Archive of drawings and plans of Scottish civil engineer Thomas Grainger for making railways in Yorkshire 1846-50

[Dimensions approximate. Descriptions provisional. All contemporary documents]

Professor Paxton, preparer of this draft listing, acquired these exceptionally interesting and detailed Grainger drawings and plans in bulk from William Morrison of Carfrae & Morrison, Civil Engineers, 4 Hill St., Edinburgh, at the firm's closure in 1978. Possibly acquired by Carfrae & Morrison in c.1855 when interested in expanding their railway engineering work. The drawings and plans are not listed in the firm's 'List' in Heriot-Watt University Archives, where Carfrae & Morrison's records now complement the comprehensive collection of instruments curated at the University by the Institution of Civil Engineers Scotland Museum.



Thomas Grainger 1794-1852Sir John Watson Gordon fecitBy courtesy of ICE Scotland Museum, Heriot-Watt University.



Grainger's signature on D232. About 70 drawings bear either his signature/initials or his Resident Engineers

D151 Leeds & Dewsbury Railway. **Proposed plan of line from Leeds to Dewsbury and Huddersfield**. [1845-50]. Scale c.13in to 1 mile. This copy is signed by **J. Henderson** Resident Engineer and shows various alterations in red ink. 22ftx18in. Roll with cont. cloth outer cover with title in gilt. Includes Ravenswharf Viaduct and Morley Tunnel.



D150 Leeds & Dewsbury Railway. **Branches**. 1845. Engraved plan Leeds to Mirfield. Scale c.13in. to 1 mile showing branch lines. This copy is signed by **J. Henderson** Resident Engineer and indicates an alteration at Leeds in red ink. 132x15in. Roll with cont. green morocco outer cover and gilt title.



- D245A Leeds & Bradford Railway. Contract drawing No. 7. Stiles, Culverts and Drains. Plans, elevations and sections. 39x27in, Undated, but c.1846 [watermark 1844].
- D260 Leeds Central Station [1846-7] Tracing of station and track layout in various ink colours, scale 30ft to1in. 58x24in. Undated.
- D261 Sketch Plan for a Central Station at Leeds. Oct. 1846. 40x25in. Includes Monk Bridge and streets, houses &c.
- D262 Leeds Central Station [1847] Drawing, 18 Feb 1847. Proposed elevation and plan. Fully coloured. 52x21in. From Grainger & Miller's office, 16 Castle St. Edinburgh. It is on record that a scale model of this ambitious proposal existed, perhaps made by E. Salter artist, Hammersmith, who modelled Ravenswharfe Viaduct. It may not have survived.



Part of drawing illustrated below



- D159 Leeds, Dewsbury & Manchester Railway [1847-8]. General Plan [and section] of Leeds Station [temporary at Wellington St.] Coloured. 46x24in. From 119 George St. Edinburgh. [another Grainger Office?]. Jan. 1848. Station elevated on timber framework with an approach viaduct of 24 timber spans. The railway opened on 31 July 1848 with trains terminating at Wellington St. temporary station close to where Central Station was to be built.
- D160 Leeds Temporary Station. Elevations, plans, sections. Waiting Rooms &c. 4 Sept 1847. 38x24in. From 119 George St., Edinburgh.
- D161 **Leeds Temporary Station**. Ibid. 37x26in, design further developed. Edinburgh 17 Nov. 1847. Attractive coloured presentation.
- D162 **Leeds Temporary Station**. Gate for Road to Station Ground. Leeds. 28 July 1848. 20x16in. Coloured. Plan, elevation and section.
- D163 Leeds Temporary Station. Sketch of temporary road viaduct. 1 Feb. 1849. 32x14in. With 3 coloured sections. Signed J. Henderson Resident Engineer.





D163A Leeds Temporary Station. Similar to D163. 24x12in. Signed J. Henderson Resident Engineer.

ch of mile to

- D164 Leeds Temporary Station. Sketch of Elevation of the Leeds Viaduct. 16x16in. Elevation, plan and section. Partly coloured. Signed J. H[enderson] Resident Engineer.
- D164A Leeds Station Turn Table Foundations. 30 June 1848. 25x23in. initialled J. H[enderson] RE.
- D165 Leeds Station Goods Shed with Turntable. [1848?]. 52x27in.
- D165A Leeds Station Temporary timber viaduct to be erected across the station ground at Leeds. From Grainger's Edinburgh office, Oct. 1847. 126x12in. Elevation and sections. Finely detailed. Partly coloured. Specification separate.



D165B Ground Plan of Leeds Goods Station. Coloured plan of corrugated iron roof [1848?] 19x13in.

- D165C Leeds Goods Station. Cross-section of A-B showing roof detail with ventilator.
- D165D Leeds Goods Station. Ibid, but for cross-section C-D.
- D165E Leeds Goods Station ibid but for cross-section E-F. Labelled on outside 'Corrugated Iron Roof for Goods Station by Morton & Co. Leeds'.
- D165F Temporary Goods Shed to be erected at **Leeds Station**. June 27th 1848. 36x19in. Drawn on linen backed paper. Coloured.

D165G Temporary Goods Shed to be erected at **Leeds Station**. July 18th 1848. 26x23in. Coloured.



D165H Leeds Goods Station Another similar drawing [in pencil]. 32x25in.

D100 Leeds, Dewsbury & Manchester and West Riding Union Railways. Leeds Viaduct. 31 March 1847. Initialled J. H[enderson, Resident Engineer]. 144x26in, contract drawing on linen. Scale: 10ft to 1in. Starts at left with a trussed cast iron beam bridge of 65ft span over the Leeds and Bradford Railway then 16 masonry arches 35ft span, 68ft span cast iron arch, 2 masonry arches and a 105ft masonry span over the R. Aire. Elevation and sections. Initialled T. G[rainger] at left.

- D100A Leeds Viaduct External Elevation of a Masonry Arch [dentelles, pilasters, enlargements of detail &c.] No title or date [watermark Whatman 1845]. 27x45in. Probably related to D100.
- D101 Leeds, Dewsbury & Manchester and West Riding Union Railways. Leeds Viaduct. 13 August 1847. Detailed drawing of interior work. Scale 5ft to an inch. 102x21in. Linen-backed contract drawing. Coloured. Signed Thomas Grainger, Engineer. Shows crossings of the Leeds & Liverpool Canal and R. Aire by 68ft and 105ft span crossings.
- D230 Leeds Viaduct. Abutments of girder bridge on the Leeds & Bradford and Leeds & Thirsk Railways. Initialled J. H[enderson, RE]. Signed Thomas Grainger [Engineer], 30 June 1847. 58x21in. Linen-backed contract drawing, partly coloured.
- D231 Leeds Viaduct. Signed by Thomas Grainger. 13 August 1847. 36x21in. Elevation showing the 105ft and 75ft masonry spans over the Aire and Leeds & Liverpool Canal. As built?
- D232 Leeds Viaduct. Signed by Thomas Grainger. [1847]. 38x26in. Details of Ironwork for Bridge over Bradford Railway. Partly coloured. An instructive exemplification of contemporary practice.



D233 Leeds Viaduct. Do. Do. Sheet 2. Signed by Thomas Grainger.

- D233A L. D. & M. Rly. Titled in Henderson's hand. 'Details of [skew] Girder Bridge [c.70ft span] over the Leeds & Bradford and Leeds & Thirsk Railways. 1 February 1848. J.H.'. Coloured. Signed 'Leeds 19 February 1848. Thos. Grainger, Engineer. 25x38in.With a wealth of ironwork detail.
- D234 Leeds Viaduct. Plan of Foundations of South Abutment of River Arch. 20x17in. Shows grillage of 11ft timber piles at 3ft centres. Pile shoes. Sectional elevation coloured. Signed by Grainger.
- D235 Leeds Viaduct. Sketch of Centering for River Arch [1847, Watermark: Whatman 1846] 30x22in. Elevation and plan. Partly coloured.

- D137 Leeds, Dewsbury and Manchester Railway. **Churwell Extension Contract.** Footbridge near Peg 15. Scale 6ft to 1 inch. Signed **Thomas Grainger**, Engineer, Leeds.4 July 1847. 28x24in. Partly coloured. 3 span timber bridge trussed with wrought iron rods. [temporarily mislaid]
- D103 Leeds, Dewsbury and Manchester Railway. **Churwell Extension Contract**? Masonry of Bridge over Wellington Lane. Signed **Thomas Grainger**, Engineer, Leeds. **J. Henderson** Resident Engineer. 24 July 1847. 28x24in. Partly coloured. Cast iron girder bridge.
- D104 Leeds, Dewsbury and Manchester Railway. **Churwell Extension Contract**. Plan of Spence Lane Bridge as executed. Signed **J. Henderson** Resident Engineer. 8 Sept.1848. 30x24in. Partly coloured. A masonry underbridge.
- D152 Leeds, Dewsbury & Manchester and West Riding Union Railways. Leeds and Birstall Turnpike
 Road Viaduct Ground Plan Sheet 1. Signed Thomas Grainger, Engineer. Leeds. 24 July 1847.
 57x24in. 2 bridges side by side skew 39° spans 63ft & 57ft. Linen backed, coloured. Office
 Copy.
- D105 Leeds & Dewsbury Railway. Centering for Skew Bridge over the Leeds & Birstall Road. Scale 6ft to 1in. 24x16in. Initialled J. H[enderson RE]. 7 Oct 1847. For a skew arch of 65ft span.
- D106 Leeds & Dewsbury Railway. Oblique Bridge over Leeds & Birstall Road. Scale 6ft to 1in.
 32x21in. Signed Tho. Grainger Engineer, J. Henderson Resident Engineer. Partly coloured.
 Masonry, 63ft 2in span.
- D107 Leeds, Dewsbury & Manchester Railway. Occupation Bridge on Mr. Shackleton's Property.
 34x25in. Signed by Thomas Grainger Engineer & J. Henderson Res. Eng. Leeds 24 July 1847.
 Cast iron girders 16ft long.
- D108 Leeds & Dewsbury Railway. **View of Timber Viaduct near Leeds**. Taken from the Whitehall Road. 26 April 1848. 17x12in. **Watercolour**, unsigned. An attractive image of this multi-span viaduct, men at work &c.
- D109 Leeds & Dewsbury Railway. Churwell Contract. Details of Ironwork for Bridge 2b [Wellington Lane]. Signed by Thomas Grainger Engineer & J. Henderson RE]. Leeds 24 July 1847. 37x25in.
- D153 Leeds & Dewsbury Railway. Churwell Contract. Details of Ironwork for Bridge 1b. Signed by Thomas Grainger Engineer. Leeds 29 August 1848. Partly coloured. Linen backed. Detailed sections &c. for ironwork, beams, parapets &c.
- D154 Leeds & Dewsbury Railway. **Churwell Viaduct as executed.** Signed **J. Henderson** Resident Engineer. 29 Aug. 1848. 36x22in. Partly coloured. Elevations and sections of this masonry viaduct of six 40ft spans.
- D110 Leeds, Dewsbury & Manchester Railway. Churwell Viaduct. Drawing No.3. Signed W.
 McCandlish. Leeds. 14 March 1846. 38x25in. Partly coloured. Showing 6 elliptical masonry arches of 40ft span.
- D111 Leeds, Dewsbury & Manchester Railway. **Churwell Viaduct. Drawing No.4.** Signed **W. McCandlish**. Leeds. 14 March 1846. Partly coloured. 25x17in. A masonry elliptical arch.
- D112 Leeds, Dewsbury & Manchester Railway. **Churwell Contract. Drawing No.9, Culverts 2 and 3.** Signed **W. McCandlish**. Leeds. 14 March 1846. 28x19in. Partly coloured. Mason work.
- D113 Leeds, Dewsbury & Manchester Railway. **Churwell Contract. Drawing No.7, Bridge 4.** Signed **W. McCandlish**. Leeds. 14 March 1846. 28x19in. Partly coloured. Mason work.

- D114 Leeds, Dewsbury & Manchester Railway. **Churwell Contract. Drawing No.8, Culvert 1.** Signed **W. McCandlish**. Leeds. 14 March 1846. 28x19in. Partly coloured. Mason work.
- D115 Leeds, Dewsbury & Manchester Railway. **Churwell Contract. Drawing No.6, Bridge 3.** Signed **W. McCandlish**. Leeds. 14 March 1846. 27x21in. Partly coloured. Oblique arch in masonry.
- D116 Leeds, Dewsbury & Manchester Railway. Churwell Contract. Occupation Bridge at Peg 33. Leeds. [1846] 27x19in. Coloured. Masonry.
- D117 Leeds, Dewsbury & Manchester Railway. **Churwell Contract** [untitled similar to D116] Leeds. [1846]. 27x21in.
- D118 Leeds, Dewsbury & Manchester Railway. Churwell Contract. Drawing No.9, Culvert No.3. Elevation, plan and section. Signed J. Henderson Resident Engineer, and Thos. Grainger Engineer 24 July 1847. 18x16in. Partly coloured.
- D119 Leeds, Dewsbury & Manchester Railway. Churwell Contract, Drawing No. 9, Culverts 2 and 3. Signed Wm. McCandlish 14 March 1846. 18x15in. Partly coloured.
- D120 Leeds, Dewsbury & Manchester Railway. **Churwell Contract. Drawing No.6a, Bridge No.3a** Signed J. Henderson Resident Engineer, **Thos. Grainger** Engineer 24 July 1847. 38x24in. Partly coloured.
- D121 Leeds, Dewsbury & Manchester Railway. Churwell Contract. Footbridge near Peg 15. Signed J. Henderson. 1848. 26x18in. Three span.
- D122 Leeds, Dewsbury & Manchester Railway. Churwell Contract. Sketch of Hand Gates at Copley Mill. [1847] 11x10in. Coloured.
- D123 Leeds, Dewsbury & Manchester Railway. **Churwell Contract. Occupation Bridge at Peg 33.** Signed J. Henderson Resident Engineer, **Thos. Grainger** Engineer [1847]. 27x24in. Partly coloured. Three-span masonry.
- D124 Leeds, Dewsbury & Manchester Railway. Churwell Contract. North West Wing of Skew Bridge over the Birstall Turnpike Road. [1847] 26x17in. Partly coloured.
- D125 Leeds, Dewsbury & Manchester Railway. **Churwell Contract. Drawing No.5, Bridge No.2.** 1846. 30x24in. Partly coloured.
- D126/D137? Leeds, Dewsbury & Manchester Railway. **Churwell Contract. Footbridge near Peg 15, 1847.** Signed by **Thomas Grainger**. Leeds 24 July 1847. 28x23in. Partly coloured. Three span timber, wrought iron trusses.
- D127 Leeds, Dewsbury & Manchester Railway. Churwell Contract. Drawing No.8, Culverts 24 Oct.
 1846. Signed J. Henderson Resident Engineer, Thos. Grainger Engineer, Leeds. 24 July 1847.
 29x21in. Partly coloured. With manuscript notes and estimates.
- D136 Leeds, Dewsbury & Manchester Railway. **Birstall Branch Contract. Drawing No.5, Bridge No.4.** 1847. 38x24in. Coloured.
- D138 Leeds, Dewsbury & Manchester Railway. **Birstall Branch Contract. Drawing No.9, Culverts and** Level Crossings. 1847. 40x25. Linen backed. Coloured. Cast iron girder 25ft span.
- D139A Leeds, Dewsbury & Manchester Railway. **Birstall Branch Contract. Drawing No.5, Bridge 4.** 1847. 22x17in. Cast iron girder 25ft span.

- D139B Leeds, Dewsbury & Manchester Railway. Birstall Branch Contract. Drawing No.6, Bridge No.6. 1847. Initialled. 38x25in. Masonry arch.
- D139C Leeds, Dewsbury & Manchester Railway. Birstall Branch Contract. Drawing No.9, Culverts, Level Crossings &c.1847. 25x21in.
- D139D Leeds, Dewsbury & Manchester Railway. **Birstall Branch Contract. Drawing No.7, Bridge No.6.** 40x25in. **Initialled.** Coloured. Cast iron girder.
- D139E Leeds, Dewsbury & Manchester Railway. Birstall Branch Contract. Drawing No.8, Bridge No.7. 1847. 45x20in, Initialled. 28ft cast iron girder.
- D139F Leeds, Dewsbury & Manchester Railway. **Birstall Branch Contract. Drawing No.4, Bridge No.3.** 1847. 40x25in. **Initialled**. 25ft span masonry arch.
- D139G Leeds, Dewsbury & Manchester Railway. **Birstall Branch Contract. Drawing No.1, Bridges 1** and 2. 1847. 37x23in. Initialled. 27ft-29ft-27ft timber.
- D148 Leeds, Dewsbury & Manchester Railway. Original design for **Leeds Aqueduct**. c. 1846. Not executed. Linen backed. 20ft long? Four-span girder viaduct over the Leeds & Bradford Railway.
- D149 Leeds, Dewsbury & Manchester Railway. Another similar drawing.
- D155 Leeds, Dewsbury & Manchester Railway. Cross-section of **Permanent Way shewing Dwarf and Curb Walls.** October 1846. Scale 3ft to 1 in. Initialled J. H[enderson] Resident Engineer. 12x9in. Coloured.
- D156 Leeds, Dewsbury & Manchester Railway. **Proposed Drift of Flood Arch thro' Nortley Bank.** December 1848. Initialled **J. H**[enderson] Resident Engineer. 20x18in.
- D157 Leeds, Dewsbury & Manchester Railway and West Riding Union Railway. Footbridge [tunnel] under Embankment. 23 Sept 1847. Initialled by J. H[enderson] RE and Thomas Grainger Engineer. 30x25in. Partly coloured.
- D137 Leeds, Dewsbury & Manchester Railway. **Dewsbury Contract. Drawing No.9, Bridge 5**. 1846. Manuscript note 'Girder to be cast 46ft W.J.C.'. 37x24in. This design seems to have influenced that shown on D136 [check].
- D237A Leeds, Dewsbury & Manchester Railway. **Dewsbury Contract. Drawing No.5, Bridge No.1.** [1846]. 30x21in. Partly coloured. Masonry arch 13ft span.
- D237B Leeds, Dewsbury & Manchester Railway. **Dewsbury Contract. Drawing No.6, Bridge No.2.** [1846]. 36x26in. Masonry arch 28ft span.
- D237C Leeds, Dewsbury & Manchester Railway. **Dewsbury Contract. Drawing No.5, Bridge No.1.** [1846]. 31x24in. Masonry arch 12ft span.
- D237D Leeds, Dewsbury & Manchester Railway. **Dewsbury Contract. Drawing No.10, Bridges 6 & 8.** 1846. 37x25in. Cast iron girder. 12ft span.
- D237E Leeds, Dewsbury & Manchester Railway. **Dewsbury Contract. Drawing No.11, Bridge 7.** 1846. Masonry arch 35ft span. [check measurement].
- D237F Leeds, Dewsbury & Manchester Railway. **Dewsbury Contract. Drawing No.7, Bridge 3.** 1846. 35x24in. Masonry arch 37ft span.

- D237G Leeds, Dewsbury & Manchester Railway. **Dewsbury Contract. Drawing No.12, Bridge No.9.** [1846]. 30x24in. Masonry arch 12ft span.
- D237H Leeds, Dewsbury & Manchester Railway. **Dewsbury Contract.** Drawing No.8, Bridge No.4. [1846]. 37x25in. Cast iron skew girder.
- D237J Leeds, Dewsbury & Manchester Railway. **Dewsbury Contract. Drawing No.11, Bridge No.7.** [1846]. 34x25in. Elliptical masonry arch 25ft span.
- D237K Leeds, Dewsbury & Manchester Railway. Dewsbury Contract? No.6 Occupation Bridge at Peg 10. 22 October 1847. Signed by J. Henderson & Thomas Grainger. 23x21in.
- D166 Leeds, Dewsbury & Manchester Railway. **Plan of Engine Shops at Copley Hill** [1848] 78x16in. Initialled **J. Henderson** Resident Engineer. Partly coloured. With buildings, track, turntable, Bridge over Copley Hill Lane and tracks leading to Leeds Station.
- D167 Leeds, Dewsbury & Manchester Railway. Copley Hill. Plan of Engine Shed. 38x23in. Coloured plan, elevation and sections. Dated from Grainger's Edinburgh Office, 119 George St., Jan. 1848.
- D168 Leeds, Dewsbury & Manchester Railway. **Details of Workshops Copley Hill.** 36x23in. Coloured. Double timber and wrought iron strap roof truss for the **Repairing, Smithy and Turning Shops**. Dated from Grainger's Edinburgh Office, 119 George St. January 1848.
- D169 Leeds, Dewsbury & Manchester Railway. **Details of Iron Work on Roof of Engine Shed** [1848] 39x26in. Wrought iron truss of 42ft span.
- D170 Leeds, Dewsbury & Manchester Railway. **Plan of Roof for Extension of Engine Shed at Copley Hill.** 28x22in. Coloured. Holograph title and initialled note by **J. Henderson** R.E., 10 August 1849.
- D171 Leeds, Dewsbury & Manchester Railway. Plan of Engineman's Room, Store Room and Office at Copley Hill. [1848]. 30x22in. [description as for D168] [check]
- D172 Leeds, Dewsbury & Manchester Railway. Plan of House for Signal Man and Platelayer at Copley Hill. [1848]. 20x12in. Coloured. Elevations, plan and section.
- D173 Leeds, Dewsbury & Manchester Railway. Furnace in the Engine Shed at Copley Hill. 14x9in. Drawn and initialled by J. Henderson, Resident Engineer 17 August 1848.
- D174 Leeds, Dewsbury & Manchester Railway. **Coke Shed at Copley Hill.** 29x16in. Coloured. [drawn by **Henderson?**] With bracket detail and water point for locomotives. 2 January 1849.
- D175 Leeds, Dewsbury & Manchester Railway. **Plan of Engine Pits at Copley Hill** [1848/49]. 14x9in. Coloured. Details of rails, pit, drain &c.
- D176 Leeds, Dewsbury & Manchester Railway. Design for **four-span masonry bridge** over R. Aire? [c.1846]. 23x13in. Coloured. Elevation and foundation plan for a 210ft long bridge - paved inverts.
- D177 Leeds, Dewsbury & Manchester Railway. James Dredge Suspension Bridge Design. 23x13in. Coloured. Elevation and plan for a bridge over a river with 175ft main span and 40ft side spans.
- D178 Leeds & Manchester Railway via Wakefield. **Footbridge near Horbury Station** [c.1837]. 26x21in. Coloured. Timber arch footbridge of 70ft span over 55ft cutting. 4 ribs at 3ft centres

with rise of 4³/₄ft at the crown. Designer T.L. Gooch. Modelled on Mr. Bull's Calder Bridge design.

- D179 Leeds & Manchester Railway via Wakefield. **Footbridge over the River Calder at Mirfield erected by Mr. Hull.** [c.1835]. 27x22in. Coloured. Timber 147½ft low-rise span. Influenced Horbury Station Footbridge design [by Gooch?] [with]
- D179A L[ancashire] & Y[orkshire] Railway/**Timber Viaduct over the River Calder** [c.1837]. 25x19in. erected 1838 [watermark 1836]. Gooch, Engineer? Elevation and section. 12 spans of 30ft.
- D236 Leeds & Manchester Railway. Dewsbury Contract (Extension). **Drawing No.5. Bridge No.3 over Calder & Hebble Canal near Ravens Wharf. 1846.** 52x26in. Ink [mainly black]. Part background colour indicative of that featuring on a fully coloured copy. Longitudinal elevation and section, transverse sections and plan of half of bridge. Scale: 5ft. to 1in. Cast iron skew arch with two 100ft. spans [5-element]. Pronounced angle of skew 41½° which was remarkable nationally. Illegible signature bottom edge left. Ms. 'August 19th 1846' [in Grainger's hand?]. Endorsed 'Scroll Copy'. Bridge still in service. A contemporary, finely executed, model exists in the National Museum of Scotland [M/Model: T.1883.66] made by Hammersmith artist E. Salter, probably commissioned by Grainger.



Viaduct over the River Calder at Ravenwarfe on the Leeds, Dewsbury & Manchester Railway Thomas Grainger Esq. Engineer. Modelled by E. Salter, Hammersmith. ©Nat. Mus. Scotland



D178R Leeds, Dewsbury & Manchester Railway. Dewsbury Contract. **Drawing No.4. Bridge No.2 over River Calder** [Ravenswharfe not mentioned but presumably not far away]. 70x29in. Ink [mainly black]. Part background colour indicative of that featuring on a fully coloured copy. Longitudinal elevation and section, transverse sections and plan of half of bridge. Scale: 5ft. to 1in. Linen backed. Twin cast iron skew arches of 100 ft. span [80 ft. on the square] with a skew angle of 56°. A remarkable bridge erected 1848 [contractor Joseph Butler]. Bridge still in service. [The following notes have been gleaned from Wikipedia for background to the next 11 drawings]

Morley Tunnel nearly two mile long is situated between Morley and Batley railway stations on the Leeds-Manchester main line. Work started in 1845, with the first stone being laid at the Batley end of the tunnel in 1846 by John Gott, Esq., who marked the occasion by a speech and handing over £50 to the workmen to contribute to their enjoyment. The mallet and the trowel used to lay the first stone were engraved with the coat of arms of Mr. Gott and the inscription: '*Presented by the contractors of the Morley tunnel to John Gott, Esq., chairman of the Leeds, Dewsbury, and Manchester Railway, on the occasion of laying the first stone of that work. Feb. 23rd, 1846*'. A plate on the stone reads: 'This, the first stone of the Morley tunnel of the Leeds, *Dewsbury, and Manchester Railway, was laid by the chairman, John Gott, Esq., of Armley, near Leeds, on Monday, 23rd February, 1846. Directors, Christopher Beckett, Thomas Benyon, Joseph Brook, William Brown, Thomas Cooke, James Garth Marshall, David Nell, and Thomas Starkey.* **Thomas Granger, engineer. Jones and Pickering, contractors**'.

The tunnel was completed in 1848, when the last keystone was placed at the Morley end of the tunnel by **Mr**. **Granger**, the principal engineer, providing a much-needed trans-Pennine link. During construction 23 working shafts were sunk in addition to the 4 permanent vent/construction shafts still in use today at Town End, Hopewell Farm, America Moor and Howley Park. At one time, men worked at 48 different points along the length of the tunnel. This was made possible by using steam engines to lower men down the working shafts to the level of the tunnel and raising stone and clay to the surface. To construct the tunnel, 11 powerful steam engines, 15 double horse gins, 2000 men and 350 horses were used, and the work caused a huge change to the landscape, particularly near Morley Low station, where a huge cutting had to be excavated and the valley stream had to be culverted. At its deepest point the tunnel is 400 feet below ground level. It is almost level throughout except for a slight gradient to allow for drainage.



Morley Tunnel. - sepia photo from 'Sport & General' [part of colln]

The tunnel is 26 feet (7.9 m) high and 26 feet wide to accommodate two tracks. Along its course tons of sandstone and clay were excavated and raised to the surface via construction shafts and dumped on spoil

heaps, two of which were by the Townend shaft on South Queen Street and Melbourne Street. St Pauls Church, which stands on South Queen Street, was known as "the church on the spoil heap", as the hill it stands on is not a natural hill but the spoil heap of Morley Railway Tunnel. Much of the sandstone brought to the surface was used as building material. Now it is owned by *Network Rail* used locally by *Northern Rail* and, by *First Trans Pennine Express* for long distance services between Leeds and Manchester Piccadilly.

Grainger was also the engineer for the Bramhope Tunnel 2.138 miles (3.441 km) long, now owned by Network Rail. It was constructed during 1845–1849 for the Leeds Northern Railway and East and West Yorkshire Junction Railway, which together later became the North Eastern Railway, and was notable for its length and crenellated north portal [Grade II listed]. The deaths of 24 men during its construction were commemorated in Otley churchyard with a castellated replica of the portal. The Tunnel was constructed by contractor James Bray, a Leeds iron and brass founder, who had previously constructed the Thackley Tunnel, Bradford. He set up two sighting towers and 20 shafts along the line of the tunnel from which it was dug. Its grand opening was on 9 July 1849 and the final cost £2,150,313. The foundation stone was laid at the bottom of No. 1 airshaft in July 1846 and the separate diggings from the shafts joined up into one long tunnel on 27 November 1848. The castellated north portal when finished was lived in for a while by railway workers. The finished tunnel is 25.5 feet (7.8 m) wide by 25 feet (7.6 m) high with a gradient of 1 in 94. At its deepest point it is 290 feet (88 m) below the surface. The first train went through on 31 May 1849 carrying railway officials, and pulled by Bray's locomotive Stephenson. Possibly up to 2,300 navvies plus their families, with 400 horses were brought in for the work said to include 188 guarrymen, 102 stonemasons, 732 tunnel men, 738 labourers and 18 carpenters. They lived in 200 wooden bothies with their families in a field opposite Bramhope cemetery, and 100 more along the tunnel length. Four shafts remain for ventilation. They measure 40 feet (12 m) by 30 feet (9.1 m) wider than the tunnel itself. A sighting tower remains opposite Bramhope cemetery. It is of 2m diameter with four vertical slits near the top and is Grade II listed. The Southern Portal is a plain sandstone horseshoe-shaped arch with rusticated voussoirs below a cornice and parapet. It is approached by a slightly curved 300-metre cutting faced with retaining walls of sandstone with a concave batter.0 The Gothic north portal was said to have been built to please the landowner William Rhodes who wanted to use one of the towers as a belvedere. The keystone features a portrait of a bearded man said to resemble Rhodes. No drawings in this list relate to this tunnel. The following 21 drawings relate to the Morley contract including the tunnel.



North portal in 2007



Sighting tower

Grainger was also the engineer for Scotland St. Tunnel on the Edinburgh Northern Line, by 1850, the first railway ferry across the River Forth [Granton-Burntisland] to Perth and Dundee. This tunnel built from 1844-47 still exists, although now disused. It is 3210 ft long on a gradient of 1 in 27 up which a stationary steam engine hauled trains to Waverley Station, Edinburgh. It was bypassed in 1868].

- D238 Leeds, Dewsbury & Manchester Railway. Morley Tunnel [The principal work on this line, 3,370 yards long, completed 3 May 1848 having taken only 21 months to build. Morley Contract
 Drawing No.4. Tunnel Entrance and Permanent Shaft. 1846. 39x26in. Linen backed. Coloured. Tunnel partly elliptical in cross-section, 25ft wide and 23ft high at the centre.
- D239 Leeds, Dewsbury & Manchester Railway. Morley Tunnel. Old Drawing of Tunnel Section.
 1845. 29x21in. Linen backed. Coloured. Completed by J. Allen, Leeds 20 Jany 1847. Received by H. R[enton RE], Morley 22 Jany 1847.

- D240 Leeds, Dewsbury & Manchester Railway. Morley Tunnel. Altered Drawing of No.3 Tunnel Section. 1846. 29x25in. Coloured. Completed by J. Allen, Leeds 20 Jany 1847. Received by H. R[enton RE], Morley 22 Jany 1847.
- D241 Leeds, Dewsbury & Manchester Railway. **Morley Tunnel. Drawing No.4. Tunnel Entrance and Vertical Shaft.** 1838. 28x22in. Similar to D238 but uncoloured and not linen backed.
- D242 Leeds, Dewsbury & Manchester Railway. Morley Tunnel. Diagram of Mr. Watson's Well showing the Pumps &c. – Those coloured have been put in by the Company. [c. 1846, watermark 1845]. 25x18in. Part coloured. Shows part of interior of Watson's Mill and the Well.
- D243 Leeds, Dewsbury & Manchester Railway. Plan of Railway at North End of Morley Tunnel showing proposed Roads on the Estate of Lord Dartmouth [May 1849]. 26x17in. Coloured. Holograph title by J. Henderson [RE].
- D244 Leeds, Dewsbury & Manchester Railway. Morley Contract. Altered Drawing of No.3 Tunnel Section. 1846. 25x16in. Coloured.
- D245 Leeds, Dewsbury & Manchester Railway. **Morley Contract. Design for Tunnel Entrance.** From Grainger's Edinburgh Office, 119 George St. Decr. 1847. 25x18in. Received by **H. R[enton]** RE.



- D246 Leeds, Dewsbury & Manchester Railway. Morley Contract. Tunnel Entrance and Vertical Shaft. 1846. 24x15in. Coloured.
- D250 Leeds, Dewsbury & Manchester Railway. **Morley Contract. Drawing no.7, Bridge under Railway No.4.** 1845. 28x19in. Elevation, plan and sections for a masonry bridge.

- D251 Leeds, Dewsbury & Manchester Railway. Morley Contract. Morley Station. Elevation and plan of proposed temporary approaches to the platform. 27 June 1848. 26x20in. Coloured. Two pencilled notes by H. Renton, Resident Engineer.
- D252 Leeds, Dewsbury & Manchester Railway. **Morley Contract. Morley Station.** Similar to D251 but with a section through the platform and canopy. Initialled **H. R**[enton RE] Morley, 27 June 1848.
- D253 Leeds, Dewsbury & Manchester Railway. **Morley Contract. Plan of part of wooden bridge at Morley Station** showing position [and elevation] of intended gate. 26x17in. Coloured. Note: "to be done immediately" initialled **H. R**[enton RE], Morley, 8 Sept. 1848.
- D254 Leeds, Dewsbury & Manchester Railway. Morley Contract. Drawing No.10, Guard Plate for Surface Crossing, Culverts &c. 1846. 24x18in. With rail and chair section.
- D255 Leeds, Dewsbury & Manchester Railway. **Morley Contract. Drawing No.6. Bridge No.2.** 1846. 28x19in. Masonry.
- D256 Leeds, Dewsbury & Manchester Railway. **Morley Contract. Drawing No. 9, Aqueduct.** 1846. 32x26in. Partly coloured. Wrought iron 28ft span 30ft above the rails.
- D257 Leeds, Dewsbury & Manchester Railway. **Morley Contract. Drawing No.11, Bridge No.5.** 1846. 27x21in. Notes initialled by **H. R** [enton RE].
- D258 Leeds, Dewsbury & Manchester Railway. **Morley Contract. Drawing No.7, Bridge 3.** 1846. 26x20in. Partly coloured. Masonry.
- D259 Leeds, Dewsbury & Manchester Railway. **Morley Contract. Drawing No.5, Bridge 1.** 1846. 24x21in. Masonry.
- D259A Leeds, Dewsbury & Manchester Railway. **Morley Contract. Morley Station Footbridge.** 12x11in. Initialled **H. R** [enton RE], Morley 27 June 1848. Sections.
- D259B Leeds, Dewsbury & Manchester Railway. **Morley Contract.** Morley Station. **Gates for Foot Passengers**. 15x10in. Ms. note: "Eight of these gates to be made immediately", initialled **H. R**[enton RE], Morley 1 Sept. 1848.
- D266/D267 Leeds, Dewsbury & Manchester Railway. Drawings connected with Model of a Skew Bridge. One showing the method of construction and the other a development of a masonry skew arch showing courses. [c.1846] 27x27in. and 36x17in & irregular.
- D130 London & North Western Railway Leeds & Thirsk Railway Junction. Plan of Signal and Pointsman's House. 28x26in. Coloured. Initialled J. H [enderson RE] 7 July 1849. Plan, elevation and sections of Signal Box with lever and linkages to points and signals.
- D131 London & North Western Railway Leeds & Thirsk Railway Junction?. Branch to join Midland
 Railway at Leeds. Drawing No.5. Bridge over the Leeds and Birstall Turnpike Road. [c.1850].
 Elevation and sections of wrought iron lattice skew bridge 69ft span. Note initialled by J.
 H[enderson RE] that this design was abandoned in favour of a wrought iron box girder.
- D132 London & North Western Railway Leeds & Thirsk Railway Junction? Leeds Junction Contract.
 Bridge over the Leeds and Birstall Turnpike Road. Details of Ironwork. 39x26in. Coloured.
 Note initialled by J. H[enderson RE]. 16 Feby 1850. 72ft span with a 32° skew.

- D133 London & North Western Railway Leeds & Thirsk Railway Junction? Branch to join Midland
 Railway at Leeds. Drawing No.2, Bridge over the Leeds & Whitehall Turnpike. [c.1850].
 35x25in. Wrought iron box girder on 52° skew.
- D134 London & North Western Railway Leeds & Thirsk Railway Junction? Branch to join Midland Railway at Leeds. Drawing No.5, Bridge over the Leeds & Whitehall [Birstall?] Turnpike. [c.1850]. 40x26in. Coloured. Box girder construction.
- D135 London & North Western Railway Leeds & Thirsk Railway Junction? Bridge [skew] over
 Leeds & Birstall Turnpike Road. 38x26in. Partly coloured. Initialled J. H[enderson RE], 17 Oct.
 1849 with note that the design was abandoned in favour of wrought iron box girder construction.
- D135A London & North Western Railway Leeds & Thirsk Railway Junction? Bridge over Spence Lane. 37x25in. Coloured. Initialled J. H[enderson RE], 29 January 1850. Cast iron girder.
- D135B London & North Western Railway Leeds & Thirsk Railway Junction? Branch to join Midland Railway at Leeds. Bridge over the Leeds & Birstall Turnpike Road. 38x25in. Coloured. Initialled J. [Henderson RE], 17 Octr 1849 with note 'Superseded'.
- D135C London & North Western Railway Leeds & Thirsk Railway Junction? Branch to join Midland Railway at Leeds. Bridge over the Leeds & Birstall Turnpike Road. General Plan Birstall Road Bridge [girder]. [c.1849]. 38x25in. Partly coloured. Not lettered. 61ft span.
- D135D London & North Western Railway Leeds & Thirsk Railway Junction? Branch to join Midland Railway at Leeds. Bridge over the Leeds & Birstall Turnpike Road. c. 1849. [girder 69ft span]. Coloured. Dust marked. Note initialled by J. H[enderson RE] that design was abandoned for a wrought iron box girder. [check size?].
- D135E London & North Western Railway Leeds & Thirsk Railway Junction? Cut out for skew design D135D. c. 1849. 34x18in.
- D135F London & North Western Railway Leeds & Thirsk Railway Junction? Section of joint chair for junction of bridge rail with common rail. Full size. c. 1849. 29x21in.
- D135G London & North Western Railway Leeds & Thirsk Railway Junction? Drawing No.7. c. 1849 38x25in. Drain. Retaining walls, gate, fence, dwarf wall &c.
- D135H London & North Western Railway Leeds & Thirsk Railway Junction? Plan of Alterations at Shackleton's Bridge [girder]. c. 1849. Coloured.
- D135J London & North Western Railway Leeds & Thirsk Railway Junction? Cattle arch under embankment. Drawing No.3. c. 1849. 33x22in. Partly coloured.
- D135K London & North Western Railway **Leeds & Thirsk Railway Junction? Pointsman's House at Copley Hill.** 29x18in. Partly coloured. Initialled J. H[enderson RE], 23 July 1850. Plans. Elevations and sections including distance signal levers, signal post &c.
- D125.London & North Western Railway Leeds & Dewsbury Section. Branch to join Midland Railway at Leeds. Plan of alterations at Shackleton's Bridge. [1850]. 28x21in. Coloured. Cast iron girder bridge. [temporarily mislaid].
- D126.London & North Western Railway Leeds & Dewsbury Section. Leeds Junction Contract. Bridge over Spence Lane. Altered Drawing No.6. 36x25in. Coloured. Initialled J. H [enderson RE], 29 January 1850. Cast iron girder bridge with wrought iron tension bolts. [temporarily mislaid].

- D158 London & North Western Railway Leeds Junction Contract. Leeds and Whitehall Turnpike Road Bridge. 37x25in. Coloured. Initialled J. H[enderson RE], 11 June 1850. Wrought iron box girders 54ft long by 3½ ft deep.
- D263 London & North Western Railway Leeds, Dewsbury & Manchester? Railway Stations c.1848 [watermark 1846]. Plan and elevations for a Fourth Class Station ... Doncaster [Moffat]. 26x19in. Partly coloured.
- D264 London & North Western Railway Leeds, Dewsbury & Manchester? Plan and elevations for a Third Class Station ... Doncaster [Moffat]. June 3rd 1848. 26x20in. Partly coloured.
- D265 London & North Western Railway Leeds, Dewsbury & Manchester? Plan and elevations for a Third Class Station ... Doncaster [Moffat] 3 June1848. 26x20in. Entrance and platform elevations.
- 2928/25 Leeds, Dewsbury & Manchester Railway. Railway Wheels. 3 ft. diameter and 9 Arms. Gauge 4 ft. 8½ in. J.F. Masser Lithographer, Leeds [c. 1845]. 26x21in. Shows bearing axles and section and elevation of wheel. Scale: 3in to 1ft.
- 2928/25A Leeds, Dewsbury & Manchester Railway. Coal Wagon. Elevations ad plan. Scale: 1in to 1ft. Lithograph. 31x24in.



2928/26 Plan of Central Leeds showing town layout with station sites heightened by hand colouring. [Scale: c. 25 in to 1mile], J.S. Masser Lithog., Leeds [c. 1845]. 40x27in. Ruled border. Neat manuscript additions presumably by Grainger's staff relating to proposed stations and railways.



Part of SW corner of plan

- D195 F. & B. Railway. Accommodation Bridge under Line. Iron beams and footpaths' 1864. 14x22in. Hand coloured drawing.
- 2928/21g Leeds and Thirsk Railway. Third Class Carriage. Elevation and Plan. 38x25in. A. Ritchie Lith. Edinr. Scale: 1 in to 1ft. [c.1845].
- 2928/21j Leeds and Thirsk Railway? Third Class Carriage. Side Elevation. 25x18in. [c.1845] Ms. Signed 'Brown Marshall & Co. Builders, Birmingham'.



- 2928/21k Leeds and Thirsk Railway? Plan of Third Class Carriage to seat 56 passengers. Signed 'Brown Marshall & Co. Builders, Birmingham'. 25x18in. Lithograph.
- 2928/23 Shipley & Colne Railway. Lithographed contract drawing for Gates[2], Stiles[2] and post and rail fencing. c. 1845. 38x27in.
- 2928/27 Shipley & Colne Railway. Lithographed contract drawing [no. 3]. Comprising plans and sections for Surface Crossings of Roads on the square and skew. c. 1845. 39x26in.
- [D600] Six finely detailed tracings of different rolling stock with the maker's *Adams & Co. Fairfield Works* stamp on each [example below] 26x21in and similar.



Number of signatures or initials of engineers on the drawings [to be checked].

Thomas Grainger, Engineer	22
W. McAndlish RE [1846]	7
J. Henderson RE [1847-50]	38
H. Renton RE	9

Roland Paxton 22.3.2023