Strategic Stone Study
A Building Stone Atlas of Merseyside

First published by English Heritage May 2012
Rebranded by Historic England December 2017
Introduction

The building stones of Merseyside fall into three well-defined groups, both stratigraphically and geographically. Stratigraphically, the oldest building stones were sourced from the Pennine Lower and Middle Coal Measures of the Upper Carboniferous. These rocks are found mainly within the eastern part of the area, forming higher ground around St Helens at the western extremity of the Rossendale Hills, and within the Lancashire Coalfield. Faulting has also brought these rocks to the surface further to the west, around Huyton and Prescot in the borough of Knowsley.

The Carboniferous rocks are overlain unconformably by the Triassic strata of the West Lancashire Plain. These dip gently in an easterly direction and are strongly influenced by north-south trending faults, resulting in a series of prominent north-south ridges. These ridges tend to be capped by the more resistant Triassic rocks of the Sherwood Sandstone Group (formerly the Bunter Pebble Beds and Lower Keuper Sandstone), with the relatively softer Triassic sandstones forming the lower ground. The sandstones exposed on many of these ridges have been quarried for building stone. The relative isolation of the Wirral Peninsula has ensured that pre-19th-century building stone had only two sources – the Helsby Sandstone Formation and the Chester Pebble Beds Formation. The Triassic building stones are characterized by colour variation, including different shades of red, pink, yellow, buff and white. Colour can vary over relatively short distances and also in proximity to the north-south faults.

The third group of building stones is encountered along the coastal plain, within Sefton district, where the paucity of rock outcrops and hence quarries, means that there are very few stone buildings. Those which do exist are mainly churches and public buildings constructed of stone brought in from elsewhere in Merseyside, Cheshire or West Lancashire.

Building stone was generally quarried close to where it was to be used, although by the 18th century, and probably much earlier in the coastal areas and around the Mersey Estuary, such a bulky commodity would have been moved by boat or barge. The deep navigable creek off the Estuary at Bromborough Bridge, Wirral, was used by ‘lighters’ to transport stone from the Storeton Quarries, to which the creek was connected by a tramway in 1837-8. Development of the turnpike, canal and railway networks, during the late 18th and early 19th centuries, ensured more cost effective shipment of building stone.

Merseyside shows a wide variety of stone buildings and structures. During the pre-industrial era, in coastal areas including the Wirral Peninsula, low status domestic buildings tended to use thatch for roofing, whereas higher status buildings used local flagstone, possibly from the Tarporley Siltstone Formation (Keuper Waterstones). By contrast, in the east part of the county, particularly around Billinge in St Helens district, most buildings were roofed with flagstone, reflecting the local availability of thinly bedded Upper Carboniferous sandstones.

Examples of the Cheshire vernacular, where timber-framed buildings were constructed on a stone plinth, can be found within Merseyside, a good example being the 16th-century Speke Hall, Liverpool. Within Wirral district, it was a tradition from the late 17th to the early 19th century to construct farm buildings from handmade brick upon a red sandstone plinth.

In the area around St Helens district, and extending into Greater Manchester, a late 19th-century ecclesiastical tradition developed of combining walling parpoints of yellow Carboniferous sandstone, with dressings of red Triassic sandstone. This aesthetically pleasing contrast can be seen in the churches of St James, at Rainhill; Holy Cross, St Helens town centre; All Saints, Rainford; United Reformed Church, Rainford and St Mary and St Joseph, Newton-le-Willows.

The Baroque detail of the magnificent Ince Blundell Hall, Sefton, was cut from Carboniferous sandstone of unknown provenance.
A significant increase in the quarrying of stone mirrored the rapid development of the ports of Liverpool and Birkenhead in particular. The first dock in Liverpool opened in 1715, and many more were constructed in the years that followed. Yellow Sherwood Sandstone from St James Mount Quarry was used to line parts of the dock walls, before this site was exhausted in about 1825. As the pace of development of the docks increased, Scottish granite was brought in from specially leased quarries to face the dock walls.

The rapid development of the port of Liverpool, as the major outlet for the industrial growth of north-west England, led to a massive increase in demand for building materials to construct warehouses, factories, workers houses and transport infrastructure.

The wealth generated from overseas trade led to a spree of house building within the county by rich merchants and also saw a surge in the construction of prestigious civic buildings in the city of Liverpool, in particular. A variety of exotic building stones from other parts of the UK and from abroad were used in the construction of the latter.

Most quarries in the county were probably established during the 18th and 19th centuries, with quarrying continuing into the 20th century at quarries such as Storeton, Rainhill and Woolton. The Sherwood Sandstone Group is still worked at Bold Heath Quarry on the St Helens-Widnes border, but the quarried stone is largely used for aggregate.
Carboniferous

Pennine Lower Coal Measures Formation

Some quarries within the Knowsley and St Helens area of Merseyside lie within the Pennine Lower Coal Measures Formation outcrop, although the specific sandstone units cannot be identified. They vary in character from massive and coarse-grained to cross-bedded, medium- or finer-grained and flaggy. Sedimentary features such as cross-bedding and lenticular-bedding are common. The sandstones are often recorded as being white and grey when fresh, weathering to yellow, buff and brown.

The quarries at Billinge worked a number of the Lower Coal Measures sandstones such as Old Lawrence Rock, Dyneley Knoll Flags and Milnrow Sandstone. The flagstones were also mined as well as being quarried. All of these sandstones are likely to have been used as building stone and flagstone in the village of Billinge and its surrounds. St Aidan’s church, by notable architect Henry Sephton, and early post-medieval Birchley Hall with its flagstone roof, constructed of sandstones quarried at Billinge. Flagstones from Billinge were highly valued, and were thus traded on a more regional scale.

The Elizabethan great house of Birchley Hall, Billinge, (below) is one of a contemporary group located in the Pennine foothills, associated with gentry class rebuilding. The walls are constructed of parpoints of locally extracted yellow fine-grained sandstone, probably Milnrow Sandstone.

The Huyton Flagstones, as they are known locally, were quarried from the Huyton area of Knowsley, and were in demand over large areas of Lancashire, according to Hull (1882). Lewis (1848), stated “To the east of the village of Huyton is an excellent slate quarry”, whilst Binney (1855) suggested the Huyton Flagstones were derived from the Old Lawrence Rock. They were probably used on the perimeter wall of Court Hey Park, Knowsley. The barn at Court Hey Park, which now houses the Merseyside Biobank, uses similar laminated, flaggy rock. Notable quarries also include Moss Bank Quarry, north of St Helens, where building stone was extracted, and Rainford Old Delf where building stone and flagstone were extracted.
**Milnrow Sandstone**
Milnrow Sandstone, also known as Billinge Beacon Flags and Crutchman Sandstone, crops out to the north of St Helens, where it has been extensively quarried since at least 1672, when John Eddlestone left a quarry at Billinge called Grindstone Delph in his will. It is distinctly variable in character over relatively short distances, ranging from coarse-grained and massive to fine-grained and flaggy. It is often flaggy, and was interbedded with siltstones and shales at the former quarry at Billinge Hill. These flagstones were used for roofing, paving, walling and building stone.

**Dyneley Knoll Flags**
Dyneley Knoll Flags, also known as Upholland Flags, Lower Flags, and Gannister Beds, crop out around the St Helens area of Merseyside and have been extensively quarried around Billinge. Exposures show a hard, fine-grained, mica-rich, flaggy rock with fine laminations, ripple marks and trace fossils. The extracted flagstones were used for paving, roofing and building stone.

**Old Lawrence Rock**
Old Lawrence Rock crops out to the north of St Helens, particularly around Billinge where it has been extensively quarried for paving, roofing and building stone. It was also quarried around Prescot, Eccleston and Windlehurst. It has a flaggy, fine-grained character, and is mica-rich with fine laminations and wisps of darker material (which may be carbonaceous). It can have a green tinge when fresh, but often weathers brown.

**Cannel Rock (South Lancashire)**
Cannel Rock crops out in the St Helens area of Merseyside, particularly to the west and south-west of St Helens, around Eccleston. It tends to be grey or white when fresh, but weathers to ochreous yellow and brown. Its character can vary from massive to cross-bedded to flaggy. Cannel Rock can be relatively resistant, forming higher ground, and was probably used close to where it was quarried.

**Ravenhead Rock**
Ravenhead Rock crops out in parts of the St Helens area of Merseyside, notably to the south of St Helens around Thatto Heath where it has been quarried. Its character can vary from massive to cross-bedded and also flaggy. When fresh, it is white to grey but it weathers to a yellow or brown. Purplish weathered horizons have also been recorded. The quarry at Thatto Heath exposed flaggy layers, so presumably this was being quarried as a source of flagstone, possibly used for paving and roofing slabs, or parpoints for building.

**Pennine Middle Coal Measures Formation**
Some of the building stone quarried in the St Helens and Knowsley areas of Merseyside is thought to originate from the Pennine Middle Coal Measures succession. Quarries are known at Whiston in Knowsley; and Stanley Bank, and Barrows Lane, near Eccleston, in St Helens. The specific sandstone horizons are rarely identified. The character of the sandstone varies from coarse-grained and massive to cross-bedded and lenticular bedded, medium or fine-grained and flaggy. The colour is generally grey when fresh, weathering to shades of brown and yellow.
TRIASSIC

Sherwood Sandstone Group

Kinnerton Sandstone Formation

‘Lower Mottled Sandstone’

These sandstones were exposed in the Neston area of the Wirral Peninsula, and were quarried around the Tarbock and Cronton areas of Knowsley. Their colour is generally bright red or red-brown, but they can also have a yellowish grey mottled appearance, with yellow bands. Well-rounded ‘millet seed’ grains can also be observed, indicating an aeolian origin.

A finer grain size, and fewer pebbles, help to distinguish the Kinnerton sandstones from those of the overlying Chester Pebble Beds Formation. These sandstones tend to be poorly cemented, although in the vicinity of faults the sandstones can be more strongly cemented. Lewis (1848) mentioned a red stone quarry in Tarbock village where this rock is known to crop out, although it is not noted as an important building stone within the county.

Chester Pebble Beds Formation

‘Bunter Pebble Beds’

This formation is widely exposed around the county, underlying the suburbs of Liverpool to the east of the city centre, and much of the southern and eastern parts of the Wirral Peninsula. As its name suggests, this unit characteristically contains pebbles, although they tend to be sparsely distributed and sporadic, unlike the equivalent beds of the Midlands, where pebbles are prolific. At Pex Hill Quarry, near Cronton, pebbles occur in discrete bands. Where pebbles do occur, they are rounded and of quartz and quartzite. Occasionally, they are of granite, felsite, mica schist, chert and derived fossils. Soft red-brown marl clasts can also be found within the sandstone; being soft they often weather out leaving voids.

The colour of the pebbly sandstones can vary from mottled reddish brown to yellowish grey, and are clearly visible at Olive Mount Cutting, Wavertree, on the 1830 Liverpool & Manchester Railway. Williamson’s Tunnels in Edge Hill, Liverpool, were partially cut into a disused quarry face within the formation.

According to Mortimer (1847), the walls of Morpeth Dock and Egerton Dock, Birkenhead were ‘built of the red freestone, principally quarried on the ground’. The red sandstone, complete with pick marks can still be seen today along parts of Tower Road, near Egerton Dock. The Chester Pebble Beds Formation is still worked today, albeit mainly for aggregate, at Bold Heath Quarry on the St Helens/Widnes border. The late medieval solar tower at Brimstage Hall, Wirral (above), was constructed using Chester Pebble Beds sandstone, which stands in contrast to the appended 17th-century house, erected using Storeton Stone. In addition, the tiny Wesleyan Chapel at Cronton village, Knowsley, is constructed of ashlar blocks produced from the Chester Pebble Beds at nearby Pex Hill Quarry.

Tranmere Stone

Tranmere Stone was quarried from the Tranmere area of the Wirral Peninsula, where quarry faces can still be seen to the west of Queen Street. This sandstone is generally pale red or pinkish red with occasional yellow bands and streaks and contains mica. Lewis (1848) stated that “Throughout the township, abundance of good stone of a light red colour and very durable is to be found, and some of the quarries are now worked to considerable advantage”. Tranmere Stone was possibly used for Birkenhead Priory according to Wirral Archaeology and Liverpool Geological Society. It was also used to construct many of the buildings in the old village of Tranmere, and Mortimer (1847) states that the rock under Tranmere was noted for its greater durability compared to that of neighbouring villages.
Rainhill Stone

Rainhill Stone was quarried from the Rainhill area of Merseyside, most notably from Mill Quarries. This sandstone is generally red-brown or pinkish-red, and is the probable source for Manor Farm Public House, built in 1662, and for the impressive group of 19th-century industrialists’ mansions which extend along Mill Lane. A small amount of Rainhill Stone was used in conjunction with Runcorn Stone on the internal walls of Liverpool’s Anglican Cathedral. It was also utilised for the acutely skewed bridge on Warrington Road, Rainhill, built in 1829 over the Liverpool to Manchester Railway.

The Manor Farm public house at Rainhill, St Helens (top left), was constructed as a lesser gentry house in 1662, and is one of a number of local post-medieval houses which utilised the coarse-grained Rainhill Stone. St Bartholemew’s Church, St Helens, (middle left) is an impressive blend of Greek temple and Italian campanile, constructed in 1838-40 in Rainhill Stone. The skew bridge at Rainhill Station (bottom left), erected in 1828-9, is probably the best-known structure on the Liverpool to Manchester Railway. The layout and construction of the arch of this complex engineering structure would have been made easier by the highly visible bedding planes of the Rainhill Stone, which were required to be located at 90 degrees to the line of thrust.

Woolton Stone

Woolton Stone was quarried at Woolton village in Liverpool, where many of the buildings were erected in this material. It is generally a dull red-brown sandstone, but rarer bands of white sandstone have been recorded. Rounded pebbles, up to 150mm across, can be seen within the sandstone, but they are generally sparsely distributed or concentrated along bedding planes. The Woolton Quarries were noteworthy for providing the great bulk of the stone for Liverpool’s Anglican Cathedral, for which the quarries remained open until 1978. The best quality stone was reputed to have been quarried from the lower, thick-bedded layers. It was also used to erect All Hallows Church, Allerton; Fenwick Chambers on Fenwick Street, and Wavertree Clock Tower; the latter utilizing some of the rarer white stone. Woolton Stone is also reputed to have been used to build Woolton Hall and the entrance gateway to Strawberry Fields, the Salvation Army children’s home, (originally the home of a wealthy merchant), on Beaconsfield Road, Woolton.
The Village Inn (top right), built in 1854 at Woolton, Liverpool, stands near to the entrance to the main Woolton Quarries, and was probably intended to relieve the quarrymen of their wages. Built in Woolton Stone, the pediment is unusual in such a building. Allerton Hall, Liverpool (below), was constructed within its own parkland by a wealthy Liverpool merchant in the 1730’s, and represented the introduction of Palladianism to the county. Now used as a public house, it was almost certainly constructed of Woolton Stone. The massive bulk of George Gilbert Scott’s 20th-century Anglican Cathedral (middle right) rises sheer above the depths of the former quarry and cemetery at St James’ Mount. A total of 23,300 cubic metres of sandstone was cut to build this colossal Gothic Revival church, most of which was Woolton Stone (with lesser amounts of both Rainhill Stone from St Helens and Runcorn Stone from Cheshire). The Picton Clock Tower, Wavertree, built in 1884, is allegedly constructed of white beds in the Woolton Quarries, as opposed to the more usual red-brown sandstone known as Woolton Stone.
Wilmslow Sandstone Formation

‘Upper Mottled Sandstone’
This sandstone crops out over quite a widespread area of Merseyside, and is distinguished from the sandstones of the Helsby and Chester Pebble Beds formations by its finer grain size and lack of pebbles. It is often bright red, or yellow, when fresh and shows a patchy yellowish grey mottling on more weathered faces. The sand grains are generally well-sorted and well-rounded, with spherical ‘millet seed’ grains visible in some horizons, suggesting that the rock was formed in an aeolian environment. Around the Thurstaston area of Wirral there is a very hard, often dark brown layer cemented with silica, known as the Thurstaston Hard Sandstone Bed. This provided a more resistant building stone, although it occurs in a bed only 2m in thickness.

Helsby Sandstone Formation

‘Lower Keuper Sandstone’
These sandstones are amongst the most widely used building stones within Merseyside. Formerly known as the Lower Keuper Sandstone, they are now assigned to the Helsby Sandstone Formation. The sandstones themselves show a variety of colours from red to yellow to brown and buff, and sometimes being white or even pink tinged. They are often mottled, showing colour variations over relatively short distance.

The sandstones are generally thick-bedded, and provide versatile freestones, and, being well cemented with silica, are hard and resistant. They are relatively soft to cut and work, but later harden upon exposure to the elements. Marl clasts are another common feature of these sandstones, but being soft, they soon weather out leaving voids in the rock.

The Helsby Sandstone was quarried at The Breck, near Wallasey, and is thought to be a possible source of the stone used to build many of the old buildings in Wallasey and much of the coastal embankment at Leasowe. It was also quarried for building stone at New Brighton, Flaybrick, and Heswall, all on the Wirral Peninsula; and also around the Bootle area of Sefton.

Knowsley Stone
Knowsley Stone was quarried around the Knowsley area of Merseyside, with a notable quarry being at Knowsley Delf. It is a hard, well cemented and resistant sandstone with rounded pebbles, usually of quartz and quartzite. It has a distinctive brown coloration, as opposed to the more common red-brown of the Triassic sandstones occuring within the area. Many of the buildings in Knowsley village, including St Mary’s church, were constructed of this material. Due to its hardness, it was much used for roads in Liverpool, such as along Parliament Street in the city centre. The attractively converted Devonshire Barn in Knowsley village (left) appears to follow an ‘estate style’ within the heartland of the holdings of the Earls of Derby. The distinctively brown-hued Knowsley Stone contrasts markedly with the ubiquitous red-brown Chester Pebble Beds sandstones used elsewhere in the county.

Wallasey Stone
Wallasey Stone was quarried around the Wallasey area on the Wirral Peninsula, and is generally pale-buff to yellow in colour. Quarrying near Poulton Station has revealed a sandstone that is coarse and pebbly, but at other quarries the stone is generally finer-grained. Hull (1872) described the stone as being rather soft and fine-grained. Most of the old village of Wallasey, probably including the detached tower of 1530 within the graveyard of St Hilary’s Church, was built of stone from the quarries on the sandstone ridge known as The Breck. The Breck sandstones were also used to build the original coastal embankment at Leasowe in about 1830, and probably the multi-phase Leasowe Castle (now a hotel).

Merseyside Strategic Stone Study 9
Brownlow Hill Stone

Brownlow Hill Stone was quarried in the area of Liverpool now largely occupied by the University of Liverpool buildings, near to the junction of Brownlow Hill and Mount Pleasant. Aiken (1795) provided a map indicating the quarry position. Liverpool’s workhouse was erected in 1769-72 adjacent to the quarries, with inmates being employed to cut and break the stone for local highways. Recent excavations at the University Campus revealed exposures of yellow medium- to coarse-grained sandstone, with cross-bedding, and soft marl pellets (J. Crossley, pers. comm.)

Toxteth Park Stone

Toxteth Park Stone is known from historical sources to have been used as a building stone within the city of Liverpool. Baines (1824), referring to the recent rebuilding of the Exchange on Water Street, claimed “the stone which is at once durable and beautiful was supplied from the quarries of the Earl of Sefton in Toxteth Park”.

The name Toxteth Park Stone may also encompass some beds of sandstone from the Helsby Sandstone Formation that were quarried from nearby Rathbone Street, and also from St James’ Mount Quarry or ‘The Mount’ (which is now occupied by St James Cemetery, where quarry faces are still visible). Aiken (1795) described this quarry as extensive, being “380 yards long, and in many places 16 yards deep, forming a vast perpendicular wall, without a vein or crack”. This sandstone was also described as “of a yellowish hue, soft when cut, but afterwards hardening”. The useful building stone at St James’ Quarry was apparently exhausted by around 1825.

As Liverpool expanded during the 18th and 19th centuries, stone from St James’ Mount Quarry was used to build many prestigious buildings and early dock structures, probably including Thomas Steers ‘Old Dock’ of 1715. Liverpool Town Hall was constructed of this sandstone, as were a number of Liverpool churches, including those of St Nicholas, St Paul, St John and St Peter. Built in 1749-54 to resemble a classical revival country house, Liverpool Town Hall (top right) is possibly the earliest surviving building within the city centre. The buff-coloured sandstone may have been derived from quarries at Toxteth Park. The Great George Street Congregational Church in Liverpool (bottom right), was constructed of a multihued, coarse sandstone, which was reputedly obtained from a quarry in Toxteth Park.

Storeton Stone

Storeton Stone is perhaps the best-known and extensively exported of all Merseyside’s building sandstones, and was extracted from a series of large quarries which developed along the western edge of the elevated north-south ridge at Bebington, Wirral. It is a thick-bedded, hard, versatile freestone, widely used for ashlar. The colour can vary from white to buff to pink-tinged and yellow, and less commonly, red. It often weathers grey to buff-grey. Some horizons contain numerous soft marl clasts, which weather out leaving voids. Relatively soft when quarried, the sandstone hardened on exposure to the atmosphere. This stone type may also have been described as ‘Bebington Stone’; since one of the series of Storeton quarries was named the ‘Higher Bebington White Freestone Quarry’. 

![Liverpool Town Hall.](image1)

![The Great George Street Congregational Church in Liverpool.](image2)
It was allegedly used for Roman gravestones in Chester, although the earliest confirmed use was at the late 14th-century Storeton Hall, located just to the west of the quarries. The industrial-scale exploitation of the quarries can be attributed to Thomas Brassey, later to become one of the world’s greatest railway engineers. As land agent to the Lord of the Manor of Birkenhead, and also manager of Storeton Quarries, he utilized this sandstone for the development of Birkenhead during the 1820’s and 1830’s, including many of the buildings erected in the grid-pattern plan around Hamilton Square. In 1837-8, he created a gravity tramway to take stone from the quarry to a wharf at Bromborough Pool, on the Mersey, from where it could be shipped elsewhere. During the 1820’s, he met George Stephenson, who was then building the Liverpool-Manchester Railway, and Stephenson used Storeton Stone to construct elements of the Sankey Viaduct at Newton-le-Willows, and also the Mill Lane Viaduct in the same town. These two structures were major engineering challenges at the time, requiring a durable sandstone with high compressive and shear strengths, and almost certainly involved the advice of Jesse Hartley, who was later to achieve fame in his role as a prominent surveyor to the Liverpool Docks. Storeton Hall, Wirral (top left), a great medieval house dated to the 1370’s, is the earliest known example of a Merseyside building constructed in Storeton Stone. Birkenhead Museum (middle left) dominates Hamilton Square, the centrepiece of a grid plan townscape which utilised Storeton Stone as its principal building material. The road bridge at Saughall Massie, Wirral, (bottom left) is the earliest known engineering work by Thomas Brassey, who managed the quarries at Storeton, and later became a great railway builder.

The Grade I listed Sankey Viaduct, St Helens, erected in 1828-30, was the first major railway viaduct to be built in the world. George Stephenson probably employed Jessie Hartley to design the nine-arched structure, but was influenced in his choice of Storeton Stone for the key elements by Thomas Brassey, then manager of Storeton Quarries. William Lever, Lord Leverhulme, acquired the quarries in 1911, using the stone in the model village of Port Sunlight and also in his home village of Thornton Hough (both Wirral). The impressive façade of the Unilever offices, at Lever House, Port Sunlight, serves as an excellent example of the large-scale use of this building sandstone. Numerous other fine buildings used Storeton Stone, including the entrance to Birkenhead Park, the Liverpool Customs House, Liverpool Lime Street Station, and Claughton Hall.
The Lever House (above), built by Lord Leverhulme in 1895 as his business headquarters at Port Sunlight, Wirral, is one of the best public locations to view Storeton Stone. The tramway between the Storeton quarries and the quay at Bromborough passed in front of this building. The Grand Entrance to Joseph Paxton’s Birkenhead Park (top right), was created in 1847. The massive arches and flanking lodges present an impressive public sculpture in pink-grey Storeton Stone. The Oratory, (middle right) built in 1829 as a mortuary chapel for St James’ Cemetery, Liverpool, assumes the appearance of a miniature Greek temple. It was erected by John Foster Junior, using large ashlar blocks of Storeton Stone. Liverpool’s commercial district (bottom right) contains a number of impressive 19th-century banking houses which resemble Greek temples. Castle Moat House appears to be constructed of Storeton Stone, on a plinth of coarse nodular limestone.

**Claughton Sandstone**

Sandstone from Claughton Quarries, west of Birkenhead, was used to build St Anne’s church on St Anne’s Street, Birkenhead, being described by Mortimer (1847) as a “…remarkably fine red sandstone from the Claughton quarries.” He also referred to a new church being built, probably Christ Church, which was completed in 1849, on top of a prominence of solid rock, “…near the Claughton Firs quarries, with the red sandstone from which it is built.”
Bidston Stone was quarried around the Bidston area of the Wirral peninsula, the best-known quarry being at Flaybrick (now part of a large cemetery). The sandstone at Flaybrick is recorded as coarse-grained, very pebbly and pale coloured. An early tramway existed to transport stone from Bidston Hill down to Birkenhead, for the building of Birkenhead Docks. Stone from Flaybrick was also used at St James’ church, Birkenhead.

The colour of Bidston Stone varies from yellow to pale red to white and buff. Bidston village retains many of its old stone-built structures, with their distinctive buff to grey colour, such as St Oswald’s church (with its tower of 1520), Bidston Hall (erected in about 1593), and Church Farm Farmhouse (of early 16th century date).

Delamere Sandstone Member

Within the Helsby Sandstone Formation lies the Delamere Sandstone Member. It has been quarried at Kirby and Caldy on the Wirral Peninsula, and exposures show a coarse-grained, pebbly, hard, and often brown rock, with occasional mudstone beds.
Other Sherwood Sandstone Group stone sources

The sandstones exposed around the Sefton area of Merseyside tend to be predominantly yellow. The quarries were in general small and for local use, but there was notable quarrying around Bootle and at Litherland. The quarry at Litherland (in the Ormskirk Sandstone Formation), was probably the source of stone for nearby Litherland Hall.

Mercia Mudstone Group

Tarporley Siltstone Formation

‘The (Keuper) Waterstones’

Exposures of the Tarporley Siltstone Formation are somewhat limited, but are noteworthy at St James’ Cemetery in Liverpool and at various locations around the Wirral Peninsula such as the ‘Dungeon’, west of Heswall, Oxton, Greasby and Irby. The Formation is generally thinly bedded, finely laminated, flaggy, mica-rich and very fine-grained. The brown sandstone layers are found interbedded with layers of reddish brown and greyish green, thinly bedded siltstone, grey shales and reddish brown mudstone. They can be observed in two disused quarries at Irby and are flaggy in nature. Descriptions of Wirral buildings by Mortimer (1847) refer to blue flagstones and blue slate stones, which may imply use of siltstones and or sandstones from this formation for roofing materials.

Imported Building and Decorative Stones

Scottish and Irish Granite

‘Imported’ granite was extensively used as kerbstones and setts in both the city centre and dock areas of Liverpool, and also in the Birkenhead dock area. During the 1820s, the Liverpool Dock Trustees acquired leases of land in order to open quarries near Dalbeattie and also south of Creetown at Kirkmabreck, exploiting the Criffel Granite, which is grey with pink feldspar crystals. This strong, durable rock-type was used to impressive effect at Albert Dock, Liverpool, where Jesse Hartley created his trademark pseudo-medieval architectural style. The Canning Half-Tide Dock (top right) was rebuilt by engineer Jesse Hartley in 1842-4, using coping stones and rubble of Criffel Granite, whilst the retaining walls are probably of Runcorn Stone. Initially, dock construction at Liverpool and Birkenhead used local sandstone from quarries such as St James’ Mount. From about 1830, however, granite was used for edgings, kerbstones and setts in those parts of the docks most likely to be damaged by either boats or wheeled vehicles. Wilding (1890) suggested that many of the granite kerbs and setts used in Liverpool were produced near Newry in Ireland (where the rock is pinkish grey in colour). During the early 20th century, granite cladding was used at a number of impressive Liverpool landmarks, including the Royal Liver Building, and the R.C. Cathedral Crypt. The Royal Liver Building (1914-16) (below) is the most impressive of the ‘Three Graces’ which dominate Liverpool’s waterfront. Of reinforced concrete with granite cladding, it was the tallest building of its period in the country.
Had Edwin Lutyens completed his planned R.C. Cathedral, started in 1933, it would have dwarfed the nearby Anglican Cathedral. The classically-styled crypt, partially set into the former quarry at Brownlow Hill, was faced in white coarse-grained granite, and was later used as a base for the Metropolitan Cathedral (above).

**Darley Dale Sandstone**

Darley Dale Sandstone (Carboniferous, Millstone Grit Group) from Derbyshire is well represented in the impressive 19th-century civic buildings of William Brown Street. St George’s Hall, the World Museum, the Picton Reading Room, the Walker Art Gallery, the former North Western Hotel and the Wellington Column, are similarly all constructed of this stone, which has weathered well. By contrast, the plinth of the Walker Art Gallery is formed of an unidentified Triassic sandstone, which is now flaking and spalling.

The Grade I listed St George’s Hall (1841-56) (below), is one of the finest neoclassical buildings in the world, and forms the centrepiece of a collection of similar civic buildings on William Brown Street. The scale demanded a uniformity only provided by the likes of Derbyshire Darley Dale Sandstone, which set a pattern for many later buildings in the city centre.
Portland Stone
Like many cities and towns within the UK, there are fine examples of buildings using Portland Stone (Upper Jurassic) within Merseyside, particularly within the city of Liverpool. The striking white colour of this variably bioclastic, ooidal limestone can be seen on the Cunard Building, the India Building, the Port of Liverpool Building and the Victoria Monument. The Cunard Building in particular includes finely carved blocks of this versatile freestone (which is easy to work and later hardens on exposure to the atmosphere). The faded grandeur of the Edwardian Adelphi Hotel, Liverpool (above), is a reminder of how the city was at the forefront of transatlantic travel. The white Portland Stone is simply a cladding over a more prosaic steel and concrete frame.

Runcorn Stone
Due to the close proximity of the quarries, Runcorn Red Sandstone (Triassic, Sherwood Sandstone Group) from Cheshire has been used within the Merseyside area. During the 1820’s, this sandstone was used in parts of the dock systems at Birkenhead and at Liverpool, including Prince’s Dock, completed in 1821. It can also be seen at the Perch Rock Battery, Wallasey (1829) and St George’s Church at Thornton Hough (1907).

Longridge Stone, Bolton Stone & Anglesey limestone
Carboniferous Longridge sandstone was used in the Albert Dock, Liverpool, and was mentioned by Mortimer (1847) in his description of the Morpeth and Egerton docks, Birkenhead. In this area of the dock system are a series of arches forming a quay, and he stated that ‘These arches, apparently about twenty in all, and also the piers, are beautifully built of Bolton and Longridge Stone. The whole of the hollow of the gates are of Anglesey limestone, as well as the rubbing bands round the piers and entrances. ‘Bolton Stone’ possibly refers to Ousel Nest Grit (Pennine Lower Coal Measures Formation), extensively quarried near Bolton, Greater Manchester.
Welsh Slate & Cumberland Slate
Slate, mainly from North Wales; but with a significant contribution from Cumbria, has been widely used throughout the county as a roofing material. The development of the docks, and the canal and railway networks, provided the means to import slate throughout Merseyside. The abolition of slate duty in 1831 led to a significant increase in the amount of slate being used for new-build and also the widespread availability of slate to re-roof the existing building stock. The Church of St Peter Apostle & Martyr at Formby, Sefton, (below) has a roof of graduated Westmorland Slate, which was used in increasing quantities in the county during the 19th century.

Exotic international sources
A wide range of ‘exotic’ building stones from different parts of the world were used within the City of Liverpool during the 19th and early 20th centuries, reflecting the wealth and status associated with this thriving port. These include a variety of marbles from Italy, Ireland and Greece, Rapakivi Granite from Finland, Larkivite from Norway, limestones from France and Germany, granites from Sweden, Norway and many other parts of the UK, gneiss from Sweden and gabbro from South Africa. The regeneration of Liverpool City Centre, in the late 20th and early 21st centuries, has led to a revival of this tradition, with the Liverpool One retail and housing development providing an excellent example.
Glossary

**Ashlar**: Stone masonry comprising blocks with carefully worked beds and joints, finely jointed (generally under 6mm) and set in horizontal courses. Stones within each course are of the same height, though successive courses may be of different heights. ‘Ashlar’ is often wrongly used as a synonym for facing stone.

**Carbonaceous**: Consisting of, containing, relating to, or yielding carbon.

**Cementation**: The diagenetic process by which the constituent framework grains of a rock are bound together by minerals precipitated from associated pore fluids e.g. silica, calcite.

**Chert**: A granular microcrystalline to cryptocrystalline variety of quartz.

**Dressings**: To say a building is constructed of brick with stone dressings means that worked stone frames the corners and openings of the structure.

**Flaggy**: A finely laminated, sedimentary rock that splits into thin sheets when exposed to weathering.

**Freestone**: Term used by masons to describe a rock that can be cut and shaped in any direction without splitting or failing.

**Granite**: Coarsely crystalline igneous rock, composed primarily of quartz, feldspars and micas, with crystal sizes greater than 3 mm.

**Interbedded**: Occurs when beds (layers or rock) of a particular lithology lie between or alternate with beds of a different lithology. For example, sedimentary rocks may be interbedded if there were sea level variations in their sedimentary depositional environment.

**Limestone**: A sedimentary rock consisting mainly of calcium carbonate (CaCO₃) grains such as ooids, shell and coral fragments and lime mud. Often highly fossiliferous.

**Mica**: Group of silicate minerals composed of varying amounts of aluminum, potassium, magnesium, iron and water. All micas form flat, plate-like crystals. Crystals cleave into smooth flakes. Biotite is dark, black or brown mica; muscovite is light-coloured or clear mica.

**Outcrop**: Area where a rock unit is exposed at the ground surface.

**Parpoints**: A term applied in Yorkshire to the cuttings made in squaring up flags and landings; the cuttings are made into ‘blockers’, ‘parpoints’, or ‘shodders’, and are used for facing walls, etc. They are sometimes cut to the proper size and used for inside partitions, similar to bricks.

**Quartz**: The crystalline form of silica (silicon dioxide, SiO₂).

**Sandstone**: A sedimentary rock composed of sand-sized grains (i.e. generally visible to the eye, but less than 2 mm in size).

**Shale**: An argillaceous rock with closely spaced, well-defined laminae.

**Siltstone**: A sedimentary rock composed of silt-sized grains (i.e. only just visible to the eye).

**Stratigraphy**: Branch of geoscience dealing with stratified rocks (generally of sedimentary origin) in terms of time and space, and their organisation into distinctive, generally mappable units.
Acknowledgements

Written by Mark Fletcher and Chantal Johnson, this study is part of Merseyside’s contribution to the Strategic Stone Study, sponsored by Historic England. All images © Mark Fletcher.

The atlas incorporates information from a range of sources. The authors would like to thank Peter France of Wirral Archaeology, Joe Crossley of Liverpool Geological Society, geologist Geoffrey Tresise, David Bridson manager of Williamson Tunnel Heritage Centre, Merseyside Biobank, MEAS, Cheshire RIGS Group, Alan Davies, former Curator of the Lancashire Mining Museum, Liverpool Museums, and David Gelsthorpe, Curator, Manchester Museum.

Edited by Graham Lott and Stephen Parry, British Geological Survey.

Based on the original design by Tarnia McAlester. First published by English Heritage May 2012. This version of the atlas was rebranded by Historic England in December 2017. The information within it remains unaltered from the first version.

We are grateful for advice from the following:

Don Cameron, British Geological Survey
Graham Lott, British Geological Survey
Stephen Parry, British Geological Survey

Further Reading


Liverpool Waters Environmental Statement, October 2010, Volume 2, Appendix 4, Cultural Heritage and Archaeology.


Liverpool Geological Society Archives and Liverpool Geological Association Archives held by Liverpool Museums at North Street, Liverpool. NH/LGS/6/1 Minute book of Liverpool Geological Association June 1880-Sept 1883.


Merseyside RIGS records held at Merseyside Biobank.


Personal communication and correspondence with David Bridson, Centre Manager of the Williamson Tunnels Heritage Centre from March 2011.

Personal communication and correspondence with Joe Crossley, Secretary of Liverpool Geologists Society from January 2011.

Personal communication and correspondence with Peter France of Wirral Archaeology from March 2011.

Personal communication and correspondence with Terry Hughes of the Stone Roofing Association and the English Stone Forum.

Personal communication with staff at MEAS, Merseyside Environmental Advisory Service, March 2011.

Personal communication with Geoffrey Tresise, geologist and expert on fossil footprints.


Storeton Quarries archive, held at Wirral Archives at Birkenhead, Wirral ZST/7 1905-47, ZST/11 1914-53.


Woolton Village website http://www.wooltonvillage.co.uk accessed January 2011

---

**British Geological Survey sources**

**Geological Memoirs**


**British Geological Survey maps**

Sheet 96, Liverpool, 1:50 000 Bedrock and Superficial deposits, 2006.

Six Inch Geological Maps held in personal collection of Alan Davies.


BGS Photo Archive P201626, P207286, P207287.

Building Stone Collection at Manchester Museum.