Historic England

Greater Manchester

Building Stones of England

The Building Stones of England

England's rich architectural heritage owes much to the great variety of stones used in buildings and other structures. The building stones commonly reflect the local geology, imparting local distinctiveness to historic towns, villages and rural landscapes.

Historic England and the British Geological Survey (BGS), working with local geologists and historic buildings experts, have compiled the Building Stones Database for England to identify important building stones, where they came from and potential alternative sources for repairs and new construction.

Drawing on this research, plus BGS publications and fieldwork, guides like this one have been produced for each English county. The guides are aimed at mineral planners, building conservation advisers, architects and surveyors, and those assessing townscapes and countryside character. The guides will also be of interest if you want to find out more about local buildings, natural history, and landscapes.

This guide is based on original research and text by Chantal Fletcher and Mark Fletcher (Matrix Archaeology).

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Front cover: Drill Hall, Bury. Fletcher Bank Grit. © Allan Hartley / Alamy Stock Photo.

How to Use this Guide

Each guide describes the local building stones in their geological timescale order, starting with the oldest layers through to the youngest. The guide ends with examples of other notable building stones from other parts of England and further afield.

Geological time periods, groups, formations and building stones

Each building stone is listed under the relevant geological timescale, group and formation. A formation may be divided into members and where relevant these are referenced in individual building stone sections.

Middle Jurassic
↑— geological time period

Inferior Oolite Group, Lincolnshire Limestone Formation
↑— geological group ↑— geological formation

Lincolnshire Limestone
↑— building stone (alternative or local name)

Bedrock geology map and stratigraphic table

To help you with the geology of the area, there is a bedrock geology map and a stratigraphic table which shows the layers of rocks and the associated building stones in this geological timescale, group, formation order.

Page numbers for each building stone are included in the stratigraphic table for ease of reference. The page numbers are inverted to correspond with the geological age order.

Contents list

If you click on the page number for a building stone in the Contents list, you will go straight to the relevant section in the guide.

Building stone sources and building examples

A companion spreadsheet to this guide provides:

- More examples of buildings. Information is included on building type, date, architectural style, building stone source, and listed/ scheduled status
- A list of known (active and ceased) building stone sources such as quarries, mines, pits and delphs
- Additional information on building stones including lithology, grain size, sedimentary structures, key identification features, and notes on failure/weathering, and use.

The Building Stone GIS map allows you to search the Building Stones Database for England for:

- A building stone type in an area
- Details on individual mapped buildings or stone sources
- Potential sources of building stone sources within a given proximity of a stone building or area
- Buildings or stone sources in individual mineral planning authority area.

Further Reading, Online Resources and Contacts

The guide includes geological and building stone references for the area. A separate guide is provided on general Further Reading, Online Resources and Contacts.

Glossary

The guides include many geological terms. A separate Glossary explaining these terms is provided to be used alongside the guides.

The guides use the BGS lexicon of named rock units.

Mineral and local planning authorities

This guide covers the Greater Manchester metropolitan county and the combined authority area, and the Bolton Council, Bury Council, Manchester City Council, Oldham Council, Rochdale Metropolitan Borough Council, Salford City Council, Stockport Council, Tameside Council, Trafford Council and Wigan mineral and local planning authority areas.

Contents

1 Introduction

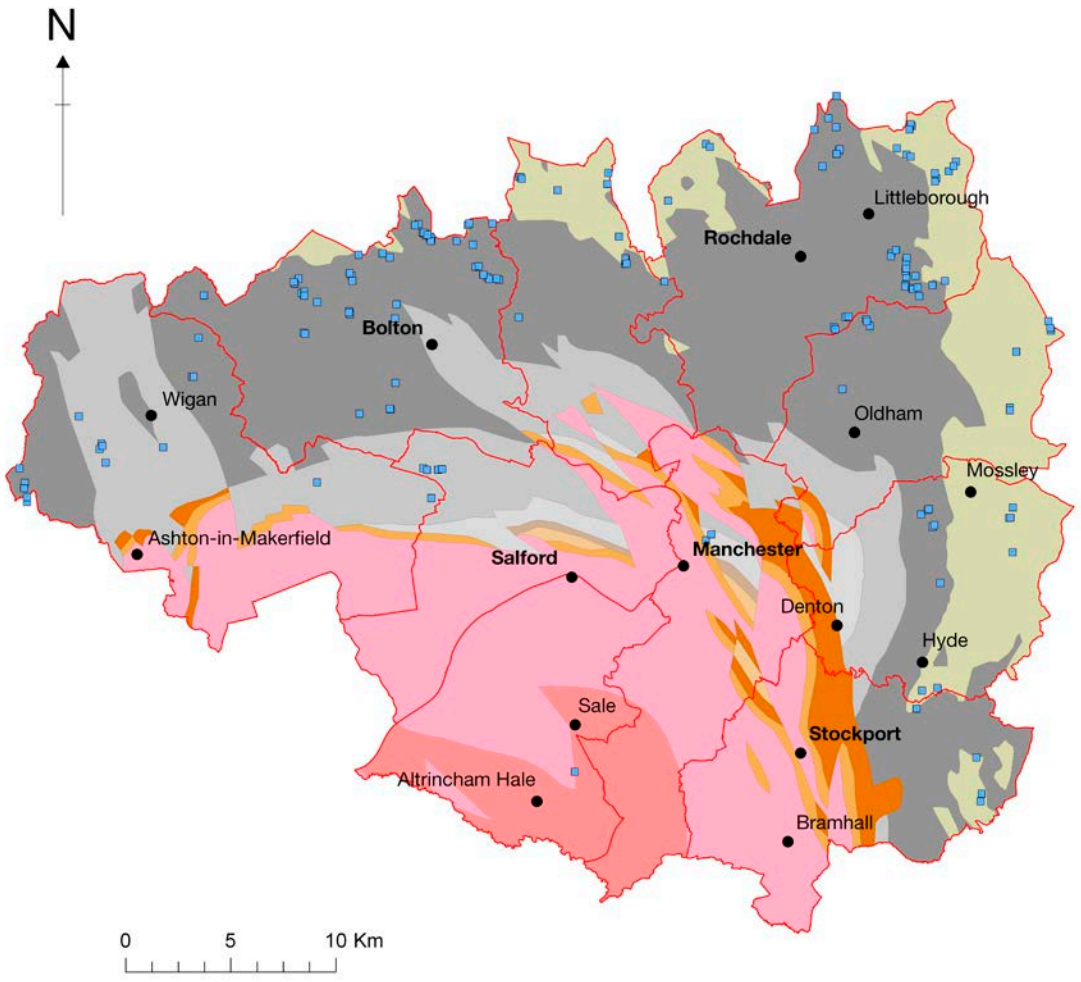
The building stones of Greater Manchester fall into three well-defined groups, both stratigraphically and geographically.

The oldest building stones are derived from the upper section of the Carboniferous Namurian Millstone Grit Group. These rocks are exposed within the denuded core of the Rossendale Anticline (the northern part of the area) and also within the core of the main Pennine Anticline (the eastern part of the area). Within this group, the rock strata tend to be gently inclined or horizontally bedded, and the sharp relief—coupled with lack of drift overburden—led to large-scale exploitation of the sandstones, especially in areas adjacent to turnpike roads.

Exposed on the flanks of the Rossendale and Pennine Anticlines are the younger rocks of the Pennine Coal Measures Group. The outcrop of this group forms the exposed Lancashire Coalfield, which extends in a great arc from Wigan in the north-west, through Bolton, Bury, Rochdale and Oldham, to Manchester and Stockport in the east. Surface exposures are limited to higher ground, where the Pleistocene boulder clays are absent, and deep river valleys, where erosion has cut away later drift deposits. The youngest rocks in the area are the Permian and Triassic sandstones and mudstones of the north Cheshire Basin. These underlie Manchester city centre, Salford and Altrincham, although surface exposures are mainly limited to river valleys due to the great thickness of the overlying Quaternary deposits. Although more easily quarried thanks to their softer natures, these Permo-Triassic rocks tended to be used much less frequently than the older, harder Carboniferous sandstones. This is because of their lower compressive strength and their tendency to weather more easily.

Manchester itself, and the ring of industrial towns that surround it, grew rapidly during the 18th and 19th centuries, consuming prodigious quantities of local stone for buildings, pavements and roads. As a result, the area contains a fairly sharp distinction between a built environment of Carboniferous sandstone within the Pennine foothills to the north and east, and urban areas almost wholly brick-built to the south and west. Because of rapacious demand during the mid to late 19th century—resulting in rapid exhaustion of local stone sources, and perhaps allied to architectural tastes—stone began to be brought in via railway and canal networks from more distant sources, such as Cumbria, Yorkshire, Derbyshire and Staffordshire. During the late 20th century and the 21st century, a considerable amount of new stone construction, or conservation repair, occurred. However, a lack of active quarries led to the import of dimension stone from outside the area.

Bedrock Geology Map



Key

Building stone sources

Bedrock geology

- Triassic Rocks — mudstone, siltstone and sandstone
- Triassic Rocks — sandstone and conglomerate, interbedded
- Permian Rocks—mudstone, siltstone and sandstone
- Permian Rocks—sandstone and conglomerate, interbedded
- Pennine Upper Coal Measures Formation—mudstone, siltstone, sandstone, coal, ironstone and ferricrete
- Pennine Middle Coal Measures Formation and South Wales Middle Coal Measures Formation
- Warwickshire Group—mudstone, siltstone, sandstone, coal, ironstone and ferricrete
- Warwickshire Group—siltstone and sandstone with subordinate mudstone
- Pennine Lower Coal Measures Formation and South Wales Lower Coal Measures Formation
- Millstone Grit Group—mudstone, siltstone and sandstone

Stratigraphic Table

Geological timescale	Groups	Formations	Building stones	Page
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		Chester Pebble Beds Formation	Chester Pebble Beds (Bunter Sandstone)	16
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		Marsden Formation	Holcombe Brook Grit Huddersfield White Rock Fletcher Bank Grit (Midgley Grit, Gorpley Grit, Pule Hill Grit, Revidge Grit) Readycon Dean Flags	6 6 5 5
		Hebden Formation	Upper and Lower Kinderscout Grits	4

Building stones in geological order from the oldest through to the youngest layers.

2 Local Building Stones

Carboniferous

Millstone Grit Group, Hebden Formation

Upper and Lower Kinderscout Grits

The Lower and Upper Kinderscout Grits underlie much of the high moorland on the eastern margin of the area, including the impressive escarpments at Blackstone Edge (Rochdale), Saddleworth Moor (Oldham) and Hollingworthall Moor (Stalybridge). They are of great thickness at the last two locations. These gritstones are a grey, coarse-grained, feldspar-rich pebbly sandstone. Gritstone is still extracted for aggregate at Buckton Vale, near Stalybridge, but previously it was worked for ashlar, sills, lintels, steps and thralls, as well as for monumental stone and gravestone bases. Carrbrook at Mossley and the villages around Saddleworth are largely constructed of this type of sandstone. At Blackstone Edge, the sandstone was quarried for mill engine beds. It was used in the Wellington Mill (now the Hat Works Museum) and Wellington Bridge in Stockport. The sandstone was also employed as plinth material for fine Victorian buildings in Manchester city centre, below facades of more exotic or finer grained building stone.

Although much harder to work than other sandstones, coarse-grained gritstones, generally, are less affected by weathering due to their high proportion of quartz. In older vernacular buildings, gritstone was employed for critical details, where greater strength was needed, such as for quoins, mullions, drip moulds, and window and door surrounds. Softer local sandstones were used for walls. The development of a mechanical saw—allegedly at Haigh Hall, Wigan, in about 1820, and then refined by James and George Hunter of Arbroath during the 1840s—enabled the use of gritstones, and their resilience made them ideal for decorative detail in large structures such as churches and public buildings. In addition to mill engine beds, the gritstones were sourced for gearing walls and chimneys as they have considerable compressive and shear strengths. Gritstone setts (commonly, but mistakenly, described as ‘granite setts’) and kerb stones became common in urban areas for street layouts, where iron wheel rims and horses’ iron-shod hooves would have damaged softer materials.

There are massive beds of gritstones in the Pennines. Many villages appear to have been wholly constructed of these sandstones, which gives the villages a distinctive and visually attractive appearance.

Millstone Grit Group, Marsden Formation

Readycon Dean Flags

The Readycon Dean Flags have limited exposure in the Denshaw area of Oldham, but they have been more widely used for building stone in West Yorkshire. The sandstone is characteristically fine grained and flaggy, with ganister-like layers and interbedding with layers of siltstone. A bluish tint is seen on fresh unweathered faces. This material has been used for flagstone, and was quarried and probably employed in the construction of Readycon Dean Reservoir.

Fletcher Bank Grit (Midgley Grit, Gorpley Grit, Pule Hill Grit, and Revidge Grit)

The Fletcher Bank Grit (also known as Midgley, Gorpley, Pule Hill or Revidge Grits) has been employed extensively within the upper Irwell Valley, in particular. The mill towns of Ramsbottom and Bury contain a significant number of buildings of this sandstone. It is grey, medium to coarse grained, massively bedded and cross-bedded.

The architect John Harper of York used Fletcher Bank Grit to construct a triumvirate of local churches (All Saints, St Marie and St Paul). The steeple and tower of St Mary's Church, Bury, part of Manchester Cathedral, and the whole of All Saints' Church, Stand, were erected in Fletcher Bank Grit, too. This sandstone is still extracted on a large scale from the fault-bounded inlier at Fletcher Bank Quarry, near Ramsbottom.

Figure 1: All Saints' Church, Stand. Fletcher Bank Grit.

Figure 2: Brooksbottom Mill, Summerseat. Fletcher Bank Grit used for quoins and window surrounds.

Huddersfield White Rock

The Huddersfield White Rock crops out in the northern and eastern margins of Greater Manchester. It was earlier thought to be the equivalent of the Holcombe Brook Grit, so there may be some exposures where the names were used synonymously. Exposures within Greater Manchester can be more variable in colour than those from outcrops in West Yorkshire, with many sandstones being grey rather than white. The Huddersfield White Rock can also be variable in its character, with some quarries yielding a massive sandstone and others showing a fine-grained, flaggy rock. It has been quarried for ashlar, sills, setts, kerbs and flags.

Holcombe Brook Grit

The Holcombe Brook Grit can be very variable in character, ranging from massive and thickly bedded to fine grained and flaggy. There are often shale partings towards the top. It has been used as a building stone within Greater Manchester for ashlar, sills, setts and kerb stones.

Millstone Grit Group, Rossendale Formation

Lower and Upper Haslingden Flags

The Lower and Upper Haslingden Flags have been quarried (and occasionally mined) on the moorland plateau to the north-west of Rochdale (at Ding Quarry). The flag seams are, respectively, 10 to 15m and 30m thick. These pale buff to pale grey fine sandstones are very hard, but the presence of micaceous material allows them to be split easily. This means they are used

extensively as paving slabs and roofing slates. The latter are characterised by the diminishing flagstone courses typical of traditional Pennine farmstead roofs, with the largest slabs at the eaves. These might equal a metre in length.

The flags ceased to be worked locally for roofing after Welsh slate began to be imported via the canal network. Thin rectangular flags were also used as parpen stones (passing through walls from side to side) at the Civic Hall, Ramsbottom, and at St Mary's Church, Hawkshaw.

Rough Rock (Birtle Stone)

The Rough Rock Sandstone occurs in extensive exposures on the high Pennine moorlands in the north and east of the area, where it has been extensively quarried. It is coarse grained, feldspar rich, iron stained and well jointed and often contains pebbles of quartz. Unlike many of the other sandstones in the area, which can be very variable in character, the Rough Rock is fairly consistent. However, there are areas, such as the Whitworth Valley, north of Rochdale, where it is not well cemented and becomes friable. The resulting porosity negates its value as a building stone, because it makes it susceptible to frost action. Where the Rough Rock is well cemented, it makes a good building stone and it has been used to produce ashlar, sills, lintels and steps.

Rough Rock was quarried along the steep scarp above Holcombe village, and also at Walmersley, Baldingstone, Birtle and Ashworth Moor, near Bury. Birtle Stone was used for St John the Baptist Church at Bircle (1845-6), which actually stands within part of the quarry, and also at St Thomas' Church near Bury.

As a strong durable rock, Rough Rock has been employed in reservoir construction, such as at Ogden Reservoir in Rochdale, and for road construction as setts and kerbs. It was also extensively used for drystone walling close to the rockhead outcrop, with the 18th century parliamentary Enclosure Acts increasing the local demand for this stone. Settlements

Figure 3: St John the Baptist Church, Bircle. Rough Rock.

on Werneth Low, between Hyde and Romiley, were built from Rough Rock Sandstone, also known here as Old Mother Rock. Many of the old quarries are still visible.

Pennine Lower Coal Measures Group, Pennine Lower Coal Measures Formation

Ousel Nest Grit

The lowest productive unit of this group comprises the Ousel Nest Grit, which occurs in faulted blocks within the west part of the Lancashire Coalfield. It is white-grey, medium to coarse-grained sandstone, massive and cross-bedded. During the 19th and early 20th centuries, it was extracted on a large scale at Cox Green and Horrocks Fold (now Wilton Quarries), north of Bolton. The account book of Daniel & Thomas Anderton, dated 1880 to 1913, lists their principal products as ashlar and cuts, but also includes wallstone, rubble, broken stone, ballast, copings, scapplings, sandstone, setts, roadstone, pitching, quarry gravel, sills and steps. These products were delivered to local churches, schools, villas, terraced streets, mills, railway stations and waterworks, with clients ranging from individuals to local corporations. In 1903, a 50-ton gritstone block, possibly the largest ever quarried in the area, was taken from Cox Green Quarry to Mill Hill Bleachworks in Bolton, probably for use as an engine bed. Ousel Nest Grit is still worked at Montcliffe Quarry, with many of the stone buildings in the nearby town of Horwich being constructed of this material.

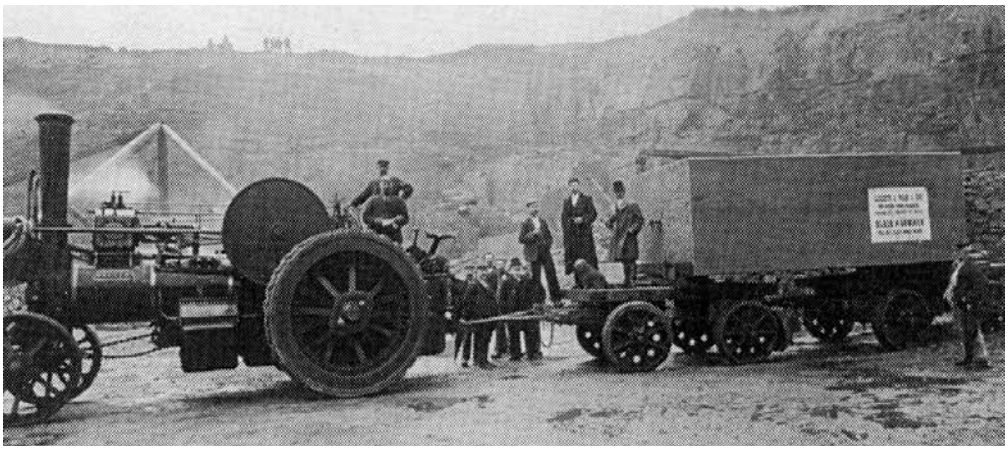

Figure 4: A 50-ton gritstone block being transported from Cox Green Quarry to Mill Hill Bleachworks in Bolton.

Figure 5: Houses at Blackrod, Bolton. Cannel Rock with Ousel Nest Grit dressings.

Woodhead Hill Rock

This sandstone can vary greatly in character, from being coarse grained and massive to fine grained and flaggy. Numerous quarries have exploited this stone, particularly around the northern and eastern margins of Greater Manchester. They are known to have extracted building stone such as ashlar, sills, flagstones and walling stone. A notable quarry, producing good quality flagstones, is at High Moor near Oldham. These flagstones were used for roofing slabs and paving flags, building and walling stone. The Victorian geologist Edward Binney, who widely surveyed in the region, described Woodhead Hill Rock as one of the best building stones in the 'Coal Series'.

In other quarries, the well-developed cross-bedding may have limited the sandstone's versatility as a building stone, as it could have a tendency to split on bedding planes. This tendency was exploited at Ludworth Moor near Marple, where blocks of irregular size and shape were won for drystone walling. Where the the blocks are bigger, it has more potential as a freestone, which could be cut into regular blocks.

Helpet Edge Rock

Generally, the Helpet Edge Rock is a massive and coarse-grained sandstone, found particularly in the north-eastern part of Greater Manchester, around Rochdale and Oldham. Towards the west, it splits into two or more sandstone beds separated by shale. The grain size also tends to become finer grained, and it can be seen as evenly bedded and flaggy. It is known to have been used in reservoir construction at Brushes Clough Reservoir near Crompton, in road building as setts and aggregate, and as a building stone in settlements, such as Crompton near Oldham.

Figure 6: Brushes Clough Reservoir near Crompton, Oldham. Helpet Edge Rock.

Milnrow Sandstone (Crutchman Sandstone, Doffcocker Flag Rock, Billinge Beacon Flags)

There are numerous quarries, particularly around Milnrow, Rochdale, where the type locality of this sandstone can be found. It varies between being coarse and massive, and fine grained and flaggy. It is often mica rich

and weathers brown. Builders around the eastern area of Stockport knew the rock as ‘chocolate drop’, because it was often found to contain small discoloured areas, probably iron-rich concretions. Settlements such as Milnrow in Rochdale and Romiley in Stockport were built from this rock, and the more fissile layers have been used for flagstones. Flags of this material were probably used to construct the walls of the great 17th-century houses at Bispham Hall, Wigan, and Staley Hall, Stalybridge.

During the late 19th century, a number of churches and chapels were constructed using a combination of Milnrow Sandstone of thin yellow parpens and dressings of red-brown Triassic sandstones. This visually attractive design can be seen at St John’s Church and St Benedict’s Church at Hindley, and at St Michael and All Angels Church at Howe Bridge, all within Wigan. The same tradition was noted within churches in the eastern parts of St Helen’s, across the border in Merseyside.

Figure 7: St John's Church, Hindley, Wigan. Milnrow Sandstone.

Figure 8: 13–17 Milnrow Road, Rochdale. Milnrow Sandstone.

Dyneley Knoll Flags

In 1795, surveyor John Holt wrote: 'Flaggs and grey slates are dug up at Holland, near Wigan.' He was almost certainly referring to the Dyneley Knoll Flags, also known as the Upholland Flags. Like the Haslingden Flags, these sandstones can have a greenish-grey tinge. They have been quarried over quite a wide area, from Billinge in Wigan, to Horwich at Bottom o'th Moor and Tottington near Bury. Although they outcrop in Oldham, they have been largely quarried along the flanks of the Tame Valley between Hartshead and Hazelhurst, and to the south of Stalybridge. Many of the flags used on the south side of Stalybridge are thought to be Dyneley Knoll Flags.

Old Lawrence Rock

The Old Lawrence Rock has been widely exposed around the upland fringes of the area, and it has been extensively quarried. It is a fine-grained sandstone with a characteristic greenish-grey tint. Wisps of carbonaceous material are also common within the rock. The character of the rock varies: it can be massive, but at other exposures it is rippled and flaggy. It is often interbedded with sandy fissile mudstones, and the main body of sandstone is generally split into two sandstone layers by a persistent layer of fissile mudstone around 1m thick. The most notable quarry in the Old Lawrence Rock was at Appley Bridge near Wigan, where the sandstone was extracted for building stone. This quarry is in Lancashire, although much of the material would have been brought via canal into Greater Manchester. Where it is worked in the Bury and Bolton areas for walling stone, the sandstone is relatively soft and fissile, and weathers easily. It has also been used for building stone, such as ashlar and flags, for example at Knott Hill, Tameside. Here, the Old Lawrence Rock was also used in the construction of Knott Hill Reservoir.

Cannel Rock and Trencherbone Rock

Cannel Rock and Trencherbone Rock have been worked since medieval times in the areas of Bury, Bolton and Wigan. The great medieval houses at Bury Castle and Smithills Hall, near Bolton, contain this material, which seems to have been exploited on a small scale in river valley exposures. These medium-grained sandstones tend to be relatively soft and easily worked, are grey when fresh and contain a significant colour variation when weathered, from purple to buff to yellow to brown. Locally, these units have a strong red colouration, probably as a consequence of staining from the overlying Permian and Triassic deposits. The Earls of Balcarres' estate, centred on Haigh Hall, produced Cannel Rock from School Quarry, and Trencherbone Rock from Toddington Delph. The latter was used to erect Haigh Church in 1831 to 1833.

Figure 9: Smithills Hall, near Bolton. Cannel Rock and Trencherbone Rock.

Blenfire Rock

Blenfire Rock forms the prominent escarpment of Oldham Edge. It has a distinctive red-pink colour when fresh, which would have made Oldham Edge a striking feature in the landscape when the numerous quarries were still working. Building stone quarried from Oldham Edge was used in Oldham town centre, at No 35 Greaves Street and as part of the churchyard wall of St Mary's Church. Its distinctive red-pink colour may have made it an attractive building stone, but its exposed surfaces can be prone to developing pitting

and cavities as the softer clays it contains weather out. Blenfire Rock has been mainly quarried for building stone around Oldham, but it has also been quarried near Haughton Green in the Tame Valley, where it is thought to have been used to build workers' cottages.

Chamber Rock

Chamber Rock is now best exposed in the disused quarry at Rocher Vale along the Medlock Valley. The other known quarry at Chamber Hall, Coppice, is no longer visible. This was possibly the source of stone for Chamber Hall, known to date back to at least 1640 and possibly back to the 13th century. Some of the 18th-century farmsteads close to Rocher Vale have been built of stone that closely resembles the locally available Chamber Rock. The iron-rich clay nodules visible in the Rocher Vale Quarry can clearly be seen in some of the building stone of the farmsteads. Chamber Rock was also probably used at the expanding Park Bridge Ironworks, which once flourished close to Rocher Vale, as its records mention the quarry. Additionally, the lower exposures at Rocher Vale could have been used to construct the stone-built engine house for the nearby Nelsons India Pit. The higher part of Chamber Rock contains many lenses of sandstone and siltstone, making it much harder to work economically as building stone.

Pennine Coal Measures Group, Pennine Middle Coal Measures Formation

Peel Hall Rock (Pemberton Rock, Bardsley Rock)

In the western part of the county, Peel Hall Rock (also known as Pemberton Rock) was mostly won from a single large quarry at Little Hulton. In appearance, it is a uniform yellow to buff, medium-grained sandstone, with occasional iron-stained pebble. The churches of St George at Tyldesley, St Paul at Little Hulton, St James at New Bury and St John the Baptist at Atherton were all prominent buildings in this stone type, within vast swathes of brick-built suburbia.

Figure 10: St George's Church, Tyldesley. Peel Hall Rock.

Bardsley Rock

The eastern equivalent to Peel Hall Rock, Bardsley Rock is exposed along the Medlock Valley at Bardsley Bridge. It also occurs further upstream at Park Bridge, on the western flank of the river, and on the high ground overlooking Park Bridge Heritage Centre, which was once the stables for Park Bridge Ironworks. Here, it shows itself as a massive, red-coloured rock. It is known to contain numerous fossils of the seed Trigonocarpus. Fossils in this locality were well recorded by the Victorian geologist George Wild, who was also involved with the local coal mines. Peel Hall Rock quarried within the western part of the area also contains *Trigonocarpus* seeds, suggesting the two sandstone types are possible correlatives. The foundations of Bardsley Bridge rest directly on Bardsley Rock, which may have been used in the construction of the bridge. Bardsley Rock could also be the source rock for nearby Bardsley House, which overlooks the bridge.

Nob End Rock

Nob End Rock seems to have been exploited only within the Irwell Gorge to the south-west of Radcliffe. It has similar colour variations to those noted in the Cannel and Trencherbone Rocks—that is, purple-orange tolight yellow—and in its weathered state, it is a soft, fissile, medium-grained rock. It is highly probable that it was the source rock for a cluster of late medieval/early post-medieval Radcliffe buildings, such as Radcliffe Tower, St Mary's Church, the tithe barn and Blackford Bridge. This rock type also outcrops in the Farnworth and Tyldesley areas, although it is not known whether it was worked here for building stone.

Figure 11: Radcliffe Tower, Radcliffe. Nob End Rock.

Newton Heath Sandstone (Smedley Grit)

Where it outcrops in the Irk Valley, Newton Heath Sandstone is known as the Smedley Grit. Old maps and descriptions by Victorian geologist Edward Binney, and later Edward Hull, confirm that the Smedley Grit was quarried in the Irk Valley. Like the nearby Collyhurst Stone of the Pennine Upper Coal Measures Formation, it has a purple colour. It may be difficult, therefore, to distinguish between old buildings within the centre of Manchester that were made from Newton Heath Sandstone and those made of the younger Collyhurst Stone.

Pennine Coal Measures Group, Pennine Upper Coal Measures Formation

Worsley Delph Rock (Collyhurst Rock, Appleton's Grit Rock, Delf Fold Rock, Binney Sandstone)

Worsley Delph Rock provided material for some of the earliest and best-known buildings in the area. It is a red-yellow, medium to coarse-grained, cross-bedded sandstone. There were two notable sources for this rock. One was Worsley Delph itself, where a small stream cut through the east end of a sandstone ridge at Worsley village. From here, rock was quarried for structures on the 1761 Bridgewater Canal. These include the iconic aqueduct at Barton-upon-Irwell and the lesser known ones on the Mersey and Bollin rivers. It was also employed in Worsley village itself.

Figure 12: Bridge over the Worsley Delph. Worsley Delph Rock.

The other source was the quarry at Collyhurst, first noted as ‘noble and famous’ by the antiquary William Camden in 1586. The sandstone extracted from here has been variously named Collyhurst Stone, Mr Appleton’s Collyhurst Rock, Appleton’s Grit Rock, Delf Fold Rock and Binney Sandstone. Current geological thinking suggests that this sandstone represents an exposure of Worsley Delph Rock. This purple-brown sandstone is thought to have been extracted to build the late medieval elements of the cathedral and the 18th-century St Ann’s Church in Manchester, as well as Sacred Trinity Church in Salford. It was probably used in the construction of many more buildings within these two pre-industrial towns.

In the past, this rock type has been confused with the younger Permian Collyhurst Sandstone, which also crops out at Collyhurst. Geologist Fred Broadhurst, whose paper with Morven Simpson in 2000 explored this confusion, suggested calling the Coal Measures Sandstone 'Binney Sandstone', in honour of the Victorian geologist Edward Binney, who did so much pioneering work to aid our understanding of geology in Greater Manchester.

Figure 13: St Ann's Church, Manchester. Worsley Delph Rock (Collyhurst Rock).

Triassic

Sherwood Sandstone Group, Chester Pebble Beds Formation

Chester Pebble Beds (Bunter Sandstone)

The Chester Pebble Beds (formerly Bunter Sandstone) form the rockhead for much of the city of Manchester and much of Stockport town centre. Within the area, the beds contain only sparse and sporadic rounded pebbles, about 25mm across, unlike the Bunter Pebble Beds of the Midlands, where pebbles are more abundant. This can make it harder to distinguish them from the other red Permian and Triassic sandstones, although they tend to be coarser grained generally, when compared with the others.

At Stockport, the River Mersey and the Tin Brook have cut gorges into this material, leaving an elevated promontory overlooking Lancashire Bridge. The earliest elements of St Mary's Church at Stockport were probably of this material, as were the plinth and foundations of the nearby Staircase House. The sandstone can be clearly seen in section where the M60 motorway passes Stockport town centre. Quarries must have existed in this vicinity, although urban development has now obscured any evidence.

Sherwood Sandstone Group, Wilmslow Sandstone Formation

Wilmslow Sandstone (Upper Mottled Sandstone)

Wilmslow Sandstone, formerly known as Upper Mottled Sandstone, is known to have been used as a building stone just over the border in Cheshire along the Bollin Valley. It is generally a fine-grained, red sandstone, containing abundant 'millet seed' sand grains, and it often has a mottled appearance. It is likely that outcrops of the Wilmslow Sandstone could be found underneath the cover of drift deposits towards the centre of Manchester.

Figure 14: Chetham's School of Music, Manchester. Wilmslow Sandstone may be the source of stone.

Sherwood Sandstone Group, Helsby Sandstone Formation

Helsby Sandstone

The Helsby Sandstone Formation (formerly known as Lower Keuper Sandstone) has been worked at Stockport and Timperley in Trafford, as well as at Lymm and Alderley Edge in Cheshire. This rock type is harder than the others in the Triassic succession, due to the localised presence of a silica cement matrix. For this reason, it is a more durable building material. It is often red or pink, from the coating of iron oxide over the sand grains, and usually contains many spherical 'millet seed' grains, indicative of an aeolian origin within a desert environment. Helsby Sandstone contains white or purplish quartz pebbles, up to 20mm across, and pebbles of red silt and red clay, which leave ovoid cavities when weathered out.

This material was used to construct the Church of St Mary at Cheadle and the Church of St James at Didsbury in Manchester. The pair of quarries at Timperley, which closed before 1900, were probably used to produce stone plinths for timber-framed and brick houses within the Dunham Massey estate. They also probably provided the stone in the striking boundary walls within the Victorian 'villa suburbs' of Altrincham.

Figure 15: Victorian villa boundary walls, Altrincham. Helsby Sandstone.

Figure 16: St Mary's Church, Cheadle. Helsby Sandstone.

3 Examples of Imported Building Stones

The earliest commonplace rock type used in the area was the metamorphic blue-grey Welsh Slate (Ordovician), which was once ubiquitous as a roof cladding in the vast swathes of terraced housing that formed the iconic industrial townscapes of Manchester's satellite towns. Green Cumberland Slate (Ordovician) and Cornish Delabole Slate (Devonian) were also utilised occasionally for roofing.

Within the Millstone Grit Group, Horncliffe Stone (Lower Haslingden Flags) was used as parpens at St Thomas' Church at Bury. The principal use of Upper Haslingden Flags was to pave the roads and yards of nearby mill towns. Some 40 railway wagon loads of flags were despatched every day from Phillipsons Flag & Stone Quarry at Round Barn, Edgworth, for this purpose.

Construction of the Leeds and Liverpool Canal in the late 18th century allowed the hard Parbold Stone (Harrock Hill Grit and Coal Measures Rock) from West Lancashire to be shipped into the county. Until the best beds expired in the 1840s, this stone was used, in particular, on the Wigan estates of the Scarisbrick family and on the Haigh estates of the Earls of Balcarres.

After the railway network connected with the principal quarries, the relatively soft Longridge Stone (Carboniferous) from Lancashire was used to reconstruct the great parish churches of All Saints, Wigan, and St Peter's, Bolton, both by architects Sharpe and Paley of Lancaster. All Souls' Church in north Bolton used this stone type for detail.

Carboniferous Gaisby Rock (Elland Flags equivalent) from Spinkwell Quarries near Bradford was used by architect Alfred Waterhouse to construct Manchester Town Hall in 1868 to 1877. 'Golden' Darley Dale Stone from Stancliffe, Derbyshire, was used for the Manchester town hall extension, the Manchester Royal Exchange, the Miners' Federation Hall, Bolton, and in the body of St Mary's Church, Bury.

Dark red Penrith Sandstone (Permian) from Lazonby clads the exterior of John Rylands Library, Manchester, while the interior is of Triassic St Bees Sandstone. Within more recent years, these stone types seem to have been superseded by the red Locharbriggs Sandstone (Permian) from Dumfries, which was utilised in the Manchester Magistrates' Court and the Manchester International Convention Centre.

Figure 17: Haigh Hall, Wigan. Parbold Stone.

Figure 18: Manchester town hall (Gaisby Rock, right), the town hall extension (Darley Dale Stone, left) and the Cenotaph (White Portland Stone).

Figure 19: The Miners' Federation Hall, Bolton. Darley Dale Stone.

Probably the most prolific ‘exotic’ stone type used in the area was the red Runcorn Sandstone (Triassic, Sherwood Sandstone Group). Shipped in great volumes via the Bridgewater and Manchester Ship Canals, this was employed at the Portico Library and Oxford Road railway viaduct in Manchester; Bowdon Church, Altrincham; St George’s Church, Stockport; and as detail in other buildings. The eminent philanthropist William Lever insisted on this stone type for his magnificent bequests of Bolton School and the Iron Church on Blackburn Road, also in Bolton.

Pale red Hollington Stone (Triassic sandstone) from Staffordshire was used in the Lady Chapel in Manchester Cathedral; St Ann’s Church, Manchester; St Mary’s Church, Bury; and St Thomas’ Church, Radcliffe.

Yellow Jurassic limestones employed in the area include Bath Stone in the Chapter House of Manchester Cathedral and the interior lining of St Luke’s Church at Heywood. White Portland Stone (Upper Jurassic) was used to form the Pantheon-like shell of Manchester Central Library and the adjacent Cenotaph, restored in 2014 with carefully matched stone. Painswick Stone (Middle Jurassic) from Stroud, Gloucestershire, is used at E W Pugin’s masterpiece Church of All Saints at Barton-upon-Irwell, where he alternated this material with Red Mansfield Stone (Permian) from Nottinghamshire.

The Victorian geological trail (1855) through Rochdale Cemetery comprises an assemblage of 27 small stone blocks, representative of many types of rock from the Cambrian to the Cretaceous. Apart from local specimens, stones were derived from sources further afield in the UK, Ireland and Italy.

Finally, the vast architectural collage of the Trafford Centre, just off the M60, has been clad and floored in a bewildering mixture of sedimentary, metamorphic and igneous rock types, with no expense spared. These have been sourced from Italy, Spain, Germany, Norway, South Africa, Brazil and India.

4 Further Reading

The Further Reading, Online Resources and Contacts guide provides general references on:

- Geology, building stones and mineral planning
- Historic building conservation, architecture and landscape.

There is also a separate glossary of geological terms.

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Figures

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