Historic England

East Sussex

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.

Front cover: Newenden Bridge, near the border of East Sussex and Kent. Wealden Group Sandstones including Ashdown Sandstone. © Geckoella for Historic England.

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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 mineral planning authority areas of East Sussex County Council and the South Downs National Park (part), and the unitary authority of the City of Brighton and Hove; and the local planning authority areas of Lewes, Wealden, Eastbourne, Rother, Hastings and the national park.

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1 Introduction

Historically, East Sussex has produced and used a wide range of indigenous building stones, although no sources are currently worked. This is, in large part, a reflection of the solid geology of the area, which can conveniently be considered in four parts, each with its own distinct landscape and character: the High Weald, the Low Weald, the chalk South Downs, and the floodplains, coastal marshes and beaches. The overall geological structure of East Sussex is one of a broad dome, which trends east to west and reaches its highest point in Ashdown Forest, in the northern part of the county.

The High Weald covers much of the northern, central and eastern parts of East Sussex, and mostly lies within the High Weald Area of Outstanding Natural Beauty (AONB). Geologically, this is the oldest part of East Sussex and comprises faulted sequences of Upper Jurassic Purbeck Group limestones with much thicker successions of Lower Cretaceous clays, sandstones and ironstones. These sediments, which belong to the Wealden Group, are collectively known as the Hastings Beds and contain the Ashdown Formation and the Tunbridge Wells Sand Formation. Harder calcareous sandstone beds within these formations, including the Ardingly Sandstone, Cuckfield Stone and Tilgate Stone, were significant sources of vernacular building stone. Formerly, this area was also an important source of ironstone for the Wealden iron industry, but commercial quarrying of this resource has been very limited in recent times.

The Low Weald is a generally flat clay vale that separates the High Weald from the Chalk Downs to the south. The exposed bedrock is dominated by Lower Cretaceous Weald Clay Formation strata, although narrow bands of Gault Clay and Lower and Upper Greensand crop out close to the scarp face of the Downs. Thin sandstones and slates at the base of the Weald Clay Formation (Horsham Stone and Horsham Stone slate) were quarried for building and roofing purposes, respectively, in East Sussex, but never on the same scale as they were in West Sussex. Thin fossiliferous bands of Sussex Marble (known variously as the Small Paludina Limestone, Large Paludina Limestone, Winklestone or Laughton Stone) were once the basis of an important decorative and paving stone industry. Occasionally, these limestones were also employed locally for building purposes.

The Lower Greensand Group is poorly developed in East Sussex and lacks the range of building stones that were produced from the corresponding strata in West Sussex (such as the Hythe Sandstone, Hythe Chert and carstone). Where present, the overlying Selbourne Group (Upper Greensand Formation) is represented mainly by unconsolidated siltstones, and the Malmstone that

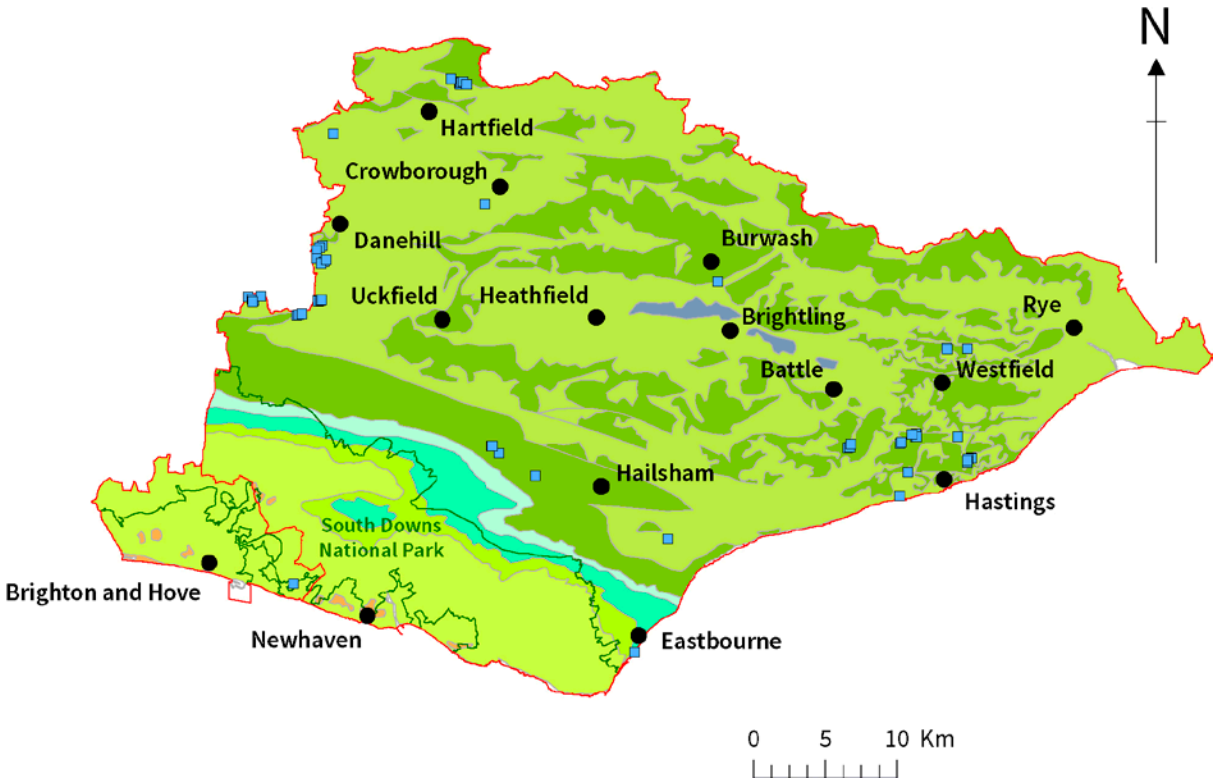
is much used for building in West Sussex is absent. In East Sussex, the Upper Greensand is best developed near Eastbourne, where the green glauconitic sandstones were worked historically as a source of building stone for the local area.

The South Downs form a significant line of hills extending along the coast, roughly westwards from Eastbourne. They produce a unique, open, rolling landscape dissected by major valleys created by the downcutting of the Rivers Ouse and Cuckmere. Virtually all of this undeveloped downland lies within the South Downs National Park and AONB. The Upper Cretaceous chalk of this area has been used on a very limited and localised scale in some buildings; the unit was quarried primarily for agricultural purposes. Flint, however, worked either directly from the White Chalk bedrock or collected from the downland fields, has long been recognised as a hard, resistant building stone and was employed in the construction of many buildings and walls across the Downs, from Brighton and Lewes to Seaford and Eastbourne.

The floodplains and coastal marshes are found adjacent to the lower reaches of the Cuckmere River, around Newhaven, between Eastbourne and Bexhill, and in the Rye Bay–Camber area on either side of the Rother estuary. These areas comprise either river floodplain deposits or large, flat sheets of alluvium resulting from inundation by the sea during recent geological times. These deposits were exploited on a very small, localised scale for supplies of reworked flints and ferricrete. Far more important were the extensive supplies of flint cobbles and pebbles present on the beaches of East Sussex and Brighton and Hove. These were used extensively all along the coastal strip as a building stone and were often laid to course in buildings or orientated in decorative patterns or chequerboard arrangements with other building stone types.

Figure 1: Bateman's, Burwash. Ashdown Sandstone.

Bedrock Geology Map



Key

Building stone sources

Bedrock geology

Lambeth Group — clay, silt, sand and gravel

White Chalk Subgroup: Chalk Group — chalk

Grey Chalk Subgroup: Chalk Group — chalk

Gault Formation and Upper Greensand Formation (Undifferentiated) — mudstone, sandstone and limestone

Lower Greensand Group — sandstone and mudstone

Wealden Group (principally Wadhurst Clay Formation and Weald Clay Formation, but includes generally finer grained lithologies of the Tunbridge Wells Sand Formation) — mudstone, siltstone and sandstone

Wealden Group (principally Ashdown Formation and generally coarser grained lithologies of the Tunbridge Wells Sand Formation) — sandstone and siltstone, interbedded

Purbeck Group — limestone and mudstone, interbedded

Stratigraphic Table

Geological timescale	Group		Formation		Building stone	Page
Quaternary	various/not defined		various/not defined		Tufa Ferricrete (Iron Pan) Downland Field Flint Beach Pebble Flint River Terrace, Fan Gravel Flint	29 29 28 27 27
Tertiary (Palaeogene)	Lambeth Group		Upnor Formation, Woolwich Formation, Reading Formation		Glauconitic sandstones, ironstones Ferruginous Flint Conglomerate Sarsen stone	26 25 25
Upper Cretaceous	Chalk Group	White Chalk Subgroup	Culver Chalk Formation		Chalk Quarry Flint	23 21
			Newhaven Chalk Formation			
			Seaford Chalk Formation			
			Lewes Nodular Chalk Formation			
			New Pit Chalk Formation			
		Grey Chalk Subgroup	various			
Lower Cretaceous	Selborne Group		Upper Greensand Formation		Eastbourne Sandstone	20
			Gault Formation			
	Lower Greensand Group		Folkestone Formation, Sandgate Formation, Hythe Formation			
	Wealden Group		Weald Clay Formation		Sussex Marble, Small Paludina Limestone, Large Paludina Limestone (Laughton Stone, Winklestone, Bethersden Marble)	19
				Horsham Sand Member	Horsham Stone slate Horsham Stone	17 17
			Tunbridge Wells Sand Formation	Grinstead Clay Member	Cuckfield Stone	16
				Ardingly Sandstone Member	Ardingly Sandstone	15
			Wadhurst Clay Formation		Northiam Sandstone Hog Hill Sandstone Tilgate Stone (Hastings Granite) Cliff End Sandstone Wadhurst Clay Ironstones, Rye Ironstone	13 12 11 11 9
			Ashdown Formation		Ashdown Sandstone	8
Upper Jurassic	Purbeck Group		Durlston Formation		Purbeck Limestone, Blues Limestone, Greys Limestone	5
			Lulworth Formation			

Summary of stratigraphical names applied to Jurassic, Cretaceous and Cenozoic sediments in East Sussex.

2 Local Building Stones

Upper Jurassic and Lower Cretaceous

Purbeck Group, Lulworth Formation, Durlston Formation

Purbeck Limestone, Blues Limestone, Greys Limestone

In East Sussex, Purbeck Limestone crops out in three partially fault-bounded inliers located towards the centre of the county around Broad Oak (from Heathfield to Brightling), north of Netherfield, and west of Whatlington (near Battle). These limestones represent the oldest strata that occur at the surface in the Weald and they are very similar to the Purbeck Group limestones of Dorset.

The two main types of Purbeck Limestone identified in East Sussex, Blues Limestone and Greys Limestone, are rather susceptible to weathering, typically delaminating along bedding surfaces and crumbling. Consequently, both limestones have been employed to a limited extent as building stones in the county.

The Blues Limestone is approximately 12m thick and consists of light blue to grey-blue limestones with calcareous mudstones. The limestones are mainly medium-grained crystalline calcarenites, but lower beds are frequently fine-grained calcilutites; some algal and pelletal limestones also occur. The limestones often contain freshwater fossils and shelly material, including bivalves (such as the clam Neomiodon and the oyster Praeexogyra) and infrequent gastropods (such as the river snail Viviparus). Fossil fish bones, scales, plant remains, and ostracods also occur at some levels.

The Blues Limestone has been used for polished paving slabs at Penhurst's Church of St Michael, and for memorial slabs in churchyards, such as at Brightling. It is also employed as a rubblestone in the walls of All Saints' Church at Mountfield, near Battle.

The Greys Limestone is up to 26m thick and comprises mainly grey, medium-grained (but occasionally coarser) crystalline calcarenites with a characteristic freshwater fossil fauna, including the bivalve Neomiodon. Some beds are packed with shelly bioclasts.

Greys Limestone was worked mainly for the production of agricultural lime. However, it has been used as a rubblestone in the walls of All Saints' Church at Mountfield and as garden paving stones at Bateman's, a 17th-century house near Burwash.

Figure 2: All Saints' Church, Mountfield. Blues Limestone and Greys Limestone.

Lower Cretaceous

Wealden Group

The Wealden Group in South East England comprises a thick sequence of Lower Cretaceous sediments. The history of the Wealden Group stratigraphy is long and complex, and various names have been applied to different parts of the succession at different times. This is partly the result of the lateral facies variations shown by these sediments across their outcrop area.

The situation is further complicated by the fact that a wide range of sandstone varieties may be present within individual formations. Several named lithological varieties of sandstone may even occur together within the same exposed quarry face. Consequently, distinguishing individual sandstones when seen ex situ or assigning them to specific formations or source quarries is, at best, extremely difficult and often impossible. For convenience, therefore, the term 'Wealden Sandstone' is used in this study of East Sussex building stones in a generic sense for any sandstone that is believed to originate from within the Wealden Group, but is otherwise of uncertain stratigraphic position.

Wealden sandstones crop out over much of central and northern East Sussex (including the Weald), north of a line extending from the east of Burgess Hill in West Sussex, via Barcombe and Laughton, to Polegate. The sandstones are typically grey to light brown in colour, and fine to medium grained. There is, however, a large variation in both lithology and colour, including yellowish-brown and cream-tinted types. These sometimes calcareous sandstones can be hard and massive, more thinly bedded and flaggy, or occur as large concretions. They are frequently micaceous and are associated with coarser grained pebble beds, which are typically encountered at either the top or base of individual sandstone units. The more massive, quartzitic or iron-cemented sandstones are usually fairly hard and resistant.

Figure 3: Bayham Abbey, Lamberhurst. Ashdown Sandstone.

Wealden sandstones haves been widely employed as the primary building stone throughout its outcrop area in East Sussex, being seen mainly in walls as a coursed rubblestone or as roughly cut blocks, but only occasionally as ashlar. The sandstones were worked from small pits and used especially for church construction. Fine examples are found at Uckfield, Crowborough, Old Heathfield, Little Horsted, Frant, Hailsham, Battle, Bexhill, Hastings, Rye, Wadhurst, Ticehurst, Etchingham, Winchelsea and Michelham Priory.

The term 'Hastings Beds' is an informal stratigraphic name applied to a sequence comprising the combined Ashdown Formation, Wadhurst Clay Formation and Tunbridge Wells Sand Formation.

Wealden Group, Ashdown Formation

Ashdown Sandstone

The Ashdown Sandstone crops out in a broad, but irregular, partly fault-controlled belt, and it forms much of the bedrock geology of northern and central East Sussex. The formation is juxtaposed with strata assigned to both the Wadhurst Clay Formation and Tunbridge Wells Sand Formation. It underlies wide tracts of land encompassing Forest Row, Danehill, Ashdown Forest to Crowhill, and Framfield to Westfield via Heathfield and Whatlington, further extending to Fairlight, Hastings, Pett, Udimore and Rye. Ashdown Sandstone is superbly exposed in the cliffs between Bexhill and Cliff End, which is the type area for these strata.

The formation contains units of fine-grained, yellowish-brown to pale grey sandstones. Each of the main sandstone units is typically up to 6m thick and has a thin, pebble bed at its base. The uppermost unit is termed the Top Ashdown Sandstone. The formation is reported to reach a total thickness of nearly 230m at Crowborough, but this may reflect duplication of part of the sequence by reverse faulting. The sandstones include a number of varieties, ranging from massive to flaggy. They are sometimes ripple-marked on the uppermost surface and are often cemented with calcite and iron oxides. Fossils in the sandstones are generally sparse and poorly preserved, but may be locally abundant and include freshwater bivalves, gastropods and plants, with occasional rolled dinosaur bones in the thin, basal, pebble-bearing beds.

In common with most of the harder Wealden Sandstones in East Sussex, the Ashdown Sandstone has been employed as a building stone throughout its outcrop area, mainly in walls as a coursed rubblestone or as roughly cut blocks, and occasionally as ashlar. Particular noteworthy examples of its use are Bateman's (near Burwash), Etchingham station, the ruins of Bayham Abbey (near Lamberhurst) and the churches at Crowborough, Old Heathfield and Rye. It is also used, in combination with Tunbridge Wells Sandstone, at Mayfield School, Mayfield.

Figure 4: Etchingham station. Ashdown Sandstone with Caen Stone dressings.

Wealden Group, Wadhurst Clay Formation

The Wadhurst Clay Formation variably abuts strata assigned to the Ashdown Formation and the Tunbridge Wells Sand Formation and crops out through northern and central East Sussex. It extends to the coast near Bexhill and Hastings, and is superbly exposed in cliffs between Bexhill and Cliff End.

The formation reaches 50m in thickness and comprises mainly grey mudstones and red/green mottled clays, with subordinate sandstones, siltstones, thin conglomerates and (in the lower part of the succession) distinctive sideritic clay ironstones.

Several impersistent sandstone units are recognised and have been used for building purposes on a minor localised scale along their outcrop. Although various names have been applied to these sandstones, including Cliff End Sandstone, Tilgate Stone, Hog Hill Sandstone and Northiam Sandstone, like many of the other Wealden Group sandstones, the Wadhurst Clay Formation sandstones tend to be similar lithologically. As a result, they usually cannot be distinguished from one another when seen *ex situ*, unless their exact provenance is known.

Wadhurst Clay Ironstones, Rye Ironstone

Ironstone bands mainly occur within the lower parts of the Wadhurst Clay Formation. They crop out along the edge of the High Weald, extending from Framfield south-eastwards to Bexhill and Hastings, via Horam. Isolated fault-bounded outcrops containing ironstone also occur around Rye, Brede and Udimore. The ironstones are invariably deep reddish, purplish or dark brown

in colour. In terms of their form, they may vary from lenticular or tabular bands (up to 250mm thick) to sideritic clay ironstone nodules or concretions. Occasionally, the tabular beds may also contain thinner layers of sideritic mudstone or clay ironstone. Locally, they are highly fossiliferous, containing abundant unflattened bivalve or ostracod shells. The well-cemented ironstones and nodules tend to be very hard and resistant to weathering.

The ironstones were formerly an important source of iron and were worked from shallow bell pits. They typically saw only minor use as a building stone in East Sussex, but they are highly distinctive where employed. Some of the best examples are found in Rye (Rye Ironstone), where Landgate Arch in East Cliff contains many lenticular blocks of deep purple-brown-coloured ironstone and the walls of the Baptist Church in Cinque Ports Street are partly composed of very hard, homogenous, knapped, sideritic concretions and ironstone lenses. Ironstone was also used on a small scale in the construction of the walls of Hastings Castle, in combination with larger quantities of Ashdown Sandstone, Tilgate Stone and flint cobbles, the last of which were obtained from nearby beaches.

Figure 5: Landgate Arch, Rye. Rye Ironstone and Wealden Sandstone, including Ashdown Sandstone.

Cliff End Sandstone

The Cliff End Sandstone occurs at the base of the Wadhurst Clay Formation and is confined mainly to the Hastings area of East Sussex. It is very well exposed in cliff sections between Hastings and Rye, and crops out extensively in the immediate hinterland. It is a massive, pale grey sandstone, reaching 10m in thickness at its type section on the coast. The top of the sandstone is commonly purplish in colour due to the presence of finely organic material, notably in the form of long slender stems and lateral rootlets that may extend downwards for a couple of metres. Locally, the top of the sandstone is also marked by a pebble bed cap.

Cliff End Sandstone was formerly worked in quarries near Fairlight. It is of very minor use as a building stone in East Sussex, and the most noteworthy example is St Andrew's Church at Fairlight.

Figure 6: St Andrew's Church, Fairlight. Cliff End Sandstone.

Tilgate Stone (Hastings Granite)

In East Sussex, Tilgate Stone (Hastings Granite) is generally applied to hard, calcareous sandstone beds and lenses that occur within the Wadhurst Clay Formation. However, in West Sussex, geologist Gideon Mantell applied the name to horizons of distinctly hard, calcareous sandstone occurring within the Cuckfield Stone Bed (Grinstead Clay Member, Tunbridge Wells Sand Formation).

In East Sussex, Tilgate Stone occurs within the main outcrop area of the Wadhurst Clay Formation in the south-eastern part of the Weald, but it is also recorded near Lewes, in the Tenterden area (in outliers near Iden, Reighton and Great Bellinghurst) and in the vicinity of Hastings (around Brede, Udimore, Ninfield, Crowhurst and between Westfield and Winchelsea). Tilgate Stone is also exposed in cliff sections between St Leonards and Hastings.

Tilgate Stone is a pale bluish-grey to brown, hard, calcareous sandstone. It is similar to Cuckfield Stone, but is usually more thinly bedded, flaggy and

micaceous. It may also occur as lenses or large concretions (called 'doggers') up to 400mm thick. Beds of Tilgate Stone rarely attain a total thickness exceeding 1.2 to 2.5m, although exceptionally they may reach up to 5m, as at Brede and Udimore. The sandstones are usually fairly hard and resistant, especially where calcite cemented. However, Tilgate Stone doggers are prone to decalcification, producing ochreous 'rottenstones' that contain just a residual core of calcareous material.

The stone is widely employed as a general walling and building stone along its outcrop. Tilgate Stone has been used extensively at Winchelsea, where St Thomas's Church, Court Hall, armoury, well, town wall and gates are all primarily constructed from this stone. Other notable examples of its use are St Mary's Church at Udimore and Hastings Castle, where it is used in combination with Ashdown Sandstone, flint cobbles and occasional ironstones. Tilgate Stone was also worked near Brede for road dressing in the 1900s.

Figure 7: Armoury and town well, Castle Street, Winchelsea. Tilgate Stone.

Hog Hill Sandstone

This sandstone is named after Hog Hill, near Icklesham, but it is best known from the Hastings area. The unit is up to 8m thick and comprises buff or khaki-coloured sandstones, typically interbedded with grey and brown clays. The lower boundary is marked by an abrupt change from sandstone to mudstone.

As with other sandstone units in the Wadhurst Clay Formation, the Hog Hill Sandstone is laterally impersistent, and rapid lateral variations in lithology are common. Where present, it occupies a stratigraphic position approximately in the middle of the Wadhurst Clay Formation. Hog Hill Sandstone has seen only very minor and localised use as a building stone along its outcrop.

Northiam Sandstone

Northiam Sandstone occurs in the upper part of the Wadhurst Clay Formation, just below a series of distinctive red mottled clays. It has a relatively limited distribution in East Sussex, and is best known from the area around Northiam (extending to Sandhurst, just over the county border in Kent) and Hastings.

It is a massive, pale buff, fine-grained sandstone unit, up to 8m thick, typically containing sandy beds with small quartz pebbles or laminated, lozenge-shaped clay ironstone pebbles (up to 50mm long) called ‘boxstones’. Occasional poorly preserved fossils may be present and these comprise mainly plant debris (horsetail ferns) or bivalve moulds.

Current bedding and festoon bedding structures are characteristic of the sandstone beds, and frequent washout, scour-and-fill structures and evidence of reworking are also present. Northiam Sandstone has seen only very minor and localised use along its outcrop. One noteworthy example, however, is the Frewen Mausoleum at St Mary’s Church at Northiam.

Figure 8: Frewen Mausoleum, St Mary's Church, Northiam. Northiam Sandstone.

Wealden Group, Tunbridge Wells Sand Formation

The basic three-fold subdivision of the Tunbridge Wells Sand Formation into a Lower Tunbridge Wells Sand and an Upper Tunbridge Wells Sand, separated by the Grinstead Clay Member (as used in West Sussex), is less easy to apply in East Sussex, especially beyond the western part of the High Weald. The formation generally contains more siltstone than the corresponding strata in West Sussex, and progressing eastwards through East Sussex the upper part of the formation becomes increasingly clay dominated, with subordinate thin sandstones. The Grinstead Clay Member is not present east of the East Hoathly to Hellingly area.

In East Sussex, the Tunbridge Wells Sand Formation is present over much of the Weald area in two wide, broadly north-west to south-east trending belts. The southern belt extends from Wivelsfield and Fletching to Maresfield, Hadlow Down and Uckfield, and through Chailey, East Hoathly, Chiddingly and Herstmonceux to Hastings, Westham and Pevensey. The northern belt, meanwhile, extends from Withyham via Frant, Cousley Wood, Hurst Green, Ewhurst and Beckley to Peasmarsh. Generally, the outcrop becomes more irregular in the south-east of the county, where fault-bounded areas of the Wadhurst Clay Formation and Ashdown Sand Formation tend to dominate the bedrock geology.

The Tunbridge Wells Sand Formation is approximately 75m thick and comprises fine-grained, buff or pale brown to pale grey sandstones. These show a wide variety of textures and colours, similar to the other Wealden Group sandstones, from which they cannot usually be distinguished unless their provenance is known. *In situ*, the sandstones are usually interbedded with siltstones and clays, which become more dominant further eastwards in the county. Fossilised rootlets and plant debris, including lignite (wood fragments), are abundant through much of the succession in the west of the county, but are generally rare further east.

Tunbridge Wells Sandstone is very commonly used as the principal building stone across its entire outcrop in East Sussex, although many houses (even in the Weald, where the outcrop is best developed) are constructed from brick. Where employed, the sandstone is used as the main walling stone, often as rough blockwork or coursed rubble. Notable examples include the Roman walls at Pevensey Castle, garden walls in the Victorian suburbs of Hastings and at Stone House and Mayfield School, both Main Street, Mayfield. Tunbridge Wells Sandstone is also widely used in churches across the Weald, including those at Chiddingly, Uckfield, Little Horsted and Frant.

Figure 9: House, Main Street, Mayfield. Tunbridge Wells Sandstone with Ardingly Sandstone.

Another stone name associated with the Tunbridge Wells Sand Formation is Horsted Sand. This stone, with its type area around Little Horsted, near Uckfield, was originally identified and defined on lithological grounds by Gideon Mantell in the 1820s. However, Mantell's scheme was not based on geological mapping and contained errors in correlation. Subsequent work has established the true stratigraphic position of the Horsted Sand, which is within what is now regarded as the lower part of the Tunbridge Wells Sand Formation.

The most important distinguishable sandstones occurring within the Tunbridge Wells Sand Formation that have been employed as building stone are described below.

Ardingly Sandstone

The outcrop of the Ardingly Sandstone broadly follows a similar pattern to that of the Tunbridge Wells Sand Formation, but it tends to be more localised in the central-western and central-northern part of the High Weald. There are two main outcrops: a northern one occurring in the Withyham to Frant area, and a southern one extending from Fletching via Maresfield and Chailey to Isfield. Locally, it often forms small crags or gives rise to very steep slopes.

The Ardingly Sandstone Member is usually 12 to 20m thick. It is a distinctive blue-grey or silver-grey-coloured 'sandrock', comprising mainly massive, fine-grained, well-sorted quartz sands. The best quality and hardest building stone beds contain a small amount of calcite cement and occur towards the top of the unit, below the Grinstead Clay Member. Visually, the Ardingly Sandstone appears to be a 'cleaner' more consistently coloured sandstone than other Wealden sandstones. Although soft when freshly quarried, Ardingly Sandstone subsequently hardens and weathers evenly over time, with a distinctive tough surface skin developing on exposed surfaces.

Ardingly Sandstone is used for high-quality ashlar, other walling and fine decorative work throughout its outcrop area, and is readily carved for ornamental features. Typically, it is employed as a subsidiary building stone within about 8km of the margins of the outcrop and in settlements located along rivers, such as the Ouse and upstream of the Adur. One of its most notable uses is as ashlar and quoins, along with Top Ashdown Sandstone, in the Church of St Giles at Dallington.

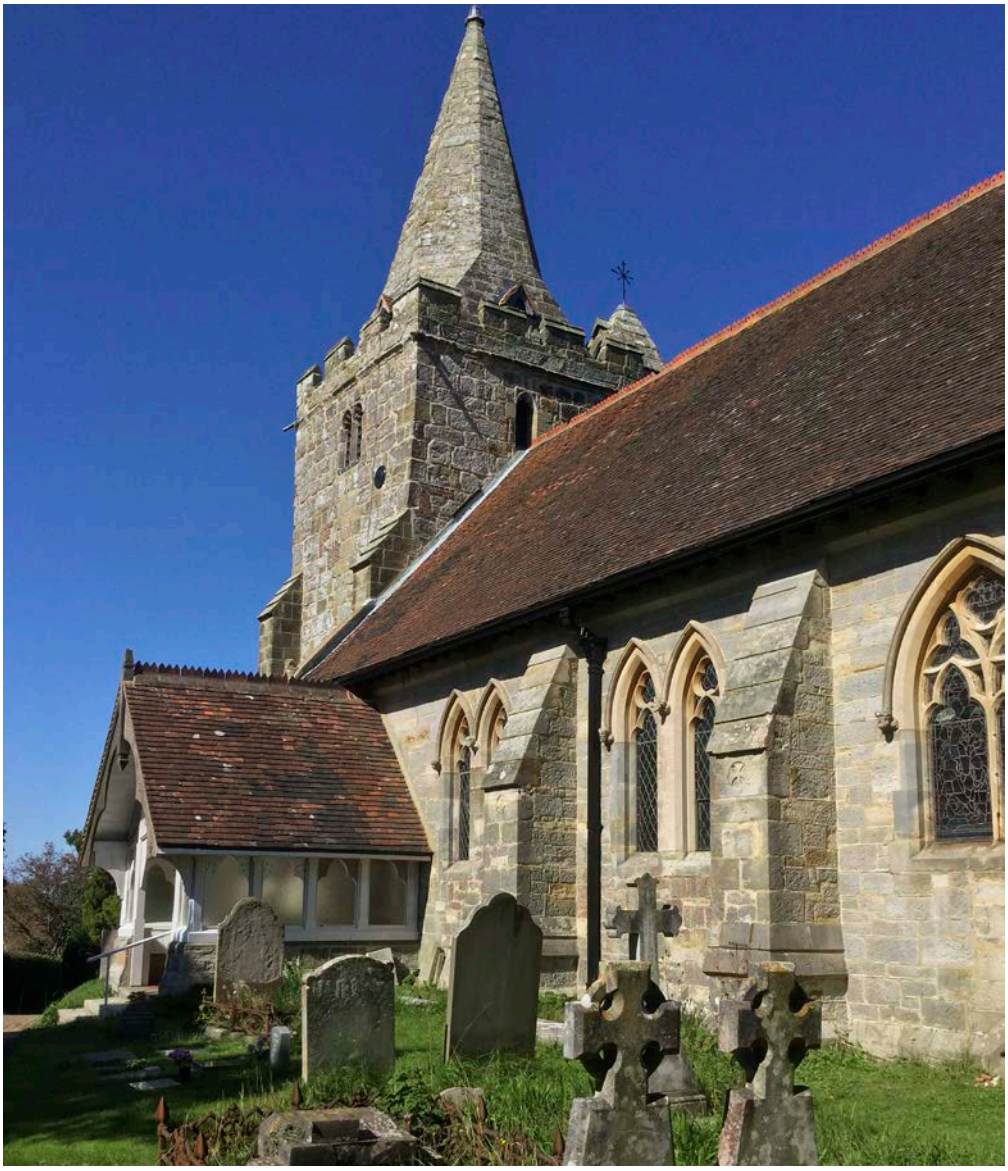


Figure 10: Church of St Giles, Dallington. Ardingly Sandstone and Ashdown Sandstone.

Cuckfield Stone

The Cuckfield Stone occurs mainly in the north-west corner of East Sussex in a series of inliers. These occur at Danehill, north of Withyham, Hartfield and Ashurst Wood, close to the boundary with West Sussex. East of a line extending from Danehill to Sheffield Park, the Cuckfield Stone rests directly on Ardingly Sandstone (the intervening Upper Grinstead Clay being absent). Here, the lithological differences between Cuckfield Stone and Ardingly Sandstone are insufficient for them to be practically distinguished.

Cuckfield Stone varies in thickness from 2 to 9m and it comprises internally flaggy, thickly bedded sandstones with lenses of hard, calcareous sandstone. These are typically dark reddish-brown to brown in colour, although shades of light brown or even grey also occur. Upon weathering, the stone develops ochreous and rusty hues, which make it attractive as a building stone. Locally, the sandstones may contain fossilised plant fragments and bivalves. The presence of festoon bedding or cross-bedding and dark brown staining are fairly distinctive, but it is not always possible to distinguish Cuckfield Stone from other lower Weald Group sandstones unless the provenance is actually known.

Cuckfield Stone has a relatively localised use as a building stone within and near its outcrop area, being seen mainly in walls as rough blockwork and coursed rubble. North of Burgess Hill, around Folly Farm near the boundary with West Sussex, a number of old pits were dug through the Upper Grinstead Clay to work the underlying Cuckfield Stone for paving and roofing slabs.

Wealden Group, Weald Clay Formation

Horsham Stone

Horsham Stone crops out in the far west of East Sussex near Wivelsfield, although it is absent from the Tenterden and Lewes areas. It comprises two sandstone horizons varying between 1 and 1.5m in thickness, which sometimes contain ironstone nodules. Horsham Stone is a fine to very fine-grained, hard, flaggy, calcareous sandstone, typically pale buff to pale grey in colour. Bands of iron staining are commonplace, and longitudinal ripple structures are often present on the surfaces of fine-grained sandstone paving slabs. Apart from trace fossils and bioturbation features, fossils are uncommon in the Horsham Stone. Those that are present include poorly preserved casts and moulds of freshwater bivalves, lignite and rare impressions of dinosaur footprints (Iguanodon).

Historically, Horsham Stone was quarried from shallow pits in the Wivelsfield area, notably at pits around Bedelands Farm, Theobalds, Antye Farm, Lunces Hall and Holford Manor. However, it saw relatively little use as a building sandstone in East Sussex, in contrast to its extensive use in West Sussex. At the Church of SS Peter and John the Baptist at Wivelsfield, Horsham Stone was employed as roughly cut blocks, in association with other sandstones, including Tunbridge Wells Sandstone. It was also used with Tunbridge Wells Sandstone in the Church of SS Andrew and Mary at Fletching and the Church of St Peter at Chailey, as well as with flint in the 12th-century Hamsey church. Paving slabs composed of Horsham Stone develop smooth, hard surfaces.

Horsham Stone Slate

Horsham Stone slate occurs in the upper part of each of the Horsham Stone horizons where they become finely laminated and can be readily split into 20 to 30mm-thick slates. These slates are medium to dark grey in colour and exhibit few structures, apart from lamination and occasional broad amplitude ripple structures. When weathered, older roofs made of Horsham Stone slate often develop a characteristic black cover of algae and lichen.

Like Horsham Stone, Horsham Stone slate was relatively little used in East Sussex, reflecting the fact that the main quarries were located in the Horsham area of West Sussex (where most of the roofing stone originated). Examples of its use as a roofing slate in East Sussex are seen in Lewes at Anne of Cleves House, Southover Grange and several other larger houses.

Figure 11: Church of St Peter, Hamsey. Horsham Stone.

Figure 12: Anne of Cleves House, Lewes. Horsham Stone slate roof eaves.

Figure 13: Roof slates. Horsham Stone.

Sussex Marble, Small Paludina Limestone, Large Paludina Limestone (Laughton Stone, Winklestone, Bethersden Marble)

Sussex Marble forms a narrow, intermittent band within the Weald Clay Formation between Barcombe Cross (near the River Ouse) and Lower Dicker (by the Cuckmere River). When fresh, it is a grey, crystalline limestone, but it quickly weathers to a brownish colour due to the presence of iron minerals. The stone is characteristically packed with the fossil shells of the freshwater gastropods, which appear whitish in section and are commonly infilled with patches of transparent crystalline calcite.

Two forms of the limestone occur in East Sussex. A lower Small Paludina Limestone occurs in beds varying from 50 to 150mm in thickness. It contains closely packed shells and fragmentary remains of the small fossil gastropod *Viviparus infracretacicus*. An upper Large Paludina Limestone (also called Laughton Stone, Winklestone or Bethersden Marble) occurs in beds varying from 100 to 300mm in thickness. It is composed largely of the globose fossil gastropod *Viviparus fluviorum*. The Large Paludina Limestone may also contain very thin marly beds with fossil ostracods.

Sussex Marble was formerly dug from shallow pits called delves. The limestone takes a good polish and was often employed internally for decorative or ornamental purposes, such as altar tables, tombs and ledgers, fonts, columns and fireplaces. Despite Sussex Marble's weakness as an external building stone (it weathers readily due to water penetration), it has been employed occasionally as a rubblestone in barns, farmhouses and cottages along its outcrop, notably in the Laughton area. It can also be seen in church walls at Plumpton, Laughton, Streat and East Chiltington.

Figure 14: Parish Church, East Chiltington. Large Paludina Limestone.

Lower Greensand Group, Folkestone Formation, Sandgate Formation, Hythe Formation

Over most of East Sussex, the Lower Greensand Group strata comprise mainly interbedded clays, silts and unconsolidated sands with occasional, laterally impersistent, pebbly units. These beds are soft, typically with very little topographic expression, and they are poorly exposed, thinning rapidly

eastwards across the county. They are the equivalent of the Hythe Formation, Sandgate Formation and Folkestone Formation, which are much harder, thicker and better developed in West Sussex, where these formations have yielded important building stones, including Hythe Sandstone, Hythe Chert, Bargate Stone, Pulborough Sandrock and carrstone. However, in East Sussex, the Lower Greensand lithologies present are often insufficiently distinct to identify the separate formations at outcrop. They are usually worked as sources of sand and gravel (not building stone) in the county area.

Selborne Group

The Upper Greensand is absent across the whole of the South Downs east of Westmeston and Plumpton and throughout the Lewes area, where the Chalk Group rests unconformably on the Gault Clay Formation. The uppermost beds of the Gault Clay are occasionally micaceous and silty. These are the unconsolidated equivalents of the Malmstone facies that occur further west, close to West Sussex where they are far more extensively developed. In East Sussex, the Upper Greensand Formation only reappears in the vicinity of Eastbourne and Beachy Head, where a glauconitic sandstone facies (the Eastbourne Sandstone) is exposed.

Selbourne Group, Upper Greensand Formation

Eastbourne Sandstone

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The Eastbourne Sandstone crops out only in the Beachy Head and Eastbourne areas, where the beds are up to 10m thick. It is a characteristic pale to dark green-coloured, fine to medium-grained, micaceous, glauconitic sandstone, which is often highly bioturbated, with occasional phosphatic nodules and serpulid worm fossils. Ventnor Stone (imported from the Isle of Wight and used in West Sussex) is very similar to Eastbourne Sandstone. However, typically, it contains more small brownish phosphatic pebbles and exhibits a more varied fossil fauna, including bivalves (scallops, oysters), ammonites and brachiopods, in addition to serpulid worms.

Eastbourne Sandstone weathers badly, and the surface flakes and spalls when exposed to the elements. Historically, however, the stone was quarried on a large scale from the foreshore at Eastbourne and was widely used as a rubblestone and coarse ashlar around Eastbourne (especially in Victorian walling) and in the south-west of the county. It was also employed for

window tracery and door jambs. Examples include the wall buttresses and dressings at St Andrew's Church at Beddingham (which also incorporates stone reused from Lewes Priory after the Dissolution of the Monasteries during the 16th century), blocks in the walls of Pevensey Castle and the impressive Norman tower of the Church of St Mary the Virgin at Eastbourne. The sandstone for this tower was quarried from a site located near the present-day Queens Hotel on Eastbourne seafront.

Figure 15: Parsonage, Eastbourne. Flint nodules and pebbles, with occasional blocks of ironstone and quoins of Eastbourne Sandstone.

Figure 16: Church of St Mary the Virgin, Eastbourne. Eastbourne Sandstone.

Upper Cretaceous

Chalk Group, White Chalk Subgroup, various formations

Quarry Flint

Quarry Flint is commonly and widely used as a building stone adjacent to and within the outcrop area of the White Chalk Subgroup across the South Downs, encompassing Brighton, Stanmer, Lewes, Newhaven, Seaford, Alfriston and Eastbourne.

It is an extremely fine-grained (cryptocrystalline) and hard form of silica containing microscopic, quartz-crystal aggregates. It usually occurs as irregularly shaped nodules that are 100 to 200mm across, or as (sub-) rounded pebbles and cobbles. Occasionally, it is also found as weakly banded tabular ‘sheets’ or layers up to 200mm thick. The colour is very distinctive: fresh flint nodules have a white outer cortex with a darker coloured (black, dark grey) interior.

Quarry Flint breaks with a characteristic conchoidal fracture, producing razor-sharp fine edges. The cleaved surfaces may exhibit banded structures resulting from the alternation of layers of slightly different composition. Flint nodules may contain cavities lined with translucent botryoidal chalcedony or small transparent quartz crystals. Some flints contain well-preserved fossils, with echinoids, sponges, bivalves and burrow structures being the most commonly encountered types.

Quarried flint is used extensively in walls in a wide variety of ways: laid to course as rough tabular ‘sheets’ or nodules; in squared blockwork or chequerwork; as knapped, faced, trimmed or cleaved-faced stone in random or decorative arrangements; or as galleting, used to fill interspaces between irregular flint nodules or other stones when the mortar is wet, thus reinforcing the mortar. It is also seen interlocking with brick or other stone dressings, quoins, window and door jambs, serving to help consolidate the building. Notable examples of its use include the walls of St Pancras Priory, Lewes, and as dressed facings in the Old Grammar School and the Church of St Michael, both also in Lewes. In addition, it is used extensively in All Saints’ Church at Laughton and St Andrew's Church at Alfriston, and in the walls and gatehouse of Lewes Castle.

Figure 17: St Andrew's Church, Alfriston. Knapped Quarry Flint and Downland Field Flint.

Figure 18: Gatehouse, Lewes Castle, Lewes. Knapped Quarry Flint.

The extremely hard and resistant nature of Quarry Flint-type nodules has resulted in them being recycled by natural processes into younger deposits. These reworked types of flint, which show specific characteristics, are described in the Quaternary section of this guide.

Chalk

In East Sussex, chalk crops out within the southern coastal area extending from Brighton to Eastbourne, where it forms the South Downs (which rise to 200m above sea level). The chalk outcrop encompasses Brighton, Stanmer, Lewes, Newhaven, Seaford, Alfriston and Eastbourne.

Chalk is a relatively soft, fine-grained, white limestone, which is typically massive and lacks discernible structures. The Chalk Group in East Sussex is up to 425m thick and the upper 90 per cent of this is represented by the White Chalk Subgroup. Distinguished by its pure white colour and layers of flint nodules, this forms much of the south-facing chalk dip slope of the South Downs and coastline between Brighton and Eastbourne. The lower 10 per cent is represented by the Grey Chalk Subgroup, which crops out along

the northern edge of the escarpment. This is a darker, typically greyish colour and is devoid of flints, but includes thin marly layers and intercalations (griotte) between thicker chalk limestone units.

Although long established, no quarrying of chalk now occurs in East Sussex. Historically, chalk was extracted for use in the manufacture of cement in the Ouse Valley, north of Lewes. Chalk was never extensively quarried for building purposes in East Sussex. Latterly, chalk extraction was limited to one site lying within the outcrop of the White Chalk Subgroup, at Tarring Neville, near Newhaven. Here, high-quality chalk was worked until 2014 for use in specialist plasters.

Chalk is generally unsuitable for external use because repeated wetting, drying and frost action cause the relatively soft rock to powder and disintegrate into small angular fragments. When used externally, softer forms of the stone may show concave weathering away from mortar lines. Chalk has, therefore, been employed primarily for interior work, although it has been used occasionally as infill rubble across the outcrop area. A barn wall at Hamsey Place Farm, Hamsey, near Lewes, provides one of the few examples of its use externally.

Figure 19: Hamsey Place Farm, Hamsey. Chalk block.

Tertiary

Lambeth Group, Upnor Formation, Woolwich Formation, Reading Formation

Sarsen Stone

The origin of Sarsen stones is generally uncertain, and within the Brighton area no specific source has yet been positively identified. At Black Rock, however, several Sarsen stones are embedded in chalky drift infill within a dry valley, and Sarsen cobbles and pebbles also occur in nearby beach deposits. Some may have derived from secondary cemented portions of the formerly more extensive Woolwich and Reading Beds. Others may be the eroded remnants of a bed of silica-cemented sand at the base of the Lambeth Group (Upnor Formation), which sat directly above the chalk of the South Downs. Reworked boulders of this material may have been transported subsequently to the Brighton and Eastbourne areas.

Sarsen stones are usually grey to pale brown in colour, becoming distinctly creamy-buff when weathered. They are very fine to fine grained, comprising sub-rounded quartz grains set within a silica matrix, which is visible on a fractured surface. Sarsen stones often occur as rounded or elongate pebbles, cobbles, boulders or even metre-scale slabs (up to 3m in length). Their surfaces are often smooth and they may occasionally show poorly defined bedding structures. Beach-worn Sarsen stones may exhibit an ‘elephant skin’ surface texture.

Although they are very hard and resistant, Sarsen stones are a very minor building stone in East Sussex. They were typically collected as beach cobbles or pebbles, along with similarly fashioned flint, and used to only a very limited extent in rubble walls near the coast, notably in Brighton, Newhaven and Seaford. Sarsen stones typically make up only about 0.1 per cent of the stone used in these predominantly flint pebble walls. Isolated Sarsen stones are also seen in church walls at Preston, Ditchling, Ovingdean, Brighton and Seaford.

Ferruginous Flint Conglomerate

Residual patches of ferruginous flint conglomerate deposits occur on the chalk outcrop of the South Downs between Brighton and Eastbourne, notably at West Blatchington, and Falmer as well as at hill cappings at Rottingdean and Saltdean. The stone is very distinctive and occurs as a dark brown or red-brown, iron-stained, sub-angular flint and quartz-pebble conglomerate, with minor ferruginous sandstones and clays. The clasts typically occur in a sandy matrix cemented by iron oxides. The relatively unabraded flints characteristically exhibit a dark green staining, which is caused by a coating of glauconite. The conglomerate reaches up to 2m in thickness in the Worthing (West Sussex) area.

Ferruginous Flint Conglomerate weathers relatively easily and crumbles on exposure to water, whereupon the flint clasts are released. Consequently, it has seen only minor use as a building stone. It may be observed as an occasional rubblestone in church walls at Telscombe, Patching, East Blatchington, Kingston and Falmer. Small amounts are also visible in walls at Lewes Priory.

Figure 20: St John the Divine Church, Patching. Ferruginous flint conglomerate.

Glauconitic Sandstones, Ironstones

Small outliers of medium-grained, glauconitic sandstones and ferruginous siltstones and ironstones overlie the Chalk Group strata of the South Downs between Brighton and Seaford. The colour of these sediments varies depending on their lithology, but, in general, the ferruginous sediments are a rich red or rust colour, whereas the glauconitic sandstones are grey-green. The sediments are often massive and exhibit few features, with the exception of some glauconitic sandstones, which contain shelly horizons with the fossil oyster Ostrea.

The hardness varies from relatively soft, in the case of the easily weathered, slightly friable glauconitic sandstones, to relatively hard, in the case of the tougher, coarser grained sandy ironstones, which often occur in association with ferruginous flint conglomerate. These sandstones and ironstones have seen only very minor use as an irregularly shaped rubblestone, and may be observed in church walls at St Peter's at West Blatchington and St Helen's at Hangleton.

Quaternary

Various groups, various formations

Quaternary Flint (including Coombe Rock and clay-with-flints) occurs in large quantities in southern East Sussex and is distributed across wide areas of the Chalk Downs and coastal plains. Its widespread availability, combined with

its hardness and resistance to weathering, means that Quaternary Flint is one of the dominant types of building stone used in the county. It typically occurs as irregularly shaped nodules or as (sub)rounded pebbles and cobbles, depending on the flint type. The colour is variable: less weathered flint nodules or pebbles have a cream outer cortex with darker coloured (greyish) interiors; weathered flints, or those that have lain in soil or superficial deposits for a long period, may be variously discoloured or bleached, often with brown-stained interiors due to the precipitation of iron hydroxides from percolating ferruginous water.

Quaternary Flint is used extensively as a walling stone in a wide variety of ways: as nodules or pebbles laid roughly to course; as squared blocks forming part of chequerwork; as knapped, faced, trimmed or cleaved faced stone in random or decorative arrangements; or sometimes as galleting.

River Terrace, Fan Gravel Flint

This type of flint occurs as water-washed, sorted, sub-rounded pebbles, usually up to 150mm in length, which are either stained brown or bleached white. It is employed mainly as a walling stone, and good examples of its use can be seen in and around Lewes, Cuckmere, West Dean and Eastbourne.

Beach Pebble Flint

Beach (and Raised Beach) Pebble Flint typically occurs as pale to dark greyish, rounded pebbles and cobbles up to 100mm in size. They are occasionally larger. The pebbles often exhibit a ‘frosted’ surface appearance or ‘chatter marks’ (small surface cracks) caused by impacts with other beach pebbles.

The collection of Beach Pebble Flint is now prohibited, but formerly it was one of the commonest and most widely used building stones in East Sussex and Brighton and Hove. Typically, the stone was employed as and where it was found, in a variety of ways and in a range of structures within coastal towns and villages stretching from Brighton to Eastbourne and Hastings. It was also used in many buildings inland, especially in Lewes, Alfriston and Pevensey. Large flint cobbles form a significant part of the castle walls at Pevensey.

Figure 21: Pevensey Castle, Pevensey. Large flint cobbles.

The main use for Beach Pebble Flint was for walling. Flint pebbles and cobbles were often sorted according to size and laid to course, as seen in the 18th-century Old Town cottages along Church Lane in Eastbourne. Occasionally, the pebbles were used in more decorative fashion, with the long axis either vertical or at an inclined angle creating an imbricate pattern.

Figure 22: Old Town Cottages, Eastbourne. Beach Pebble Flint.

Downland Field Flint

This type of flint occurs as irregularly shaped nodules on the field surface of the Chalk Downs. The size of the nodules varies from 100 to 300mm, but larger nodules occur occasionally. The outer 'skin' (cortex) of the nodule is usually cream coloured, with a darker brownish or greyish interior that becomes white on old fractured surfaces. This lightly weathered appearance helps distinguish Downland Field Flint from the much fresher looking Quarry Flint, which has a white outer cortex and a very dark grey or black interior.

Downland Field Flint is a very common and widely used stone, in a wide variety of buildings and structures across the the Chalk Downs and (to a

Figure 23: Church of St Pancras, Kingston. Downland Field Flint with Ferruginous Flint Conglomerate and tufa.

lesser extent) along the coastal plains. It was used extensively in walls in a variety of ways, with nodules often being selected for their shape and size, and laid in either a random or coursed manner.

Ferricrete (Iron Pan)

Ferricrete typically exhibits a distinctive conglomeratic or brecciated texture, created by clasts of sandstone, chert or flint set within an iron-oxide sandy matrix. It occurs intermittently in irregular layers up to 500mm thick, and was formerly quarried on a small scale from shallow pits dug in river terrace and floodplain deposits near the rivers Ouse, Cuckmere, Brede, Tillingham and Rother, and on the Pevensey Levels. Ferricrete has been employed as a building stone on a small scale; a good example of its use as roughly cut lenticular blocks is provided by the Roman outer curtain wall and towers at Pevensey Castle. Ferricrete was also occasionally used as isolated blocks of rubble stone in Medieval church walls, such as at Northiam.

Figure 24: Pevensey Castle, Pevensey. Ferricrete and ironstone blocks.

Tufa

Tufa is a whitish or pale grey-coloured, highly porous limestone formed by the precipitation of calcium carbonate (lime) from springs where the water has passed through calcareous rocks, such as limestone or chalk. Its occurrence in East Sussex is still poorly understood. Tufa is known to have formed in springs emanating from the Purbeck limestones near Burwash, but it is also thought to occur in association with as yet undiscovered springs that emerged from the Chalk Group succession at some stage in the past.

Tufa is soft and crumbly when freshly quarried, and it is easily cut into ashlar. However, upon exposure to air, it hardens quickly. It has been employed only very occasionally as a building stone in East Sussex, but where used it is typically seen as roughly cut or rubblestone blocks in old walls and medieval churches. Examples can be seen in Brighton, West Blatchington, Wilmington and Kingston.

3 Examples of Imported Building Stones

Building stone has been imported into East Sussex since Roman times. However, it was during Norman times that this trade increased greatly, with many tonnes of stone being shipped into the county from France, especially for the construction of grander buildings in the coastal regions.

There was also considerable transport of British-derived stones into East Sussex, especially Purbeck Stone and Purbeck Marble from Dorset (Isle of Purbeck). Bembridge Limestone, Ventnor Stone, Quarr Stone and Bonchurch Stone from the Isle of Wight, Chilmark Stone from Wiltshire, and Bath Stone, Doulting Stone and Beer Stone from South West England are other notable examples.

Early Carboniferous

Tournai Marble Tournai, Belgium

A black, very fine-grain limestone, which takes a high polish. Occasional fossils are preserved in white calcite. The marble is resistant to weathering however it is normally used for interior memorials. There are numerous examples in the Rotherfield, Ticehurst and Wadhurst churches.

Upper Carboniferous

Pennine Coal Measures Group, Lower Coal Measures Formation

York Stone (Elland Flags) Halifax area, Yorkshire

A grey to buff coloured, flaggy sandstone. It may be ripple marked and exhibit trough cross bedding. An example is the York Stone paving in North Street, Brighton.

Middle Jurassic

Inferior Oolite Group, Upper Lincolnshire Limestone Formation

Clipsham Stone, Rutland

A durable, cream-buff coloured, bioclastic limestone. It was often used as ashlar and a (very common) Victorian replacement in many churches (notably as quoins).

Great Oolite Group, Chalfield Oolite Formation

Bath Stone, Bath, NE Somerset and possibly Corsham area, Wiltshire

A creamish to ochreous, oolitic limestone (freestone). It was often used as ashlar and as a Victorian replacement in many churches.

Caen Stone, Normandy, France

A high quality, creamy or pale yellowish coloured limestone (freestone). It principally features in Norman stonework but was used up to *c* 1400. Caen Stone was frequently recycled into later stone buildings, for example Southover Grange and elsewhere in Lewes, and the Court Hall in Winchelsea.

Figure 25: Southover Grange, Lewes. Caen Stone.

Upper Jurassic

Portland Group, Portland Stone Formation

Portland Stone, Isle of Portland, Dorset

A very pale, white, fine-grained limestone. It has been used as a freestone in many civic buildings, facades and columns. Notable examples include the Royal Pavilion Brighton (with lesser amounts of Bath Stone), and Lewes and Eastbourne Town Halls.

Figure 26: Royal Pavilion, Brighton. Portland and Bath Stone dressings.

Lower Cretaceous

Purbeck Group, Durlston Formation

Purbeck Marble, Isle of Purbeck, Dorset

A dark grey to buff, shelly limestone, containing fossil *Viviparus* shells (but smaller than the shells in Sussex Marble), and other finely-broken shell material. Purbeck Marble was used mainly for internal church memorials, ledgers, columns, bases and capitals, especially in Battle Abbey and Winchelsea Church, and sometimes for paving.

Tertiary

Solent Group, Bembridge Limestone Formation

Bembridge Limestone, Isle of Wight

A buff, fine-grained, shelly limestone (freestone). The fossils include the gastropod *Galba* and alga *Chara*. Small amounts are used as ashlar in Wilmington.

Solent Group, Headon Hill Formation

Quarr Stone, Isle of Wight

A pale grey to buff, porous, open-textured, shelly limestone. The fossils are typically present as internal moulds. It was used as a subsidiary building stone in churches across the coastal area from Brighton to Lewes. Quarr Stone was much used in Lewes Priory.

Figure 27: Lewes Priory, Lewes. Quarr Stone with flint, Wealden Sandstone and ironstone.

4 Further Reading

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

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

There is also a separate glossary of geological terms.

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Figures

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