypassed in 1856 with the opening of a new branch line. Stephenson's iron structure was dismantled in 1901 and replaced by a steel beam bridge reusing the original stone abutments, which allowed the crossing to be used by locomotives serving a newly opened coal mine south of the river. Stephenson's iron bridge, however, was preserved, eventually passing into the collection of the National Railway Museum. Recently restored and repainted in its original colours, it is now on display at Locomotion, Shildon.

**Above:** Ironwork of Stephenson's Gaunless Bridge in original colours at Locomotion, Shildon. © Historic England

**Above:** Hummer Beck Bridge: horse-drawn part of the 1825 line.
© Historic England

Stephenson's design is remarkable, employing both cast and wrought-iron components which slot together without requiring bolts. The bridge uses an innovative form of lenticular (lens-shaped) truss that acquires its strength from the upper members (or chords) being in compression and the lower in tension, cancelling out the compressive and tensile forces and therefore exerting only vertical forces on the piers. The iron structure is freestanding and did not rely on the masonry abutments either side of the river. These abutments, which form the terminals of the railway embankments approaching the river, still survive and form part of a scheduled monument which also includes two conventional masonry bridges over streams, Oakley Cross and Hummer Beck.

These bridges, also attributed to Stephenson, are the least altered bridges on the entire line built for the 1825 opening.

## Accommodation bridges

The Brusselton Accommodation Bridge was previously dated to 1825 and attributed to Stephenson. Its design is quite different to the line's original masonry bridges which feature roll-moulded arch rings and is now known to have been designed by Thomas Storey and built in 1832-1833. It was one of two bridges built for the owner of the land that was divided by the western Brusselton Incline. The opening of the Haggerleases branch line in 1830 to collieries on Cockfield Fell had increased the traffic on the incline: perhaps stoppages caused by cows crossing the line had become a problem.

Stephenson's design is remarkable, employing both cast and wrought-iron components which slot together without requiring bolts.

**Right:** 1833 accommodation bridge on the western Brusselton Incline.
© Peter Giroux and the Friends of the S&DR

The need to provide accommodation crossings for owners whose land was bisected by the railway was one of the costs that the S&DR had underestimated.

## Economies in construction: dual and single lines

The need to provide accommodation crossings for owners whose land was bisected by the railway was one of the costs that the S&DR had underestimated. Although the line was designed and was mainly built to be dual-tracked, economies were made during construction. Only a single line was laid, with frequent passing loops, and although cuttings and embankments were sized for dual tracks, most bridges were built for just a single line.

In the early 1830s the locomotive-hauled line running east and south from Shildon to the Tees at Stockton was upgraded to dual tracks and the original sleeper stones of the western end of the line (which had two holes for rail fixings) were replaced with larger, four-holed blocks. This dualling of the line resulted in the widening of underbridges, carrying the railway line, to take two tracks such as the accommodation bridge near Dene Beck and in Darlington

## Overbridges

The original bridges built to carry roads and paths over the railway (overbridges) had been built to span a single line: these had to be completely rebuilt to span the dual line. Between Newton Aycliffe and Darlington there were five identical overbridges which had been assumed to date to the late 19th century because of their rock-faced stonework.

The bridge at Simpasture Junction was rebuilt after a railway accident and that at Codling Beck was demolished in 2012, leaving three survivors. These all have narrow-waisted plan forms and restricted clearance of just 21 feet 10 inches (about 6.7 metres) all indicating an early date. The demolition rubble of Codling Bridge also included reused two-holed sleeper stones, suggesting that all of these bridges were those mentioned in company minutes in 1831-33 that were designed by Thomas Storey when the line was re-laid as dual track.

All three survivors are now listed, the best example being Little Whessoe occupation bridge. Interestingly, the stonework is very similar to that of Skerne Bridge's current wing walls, suggesting that these might also be earlier than previously thought.

## Company organisation

As a pioneering railway, the S&DR's approach to running their business evolved and was not fixed. Individuals were sometimes directly employed but were often working as contractors or sub-contractors. Subsidiary companies were also often set up to build new infrastructure expanding the network. All this led to increasing amounts of variability in designs in later years as can be seen with the S&DRs extension up Weardale (See Jecock this issue).

## Impact of our research

The research undertaken as part of the Heritage Action Zone project has resulted in a greater understanding of the surviving early19th century bridges of the S&DR, all built during the pioneering phase of railway development when Britain led the world in this vital new technology. Alongside updated descriptions of existing designations, our improved understanding has led to five new listings, helping to preserve these often modest and overlooked elements of the famous railway.

**Above:** Aycliffe Wood a twin of Little Whessoe Bridge. © Graham Potter Source: Missing Pieces Project.

As a pioneering railway, the S&DR's approach to running their business evolved and was not fixed.

## About the author

**Eric Branse-Instone,**
**Listing Adviser at Historic England**

Eric has been assessing historic sites for scheduling and listing for nearly 30 years. He has a particular interest in railways inherited from his father who was a railway engineer and designer of bridges.

## Further information

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Skeat WO, 1973: **George Stephenson the Engineer and his Letters**

# The Bridges of the Bishop Auckland & Weardale Railway

## Increasing engineering confidence and experimentation in form and style.

### Introduction

By the mid-1830s, the Stockton & Darlington Railway (S&DR) was generating a healthy profit for its shareholders and was seeking to expand its sphere of influence and access to markets and goods. To this end, the company advanced a scheme to extend its mainline from Shildon north-west into Weardale.

The line (taken forward as the Bishop Auckland & Weardale Railway or BA&W) had reached as far west as Crook by 1843, eventually terminating at Eastgate in Weardale. It opened up new areas for mineral extraction, in particular deposits of coal and limestone, and connected existing mining concerns and other industries with national markets for the first time.

However, in contrast to the 'house style' that many railway companies, certainly in later years, applied to the bridges and tunnels they built on a new line, a study carried out by Historic England in 2019-20 as part of its Bishop Auckland Heritage Action Zone (HAZ) initiative has revealed that the BA&W applied a much more eclectic range of engineering solutions and architectural treatments.

## The research programme

The Bishop Auckland study looked at eight bridges (excluding footbridges) and culverts that lie on 3 kilometres of the line between the Shildon Tunnel and just west of Bishop Auckland. The original Engineer's Line Reference (ELR) bridge numbers for these structures were BA&W/4-12, later changed to DAE2/4-12. The study focussed on the physical evidence of each bridge's fabric but was also informed by original engineering drawings preserved in the Network Rail Archive (NRA); it did not research the wider archives of the BA&W directly.

## The bridges

The evidence of the surviving drawings (which because of COVID restrictions were seen only in facsimile, sometimes of poor-quality) suggests, unsurprisingly, that construction of the bridges happened in order from south-east to north-west as work on the line proceeded northwards from Shildon.

The plan for the first bridge after the Shildon Tunnel is entitled 'Proposed Bridge over the Highway between South Church and Eldon'. The plan is signed and dated by the contractor; the signature is hard to read but the date is 22 April 1839. From an architectural point of view this bridge (ELR DAE2/4) is unremarkable. Its elevations are plain, each comprising a single semi-circular arch ring of simple stone voussoirs rising from an impost band at the springings and surmounted by a narrow roll moulding; the spandrels are ashlar laid in horizontal courses, although now heavily obscured by later track widenings (Figure 1). As such, the design treatment appears very reminiscent of the architecturally plain and unpretentious bridges George Stephenson designed for the early S&DR (e.g. Hummerbeck Bridge; Branse-Instone this issue, Figure 3).

The bridge is more interesting from an engineering standpoint, however, since it lies about 35o skew, not at right angles, to the road over which it passes. To help resist the very different thrusts that skew bridges impose compared to bridges that cross an obstacle at 90 degrees, arch rings and barrel are laid according to the helicoidal method (Figure 2) where the bedding joints between stones run at right angles to the bridge elevations rather than the abutment faces.


The BA&W applied a much more eclectic range of engineering solutions and architectural treatments.

**Figure 1 (left):** The eastern elevation of railway underbridge DAE2/4, masked by later track widening. © Historic England

**Figure 2 (right):** Detail of the arch barrel of DAE2/4, showing the helicoidal coursing. © Historic England

In addition, each stone in the impost bands is cut with a dog-tooth upper surface to further counteract the tendency of the arch barrel to slide over the abutments (Figure 3). No similar mitigation was applied to prevent the spandrels sliding over the arch ring, however, and there is evidence of movement here, addressed by later patching and the insertion of at least one metal tie rod and pattress plate. How quickly this movement became apparent is unknown.

Skipping over the next structure on the line (a small culvert of very simple design), the original elevations of the next bridge (DAE2/6, named 'Shepherds' on modern Network Rail signs) are now hidden behind extensions added later in the century when this section of line was quadrupled. No engineering drawings showing the original elevations have been traced, but the arch barrel is semi-circular and everything about the bridge speaks of simple architectural treatment very similar to DAE2/4. The bridge is a 'regular' arch oriented square to the rail line and did not need special engineering solutions.

**Figure 3 (above):** Detail of the springing of the arch barrel of DAE2/4, showing the stones of the impost banding cut as one with the first course of stones in the arch barrel to help prevent the barrel sliding over the abutments. © Historic England

**Figure 4 (below):** The south-western (downhill) elevation of railway underbridge DAE2/7. © Historic England

**Figure 5:** Detail of the stonework and the central cartouche in the eastern abutment of DAE2/7. © Historic England

The Company was becoming increasingly proud and confident in the railway it was constructing and wanted its bridges to proclaim that fact.

The next bridge (DAE2/7, crossing a road now called Bone Mill Bank) is again some 30 degrees skew. It is, however, very different in design (Figure 4) from DAE2/4. Although the engineering drawings are undated, we know the bridge was erected between 1839 and 1842 for the railway was open to South Church station (positioned immediately before the bridge) by late 1841, and to Bishop Auckland station in 1842. In engineering terms, the design undoubtedly reflects rapid advances in the understanding of the mathematics of skew-arched bridges in the short time since DAE2/4 was built. In 1839, George Watson Buck published a treatise on what he called 'oblique bridges' in which he showed that semi-circular arches become unsafe where the angle of skew exceeds 250 degrees, after which it is necessary to employ a segmental arch; he also advocated stepped voussoirs to help counteract the tendency for movement at the boundary between arch ring and spandrel.

But in addition to the improved engineering solution, the bridge is also very different architecturally. All original masonry is rock-faced and margined, and that in the abutment walls features a series of diagonal and horizontal incised lines, or in the case of one stone central to the eastern abutment, a swirly cartouche (Figure 5). The impression given is that the Company was becoming increasingly proud and confident in the railway it was constructing and wanted its bridges to proclaim that fact to the communities (and potential users) through which the railway passed.

The next structure along (DAE2/8) is, in engineering terms, not a bridge but a culvert: it takes the River Gaunless through and under a high earth embankment laid to take the railway across the river valley. However, it chimes very much with the more confident, flamboyant approach to bridge-building exhibited by DAE2/7. The voussoirs forming the arch rings in both elevations are massive and have angled ends that extend a short distance into the horizontal coursing of the adjoining headwalls. Furthermore, all masonry on the elevations is rock-faced and V-grooved. The styling gives the culvert a very definite Baroque flourish (Figure 6), unlike anything else on the line. Its nearest comparison is probably the north portal of the Shildon Tunnel (see Howard this issue), although that cannot be described as Baroque.

The next two bridges on the line on the lead-in to Bishop Auckland are either replacements on a different site or heavily rebuilt. However, the two bridges immediately west of the town (the final ones included in the study) continue this story of experimentation in design and form.

**Figure 6 (above):** The southern portal of culvert DAE2/8 taking the River Gaunless beneath the railway. © Historic England

**Figure 7 (below):** The western elevation of railway overbridge DAE2/11. © Historic England

The first of these, DAE2/11 (an overbridge taking the modern Etherley Lane across the railway) is more subdued in architectural expression than DAE2/7, but nevertheless is a fine example of its type and certainly more stylish than DAE2/4 or 6. For this reason, it was already listed at Grade II prior to the HAZ. It is again a skew bridge (this time of three arches) and so has the helicoidal coursing, segmental arch rings and stepped voussoirs one would expect at this date (Figure 7); the voussoirs, however, are not plain but have chamfered edges creating an aesthetically very pleasing V-groove effect. According to a signature on the archive drawings, the bridge was built by the contractor, Henry Dawson or Davison (the handwriting is hard to read) in 1842-3.

Finally, bridge DAE2/12 is of a very different form altogether: a wrought-iron lenticular (lens-shaped) truss built to take a minor occupation road across the railway (Figure 8). It was already listed at Grade II* prior to the HAZ, chiefly because as stated by the noted engineering historian, Robert Rennison, it is the earliest example of its type still in use and on its original site. But why build such a different design of bridge here? In all probability, the BA&W deemed it unnecessary to go to the expense of a masonry structure because the bridge had only to carry farm traffic. (Nevertheless, our research has indicated the truss had to be strengthened or stiffened 20 years after construction by the addition of a second lower member or chord (Figure 9).

**Figure 8 (above):** The western elevation of the lenticular truss bridge, DAE2/12. © Mr Brian Wilcockson (Source: Historic England Archive IOE01_01853_03)

**Figure 9 (left):** Detail of the chords, truss structure and cross-bracing of DAE2/12. © Historic England

The engineering drawing for it in the NRA is instructive and may throw further light on what influenced the design choice. It is signed John Storey for the Shildon Works Company, who were in-house contractors for the S&DR. John is unknown other than as the brother of Thomas Storey who succeeded Stephenson as the S&DR's Chief Engineer in 1825. It is not clear whether John's signature indicates that he designed the bridge or was just the draughtsman, acting perhaps on behalf of his brother (who by this time was employed by the BA&W as a consulting engineer), but what is certain is that Thomas lived at St Helen's Auckland, not far from the lenticular truss that Stephenson had designed and constructed for the S&DR in 1823-4 to take that railway across the River Gaunless (see Branse-Instone this issue). It seems very likely, therefore, that the Storey brothers took inspiration from Stephenson's pioneering wrought-iron truss and that DAE2/12 stands in direct line of influence from it.

## Results

All in all, the research has highlighted major similarities and direct links between the first bridges on the BA&W and those George Stephenson built for the S&DR. But it has also shown how bridge design on the BA&W rapidly evolved under his immediate successors, Thomas Storey and perhaps John Harris. This was undoubtedly partly in response to advances in engineering knowledge, but also suggests the Company was becoming more confident and expressive in the architectural statements it wanted its bridges to project. The listing descriptions for the two bridges already listed have been revised accordingly. It is hoped the undesignated bridges will be considered for listing as time allows.

## About the author

**Marcus Jecock, FSA**
**Senior Archaeological Investigator and Coastal Lead.**

Marcus is a landscape archaeologist who has worked for Historic England and its predecessor organisations for almost 40 years. He has latterly developed a particular interest in bridges of all ages and types.

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# Transforming a Historic Market Town

## The impact of the railways at Bishop Auckland.

Located high on a plateau overlooking the picturesque Weardale valley within County Durham, Bishop Auckland is perhaps best known for Auckland Palace, the former chief residence of the Bishops of Durham. The town has a rich and varied architectural legacy, much of which was shaped by the railways.

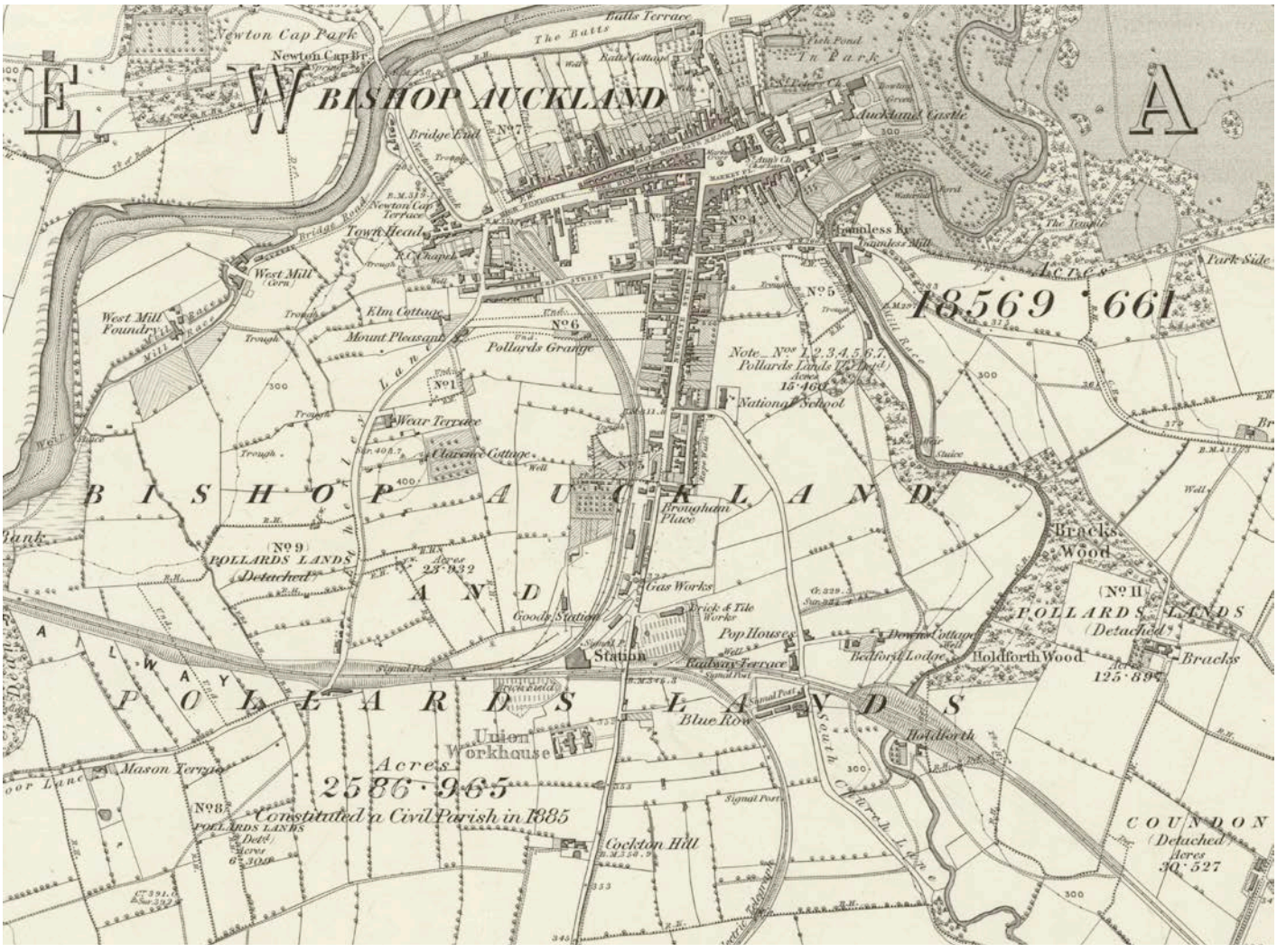


**Figure 1:** Extract from the 6-inch Ordnance Survey map published in 1859 (surveyed 1857), showing the new railway lines and station at Bishop Auckland. Reproduced with permission of the National Library of Scotland https://maps.nls.uk/

Parson and White describe Bishop Auckland in their 1827 Directory as having a 'very neat and clean appearance... in an airy and healthy situation', with its centre focused on the market place in front of the Bishop's Castle (or Palace) surrounded by plenty of inns and hostelries with coaches to Lancaster, Durham and Newcastle to name but a few. While the bishop's residence attracted wealthy residents including clergy, doctors and solicitors, there were a variety of craftsmen and traders such as shopkeepers, straw hat makers, butchers, blacksmiths, linen drapers and watchmakers. Industry was minimal and on a small, often domestic, scale.

The first railway to reach the town was the Bishop Auckland and Weardale in 1842, but within 50 years it had been joined by three others, making the town a busy transport hub. The railways were built principally to transport coal from the local coalfield. In 1838 there were 14 coal pits within 3 miles of the town, but by the early 20th century this had increased to 40 within 5 miles. The railways transported not just vast quantities of freight but also passengers, and transformed the landscape with their embankments, cuttings, bridges and viaducts (Figure 1), many of which remain today.

## The construction and development of the railway lines

The Bishop Auckland and Weardale Railway was constructed to enable the Stockton and Darlington Railway Company to profit from the coal reserves around Crook and Howden-le-Wear to the north-west of the town. Overseen by the formidable engineer Thomas Storey (1789-1859), a relative and former employee of George Stephenson (1781-1848), the line, running north from New Shildon, began construction in 1837. It took five years to reach Bishop Auckland mainly due to the massive feats of engineering required to construct the Shildon Tunnel (also known as the Prince of Wales Tunnel) through a 500-foot (approx 152 metres) high magnesium limestone ridge, and lay the 0.8 kilometre-long Holdforth Embankment across the River Guinness (Figure 2).

The town has a rich and varied architectural legacy, much of which was shaped by the railways.

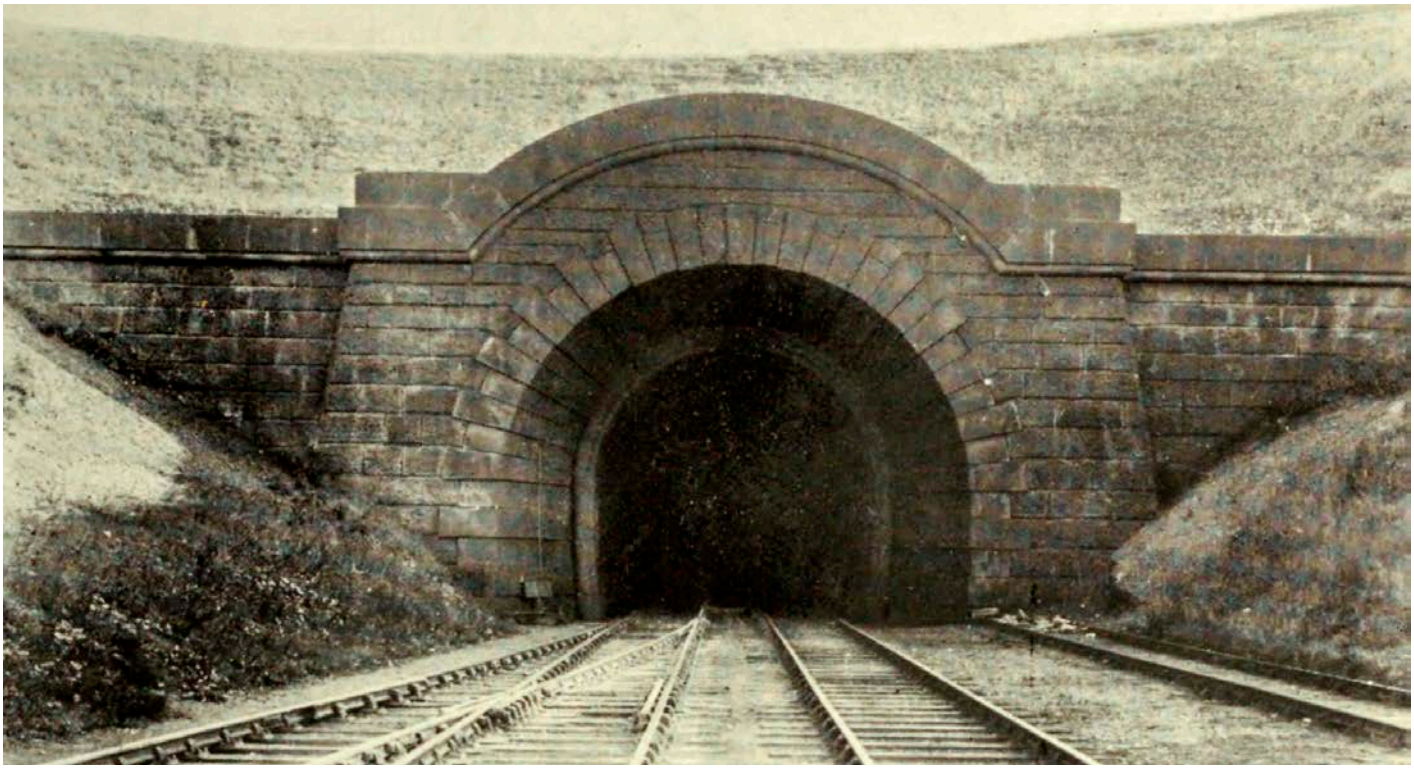

**Figure 2:** The north portal of the Shildon Tunnel taken before 1915. Public domain, via Wikimedia Commons

**Figure 3:** Newton Cap Viaduct, viewed from Newton Cap Bridge located to the west. © Historic England Archive DP393081

The line skirted the south side of Bishop Auckland with sidings to the goods station. Within a few years, new industries had been established in close proximity including brick and tile works and gas works. While evidence of these industries has now gone, the railway still serves the town, with a modern (1980s) station, while the line westwards (extended to Wearhead in 1895) continues to operate as the Weardale Railway, a successful heritage railway.

In 1854 construction began of a new railway connecting Bishop Auckland with Durham to the east. This railway, the Bishop Auckland and Durham Branch, was built by the North Eastern Railway and was completed in 1857. It approached the town from the north and joined the existing Bishop Auckland and Weardale line on the west side of the town. This major line had a significant impact on the layout and fabric of the town, requiring a cutting through the western edge of the town centre with a tunnel at High Bondgate, a bridge to carry the line at Princes Street and a bridge to carry Tenters Street over it (all now demolished).

The massive Newton Cap viaduct, measuring 828 feet (252 metres) long with 11 arches, each with a span of 60 feet (18 metres), took the Durham branch line across the valley of the River Wear (Figure 3) north of the town. The branch closed to passenger trains in 1964 and to freight in 1968. The viaduct, however, was saved from demolition and converted to a road bridge in 1993 (the first former rail bridge to be converted to road use in England), and remains a significant and impressive landmark within the landscape. Close to its south end stand two pairs of good quality back-to-back houses, built of brick with stone dressings by the railway company to house its workers in the mid-19th century (Figure 4).


**Figure 4:** Railway cottages at High Bondgate, built as back-to-backs beside the North Eastern Railway.
© Historic England Archive DP290686

This major line had a significant impact on the layout and fabric of the town.

In 1863, the South Durham and Lancashire Union Railway line was extended to Bishop Auckland enabling the transportation of coke from the Durham coalfield westwards to the ironworks of Cumbria and of iron ore from Cumbria to Teesside and Consett, major centres of steel production. Finally, the fourth line to be introduced was the Bishop Auckland and Spennymoor Branch Railway in 1885, extending the Byers Green Branch of the Clarence Railway and passing to the east of the town through Auckland Park, much to the concern of J. B. Lightfoot, the incumbent bishop, who was worried about the views from his windows. Despite his concerns, Bishop Auckland had become an important transport hub by the end of the 19th century (Figure 5).

## Stations and works

With such a vast transport network, a suitably sized goods station was required to handle freight. A small goods station was constructed near to a new railway station (rebuilt in about 1857 to accommodate the two main lines, replaced in the 1960s and again in the 1980s) and is shown on the 1857 map (see Figure 1), and this was expanded later in the 19th century. It was located at the western side of South Road (now Newgate Street) and accommodated cranes, sheds, a weighing machine and a towering signal box (Figure 6). All have since gone and the site is now a supermarket car park.

With such a vast transport network, a suitably sized goods station was required to handle freight.

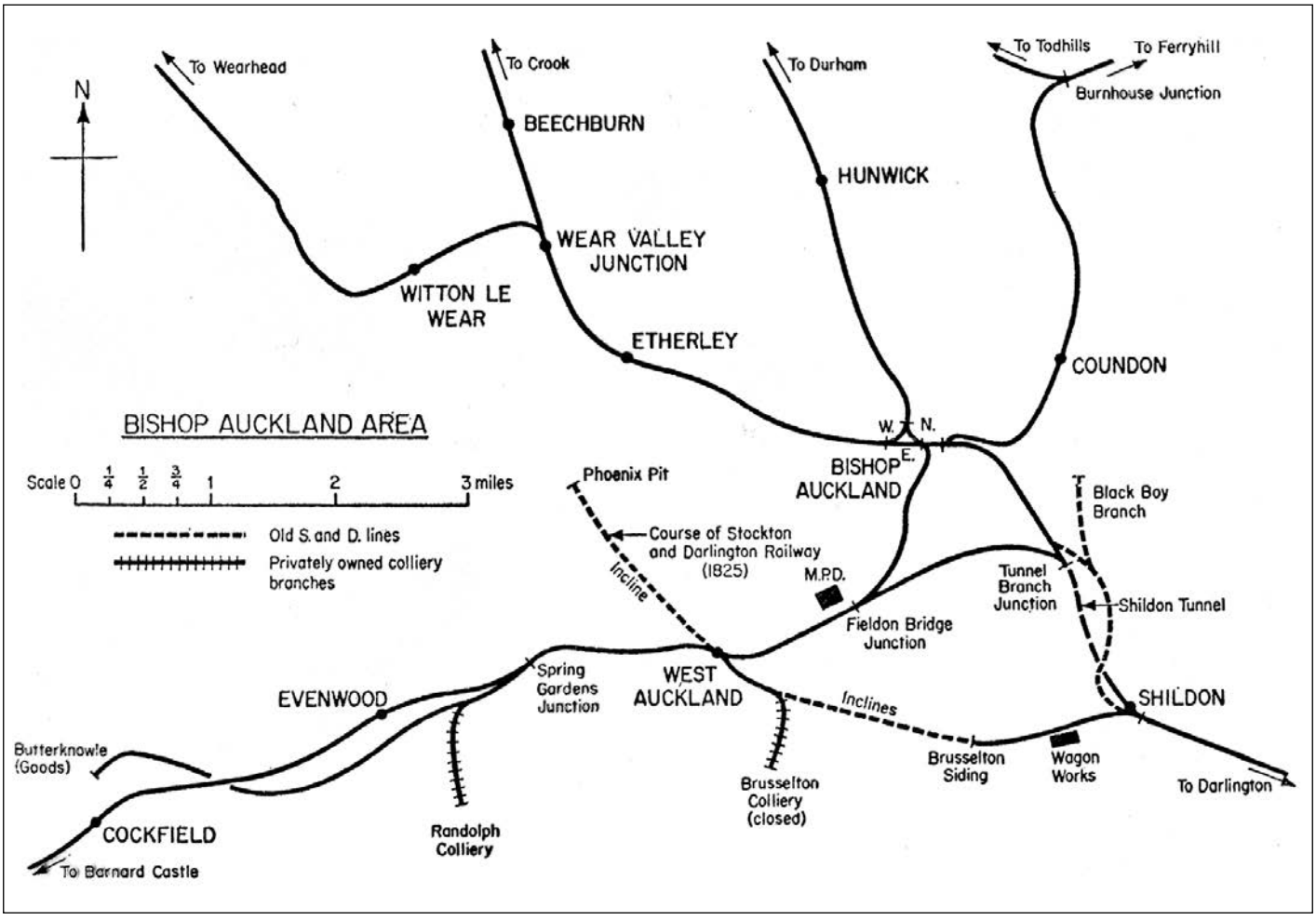


**Figure 5:** Railways in and around Bishop Auckland before the Second World War. Reproduced with kind permission of Tom Hutchinson


**Figure 6:** Reconstruction by Allan T Adams of the industries around the railway interchange at South Road (later Newgate Street) area of Bishop Auckland, about 1920. In the foreground is the large engineering works of Lingfield and Gardiner and Company and in the background is the Goods Station with its extensive marshalling yards and signal box. © Historic England

Industries and businesses gravitated to this transport hub. One of the largest and most successful was Lingford and Gardiner and Company.

Industries and businesses gravitated to this transport hub. One of the largest and most successful was Lingford and Gardiner and Company who acquired a plot of land between Railway Street and Chester Street in 1856. The company was formed by Samuel Lingford and brothers George and John Gardiner in 1861 and specialised in the repair and manufacture of locomotives, colliery hauling and winding engines, boilers and other fittings and parts.

Over the course of 50 years, the works developed to cover a 1.6 hectare site with its own railway spur and level crossing. A new lathe shop, smith's shop and foundry were proposed in 1868. Some of the single-storey brick workshops survive along the south side of Railway Street, and a taller building with central entrance survives to the north, perhaps the former main

**Figure 7:** Former premises of Lingford Gardiner on the south side of Railway Street. © Historic England Archive DP393064

**Figure 8:** Former premises of Lingford Gardiner and Company to the south side of Railway Street. © Historic England

entrance and administrative building (Figure 7 and 8). The complex had expanded massively by 1894 with a series of iron and brass foundries and shops for creating patterns, boilers and engines (Figure 9). The company remained operational until 1931 when the neighbouring engineering firm Robert Wilson and Sons (established in 1842) acquired some of the business and premises. The surviving buildings are today occupied by other small businesses, maintaining the strong industrial character of the area.

## Impact on the wider town

The location of the railway and industry to the south of the old town centre prompted the development of a new residential suburb. Intermixed with the factories and workshops were rows of terraced houses built from the 1840s onwards; these created a bustling and vibrant neighbourhood character that survives today (Figure 10). One of the earliest streets was built by the engineer Thomas Storey and named Flintoff Street after his married daughter, Hannah.

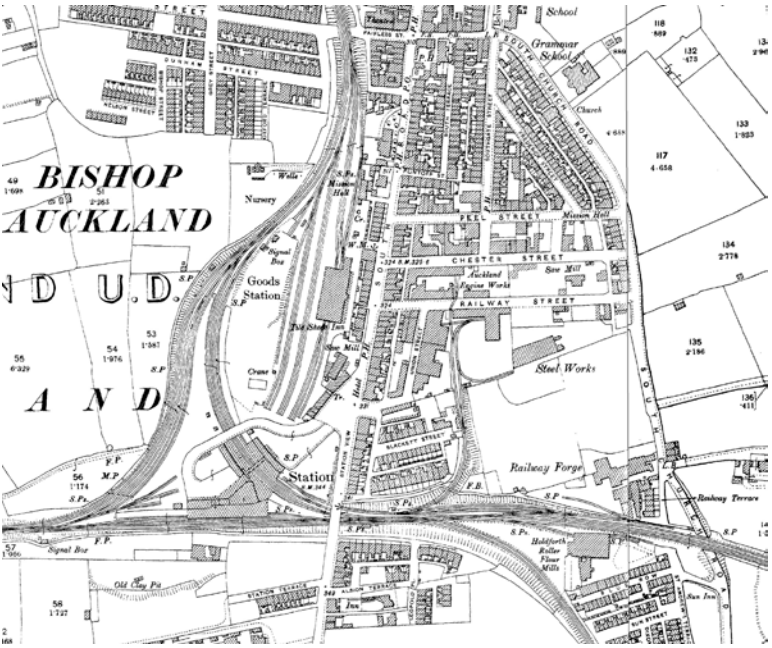


**Figure 9:** Extract from the 1897 Ordnance Survey 25-inch map (surveyed in 1896) showing the well-established industries and railway tracks in the south part of the town. © and database right Crown Copyright and Landmark Information Group Ltd (All rights reserved 2025.) Licence numbers 000394 and TP0024

**Figure 10:** Mural of Stan Laurel, the comedian who lived in Bishop Auckland © Historic England Archive DP393088

Many of the houses in this area were simple back-to-backs comprising a single living room on the ground floor and bedroom above, with shared facilities in a communal yard. Because they were small and became associated with overcrowding and deprivation, most were cleared in the early to mid-20th century and others amalgamated into larger houses with elevations to the front and back.

Older parts of the town were also affected by the rapid industrial development with an increase in population, which led to overcrowding and maximizing building plots with smaller houses and lodging houses. Gradually, as Bishop Auckland became more prosperous and began to also attract professional workers and investors through the late 19th century, larger terraced houses were constructed along with banks, shops and institutional and recreational buildings (Figure 11). This prosperity was largely driven by the railways and the industries it generated.

**Figure 11:** The south side of Market Place at Bishop Auckland showing the former Backhouse and Company Bank (built 1881) in the centre, former Hedley's drapery store (later Doggarts department store) to the right (rebuilt 1871-4) and the King James I School to the left (established in the mid-19th century and refronted in the 1920s). © Historic England Archive DP290645

Bishop Auckland has continually reinvented itself, most recently as a heritage and culture hotspot.

## Bishop Auckland adapts to post-industrial life

Conversely, with the decline of industry in the early 20th century, compounded by the economic depression of the 1930s and the Second World War, the town suffered a period of hardship with high levels of unemployment and poor living conditions. Bishop Auckland shared in the opening up of the Durham coalfield, but only fragments of the historic railway and industrial fabric have survived. However, it is still evident, actually or vestigially, in, for example, the route of modern roads (on former railway lines), the street pattern of industrial housing, and, by association, in the commercial and institutional buildings which transformed the town after the arrival of the railways. Bishop Auckland has continually reinvented itself, most recently as a heritage and culture hotspot with museums and galleries, restaurants, cafes and shops, bolstered by the Heritage Action Zone, a government-sponsored initiative which took place between 2018 and 2023 to target growth in historic places. The great heritage highlight, of course, is the Bishop's Palace, but much of what we see today in the town is explained by coal and the railway.

## About the author

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Architectural Investigator at Historic England

Clare is a buildings archaeologist and architectural historian who has researched and investigated a variety of buildings, sites, landscapes and urbanscapes across her career. She recently co-authored the book Bishop Auckland: The growth of a historic market town, published in 2023.

## Further information

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Celebrating Bishop Auckland Heritage Action Zone https://historicengland.org.uk/whats-new/in-your-area/north-east/celebrating-the-bishop-auckland-heritage-action-zone/

# Curzon Street Station, Birmingham: Past, Present and Future

## The first railway to connect the capital with a major provincial city.

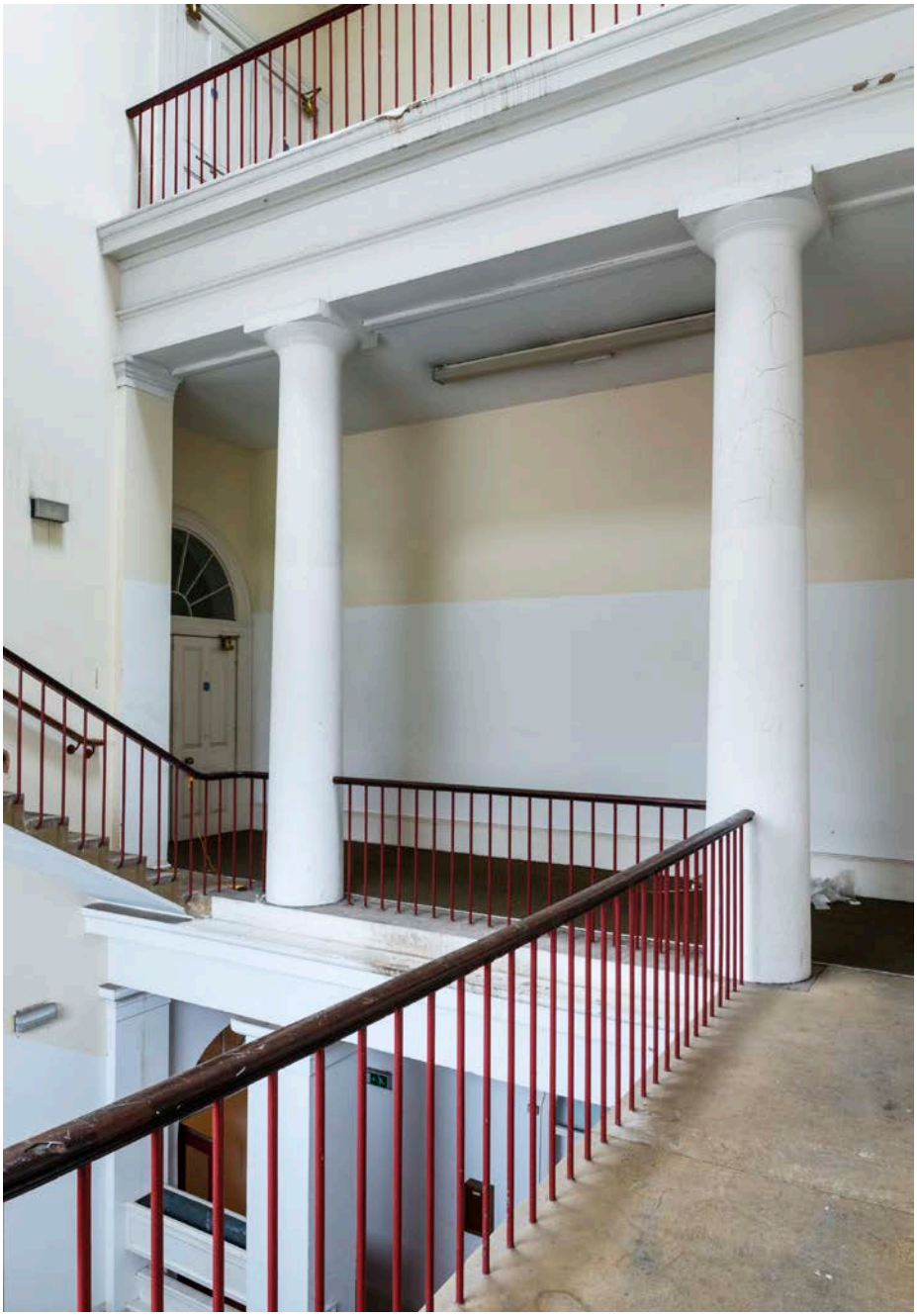
From its origin as the northern passenger terminus of the London & Birmingham Railway (L&BR), the first railway to connect the capital with a major provincial city, to its downgrading as a goods yard, followed by use of part of the site as a Post Office distribution depot and eventually, dereliction, we have seen constant change at Curzon Street over the past 190 years. The decision to site the Birmingham terminal of HS2 there adds yet another layer to the palimpsest.

**Above:** The Principal Building 10 December 2014.
© Historic England Archive DP164909

## The research project

In 2014, in view of the enormous changes that were coming to the area, I was asked to provide an assessment of significance and context of the major surviving structure on the site, the architect Philip Hardwick's celebrated grade 1 listed monumental building of 1838, often referred to as Curzon Street Station, although it was never actually used as such. It is instead a structure, called 'the Principal Building' on Hardwick's plans, intended to act as a frontispiece to the station beyond. I also investigated the other remaining structures at the site including the cut-down remains of the screen walls of the Grand Junction Railway (GJR) station, which connected Birmingham to the Liverpool & Manchester Railway (L&MR) to the north and argued for archaeological investigation to be carried out to see if remains of the stations and locomotive facilities marked on early maps could be traced.

The Principal Building epitomizes just how far railways and the new age they represented had come in merely 13 years since the Stockton & Darlington Railway (S&DR) was opened.



**Above right:** The staircase hall of the Principal Building 10 December 2014. © Historic England Archive DP164924

## The Principal Building

The Principal Building epitomizes just how far railways and the new age they represented had come in merely 13 years since the Stockton & Darlington Railway (S&DR) was opened. It marked the completion of the L&BR (Engineer: Robert Stephenson) and was the companion work to Hardwick's Euston Arch or propylaeum (monumental gateway) which fulfilled a similar symbolic function at the south end of the line. Arguably, now that the Euston 'Arch' has been destroyed, it is the greatest monument to the early railway age, not just for what it is but for what it represents.

It is simply on another level to the relatively functional buildings put up by the S&DR in its earliest years. Contemporary descriptions and Hardwick's drawings (preserved at the National Railway Museum, York) make it clear that it was built as the L&BR company's

offices and boardroom, with a refreshment room on the ground floor. Contemporaries recognised its symbolic role: Arthur Freeling in his Companion to the London & Birmingham Railway, published in 1837, said of the railway 'This is a Roman Work, conceived in a Roman spirit, and accomplished with Roman perseverance and determination'. In such circumstances, only a neo-Classical building on a grand scale was appropriate and the giant Ionic order and austere, well-proportioned entrance hall provide the necessary gravitas.

The building was never used for its intended purpose. Within a year of opening, Hardwick was asked to make alterations to convert it into a hotel and then, in 1841, the L&BR decided to enlarge the hotel portion by adding a north wing by Robert B Dockray, Robert Stephenson's assistant engineer. The wing's elevations, with heavy eaves corbelling, did not visually match those of the Principal Building, and, subsequently seen as an afterthought, it was demolished in the early 1980s.

The Principal Building is owned by Birmingham City Council, and its future use is still under discussion.

The building was never used for its intended purpose.

**Above:** A general view of the Curzon Street site as a goods yard 26 September 1964. © Historic England BB64/02096.

**Above:** The Screen Wall of the GJR Station facing Curzon Street 25 September 1964. © Historic England BB64/02094

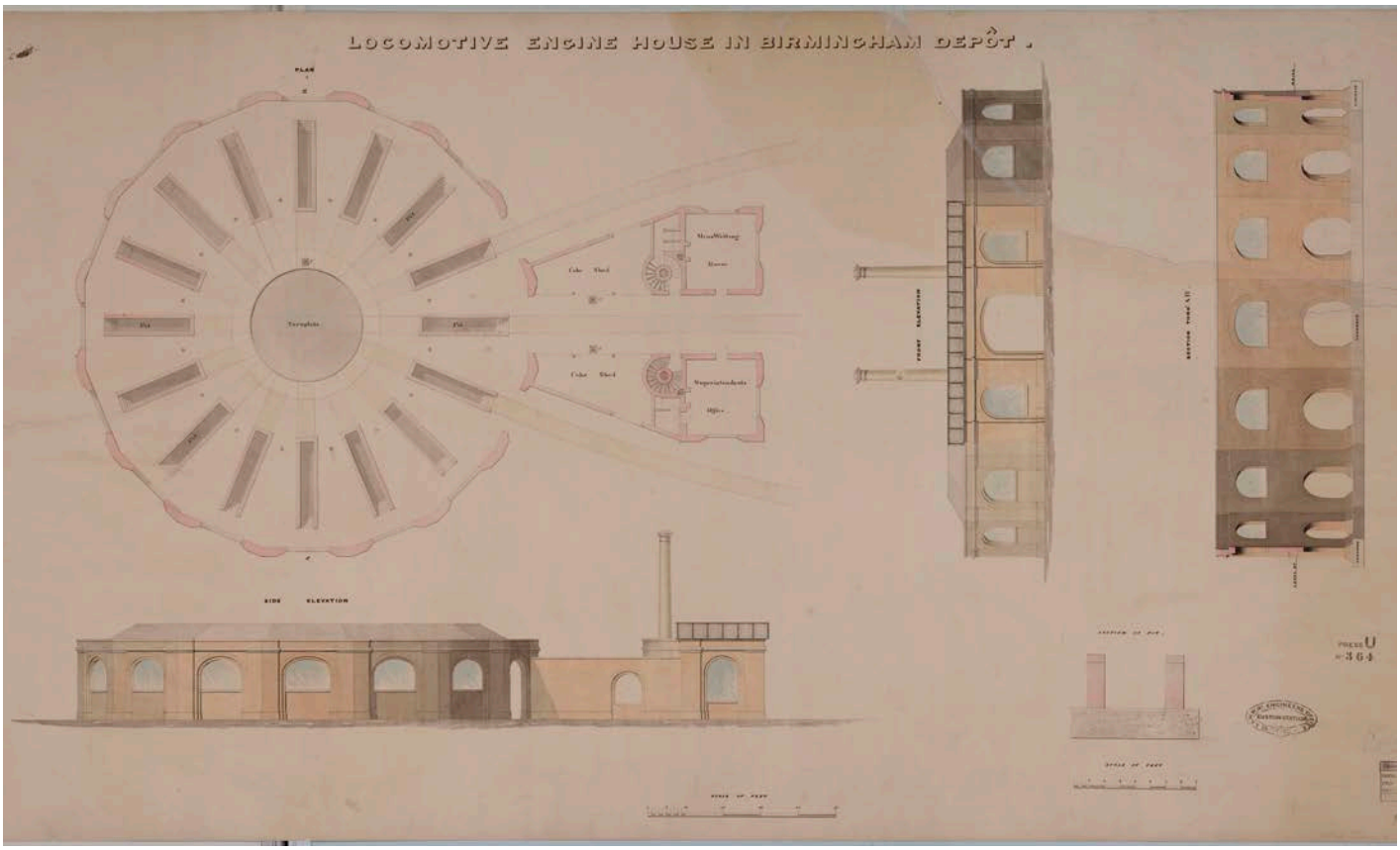
**Above:** The remains of the Screen Wall of the GJR 10 December 2014.
© Historic England Archive DP164955

**Below:** The contract drawings of the Roundhouse, as prepared in Robert Stephenson's office and signed by the engineer Peter Lecount for the L&BR and the contractors, Grissell & Peto, 23 March 1837. Science & Society Picture Library.

## The Roundhouse

The locomotive roundhouse, which was in use on 12 November 1837, is probably the earliest roundhouse to be constructed in the world. It is nearly two years earlier than the other leading contender, the extant North Midland Railway structure of 1839-40 at Derby. The roundhouse form was never as popular in Great Britain as it was in Europe or the United States where it was practically synonymous with housing locomotives. Circular roundhouses rapidly became obsolete due to the increasing size of locomotives while a turntable failure could paralyse the whole facility. Those early structures that have survived were converted to other uses after a relatively short period, such as inclusion in a works at Derby and Stoke-on-Trent or as a store at Camden. Many, like Curzon Street, torn down in 1860, were demolished.

The roundhouse, like the other structures at Curzon Street, is well-documented with Robert Stephenson's plans and elevations surviving. These reveal the roundhouse to be an impressive, albeit small, structure making use of a pumping house (which provided the water for the locomotives) with a large water tank above, flanked by two chimneys to form a grand entrance to it. It was evidently done with an eye to architectural effect as it formed a frontispiece to the building in the same way that the Principal Building did to the station. Again, we are reminded of Stephenson's need to project a sense of grandeur in the works undertaken.



**Above:** The excavated Roundhouse, seen from above. © HS2 Ltd

The remains revealed by the excavations, undertaken in 2020 by MOLA Headland Archaeology on behalf of HS2 Ltd, show precise conformity to Stephenson's plans and consist of the exterior walls, the base of the central turntable and inspection pits under each of the shed's 16 roads, together with the walls of the 1852 extension at the north end of the building. Also revealed were remains of a tunnel from the canal to the roundhouse to enable coke to be transported from boats to a subterranean vault to supply the locomotives. As may be seen in the photographs, the surviving parts are extensive and, since excavation, have been reburied with the intention of preserving them, except for a small portion at the north end where the HS2 viaduct requires deep foundations.

## The station buildings

Very little remained of the L&BR station buildings as successive redevelopment of buildings on the site had removed much of the archaeological evidence. However, much more was discovered about the GJR station. The lower part of its screen wall of the GJR station remains in place and its possible retention is under consideration. The buildings behind the screen wall in the part of the site occupied by the GJR station were all demolished following closure of the goods depot in 1966 but surprisingly substantial remains of the foundations of the GJR station were found following extensive excavation. It became clear that much of the station was re-used when it was relegated to goods use. Departure and arrival platforms, vehicle turntables,

The archaeological work gives us a much clearer understanding of how such early buildings functioned.

stables and the booking office were all revealed, along with evidence of later buildings such as two large grain sheds of 1864 and 1868. The archaeological work gives us a much clearer understanding of how such early buildings functioned as the equivalent station buildings at Euston on the L&BR and the two stations at Liverpool at Crown Street (L&MR) and Lime Street (GJR), all of which were later extensively rebuilt, have never been investigated in this way.

## The legacy of Curzon Street

Taken as a whole, we have had in Curzon Street a remarkable opportunity to investigate an early major railway station complex which can be used to inform the future development of the site. We have learnt much about the internal arrangement of the Principal Building and how it was used, how the GJR station was set out, and discovered the largely intact foundations of what is probably the first locomotive roundhouse in

**Above:** The locomotive stalls and turntable of the Roundhouse. © HS2 Ltd

The Curzon Street complex is therefore, of the highest international significance.

the world. The understanding we have gained from the archaeology and fieldwork at Curzon Street has added substantially to that gained from study of the surviving passenger station and warehouse of the L&MR at Manchester Liverpool Road. In the 1830s, Britain led the world in railway technology, its importance reflected in the neo-classical symbolism implicit in the L&BR's architecture. The Curzon Street complex is therefore, taken together with the extant bridges, viaducts and tunnels of the L&BR and with the remaining infrastructure of the S&DR and L&MR, of the highest international significance as primary evidence of a key aspect of industrialisation, arguably the most fundamental driver for worldwide change in the nineteenth century. That it co-exists with the rail technology of the future is a happy coincidence.

## About the author

**John Minnis FSA**

John is a retired Senior Investigator with Historic England with a special interest in transport buildings. Among his publications are Railway Goods Sheds and Warehouses in England, Britain's Lost Railways, England's Motoring Heritage from the Air and (with Kathryn Morrison) Carscapes: the Motor Car, Architecture and Landscape in England. He has also worked for the Pevsner Architectural Guides.

## Further information

Minnis J, 2015: 'Curzon Street Station, New Canal Street, Birmingham,' **Historic England Research Report Series** 029/2015, https://historicengland.org.uk/research/results/reports/29-2015

Case Study 1 - Curzon Street Round House, Birmingham
Published 29 November 2024
https://historicengland.org.uk/images-books/publications/preserving-archaeological-remains/appdx5-cs1-curzon-street/

MOLA Headland Archaeology Archive at the Archaeological Data Service
https://archaeologydataservice.ac.uk/archives/view/1004530/

# Roundup of our Railway Related Reports, Publications and Guidance

Explore our back catalogue of reports, books and other publications as well as guidance on railway heritage and history.

## Research reports

**New Shildon, County Durham: Historic Area Assessment**
Authors: Lucy Jessop, Richard Pougher

This Historic Area Assessment considers the development and buildings of New Shildon, County Durham, from the foundation of the town in about 1825 to the present day. Its first buildings were constructed when the Stockton & Darlington Railway (S&DR) opened for business, and New Shildon became the home of its railway works for the next 150 years.

https://historicengland.org.uk/research/results/reports/27-2023

**Stockton and Darlington Railway Locomotive-Coaling Stage, Shildon, Co. Durham: Historic Building Investigation and Assessment of Significance**
Authors: Marcus Jecock, Elizabeth Stephens, Gary Young, Matthew Bristow

This report describes the significance and place in railway history of the Shildon locomotive-coaling stage (aka 'Coal Drops'), built by the Stockton & Darlington Railway (S&DR) in early 1847 to improve the re-fuelling times of steam locomotives returning empty coal trains to the company's marshalling yard and engine shed at Shildon before they headed back east to staiths on the River Tees with their next train. It is argued that it represents one of the first attempts - if not the first attempt - in Britain (and given Britain's primacy in railways, possibly the world) to mechanise the process of coaling locomotives.

https://historicengland.org.uk/research/results/reports/75-2022

**Stockton And Darlington Railway Carriage Works, Darlington: Historic Building Investigation and Assessment of Significance**
Author: Purcell Architecture Ltd

The Stockton & Darlington Railway (S&DR) Carriage Works is a Grade II-listed building located on Hopetown Lane, Darlington. This historic building report was commissioned by Historic England for the Stockton & Darlington Railway Heritage Action Zone to inform the development of Darlington's Railway Heritage Quarter Masterplan. The Carriage Works is a rare survival of a building type designed when railway architecture was in its infancy.

https://historicengland.org.uk/research/results/reports/18-2021

**The Road, Rail and Parkland Bridges of Bishop Auckland, Co Durham: an assessment of the historical and archaeological evidence**
Author: Marcus Jecock

This report describes and discusses a corpus of 32 historic road, rail and parkland bridges that lie in and immediately around the town of Bishop Auckland in County Durham. Detailed descriptions and fabric analyses of each of the bridges are presented in gazetteer format, prefaced by a general discussion and overview that attempts to draw out themes, both local and national, in the story of the town's bridges, as well as highlighting significance.

https://historicengland.org.uk/research/results/reports/4-2021

**Heritage Railways and Covid-19: Getting Back on Track**
Author: Marcus Ward

Heritage railways have experienced wide ranging challenges due to the Covid-19 pandemic. However, some have demonstrated notable resilience in face of these difficulties, benefiting from strategies that they have employed themselves or that have been implemented by the heritage railway sector at large. This report highlights a selection of these approaches to discuss their wider applicability across the heritage sector to support resilience to challenges in the future.

https://historicengland.org.uk/research/results/reports/51-2021

**Stockton and Darlington Railway, Soho Works, Shildon, County Durham: Report on Geophysical Surveys, June 2021**
Authors: Neil Linford, Andy Payne

Ground Penetrating Radar fluxgate gradiometer and earth resistance surveys were conducted over the former Stockton and Darlington Railway Soho Works at Shildon, County Durham. The aim of the survey was to investigate the below ground survival of Timothy Hackworth's Soho Works, which developed through the 1830s and 1840s, in the area adjacent to the standing Soho Cottages.

https://historicengland.org.uk/research/results/reports/41-2021

**The Stockton & Darlington Railway Goods Depot, Darlington: Historic Building Investigation and Assessment of Significance**
Author: Purcell Architecture Ltd

This report examines the history, development, function and significance of the Stockton and Darlington Railway (S&DR) Goods Depot at Darlington. It provides: a general history of the North Road site; the historic development and functionality of the Goods Depot building; an analysis of the building and its principal phases; discussion of the building's place in the evolution of goods sheds as a building type; and an assessment of the building's significance.

https://historicengland.org.uk/research/results/reports/19-2021

**The Lime Depot, Hopetown Lane, Darlington: historic building investigation and statement of significance**
Author: Archaeo-Environment Ltd

This report, commissioned by Historic England in 2019, is an historic building investigation and statement of significance of the Lime Depot on Hopetown Lane in Darlington, undertaken in support of the Stockton & Darlington Railway (S&DR) Heritage Action Zone.

https://historicengland.org.uk/research/results/reports/183-2020

**Stockton and Darlington Railway Heritage Action Zone – Aerial Investigation and Mapping**
Author: David Knight

Thousands of historic aerial photographs and visualisations of lidar data were analysed to produce a spatially accurate archaeological map with accompanying records for a 1 kilometre-wide corridor centred on this core network. The study identified and mapped many elements of original railway infrastructure, including bridges, buildings, crossings, embankments, cuttings and trackside boundaries.

https://historicengland.org.uk/research/results/reports/28-2019

**Rosedale Branch East Railway, North Yorkshire: Archaeological survey and investigation of a short section east of the Dale Head embankment**
Authors: Rebecca Pullen, Marcus Jecock

In 2019, Historic England carried out non-intrusive archaeological investigation of the 500 metre-long section of railway between the eastern end of the Dale Head embankment and the embankment to the east of Castle Crag escarpment.

https://historicengland.org.uk/research/results/reports/62-2019

**Western Goods Shed (Barpart House) King's Cross, London**
Author: Jonathan Clarke

The recording of the Western Goods Shed (Barpart House) in November 1998 supplements previous investigations of the King's Cross Goods Yard.

https://historicengland.org.uk/research/results/reports/89-1999

**Midland Goods Shed: King's Cross, London**
Authors: Robyn Burgess, Keith Falconer

This area of the Great Northern Railway's King's Cross Goods Yard contains elements which date from the development of the site in 1850 but all the buildings and structures have been greatly altered, in some cases several times. The central 300 foot long brick building known as the Midland Shed occupies the site, and retains some of the fabric of, Lewis Cubitt's 1850 Carriage Shed, associated with the temporary 1850 passenger station, of which some ironwork also survives.

https://historicengland.org.uk/research/results/reports/86-1999

**Historic Railway Buildings and Structures: overview of development pressure and review of significance**
Author: Rob Kinchin-Smith

The report published in 2017looks at the historic development of the railways and details the potential impact of infrastructure schemes. In the second volume the commissioned consultants give their view of the potential significance of 22 main types of historic railway buildings and structures. The report is supported by maps and a gazetteer.

https://historicengland.org.uk/research/results/reports/72-2016

**20th Century Air-Raid Precaution Railway Control Centres**
Authors: Paul Francis, Paul Bellamy, Graham Crisp

This report was commissioned from leading members of the Airfield Research Group by English Heritage (now Historic England), in order to have a better understanding of 20th century air raid precaution railway control centres in England.

https://historicengland.org.uk/research/results/reports/101-2014

**Early Railways: Review and Summary of Recent Research**
Authors: Neil Cossons, David Gwyn

This study, commissioned by Historic England, reviews the current literature and summarises the wider state of understanding of early railways with a view to recommending future research and publication and to offer guidance on potential designation.

https://historicengland.org.uk/research/results/reports/25-2017

**Curzon Street Station, New Canal Street, Birmingham**
Author: John Minnis

This report, which was produced in response to the proposed siting of the HS2 Birmingham terminal, examines the surviving structures of the London & Birmingham Railway terminus at Curzon Street, Birmingham.

https://historicengland.org.uk/research/results/reports/29-2015

**Railway Signal Boxes: A Review**
Author: John Minnis

This 2012 report provides a national review of signal boxes, both operational Network Rail boxes, and those out of use, on heritage railways, and in museums. It identifies the most significant remaining examples and makes recommendations as to boxes to go forward for assessment for listing.

https://historicengland.org.uk/research/results/reports/28-2012

## Books and other publications

**Britain's Railways in Wartime**
Author: Anthony Lambert
Published 2018

This book pays tribute to the railway men and women and their often heroic responses to the demands of war.

https://historicengland.org.uk/images-books/publications/britains-railways-in-wartime

Readers' Discount
We are pleased to offer Historic England Research Magazine readers a discount code: 27HERESEARCH, for this and other books published together with Liverpool University Press. Enter the code at Liverpool University Press checkout to receive an extra 10% off the Liverpool University press website price (which is itself currently 20% off the Recommended Retail Price) making a reduction of 30% in total.

**England's Railway Heritage from the Air**
Author: Peter Waller
Published 2018

An exploration of England's railway heritage – the history, the buildings, the infrastructure and the changing landscape.

https://historicengland.org.uk/images-books/publications/englands-railway-heritage-from-the-air

**The Railway Goods Shed and Warehouse in England**
Authors: John Minnis, Simon Hickman
Published 2016

Part of the Informed Conservation Series. Provides an accessible overview and introduction to the subject.

https://historicengland.org.uk/images-books/publications/railway-goods-shed-and-warehouse-in-england

**The English Railway Station**
Author: Steven Parissien
Published 2014

An accessible, engaging and comprehensively illustrated general history of the architectural development and social history of the British railway station.

https://historicengland.org.uk/images-books/publications/english-railway-station

**History and Significance of the Great Western Main Line**
Published 2012

This document was produced in connection with the project to electrify the Great Western Main Line from London to Bristol, plus the subsidiary lines from Didcot to Oxford, from Reading to Newbury and via the Severn Tunnel to Cardiff. Its aim was to provide an assessment of the historic buildings and structures along these lines.

https://historicengland.org.uk/images-books/publications/history-significance-gwml

**Great Western Main Line Route Structures Gazetteer**
Published 2012

The purpose of this document was to provide a baseline description and assessment of the significance of every railway structure and building along the lines affected by the Great Western Main Line Electrification Project.

https://historicengland.org.uk/images-books/publications/gwml-gazetteer

**Swindon: The legacy of a railway town**
Authors: John Cattell, Keith Falconer
Published 1995 (out of print)

Examines the building and structures which resulted from the Great Western Railway's development of Swindon Works and traces the architectural history of the engineering works and the associated village.

https://historicengland.org.uk/images-books/publications/swindon-legacy-of-a-railway-town

## Guidance

**Infrastructure - Transport: Listing Selection Guide**
Published 2017

A guide to outline the selection criteria used when listing transport structures. This guide assesses structures associated with all forms of transport. The turnpike and canal systems revolutionised road and water travel, and arguably made the Industrial Revolution possible. Railways are a British invention and their early remains are of international significance.

https://historicengland.org.uk/images-books/publications/dlsg-transport-buildings

**Transport Sites: Scheduling Selection Guide**
Published 2017

A guide to outline the selection criteria used when listing transport structures.

https://cms.historicengland.org.uk/unicorn/preview/?id=97515

**Signal Boxes: Introduction to Heritage Assets**
Published 2016

A short guide to the history and typology of railway signal boxes.

https://historicengland.org.uk/images-books/publications/iha-signal-boxes

**Railway Goods Sheds and Warehouses: Introductions to Heritage Assets**
Published 2016

An overview of the building type from its origins in the late 1820s until the final examples in the 1960s.

https://historicengland.org.uk/images-books/publications/iha-railway-goods-sheds-warehouses

**RESEARCH** magazine

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Web design
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Previous issues of Historic England Research can be viewed online at:
**http://bit.ly/HEresearchbackissues**

ISSN: 2058-1858

Product Code: HE0091



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