Historic England

Lincolnshire

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 is based on original research and text by Graham Lott and Stephen Parry (British Geological Survey).

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Front cover: High Street, St Martin's, Stamford. Lincolnshire Limestone. © Patricia Payne. Source: Historic England Archive.

How to Use this Guide

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

Geological time periods, groups, formations and building stones

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

Middle Jurassic
↑— geological time period

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

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

Bedrock geology map and stratigraphic table

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

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

Contents list

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

Building stone sources and building examples

A companion spreadsheet to this guide provides:

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

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

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

Further Reading, Online Resources and Contacts

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

Glossary

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

The guides use the BGS lexicon of named rock units.

Mineral and local planning authorities

This guide covers the Lincolnshire County Council mineral planning authority area, and the local planning authority areas of the City of Lincoln, North Kesteven, South Kesteven, South Holland, Boston, East Lindsey and West. North Lincolnshire and North East Lincolnshire areas are covered in the East Yorkshire and northern Lincolnshire guide.

Contents

1 Introduction

Both the topography of Lincolnshire and the character of its varied vernacular architecture are very much a reflection of the county's underlying geological succession. This succession comprises a mixture of mudstones, limestones and sandstones, which form a series of roughly north–south trending outcrops. Collectively, they dip gently eastwards towards the coast before disappearing beneath the North Sea. Most of the bedrock lithologies have been worked as sources of building materials for the areas surrounding their respective outcrops. In the mudstone-dominated vales, brick making predominated, whereas on the limestone, chalk and sandstone ridges, the harder rock types were quarried. In the latter, buildings and villages constructed of stone tend to be more prolific.

Western parts of Lincolnshire take in the low-lying areas of the Trent Valley and Isle of Axholme, and they are underlain by mudstone-dominated sequences of Upper Triassic and Lower Jurassic age. Further east, a significant ridge known locally as 'the Cliff' is present. Best developed at Lincoln itself, this principally comprises a succession of interbedded, orange-brown, calcareous ironstones and yellow limestones, which together represent the Middle Jurassic. Most significant among the limestones are those of the Lincolnshire Limestone Formation, which cap the ridge. These particular limestones were, and still are, by far the most important source of building stone in the county. The intrinsic quality and abundance of the Lincolnshire Limestone spawned an industry that has both supplied the county's building stone needs and made Lincolnshire a major exporter of building stone since Roman times.

East of the Cliff, the topography becomes subdued once more. This is a direct expression of the underlying presence of interbedded Upper Jurassic mudstones and limestones: the Ampthill, Oxford and Kimmeridge clays of the Ancholme Group. These beds give rise to the broad, low-lying expanse known as the Central Lincolnshire Vale, which extends southwards from North Kelsey through Market Rasen, Horncastle and Tattershall to Boston on the northern margin of the Wash–Fenland embayment. Much of the vale follows the course of the River Witham, which has served as a key part of the local communications network since at least medieval times, facilitating the movement of stone and other commodities. In general, the lithologies encountered in this area are unsuitable for use as building stone. The vale is curtailed to the north and east by the highest ground of the county, known as the Lincolnshire Wolds.

The scarp slope forming the leading edge of the Lincolnshire Wolds exposes a thin, lithologically diverse succession of uppermost Jurassic and Lower Cretaceous age. This includes the green, glauconitic sandstones (Spilsby Sandstone Formation) and ironstones that were, in the past, important sources of building stone for many of the villages located on or close to their outcrops.

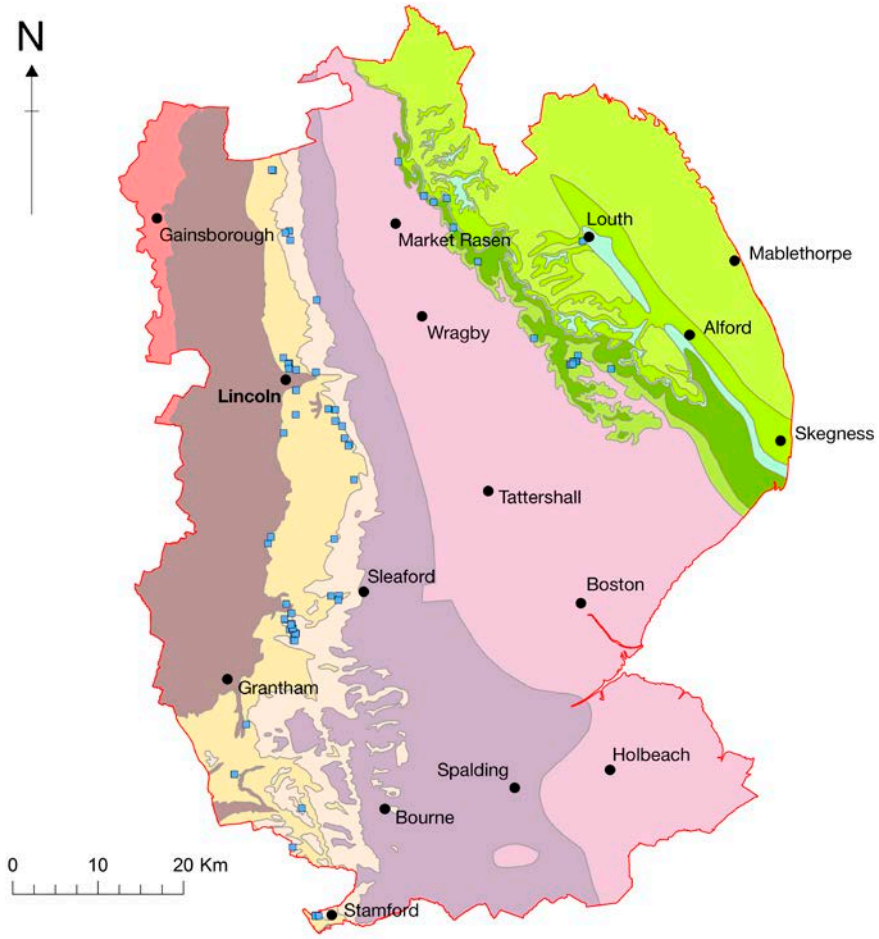
Capping the Wolds ridge and forming the stratigraphically highest part of Lincolnshire's geological succession are the white micritic limestones of the Upper Cretaceous Chalk Group. The Lincolnshire chalks saw limited use historically as a building and walling stone, and they have long been superseded by brick as a construction material of choice.

The southern limit of the Wolds is obscured by a thickening cover of soft, poorly consolidated sediments that forms the area of south Lincolnshire known as the Fenland(s). The Quaternary deposits of the Fenland(s) have effectively provided no useful sources of building stone, and most buildings in this area are constructed of local brick or stone imported from other parts of Lincolnshire and beyond.

The unfailing supply of good quality indigenous stone, sourced in particular from the Middle Jurassic limestones, enabled Lincolnshire to remain self-sufficient in terms of building stone production from Roman times up until the late 19th century. Only with improvements to the road and rail networks did more exotic building stones begin to make an impact in the county's expanding population centres.

Figure 1: Stoke Rochford Hall, near Grantham. Lincolnshire Limestone.

Bedrock Geology Map



Key

Building stone sources

Bedrock geology

White Chalk Subgroup — chalk

Grey Chalk Subgroup — chalk

Lower Greensand Group — sandstone and mudstone

Wealden Group — mudstone, siltstone and sandstone

Wealden Group — sandstone and siltstone, interbedded

West Walton Formation, Ampthill Clay Formation and Kimmeridge Clay Formation (undifferentiated) — mudstone, siltstone, limestone, sandstone

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

Triassic Rocks (undifferentiated) — mudstone, siltstone and sandstone

Stratigraphic Table

Geological timescale	Group		Formation	Building stone	Page
Quaternary	various		various	Tufa Cobbles	18 18
Upper Cretaceous	Chalk Group	White Chalk Subgroup	Flamborough Chalk Formation	Chalk Flint	17 17
			Burnham Chalk Formation		
			Welton Chalk Formation		
		Grey Chalk Subgroup	Ferriby Chalk Formation		
Lower Cretaceous	Cromer Knoll Group		Hustanton Formation		
	not applicable		Carstone Formation	Tealby Ironstone Tealby Limestone	15 15
	not applicable		Roach Formation		
	not applicable		Tealby Formation		
	not applicable		Claxby Ironstone Formation		
Upper Jurassic	Cromer Knoll Group		Spilsby Sandstone Formation	Spilsby Sandstone (Greenstone)	13
Middle Jurassic	Ancholme Group		Kimmeridge Clay Formation		
			Ampthill Clay Formation		
			West Walton Formation		
			Oxford Clay Formation		
			Kellaways Formation		
	Great Oolite Group		Cornbrash Formation	Blisworth Limestone	13
			Blisworth Clay Formation		
			Blisworth Limestone Formation		
			Rutland Formation		
	Inferior Oolite Group		Lincolnshire Limestone Formation	Lincolnshire Limestone (Ancaster Ragstone (Weatherbed), Hard White, Freestone)	9
			Northampton Sand Formation	Northampton Sand	8
			Grantham Formation		
Lower Jurassic	Lias Group		Marlstone Formation	Marlstone Rock (Marlstone)	7
			Whitby Mudstone Formation		
			Charmouth Mudstone Formation		
			Scunthorpe Mudstone Formation	Blue Lias	5
Triassic	Penarth Group		various		
	Mercia Mudstone Group		various		

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

2 Local Building Stones

Triassic

Mercia Mudstone Group, Penarth Group, various formations

The predominantly low-lying, rolling landscape of western and north-western Lincolnshire represents an eastwards extension of the Trent Valley and Isle of Axholme. It is within these western parts that the oldest rocks of the county, which are of Triassic age, are found. Assigned to the Mercia Mudstone Group and the Penarth Group, the Triassic strata follow the course of the River Trent from Susworth in the north to Newton on Trent in the south. Much of the outcrop, however, is concealed beneath unconsolidated Quaternary fluvial and fluvial-glacial sediments. Bedrock is exposed only around Gainsborough, where it essentially comprises red mudstones with occasional thin interbeds of green-grey sandstone (known locally as Skerries) and gypsum.

Lower Jurassic

Lias Group

Conformably overlying the Triassic red bed succession is a thick sequence of interbedded, fine-grained, grey limestones and calcareous mudstones that comprise the uppermost Triassic to Lower Jurassic Lias Group. The Lias outcrop extends from Scotter in the north to Grantham in the south, increasing in width as it does so, before disappearing in an easterly and south-easterly direction beneath the prominent topographic ridge (the Cliff) formed by the Middle Jurassic limestones.

Lias Group, Scunthorpe Mudstone Formation

Blue Lias

The Scunthorpe Mudstone Formation, broadly equivalent to the Blue Lias Formation further south-west, is dominated by thinly bedded, pale blue-grey (but weathering yellow), fine-grained limestones. In the past, these basal limestones were widely quarried both for local building stone and as a source of building and agricultural lime. The Blue Lias has seen sporadic use as thinly coursed, squared rubblestone in village buildings and churches along the western edge of the county. Examples can be seen at Long Bennington, Dry Doddington (including the Church of St James, with its renowned leaning tower and broach spire), Norton Disney, Swinderby, Newton on Trent and Lea.

Figure 2: Crosburn House, Long Bennington. Blue Lias.

Figure 3: Houses, Main Road, Long Bennington. Blue Lias.

Figure 4: Church of St James, Dry Doddington. Blue Lias and Lincolnshire Limestone.

Lias Group, Marlstone Rock Formation

Marlstone Rock (Marlstone)

The overlying Middle Lias succession of Lincolnshire is characterised by a thin development of coarser grained, variably fossiliferous, ooidal and sandy ironstone lithologies. These yellow-brown ironstones, which are assigned to the Marlstone Rock Formation, were exploited historically as a source of both iron ore and building stone along their narrow and sporadic outcrop. The Lias ironstones most commonly feature as part of rubblestone fabrics within rural buildings and garden walls, including in the villages of Denton, Harlaxton, Allington, Barkston, Honington, Hough-on-the-Hill, Caythorpe and Fulbeck. In higher status buildings, such as churches and country houses, however, Marlstone Rock is seen as regularly coursed ashlar blocks, usually with paler Lincolnshire Limestone dressings. Occasionally, these ironstones were used for decorative effect as bands and string courses in a predominantly off-white or yellow Lincolnshire Limestone wall fabric. The converse is also true, as some ironstone buildings (at Woolsthorpe by Belvoir, for example) include paler bands of yellow Lincolnshire Limestone, which stand in contrast to the dark ironstone that forms the principal component of the fabric.

To the north of Lincoln, Marlstone Rock has evidently seen only limited use as a building stone. It has been identified with a high level of confidence in the Church of St Andrew at Fillingham (west wall of the nave), but otherwise it seems to feature only sporadically as isolated blocks within the buildings of villages located on or close to the Marlstone Rock Formation outcrop. These include Scampton, Harpswell, Hemswell and Blyborough.

Figure 5: Old Manor House, Allington. Marlstone Rock and Lincolnshire Limestone.

Figure 6: West wall, St Vincent's Church, Caythorpe. Marlstone Rock and Lincolnshire Limestone.

Middle Jurassic

Inferior Oolite Group, Northampton Sand Formation

Northampton Sand

The thin, yellow-brown, sandy and ooidal ironstones that occur locally at the base of the Middle Jurassic succession were once worked at various places along the length of their outcrop, as a source of both iron ore and building stone. It has physical similarities to the stratigraphically underlying Marlstone Rock so individual Northampton Sand buildings have not been positively identified.

Inferior Oolite Group, Lincolnshire Limestone Formation

Lincolnshire Limestone (Ancaster Ragstone (Weatherbed), Hard White, Freestone)

The typically coarse-grained, creamy-white to yellow-orange, ooidal and bioclastic limestones that characterise much of this formation are by far the best known of Lincolnshire's vernacular building stones. The Lincolnshire Limestone has been quarried for building stone along the full length of its outcrop, at some localities, such as around Lincoln, Ancaster, Heydour and Stamford, since at least Roman times. By medieval times, Lincolnshire Limestone was being extensively transported eastwards and south-eastwards, along a fairly elaborate system of waterways, for use in the monastic sites and other ecclesiastical buildings of the Fenland(s), including Crowland Abbey. In the 17th and 18th centuries, these quarries gradually expanded in order to satisfy not only Lincolnshire's demand for limestone but also that of the adjacent counties and areas beyond, including Cambridgeshire (where it was used in the cathedrals at Ely and Peterborough, and Cambridge colleges including the chapels at King's College and St John's College), Norfolk, Northamptonshire, Rutland and Suffolk.

Figure 7: Crowland Abbey. Lincolnshire Limestone.

To the north of Lincoln, the Lincolnshire Limestone Formation progressively thins and is less obviously ooidal in character than it is to the south. Although still widely used as a local vernacular building stone in villages (especially in churches) situated on or near the outcrop, at Snitterby and Welton, for example, the unit does not contain sufficient thick, ooidal limestone beds to have yielded high-quality ashlar blockstone. Where such stone was needed for carved and other decorative work, in particular for the churches, much of it appears to have been sourced from the quarries further south, at Lincoln, Ancaster and Heydour.

Arguably, the external fabric of the cathedral at Lincoln provides the best display of ashlared Lincolnshire Limestone, but there are numerous other limestone buildings throughout the city, including the castle and Guildhall, as well as the houses of Steep Hill. The limestone for the original cathedral fabric was initially quarried from the local outcrops presented by the Cliff itself, and there is even evidence of extensive mining of the stone from galleries beneath the building. Up until recently much of the stone needed for conservation repair was supplied by the cathedral's own quarry nearby.

Figure 8: Lincoln Cathedral. Lincolnshire Limestone.

Figure 9: Curtain wall and east gateway, Lincoln Castle. Lincolnshire Limestone.

The most renowned of Lincolnshire's limestone quarries are those at Ancaster. Active since Roman times, the quarries worked the principal beds in the Lincolnshire Limestone succession. The uppermost bed of the sequence is known as the Ancaster Ragstone or Weatherbed (2 to 3m thick), and it comprises cross-bedded, pale yellow (but occasionally reddish), ooidal and bioclastic limestones. Underlying the Ancaster Ragstone are the Hard White and the Freestone beds, which have a combined thickness of about 3 to 4m. The ooidal Hard White Limestone, as its name suggests, is sufficiently well cemented to provide a marble-like polished finish. The Freestone beds are, in general, less coarsely fossiliferous than those of the Ancaster Ragstone, and they provided much of the high-quality block required for the ashlar and decorative stonework of churches and monastic buildings.

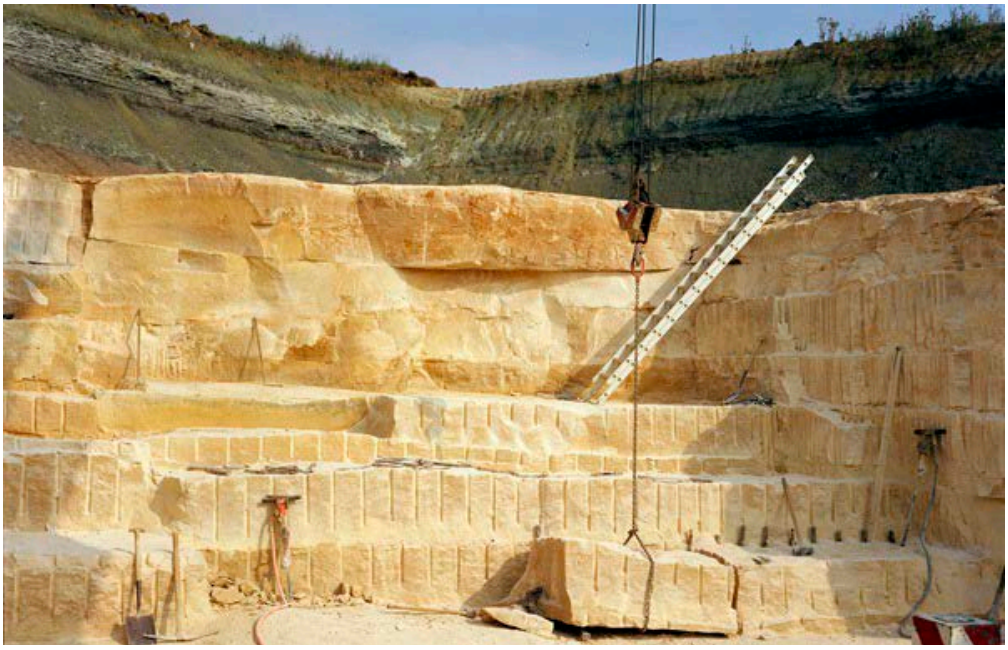


Figure 10: Quarry, Ancaster. Lincolnshire Limestone.

The scale of production, transportation and distribution of these Lincolnshire Limestones is surprising, particularly when the relative isolation of the quarries in terms of major transport routes is taken into account. Early transportation relied on using waterways, such as the Witham, Slea and Kyme Eau, to supply the medieval monastic sites at Bardney and Crowland, as well as those at Ely and Ramsey in Cambridgeshire. The River Trent was used in the late 16th century to carry Ancaster Stone to Nottingham to build Wollaton Hall.

The number of towns, villages and individual buildings constructed of Lincolnshire Limestone, particularly those located along the outcrop itself, is prodigious. Perhaps the finest display of the lithological variation shown by these limestones can be seen at Stamford, on the southern border of the county. Many former quarries in the surrounding Lincolnshire Limestone Formation have, for centuries, provided the stone that makes Stamford a truly unique 'stone town'. Its buildings span some 1,000 years, and their constituent limestones were sourced not only from quarries in Lincolnshire but also from others in adjacent counties. Named varieties include Barnack, Ketton, Wittering Pendle, Ancaster, Clipsham and Weldon, plus a more generic Stamford Stone produced from smaller local quarries.

Figure 11: St Martin's Place, Stamford. Lincolnshire Limestone.

There are many individual architecturally outstanding buildings constructed of Lincolnshire Limestone. Examples include great houses at such as Belton and Stoke Rochford. There are few Lincolnshire churches in which Lincolnshire Limestone has not been used either for ashlar or decorative carved work, particularly for the elaborate window tracery exhibited by many. Examples can be seen at Ancaster (St Martin's), Brant Broughton (St Helen's), Grantham (St Wulfram's), Heckington (St Andrew's), Louth (St James'), Scotton (St Genwys'), Tattershall (Holy Trinity), Wilsford (St Mary's), Boston (St Boltoph's), Brant Broughton (St Helen's), Grantham (St Wulfram's), Deeping St James (St James'), and Louth (St James').

Evidence of Lincolnshire Limestone having been put to decorative use during Anglo-Saxon times is provided by the elaborately carved cross shafts and grave covers that date to this period. Remnants of these are found across Lincolnshire, most notably in the Kesteven area at Ropsley, Cranwell and Digby, for example. These artefacts are not restricted to Lincolnshire, however, with examples being found in adjacent counties, including cross shaft fragments at East Bridgford and Shelford in Nottinghamshire.

In the 19th century, the limestones quarried at Ancaster were used at Windsor Castle, for the original university buildings in Nottingham and in York railway station, to name but a few examples. Quarries remain active in the Ancaster area today, and recently provided stone for the new facade of The Collection Museum at Lincoln. They also continue to underpin conservation repair projects across the county and beyond.

Figure 12: St Botolph's Church, Boston. Lincolnshire Limestone.

Great Oolite Group, Bilsworth Limestone Formation

Bilsworth Limestone

In Lincolnshire, the Great Oolite Group consists of non-marine sandstones and mudstones, as well as units of compositionally variable limestone. The thick ooidal limestone beds that characterise the group further south-west, in the Bath and Cotswold areas, are not developed in Lincolnshire. Despite this absence, the limestones that do occur (Blisworth Limestone Formation) have been worked locally and used for field boundary and other walling. However, they are not regarded as an important building stone resource.

Upper Jurassic

Ancholme Group, various formations

The mudstone-dominated Ancholme Group succession (incorporating the Kellaways, Oxford Clay, West Walton, Ampthill and Kimmeridge Clay formations) contains no lithologies suitable for building purposes, but where locally exposed it was worked for brick clay.

Lower Cretaceous

Cromer Knoll Group, Spilsby Sandstone Formation

Spilsby Sandstone (Greenstone)

The uppermost Jurassic and Lower Cretaceous succession of Lincolnshire is lithologically complex, consisting of interbedded sandstones, mudstones and ironstones. Only the harder, better-cemented beds have proved suitable for use as local building stone. Among the constituent lithologies, the most striking is the calcareous Spilsby Sandstone, whose distinctive green colouration is a consequence of the abundant presence of the green iron

silicate mineral glauconite. It is from this that the commonly used term ‘greenstone’ is derived. The glauconite occurs as sand-sized grains dispersed throughout the quartz and feldspar-dominated frameworks of these sandstones. Large calcareous fossils are an additional commonly observed feature of some Spilsby Sandstone beds, as are concentrations of quartz and ironstone pebbles. These sandstones are found within the shallow valleys that characterise the western edge of the Cretaceous outcrop, and they have been widely used in many buildings located close to where they occur.

Spilsby Sandstone is particularly common in the churches of the area, including those at Horncastle (St Mary’s), Fulletby (St Andrew’s), Tetford (St Mary’s), Alford (St Wilfrid’s), Donington-on-Bain (St Andrew’s) and South Willingham (St Martin’s). The sandstones are comparatively soft, and they are often a target for the burrowing activities of masonry bees, which have inflicted considerable damage on the ashlar blocks of some church fabrics. There are currently no quarries working the Spilsby Sandstone for building stone, which poses a considerable challenge to conservation repair efforts.

Figure 13: St Mary's Church, Tetford. Spilsby Sandstone.

Figure 14: St Mary's Church, Tetford. Spilsby Sandstone.

Groups ‘not applicable’, Claxby Ironstone Formation, Tealby Formation, Roach Formation, Carstone Formation

Tealby Limestone, Tealby Ironstone

Overlying the basal Cretaceous sandstone is a sequence dominated by yellow-brown sandy ironstones and ferruginous limestones that include the beds of the Claxby Ironstone, Tealby, Roach and Carstone formations. The ironstones are generally quite varied, both in composition and colour, ranging from pale yellow-brown to orange or even purple-red. They are muddy, calcareous, occasionally ooidal, and often coarsely fossiliferous, with ‘nests’ of large thick-walled bivalves, which commonly weather proud in the blocks. The ironstones have been exploited extensively, both for building stone and as a low-grade iron ore, since Roman times. They are perhaps best seen in the village of Tealby itself, but a number of other villages situated along the outcrop are largely constructed of these strongly coloured ironstone lithologies. Specific examples include Caistor, Claxby, Cuxwold, Market Rasen, Rothwell and Swallow.

Despite its widespread use, Tealby Ironstone is relatively weak and over time it tends to spall and cavitate. The long absence of operational quarries within the Tealby Formation, and more specifically the Tealby Limestone Member, has meant that previous episodes of conservation repairs have commonly been carried out using Lincolnshire Limestone. This is a much harder stone, and its use will inevitably promote further stone decay and failure.

Other localised developments of ironstone are known to occur in the upper parts of the Lower Cretaceous succession in Lincolnshire, and they include the Roach Formation and the Carstone Formation. The constituent lithologies of these units are generally soft and friable, however, and definite examples of their use as building stones cannot be provided at the present time. There are currently no quarries working these ironstones in Lincolnshire.

Figure 15: Grammar school, Caistor. Tealby Ironstone.

Figure 16: All Saints Church, Tealby. Tealby Limestone.

Figure 17: All Saints Church, Tealby. Tealby Limestone.

Figure 18: Sutton Estate houses, Stainton Hall, Stainton le Vale. Tealby Limestone.

Upper Cretaceous

Chalk Group, Welton Chalk Formation, Burnham Chalk Formation, Flamborough Chalk Formation

Chalk and flint

The Upper Cretaceous of Lincolnshire is overwhelmingly dominated by beds of white to pale grey micritic limestone (chalk). These underlie much of the east of the county and give rise to the rolling upland terrain known as the Lincolnshire Wolds. In some parts of the county, the basal part of this Upper Cretaceous succession includes a thin unit of distinctly red chalk (the Hunstanton Formation). This is the case at Goulceby, for example, where red chalk features within the Spilsby Sandstone-dominated fabric of the Church of All Saints. However, although this red chalk has been used to a moderate extent as a building stone along the southern margin of the Wash embayment in Norfolk (at Hunstanton itself, for example), it does not appear to have been sufficiently durable and/or accessible enough to have been widely used in Lincolnshire.

The lower parts of the White Chalk Subgroup succession of eastern Lincolnshire do include some harder beds, which were widely quarried and used locally for building stone along the outcrop. Around Louth, for example, chalk is conspicuous, and it is seen in the fabric of the Church of All Saints at Legbourne and the Church of St Leonard at Haugh, for example. Blocks of white chalk also occur sporadically in the fabric of many churches and farm buildings over its entire outcrop. They can be seen, for example, in buildings at Beesby (in association with Spilsby Sandstone), Conisholme, Covenham St Mary (in association with Tealby Ironstone), Fotherby, Ludborough (in association with Tealby Ironstone) and Utterby (again in association with Tealby Ironstone). The striking church ruins in the deserted medieval village at Calceby are largely constructed of white chalk blocks, which stand in stark contrast to the green glauconitic Spilsby Sandstone blocks also present.

The Chalk Group succession of Lincolnshire contains abundant flint in tabular form, but it does not contain bands of flint nodules that are suitable for knapping. There are, consequently, few examples of buildings featuring flint in the county. At Sutton Bridge, nodular black flints (in association with Lincolnshire Limestone dressings) have been finely knapped to create a very distinctive walling fabric for the Church of St Matthew. It is likely, however, that these flints were imported from East Anglia, where decorative flint-knapping traditions and skills were far more prevalent.

Figure 19: Ruins of St Andrew's Church, Calceby. Chalk and some Silsby Sandstone.

Quaternary

Various groups, various formations

Cobbles

The unconsolidated Quaternary deposits of Lincolnshire include occasional boulder-rich beds, which contain a variety of exotic lithologies. These boulder beds have been exploited locally as a source of building material, with the individual boulders being used as small-scale infill, for example at the Church of St Helen at North Thoresby, which principally comprises Tealby Ironstone, chalk and Lincolnshire Limestone.

Tufa

During Quaternary times, the precipitation of porous, calcareous tufa deposits from groundwaters flowing out of the Cretaceous chalks and the other limestone units of Lincolnshire would be neither unexpected nor uncommon. There appears to be very little surviving evidence of the systematic working of these deposits for building material, however. Occasional isolated blocks of tufa can, nonetheless, be seen in the fabrics of some churches, and it has also been used in the construction of the occasional Victorian grotto.

3 Examples of Imported Stones

The use (or indeed reuse) of building stone imported into Lincolnshire for specific purposes dates back to at least medieval times. The best-known examples are provided by the Dorset-sourced Purbeck Marble columns and tomb slabs that feature extensively in Lincoln Cathedral and in several other local churches that date to this period. In the south, the Fenland abbey ruins at Crowland similarly boast the weathered remnants of decorative Purbeck Marble columns.

Figure 20: West entrance, Crowland Abbey. Purbeck Marble columns.

Other imports include the black, sparsely crinoidal ‘marble’ tomb slabs from Eggleston in County Durham and the coarsely fossiliferous Frosterley Marble (both Carboniferous limestones) seen in Lincoln Cathedral. This same building also contains some decorative columns of fossiliferous Middle Jurassic Alwalton Marble from Cambridgeshire. Elsewhere, there are very fine examples of the use of white Triassic alabaster for finely carved monuments, including at the Church of St Leonard at South Cockerington. This alabaster was mined along the Nottinghamshire–Derbyshire border.

The most extreme example of using imported stone, however, which must have presented considerable logistical challenges, is provided by Lincoln Cathedral’s massive, intricately carved Norman font. This black Carboniferous limestone structure was brought to Lincolnshire from Tournai in Belgium.

The import of foreign stones is more generally associated with the widespread urban development that has taken place since Victorian times. Improved transportation links over time facilitated the use of a wide variety of sandstones and limestones from outwith the county. Most notable are the Carboniferous sandstones from Derbyshire and Yorkshire (yielded by the Millstone Grit and Pennine Coal Measures groups) and the uppermost Jurassic limestones (Portland Stone) from South Dorset, the latter of which were used in the facades of banks and other commercial premises. The greatest range of UK-sourced imported stone types is probably found in the graveyard monuments of the county. These include granites of various colours and textures, principally from Scotland but occasionally from Cumbria, and a wide range of slates from Wales (in addition to occasional Swithland Slate headstones from Leicestershire).

Figure 21: 27 Strait Bargate, Boston. Portland Limestone.

Like many other counties, Lincolnshire did not have a local source of durable roofing slates. Consequently, along the south-western border of the county, such as in Stamford, the fissile, silty Middle Jurassic limestones originating from the Collyweston Stone slate mines in Northamptonshire were commonly used. In general, however, early buildings were roofed with a variety of locally made clay tiles. In the 18th and 19th centuries, metamorphic slates from Cumbria and Wales became more widely available and were put to extensive use.

Figure 22: 19 St Mary's Street, Stamford. Collyweston Stone slate roof.

4 Further Reading

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

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

There is also a separate glossary of geological terms.

Lincolnshire references

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Figures

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