Historic England

# Rutland

## 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 Carole Bancroft-Turner and Debbie Frearson, Historic Investigations.

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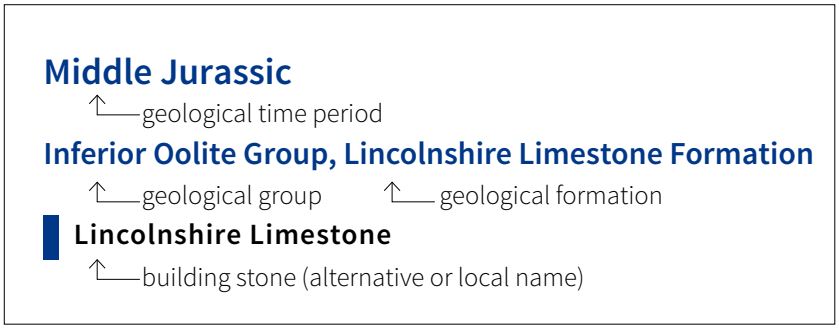
Front cover: Church Street, Lyddington. Marlstone. © John Morrison / Alamy Stock Photo.

# 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 and local planning authority area of Rutland County Council.

# Contents

# 1 Introduction

The Rutland landscape has an individual and distinctive character. It is a slightly hilly and rolling county, deeply cut by wide valleys whose features reflect the underlying Jurassic geology.

Rutland's ferruginous sandstones and ironstones have commonly been used for building throughout the county, and two of its limestones (at Ketton and Clipsham) provide building stones of both local and national importance. Rutland is a rural county and it has seen very little large-scale industrial growth. The development of the two main market towns, Oakham and Uppingham, has been confined by conservation area policies. This has meant that a lot of the county's stone-built village character has been retained. Apart from Oakham Castle and the Bishops of Lincoln's house at Lyddington, little medieval stone architecture of importance has survived in the county. However, there are still many good examples of smaller stone manor houses, yeomen's dwellings and cottages from the late 16th and 17th centuries. In the past, almost every town and village had its own quarry, and many of the buildings are a reflection of their underlying geology.

In the past, the county of Rutland came under the ownership of two great estates: Ancaster and Burghley. They both utilised their own quarries for the building and maintenance of their estates. The quarry at Ancaster (Lincolnshire) worked the stone favoured by the Earl of Ancaster when building at Empingham, and it was used for details such as coats of arms on buildings, and as boundary stones in the estate fields. Ancaster Stone is an ooidal and bioclastic limestone that is white to pale yellow. Although not quarried within Rutland, it was used in many Rutland buildings in the past.

The geological strata of Rutland were deposited during the Jurassic. They range in age from the Lias Group of the Lower Jurassic to the Kellaways Formation at the top of the Middle Jurassic.

There is only minor folding and faulting of the strata and, because of their low angle of dip, the rivers deeply dissect the sequence. Some of the oldest beds can be found in the valleys of the Gwash and the Welland, as far east as the county boundary at Tickencote and Tinwell. Thin, irregular and unconsolidated spreads of boulder clay and some superficial sands and gravels, which were deposited during the Pleistocene glaciations, conceal the solid geology over large parts of the county, mainly in the hilly areas in the south-west and north-east. To the west of Rutland, the underlying mudstones and limestones of the Triassic and Lower Jurassic form the floor of the lowland area, eventually extending out into outliers

Figure 1: The Earl of Ancaster's coat of arms, Emphingham. Ancaster Stone.

of hard Precambrian crystalline rocks that form the prominent hills in the neighbouring county of Leicestershire.

To the east of the county, the Middle Jurassic strata dip gently eastwards, producing characteristic north–south scarp lands, similar to those of the Cotswolds. The scarps are predominately formed by the sandy and ooidal ironstones, ferruginous sandstones and ooidal limestones that are the principal lithologies of the Middle Jurassic of this area. In Northamptonshire and Rutland, the lower beds of the Middle Jurassic are sandy and iron rich, and are less resistant to weathering than the overlying limestones. Where they crop out in east and central Rutland, they produce rich red soils.

By contrast, the overlying ooidal limestones show little change in character over the length of their outcrop. They comprise the Lincolnshire Limestone Formation, which underlies much of the eastern half of the county. These limestones form a plateau, which dips gently away to the east before disappearing beneath the mudstones of the Upper Jurassic and recent Fenland deposits.

The ferruginous beds of both the Marlstone Rock and the Northampton Sand formations were exploited from earliest times as building stones. However, in the early 20th century, these ironstones were primarily and widely exploited as ore after the newly invented Bessemer Converter was introduced. This facilitated the extraction of iron from the stone and meant that lower quality 'iron' stone could now be used by the industry. Large open surface mines were created in the ironstone outcrops around Pilton and Market Overton. This resource is now virtually exhausted, both as an ore and as a building stone source.

Limestones are sedimentary rocks that accumulated in layers or beds. In general, the beds in the quarries can range from coarse-grained, shelly varieties, difficult to work, but often quite durable (ragstones and weatherbeds, to the close-grained and even-textured ooidal beds of the best freestones, which are less hard and more amenable to working and carving by stonemasons.

Many of the ooidal limestones in Rutland are generally held in high regard as building stones. The best freestone beds are composed predominantly of ooids, which are small spherical carbonate grains the size of a pin head or less, with an internal structure of concentrically layered calcium carbonate crystals. Not all the Rutland limestones, however, are ooidal, and some beds include varying proportions of coarse shell fragments (bioclasts). The amount of calcite cement that binds these grains together can also vary. In some of the limestones, there are sparse fine crystals of calcium carbonate cement, as in the porous Ketton Stone. In other limestones, there is a more pervasive calcite cement, producing a harder, less porous building stone like Clipsham Stone.

# Bedrock Geology Map


**Key**

Building stone sources

**Bedrock geology**

Kellaways Formation and Oxford Clay Formation (undifferentiated) — mudstone, siltstone and sandstone

Great Oolite Group — sandstone, limestone and argillaceous rocks

Inferior Oolite Group — limestone, sandstone, siltstone and mudstone

Lias Group — mudstone, siltstone, limestone and sandstone

# Stratigraphic Table

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

# 2 Local Building Stones

## Lower Jurassic

### Lias Group, Marlstone Rock Formation

#### Marlstone Rock, Oxford Marlstone (Banbury Ironstone)

This formation is a hard, fossiliferous, ferruginous limestone (locally an ironstone), with a variable thickness. Due to extensive quarrying of the stone as an iron ore, there is very little Marlstone left in the county. The stone used for conservation repair is the Oxfordshire Marlstone, known as Banbury Ironstone, which also weathers to a distinctive golden-orange/brown colour.

Marlstone is seen in many buildings of the pre-industrial quarrying era, for example in the villages and towns of Pilton, Glaston, Lyddington, Uppingham and Oakham. Oakham High Street, in particular, shows a varied use of this stone, in the 15th-century Flores House, the chapel and various shopfronts, for example. Commonly, Marlstone is seen with contrasting paler limestone lintels, dressings and mouldings from Ketton and Clipsham, or from nearby Lincolnshire limestones quarries.

## Middle Jurassic

### Inferior Oolite Group, Northampton Sand Formation

All the beds of the Northampton Sand Formation are ferruginous to some degree. The rocks weather in warm shades of brown to yellow, and the range of rock types varies across the outcrop. Long before the iron ore industry took over, this Rutland ironstone was dug for building stone in small stone pits and quarries on local outcrops. These former stone pits were engulfed by the subsequent iron ore excavations and were lost when the landscape was restored to agriculture, or used as landfill sites such as within the parish of Morcott, for example. Two kinds of Northampton Sand Formation stones can be distinguished: the plum-cored brown, burrowed, calcareous stone, which is also seen as ashlar and quoins, and the more ochreous, rusty and sandy ironstone. Both building stones are seen within the few kilometres towards Uppingham.

#### Northampton Stone

This stone has been quarried extensively for building stone. It crops out along almost the whole of the western side of the county, at Uppingham,


Figure 2: High Street, Oakham. Northampton Stone.

Lyddington, Caldecott, Pilton and Glaston and, to a lesser extent, at Barrowden. It is a medium brown ironstone with a purplish to grey core and it has been used for houses, churches and walls. In older buildings, the ironstone has crumbled and deteriorated. Lower levels in the succession were known as the 'Bastard Stone' by quarrymen as they contained no iron ore. At Lyddington, the late 15th-century Bede House is a good example of a building using Northampton Stone, with limestone quoins and decoration. This stone was also used in cottages at Braunston, where smaller blockwork is prevalent.

A 17th-century thatch-roofed house and outbuildings on Main Street in the village of Caldecott demonstrates the colour differential of Northampton Stone, with ashlar banding in Uppingham Stone and Upper Lincolnshire Limestone.

Figure 3: Bede House, Lyddington. Northampton Stone with Limestone quoins and decoration.

### Uppingham Stone

The stone is a very hard, dark grey/green/blue rock that weathers to become a deep brown stone, with shades of yellow. It was quarried in various locations just outside Uppingham. In the town, it has been used extensively, especially in the High Street and for high-status boundary walls, and also in the villages of Caldecott, Lyddington and Glaston.

Figure 4: Boundary wall, Uppingham. Northampton Stone and Uppingham Stone.

## Inferior Oolite Group, Lincolnshire Limestone Formation

The Lincolnshire Limestone Formation is the most thickly developed Middle Jurassic limestone unit in the East Midlands and it is an important source of building stone and lime for cement manufacture at Ketton. The formation is subdivided into Lower and Upper Lincolnshire Limestone Members. The principal building stone quarries (Ketton, Clipsham, Casterton, and also at Stamford in Lincolnshire) all lie within the upper member of the formation. The use of Lincolnshire Limestone as both ashlared freestone and smaller rubblestone blocks is ubiquitous in buildings throughout the county. It has been used for side and rear elevations, interior walls and for the lining of the inside of freestone ashlar walls.

This informal unit of the formation includes numerous thin limestone beds that were used locally for wallstones. However, the most important building stone produced from this interval is the fissile sandy limestone known as the Collyweston Stone slate.

Figure 5: Cottage. Lincolnshire Limestone.

## Collyweston Stone slate

The slate mines lie just outside the eastern boundary of the county in Northamptonshire, but they have historically supplied stone roofing slates for numerous buildings in Rutland and its adjacent counties.

Figure 6: Bell House, Lyddington. Collyweston Stone slate roof and Northampton Stone ashlar.

The stone was employed extensively for roofing, and evidence from the Roman towns at Great Casterton and Thistleton confirms its early use as a slate. Prior to the 19th century, Collyweston Stone slate was used extensively in Rutland, but with the advent of the railway it became cheaper to 'import' Welsh Slate for roofing.

### Ketton Stone

This is a fine quality, porous, ooidal limestone quarried in large blocks. It is cream to pale yellow in colour and occasionally contains pale pink-stained beds. It has often been described as the perfect oolite because of its well-sorted, spheroidal ooidal texture. The quarries have been commercially worked since the 1500s. Ketton Stone has been more widely used beyond the county than within it — most notably at Cambridge, where there is a long history of the stone has been used in many of the colleges. Examples include the 17th-century Wren Library at Trinity, the Wren chapels at Pembroke College and Emmanuel College and a number of buildings at Clare College. Large quantities of Ketton Stone were used to build Burghley House, Stamford. During the 18th century, thousands of headstones and monuments of Ketton Stone were made for churchyards in Rutland and its neighbouring counties. Ketton Stone was again used extensively in the 19th century in new Cambridge college buildings and in extensions at King's, Trinity and St John's, as well as for dressings at Sandringham House, Norfolk. In the 20th century, new buildings at Downing College and Christ's College were constructed using Ketton Stone. Hibbins House in Ketton is a fine example of the stone's versatility, with a carved ashlar frontage displaying a pink hue and carved doorways.

Ketton Quarry is also a major producer of finely crushed Ketton lime for cement.

Figure 7: Hibbins House, Ketton. Ketton Stone.

## Ketton Rag (Top and Bottom Rags)

This is a hard, dark brown, banded stone, more pervasively cemented than the Ketton Stone, with visible intergranular, crystalline (spar) calcite cement and a more coarsely bioclastic (shelly) texture. It often has white calcitic veins running through it and it is widely used as a walling stone in and around Ketton.

Figure 8: Wall, Ketton. Ketton Rag.

## Great Casterton Stone, Stamford Stone

These fine-grained ooidal freestones are relatively free from bioclastic debris and are quarried in the north-west of the county. Over the years, there have been five quarries, some within the boundary of Stamford and others at Great Casterton, hence the dual names, but it is the same bed that is being worked in both locations.

Many of the houses in Great Casterton are built of this stone. It was also used extensively to rebuild Stamford's medieval churches after they were destroyed during the War of the Roses in the 15th century, and many of the town's buildings are faced with this stone. It is comparatively easy to work by hand. Stamford Stone was employed at Downing College in Cambridge and at Ely Cathedral, Cambridgeshire. Below the freestone is a bed of hard, well-cemented and lighter coloured ooidal limestone, commonly termed Stamford Marble. It was used internally for fireplaces, flooring slabs and steps.

## Edith Weston Stone

This stone is very similar to the Stamford and Ketton stones, but it was not as heavily exploited. It has been used for building and memorial stones. Below the main bed of limestone is a ‘slate’ bed, which is denser than that found at Collyweston.

Figure 9: Main Street, Great Casterton. Stamford and Great Casterton stones.

Figure 10: Main Street, Great Casterton. Stamford and Great Casterton stones.

## Clipsham Stone

The quarries at Clipsham have a long history of use from Roman times. The stone has been used extensively to repair many decaying Oxford college buildings, including All Souls, Christ Church and New College. Elsewhere, it was used at Windsor Castle, Berkshire in the 14th century, and for the restoration of the Palace of Westminster and rebuilding the blitzed House of Commons in London in the 20th century. Much of the famous facade of the Houses of Parliament is now re-faced with Clipsham Stone.

Locally, because of its durable character, it was used for more decorative purposes in pinnacles, cornices and sills. The stone has a shelly texture and is cream in colour, sometimes with a light blue hue (blue hearted). It is hard, but not difficult to work, and weathers to silver grey.

The quarries at Clipsham are substantial and have exploited several limestone beds. The umbrella name of 'Clipsham Stone' covers all the stone quarried, including a high-quality, fine-grained, silver-white stone used for internal features such as stone fireplaces. Many of the new buildings within the county utilise Clipsham limestone from the present quarry. Houses built today use a variety of products from these quarries, including sawn, hand-hammered, cropped or tumbled stones. In Church Street, North Luffenham, many of the cottages that have been renovated have used this stone for new ancillary buildings such as garages.

Figure 11: Cottage, Clipsham. Clipsham Stone.

### Greetham Stone

The quarry at Greetham originally contained a coarse-grained, bioclastic limestone used only for aggregate. About 20 years ago, an upper bed suitable for masonry was exposed. It is fine grained and honey yellow in colour and has a fine fossiliferous layer.

## Great Oolite Group, Blisworth Limestone Formation

### Blisworth Limestone, Great Oolite Limestone

This lithologically highly variable limestone contains oysters and other shells, peloidal grains and ooids in a micritic muddy matrix. The principal quarries are near Oundle in Northamptonshire, but the limestone is also found at Ketton Quarry overlying the Rutland Formation.

## Great Oolite Group, Cornbrash Formation

### Cornbrash

This unit is exposed as the uppermost limestone at Ketton Quarry. It is a rough, fossiliferous, muddy, hard grey limestone, which can only be quarried by blasting. When weathered, it breaks up into flat layers that are light brown in colour. It is principally used for rough walling and as a road aggregate.

# 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.

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## Figures

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