Historic England

North Yorkshire, East

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 John Powell (British Geological Survey).

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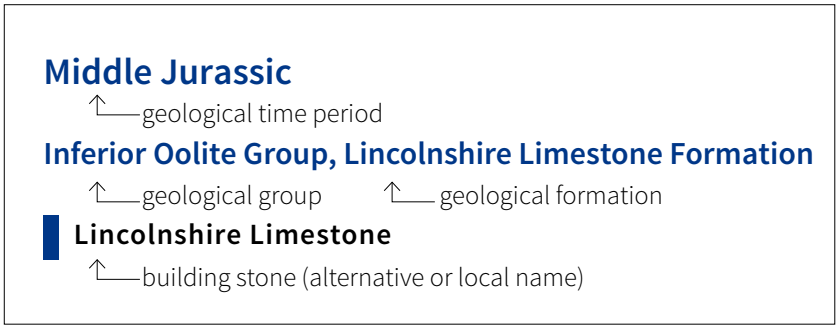
Front cover: Goathland railway station. Aislaby Stone. © John Devlin / Alamy Stock Photo.

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.



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 mineral planning authority areas of North Yorkshire County Council (eastern part), the North York Moors National Park Authority, the unitary authority area of the City of York, and the local planning authority areas of Selby, Harrogate, Craven, Richmondshire, Hambleton (part), Ryedale and Scarborough. The Middlesbrough, Redcar and Cleveland, and Stockton on Tees areas are covered in the *County Durham, Tyne and Wear and Tees Valley* guide.

Contents

1 Introduction

The character of the landscape, towns and villages of the eastern half of North Yorkshire are reflected in its underlying geology, principally the Jurassic rocks. Locally quarried stone was used for vernacular buildings, monastic abbeys, including Ampleforth, Byland, Mount Grace and Rievaulx, for example, as well as municipal town buildings, churches and country houses. It was also employed in the construction of harbours and railway/road bridges over a large area, but mainly where good quality stone was readily available. Development of the railway network in the 19th century and the transportation of building stone by ship from local ports such as Whitby allowed the higher quality building stones to be used in buildings over a wider area, including in major cities such as London and at the docks in Tangier, Morocco.

The Permian rocks that crop out in the west of the area include the dolomitic limestone units of the Cadeby Formation and the Brotherton Formation. These were widely used as building stone, including at York Minster.

Red and grey Triassic Sherwood Sandstone was worked extensively for building stone in the Midlands, and it was transported by rail throughout the UK, including to north-east Yorkshire. However, in this region, these rocks are mostly obscured by thick deposits of Quaternary glacial sediments in the low ground of the Vale of York. The thicker beds of the Sherwood Sandstone were quarried locally for building stone near Warlaby and Ripon.

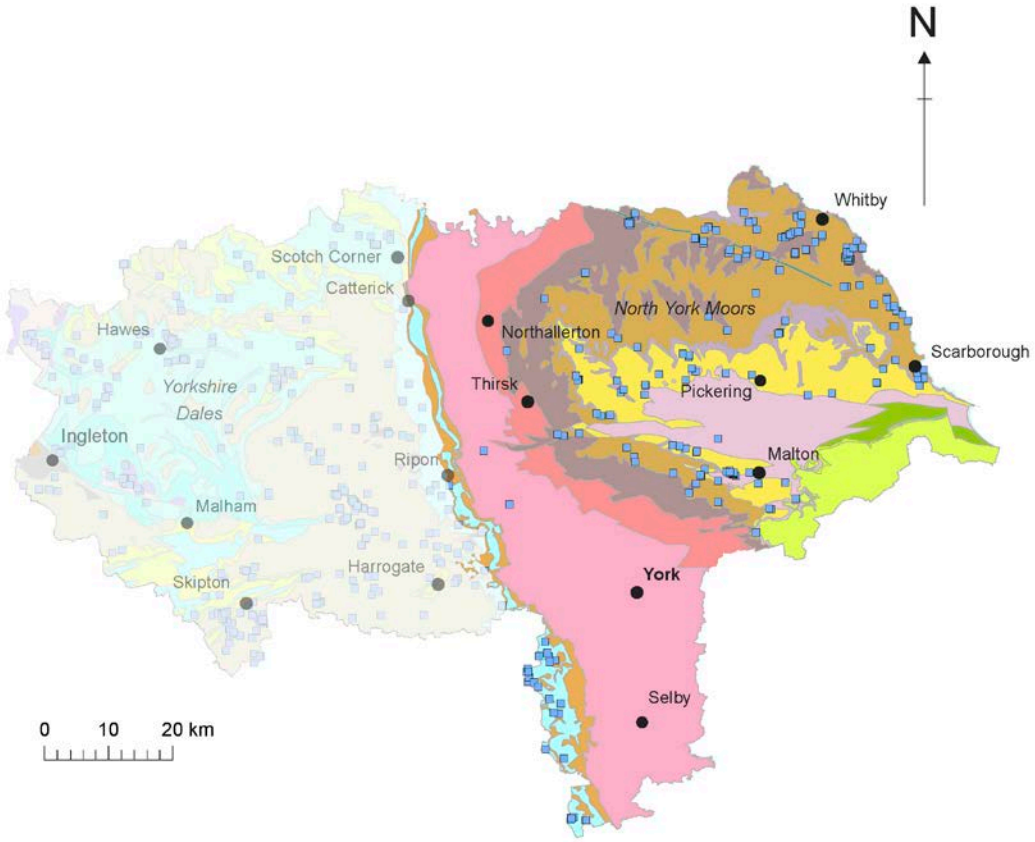
The Jurassic rocks that typify the landscape of the North York Moors and Hambleton Hills range in age from about 145 to 199 million years old. They are overlain by younger Cretaceous clays and chalk, the latter characterising the Yorkshire Wolds. The oldest Jurassic strata in the area, the Lias Group, are generally too soft to be used as building stone. However, the Middle Jurassic Dogger Formation and the overlying Ravenscar Group provided excellent building stones, especially the harder yellow, dark brown and grey sandstone lithologies. These rocks form many of the escarpments of the bold north and west-facing escarpments of the North York Moors. Here, local quarrying took place and the stone was used in village and farms buildings across the northern moors, from Whitby to Osmotherley, and to the south as far as Kilburn. These sandstones were also quarried for building stone in the Howardian Hills, along with Middle Jurassic limestones such as Whitwell Oolite and Brandsby Roadstone.

Higher in the sequence, the pale brown Middle Jurassic Osgodby Formation sandstones and, especially, the Upper Jurassic Corallian Group limestones and calcareous sandstones typify the buildings and walling stone of the Hambleton Hills and Tabular Hills of the North York Moors, as well as the Howardian Hills located to the south-west. These pale grey and yellow-brown building stones were widely used in towns, villages and important country houses, including at Nunnington Hall, Duncombe Park and Castle Howard. A local variant, the Hildenley Limestone, has been much prized since Roman times as fine-grained freestone, commonly employed for monumental sculpture and architraves.

The Chalk Group (Cretaceous age) of the Yorkshire Wolds is notably harder than its counterpart in southern England. It was, therefore, used as a local building and walling stone in churches and village buildings.

Finally, the Quaternary glacial deposits have provided large boulders locally. These have been incorporated in the foundations and lower courses of village buildings, especially where good quality building stone is sparse, such as in the Yorkshire Wolds.

Bedrock Geology Map



Key

Building stone sources

Bedrock geology

White Chalk Subgroup — chalk: chalk group

Grey Chalk Subgroup — chalk: chalk group

Hunstanton Formation — chalk

Speeton Clay Formation — mudstone, limestone, siltstone, tuffs

Ampthill Clay Formation and Kimmeridge Clay Formation — mudstone and siltstone

Corallian Group — limestone, sandstone, siltstone and mudstone

Osgodby Formation and Oxford Clay Formation — mudstone, siltstone and sandstone

Ravenscar Group — sandstone, siltstone, mudstone and limestone

Lias Group — mudstone, siltstone, limestone and sandstone

Triassic Rocks (Mercia Mudstone Group) — mudstone, siltstone and sandstone

Triassic Rocks (Sherwood Sandstone Group) — sandstone and conglomerate, interbedded

Zechstein Group (Cadeby and Brotherton Formations) — dolomitised limestone and dolomite

Permian Rocks— mudstone, siltstone and sandstone

Igneous Rocks

Cleveland Dyke, Palaeogene — dolerite

Stratigraphic Table

Geological timescale	Group	Formation	Building stone	Page
Quaternary	various	various	Tufa Pebbles, boulders	21 21
Tertiary	Mull Dyke Swarm	Cleveland Dyke	Whinstone (dolerite)	20
Upper Cretaceous	Chalk Group	Flamborough Chalk Formation	Chalk (Flamborough Chalk, Burnham Chalk) Flint	19
		Burnham Chalk Formation		
		Welton Chalk Formation		
		Ferriby Chalk Formation		
Lower Cretaceous	Cromer Knoll Group	Hunstanton Formation		
		Speeton Clay Formation		
Upper and Middle Jurassic	ungrouped	Kimmeridge Clay Formation		
		Ampthill Clay Formation		
	Corallian Group	Upper Calcareous Grit Formation	Upper Calcareous Grit North Grimston Cementstone	19 19
		Corallian Oolite Formation	Coral Rag Malton Oolite, Hildenley Limestone Middle Calcareous Grit Hambleton Oolite Yedmandale Passage Beds	18 17 17 16 16
		Lower Calcareous Grit Formation	Lower Calcareous Grit, Birdsall Calcareous Grit	15
	ungrouped	Oxford Clay		
		Osgodby Formation	Hackness Rock Kellaways Rock	14 13
		Cornbrash Formation		
	Ravenscar Group	Scalby Formation	Moor Grit Member Sandstone	13
		Scarborough Formation	Scarborough Limestone (Brandsby Roadstone)	12
		Cloughton Formation	Cloughton Sandstone Whitwell Oolite (Cave Oolite)	9 9
		Ellerbeck Formation		
		Saltwick Formation	Whitby Stone (Aislaby Stone, Bilsdale Stone, Fairhead Stone, Moor Grit Member Sandstone)	9
	ungrouped	Dogger Formation	Dogger Sandstone	8
Lower Jurassic	Lias Group	Whitby Mudstone Formation		
		Cleveland Ironstone Formation	Cleveland Ironstone	8
		Staithes Sandstone Formation	Staithes Sandstone	7
		Redcar Mudstone Formation		
Triassic	Penarth Group	various		
	Mercia Mudstone Group			
	Sherwood Sandstone Group	various	Sherwood Sandstone	
Permian	Zechstein Group	Brotherton Formation	Upper Magnesian Limestone	7
		Cadeby Formation	Lower Magnesian Limestone	5

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

2 Local Building Stones

Permian

The Permian succession is very well exposed along the outcrop, southwards from Tadcaster to Womersley, but it is generally obscured by superficial deposits. It is poorly exposed over much of the area to the north of Ripon. Lithologically, the Lower Permian succession comprises reddened, coarse-grained breccias and sandstones, which have not generally been suitable for use as building stones. In contrast, the Upper Permian succession includes the dolomitic limestone units of the Cadeby Formation and the Brotherton Formation in the south, which were important building stone sources historically and remain so today. North of Richmond, these Zechstein Group limestones form part of the Raisby Formation. They were quarried locally for building stone in the distant past, but today are worked only for lime.

Zechstein Group, Cadeby Formation

Lower Magnesian Limestone

The pale yellow-white, fine to coarse-grained, bioclastic and ooidal, dolomitic limestones of this formation are particularly important sources of local building stone. The outcrop is pock-marked by quarries, many of which have produced fine quality building stone since at least the 12th

Figure 1: All Saints' Church, Sherburn in Elmet. Lower Magnesian Limestone.

century, most noticeably at the Huddleston, Smaws, Lords and Jackdaw Crag quarries. Most of the villages on or close to the outcrop are constructed of these pale limestones, including Tadcaster, Sherburn in Elmet, Monk Fryston, Womersley and Little Smeaton. The quarries in the Tadcaster to Sherburn area have also provided stone for numerous buildings in the city of York, including York Minster, and the city walls. Three active quarries still produce building stone from the formation.

Figure 2: St Mary's Church, Tadcaster. Lower Magnesian Limestone.

Figure 3: York Minster. Lower Magnesian Limestone.

Zechstein, Brotherton Formation

Upper Magnesian Limestone

The more thinly bedded limestones of this formation were generally quarried principally as a source of lime, but they were also used locally in field walls and farm buildings along its outcrop.

Triassic

Sherwood Sandstone Group, various formations

Triassic Sherwood Sandstone was worked widely for building stone in the Midlands, where it is known as Staffordshire (Hollington) Red and Grey. These varieties were transported by rail throughout the UK, including to north-east Yorkshire. In this region, the Sherwood Sandstone is mostly obscured by thick deposits of Quaternary glacial sediments in the low ground of the Vale of York. However, where rivers have locally cut down through the Quaternary deposits to reveal the underlying bedrock, the thicker beds of the Sherwood Sandstone, quarried at Rainton near Ripon and Aldborough near Boroughbridge, were used as local building stone.

Lower Jurassic

Lias Group, Staithes Sandstone Formation

Staithes Sandstone

This yellow-grey, fine-grained calcareous sandstone was not widely used as a building stone because it is relatively soft. However, it has been employed as a flooring flagstone in coastal villages, such as Staithes and Runswick, where it crops out.

Figure 4: Cottages, Staithes Harbour. Staithes Sandstone.

Lias Group, Cleveland Ironstone Formation

Cleveland Ironstone

The Cleveland Ironstone was mined and quarried extensively along its outcrop but mainly for its iron content rather than as a building stone. It is a grey to yellow-brown sideritic and berthierinitic ironstone and iron-rich sandstone, with abundant ooids and shelly fossils.

Upper and Middle Jurassic

Ungrouped, Dogger Formation

Dogger Sandstone

This is generally a thin, red-brown, iron-rich sandstone and it was quarried for local use in the area around Crambe and Spy Hill, near Whitwell-on-the-Hill, as a quoin and ashlar stone.

At the Church of St Michael at Crambe, a red-brown and yellow-brown Dogger Formation sandstone (Spy Hill variety) was used with a range of other building stones, including pale grey Hildenley Limestone. However near Sutton Bank in the Hambleton Hills, and at Mowthorpe, near Terringtonin the Howardian Hills, it is represented, atypically, by a pale grey and brown, ooidal, cross-bedded, shelly limestone. This limestone was formerly quarried for use as freestone and rubble blocks in local farm buildings in the lower Mowthorpe area. It was also employed in the 12th century at nearby Sheriff Hutton Castle, where it was used for the construction of walls, and later in adjacent village buildings.

Figure 5: St Michael's Church, Crambe. Dogger Sandstone and Hildenley Limestone.

Figure 6: Sheriff Hutton Castle. Dogger Limestone.

Ravenscar Group, Saltwick Formation, Cloughton Formation

Whitby Stone (Aislaby Stone, Bilsdale Stone, Fairhead Stone, Moor Grit Member Sandstone), Cloughton Sandstone, Whitwell Oolite (Cave Oolite)

Buff, yellow and brown, medium to coarse-grained, Whitby sandstone (also known locally as Aislaby, Bilsdale or Fairhead Stone) is widely available in the North York Moors and the Howardian Hills. It was used over a large area as a building stone in villages, farm buildings and walls, as well as for monumental sculpture. The thicker sandstones generally form laterally impersistent beds and crags along the escarpment of the northern moors, where they were quarried, locally, for freestone and ashlar. The most productive large quarries, at Galley Hill, Aislaby, near Whitby, were used in the construction of many domestic and civic buildings in and around the town, for example Whitby Abbey. High-quality stone was exported from here for use in London, including at Covent Garden. It was employed in many churches in the North Yorkshire area, in the construction of road and railway bridges, and at railway stations. It was also used as ‘pierstone’ or ‘blockstone’ for the harbours at Whitby, Saltwick Bay, Ramsgate, Margate and Tangier (Morocco). The stone is still worked at Aislaby.

The distribution of sandstone quarries in the North York Moors (at Upsall, Boltby, Thirlby and Goldsborough) shows that it was generally the thick sandstone beds in the, the Saltwick Formation that were exploited. The quarries provided slabs of variable thicknesses that could be easily worked for a variety of uses, including freestone, ashlar, quoins, walling stone and rubble fill. The stone was transported for use for cottages in lower villages like Osmotherly and Egton and for buildings such as Mount Grace Priory and the early parts of Rievaulx Abbey, and the former mission chapel at Kettleness.

The Riccal Dale relatively hard, coarse-grained variety was quarried as large blocks for use in road and railway bridge construction on the Helmsley branch line. The formation also provided good quality flagstone. A variety of this sandstone, known as the Moor Grit Member, is generally white or pale grey in colour and it is found higher up on the moors. It varies from a pebbly, coarse-grained rock to a white, fine-grained variety. The latter is easily split along bedding planes and was used as flagstones at Whitby quay, for example. It was also employed in early buildings at Byland Abbey.

Fine examples of the stratigraphically higher (but similar) Cloughton Formation sandstones can be seen in the villages of Cloughton and Burniston, and at Hayburn Wyke on the coast, as well as at Goathland railway station.

Whitwell Oolite is a white, shelly, ooidal limestone found in the Hambleton Hills and especially in the Howardian Hills where it was quarried extensively for building stone near the village of Whitwell-on-the-Hill. It forms part of the fabric of nearby Kirkham Priory, and fine examples of its use as a freestone can be seen in the local villages, such as Kirkham and Westow. The Stone Trough Inn at Kirkham uses pale grey Whitwell Oolite in the walls, with occasional red-brown Dogger Formation sandstone. The quoins are of Corallian Group limestone. The stone was easy to work, which made it suitable for piers, breakwaters and docks, for example at Hull. In the Humberside area, it is known as Cave Oolite, and a fine-grained variety known as Cave Marble was used for interior decoration.

Figure 7: Chapel, near Kettleness. Aislaby Stone.

Figure 8: Mount Grace Priory, Osmotherley. Aislaby Stone.

Figure 9: Farm building. Aislaby Stone.

Figure 10: Whitby harbour flagstones. Moor Grit Member Sandstone.

Figure 11: The Trough Inn, Kirkham. Whitwell Oolite and Dogger Formation Sandstone, and Corallian Group limestone quoins.

Ravenscar Group, Scarborough Formation

Scarborough Limestone (Brandsby Roadstone)

Throughout much of the North York Moors, the Scarborough Formation is represented by calcareous mudstone, with thin beds and concretions of pale grey limestone. It is little used as building stone, although large limestone blocks were employed in the construction of the pier at Scarborough. In the Hambleton Hills and Howardian Hills, however, the formation passes laterally to a pale grey, cross-bedded, thin-bedded (flaggy) limestone known locally as the Brandsby Roadstone.

This limestone is siliceous and relatively hard, and it is overlain by softer yellow-brown, coarse-grained, shelly sandstone called the Crinoid Grit Member. The Brandsby Roadstone was used locally for houses, walling and road metal. This thin-bedded flagstone, easily split into large slabs, was also employed more widely as a walling and roofing stone, including at the Church of All Saints at Brandsby.

Figure 12: Houses, Brandsby. Brandsby Roadstone.

Figure 13: Wall of All Saints Church, Brandsby. Brandsby Roadstone.

Ungrouped, Osgodby Formation

Kellaways Rock

The Kellaways Rock is a yellow-brown, medium-grained, ferruginous and calcareous sandstone, with occasional fossil shells or voids where the original shells have been dissolved away. Its yellow to deep red-brown colour is due to the presence of iron in the form of berthierine (iron silicate, also known as chamosite) ooliths. The iron-rich sandstones comprising the Hackness Rock Member and the underlying Redcliff Rock Member provided good freestone and ashlar. However, their relative softness and calcareous 'cement', compared to the hard, silica-cemented Ravenscar Group sandstones, for example Aislaby Stone, make them prone to weathering and spalling over time. The Kellaways Rock was quarried extensively along the escarpment at Levisham Moor, above Newton Dale, where it was used in the construction of Skelton Tower. It was transported by railway along Newton Dale for use in buildings in Levisham village and Pickering, at the railway station, for example.

Figure 14: Pickering station, part of the North Yorkshire Railway. Kellaways Rock.

Hackness Rock

The overlying Hackness Rock was quarried near the eponymous village and it was used in the construction of the Rotunda Museum in Scarborough, designed by the eminent 19th-century geologist William Smith.

Other significant uses of this stone include the Church of St Peter and the church hall at Hackness, Yorkshire Museum (York) and some of the earlier buildings at Rievaulx Abbey. Yellow-brown Middle Jurassic sandstones were employed in the lower levels of the transept at the abbey, and sandstone from the Saltwick Formation was used in the foreground walls. Also worthy of note are the upward transition and later use of Birdsall Calcareous Grit (pale grey) and Hambleton Oolite for the arches in Rievaulx Abbey.

Figure 15: Rotunda Museum, Scarborough. Hackness Rock.

Figure 16: Rievaulx Abbey. Hackness Rock.

Corallian Group

The Corallian Group includes pure, pale grey, mostly ooidal limestones and yellow-buff calcareous sandstones (grits). These rock types are locally distinct, but in some areas, such as the Hambleton Hills and Howardian Hills, they grade laterally one into the other. The most distinctive and widely used building stones are the pale grey to white ooidal limestones represented by the Hambleton Oolite Member and the Malton Oolite Member, and the yellow-buff calcareous sandstones represented by the Lower Calcareous Grit Formation, Birdsall Calcareous Grit Member, Yedmandale Member (formerly Passage Beds), Middle Calcareous Grit Member and Upper Calcareous Grit Formation. Ooids are small, generally circular grains that look like fish roe, and they are made up of concentric layers of lime (calcium carbonate). The calcareous grits may have dispersed ooids, but they consist predominantly of small, globule-like, silica spicules derived from fossil sponges. Both building stone types have a calcareous matrix (limey cement) and contain shelly, calcitic fossils.

Corallian Group, Lower Calcareous Grit Formation

Lower Calcareous Grit, Birdsall Calcareous Grit

The Lower Calcareous Grit Formation was used widely from Scarborough to the Hambleton Hills and Howardian Hills. However, in the Hambleton Hills and Tabular Hills, some of the quarries originally designated Lower Calcareous Grit are actually in the stratigraphically higher Birdsall Calcareous Grit Member. The Lower Calcareous Grit was quarried near Oliver's Mount, Scarborough, for use locally and in the Malton area. In the Howardian Hills, the Lower Calcareous Grit and the Birdsall Calcareous Grit were quarried extensively for freestone because the stones could be easily fashioned into blocks. Lower Calcareous Grit was much used at Byland Abbey, in the later buildings at Rievaulx Abbey and at Castle Howard, as well as in vernacular buildings in and around Birdsall and Huttons Ambo. Unfortunately, these stones can weather badly over time and are subject to spalling where exposed to rain.

Figure 17: Byland Abbey. Lower Calcareous Grit and Birdsall Calcareous Grit.

Corallian Group, Corallian Oolite Formation

Yedmandale Passage Beds

The Yedmandale Member is a yellow, quartz-rich, fine to medium-grained calcareous sandstone. It was quarried for local building and walling stone near the villages of Dalby, Levisham and Lockton, where it outcrops.

Hambleton Oolite

This is a pale grey to white, fine-grained, ooidal limestone that crops out in the Hambleton Hills and Howardian Hills. It is generally thin-bedded and flaggy, thus making it suitable for walling and building stone. Shallow quarries for this purpose, such as Kepwick Quarry, are common in the Hambleton Hills. Thicker beds were used for freestone and ashlar in local churches, village and farm houses, as seen at Scawton, Cold Kirby, Old Byland, Helmsley and parts of Pickering.

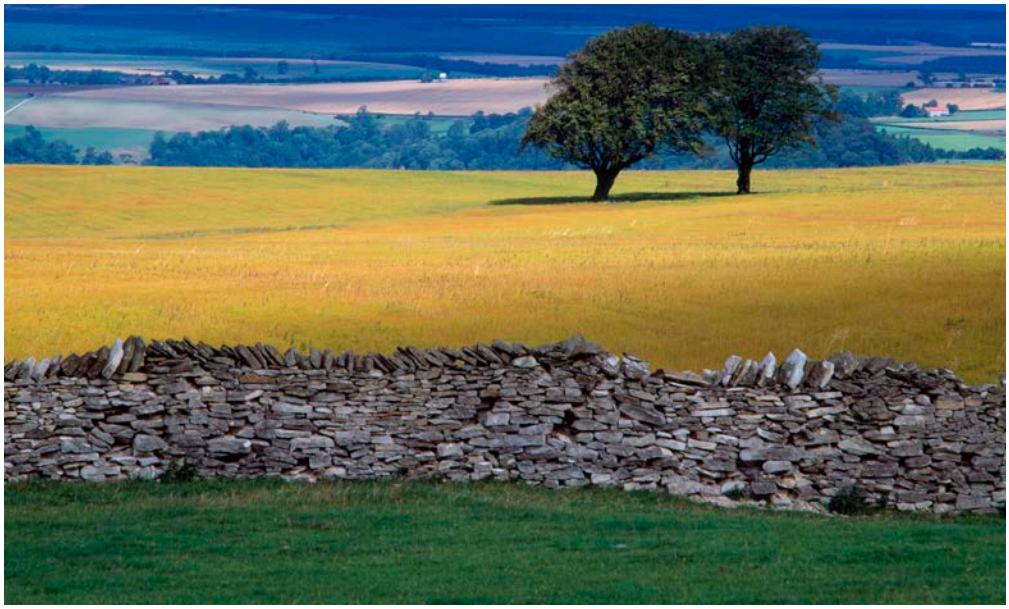


Figure 18: Field walls, Scawton Moor. Hambleton Oolite.

Figure 19: Bridge Street, Helmsley. Hambleton Oolite.

Middle Calcareous Grit

This is lithologically similar to the Birdsall Calcareous Grit, but it is generally softer and has fewer sponge spicules. It is a good building stone and was worked for freestone and ashlar near Helmsley, Thornton Dale and Pickering at the southern margin of the Tabular Hills. It was used in the construction of Ampleforth College and Duncombe Park house, and in village buildings in the Tabular Hills and Howardian Hills.

Malton Oolite, Hildenley Limestone

Malton Oolite is lithologically similar to the Hambleton Oolite, although the size of the ooids is generally larger in the former. It was widely quarried in the Tabular Hills and Howardian Hills for local use as ashlar and quoin stone in country houses, churches, and village and farm buildings. Examples can be seen in Malton, Hovingham and Cawton, and in parts of Slingsby Castle. It is currently worked for aggregate near Hovingham.

Hildenley Limestone is a distinctive variety of the Malton Oolite Member and it was worked locally in a series of quarries south-west of Malton, near Hildenley Home Farm. It is a white to pale grey, thin-bedded, fine-grained, porcellanous limestone, with a small proportion of sponge spicules and occasional small shelly fossils, the latter often replaced by silica. Its compact nature made it highly suited for use as freestone and ashlar and, especially, in monumental sculpture. There is evidence that it has been prized and worked since Roman times for coffins, carved fireplaces and window quoins. Examples can be seen in the churches at Old Malton, Crambe, Hildenley, Hovingham and Appleton-le-Street; at Howsham Hall and Hildenley Hall; in the chapel at Castle Howard and in part of the fabrics of Kirkham Priory, Slingsby Castle and York House (Malton). This prized stone was often reused in vernacular houses in local villages and towns, such as Amotherby and Malton.

Figure 20: Kirkham Priory. Hildenley Limestone.

Corallian Group, Corallian Ooolite

Coral Rag

Overlying the Malton Oolite, the Coral Rag comprises yellow-grey and pale grey limestone, locally rich in shelly fossils and corals. Coral Rag was quarried around Nunnington for village and farm buildings, and for ashlar used at Nunnington Hall.

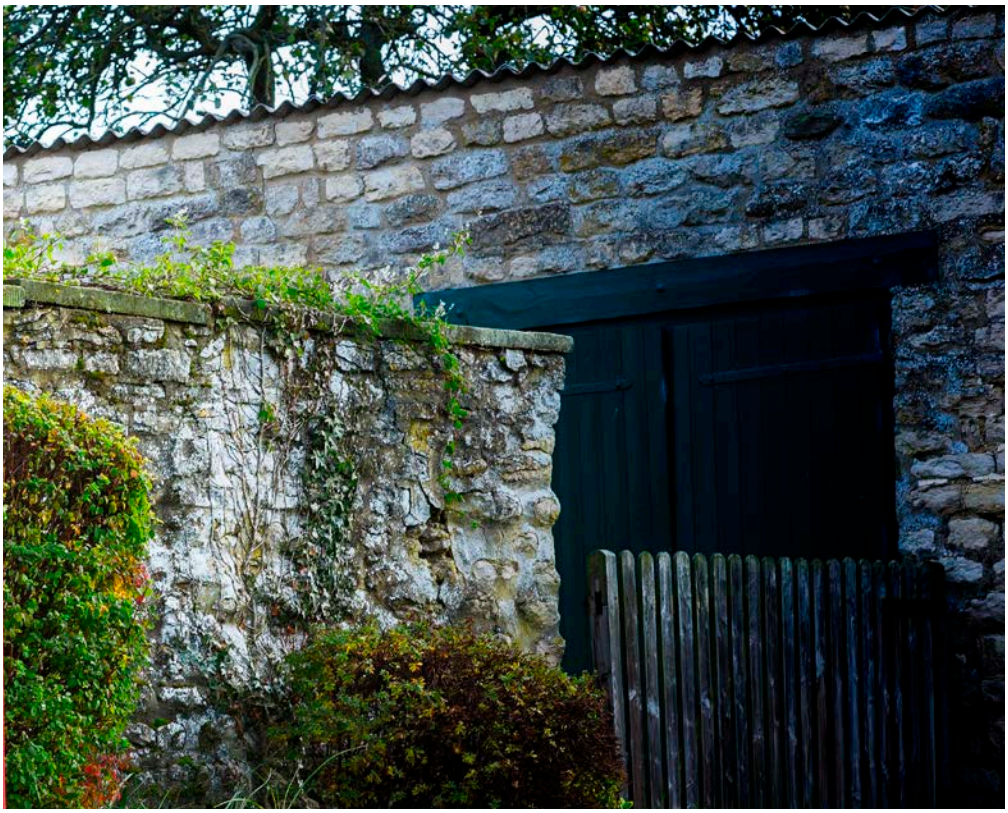


Figure 21: Garden walls, Nunnington. Coral Rag.

Figure 22: Nunnington Hall. Coral Rag.

Corallian Group, Upper Calcareous Grit Formation

Upper Calcareous Grit, North Grimston Cementstone

This is lithologically similar to the Lower and Middle Calcareous Grits. However, it was less commonly used as a building stone because the sandy beds are generally softer and, locally, the beds containing abundant sponge spicules are too hard to work easily. Quarries located north-west of Pickering suggest that it might have been used for building stone in the town, but it is difficult to differentiate between this stone and the Middle Calcareous Grit.

The North Grimston Cementstone is a locally developed, pale grey, fine-grained, siliceous limestone. Its fragmentary nature made it poorly suited for widespread use as a building stone, although it was employed, in the villages of North Gromston, Langton and Birdsall.

Upper Cretaceous

Chalk Group, various formations

Chalk (Flamborough Chalk, Burnham Chalk)

The white chalk of the Yorkshire and Humberside Wolds is lithologically similar to the chalk of southern England and comprises microscopic calcareous (limey) remains of marine plants. Some chalk formations have bands and/or nodules of grey to black flint (silica), originally derived from siliceous marine microfossils. However, the chalk rock of northern England is much harder and better cemented than the southern variant, because it has been buried at greater depths over geological time. Consequently, hard white chalk has been used as a building stone more widely in this region.

Figure 23: Wall, Bempton. Sandstone and quartzite boulders with higher courses of chalk and red brick.

Tertiary

Mull Dyke Swarm, Cleveland Dyke

Whinstone (Dolerite)

This hard durable Whinstone (dolerite) was intruded as a sub-vertical, molten dyke during Tertiary times. It was quarried widely in the late 19th and early 20th centuries across the North York Moors, at Roseberry Topping, Cliff Rigg and Goathland, for example, mainly for use as roadstone. However, large blocks have been employed locally as a decorative building stone.

Quaternary

Various groups, various formations

Pebbles, Boulders

With an abundance of good quality building stones throughout north-east Yorkshire, little use was made of Quaternary deposits, except as a source of brick clay. However, in the villages of the Vale of York and in the Yorkshire Wolds, where brick dominates the vernacular buildings, and good quality building stone was either absent or too expensive to transport, local pebbles and boulders derived from the Quaternary deposits were employed. These mostly comprise large exotic boulders of hard sandstone or quartzite. They were often combined with chalk and brick in foundations and footings for village houses and walls.

Tufa

Tufa is a porous pale brown limestone that forms around springs emanating from calcareous bedrock, especially the limestones of the Corallian Group. This relatively light ornamental stone was worked in the upper part of Forge Valley.

3 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.

North Yorkshire, East references

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Figures

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