This guidance leaflet intends to help those responsible for stone buildings understand the necessity of carrying out appropriate and prudent maintenance and repairs. It must be stressed that repairs to stone buildings should always be carried out by builders who are skilled in the appropriate methods of repairs. The Borough Council has a list of builders and craftworkers who have experience in working in stone.

**INAPPROPRIATE REPAIRS MAY BE DESTRUCTIVE AND IRREVERSIBLE.**

Please contact the Conservation Officer at the Council Offices who are always happy to discuss any proposed scheme of repair to a stone building.

Please note that **LISTED BUILDING CONSENT** may be required for any works of repair to a Listed Building which affect its character.

**Further reading:**


The Buildings of England - Surrey by Ian Nairn and Nikolaus Pevsner.

The Pattern of English Building by Alec Clifton-Taylor

English Stone Building by Alec Clifton-Taylor and A.S Ireson.
**THE REPAIR AND MAINTENANCE OF STONE BUILDINGS**

Stone buildings in the area enhance the interest and diversity of the environment in what is predominantly a brick and tile area. These important buildings deserve to be properly cared for in order to ensure their long-term survival for the future.

**This leaflet aims to provide guidelines for appropriate maintenance and sympathetic repairs.**

The chief building stones commonly found within the County are Ironstone, Bargate stone, flint and clunch.

**Ironstone** is the name given to a stone that is impregnated with iron which rusts to give the stone its distinctive brown colour. The local ironstone is sandstone quarried from the Greensand, and is also called Carstone, Malmstone and Firestone.

**Bargate stone** is a hard durable sandstone, that was quarried uniquely in the Guildford/Godalming area, and was often used for buildings close to the quarries. It has a warm, tawny colour and many of the local churches, as well as numerous local cottages, houses and boundary walls, are built of this stone. However, it is no longer quarried and supplies are usually restricted to stone salvaged from demolition.

**Puddingstone** derives its name by comprising a mix of flinty pebbles and small lumps of sandstone cemented together by a dark brown iron oxide mix. Found in the gravely areas of north-west Surrey, the hard, coarse stone has been used in the main building of Cobham Church.

**Bagstone** is a generic term applied to any stone of hard or coarse texture. Generally a rough, brittle material, it does not lend itself to fine dressing and is used sometimes for infilling, or with other materials.

**Chalkstone or Clunch** was dug from the foot of the North Downs. It is a fine soft stone, that is perishable in damp conditions. It is sometimes found as infilling for timber framed buildings that may have been faced externally with brick or stone. There are several examples of the use of clunch in Scale and around Farnham where it frequently occurs as a walling material in buildings.

**Horseshall Slab** is a hard sandstone from the Weald Clay beds with a tendency to split making it an ideal material for tile making. Used in Surrey for roofing and flooring, and sometimes for field walls and capping chimneys. Brewers Street Farm at Fletchingley has a fine example of a slab roof.

**Flints** are small hard stones dug out of the local chalk formation and out of sandy formations at Upper Hale, Farnham. They have often been used where there is no good local building stone and many of Surrey’s churches are faced with flint. Flint is usually used in conjunction with brick or stone for the dressings and quoins. There are some fine flint buildings in the Horsley area and at Upper Hale, Farnham.

**MAINTENANCE OF STONE BUILDINGS - to prevent future problems.**

The crucial aspect of maintenance is the protection of the building from water and damp penetration.

Prolonged damp causes the local sandstone to decay and it is vital that clunch does not remain damp for long periods. Damp can also lead to frost damage. Frost can cause cracks across the face of sandstone and can lead to the disintegration of clunch. Frost may also damage the mortar in a stone wall. The strength and integrity of a flint wall depends on the mortar surrounding the flints.

It is important that roof coverings, flashings and copings, gutters, downpipes and hoppers are kept in good working order and that leaves are regularly cleared from flat roofs, downpipes, gullies, perimeter drainage channels, etc. Ferrous metal should be kept well painted. Clunch walls require a good base and substantial eaves for protection against damp.

**The control of climbing plants.**

Dense growth of climbing plants and creepers can cause problems to a stone building.

Large plants will cause persistently damp walls and may block eaves and gullies. The aerial roots of ivy will intrude into the mortar joints, loosening flints and eventually jacking apart sandstone blocks.

Excessive plant growth will disturb plaster and footings, and eventually erases courses. All plant growth should be discouraged against clunch walls as they should be kept dry. Climbing plants may also scour the soft stone.

The growth of climbing plants should be controlled or the plants removed.

Ivy should never be ripped away from a stone wall. It should be killed either by cutting through the stem close to the ground and a poisonous paste applied, or by poisoning the ivy through its root system. The ivy is left to die back and then carefully removed from the wall without damaging the mortar.

**Water repellent treatments.**

The application of a waterproof coating to any Ironstone, Bargate stone, flint or clunch building is inappropriate and unnecessary. Moisture will become trapped behind the coating and damage the stonework.

It is preferable to establish the cause of the damp and repair defective copings, gutters, downpipes and flashings. Joints and cracks in the wall should be checked.

Water repellent treatments should never be applied to decaying stone as the decay will be exacerbated.

**Stone Cleaning.**

It is generally unnecessary to clean stone buildings as this part of the country area does not suffer unduly from damaging atmospheric pollution. Stone tends to attract dirt in the areas exposed to the weather, and traffic emissions in
The tops of free standing walls should be capped.

Generally stone cleaning treatments may cause more damage than benefit, and should never be considered for church buildings. Clunch and sandstone may become saturated by water cleaning systems, and weak joints may be dislodged in all stone walls. Abrasives used to dislodge dirt may damage the joints and cause pitting of the surface of the stonework. Chemical cleaning methods often leave damage cleaning systems, and weak joints may be dislodged in back clunch.

A stone wall requires repointing only when the mortar has weathered out, leaving open or recessed joints vulnerable to water penetration, or where the mortar is very soft or loose.

**Boundary Walls.**

Free standing walls are more vulnerable to decay as they get wet on both sides.

The tops of free standing walls should be capped to prevent water penetration and shaped to shed water quickly.

**Boundary wall in need of attention.**

The plant growth means the wall is damp for long periods, the mortar is decayed, leaving open vulnerable joints. Parts of the wall have been poorly repaired with hard cement mortar, messily applied.

If repointing is necessary, it should be done in a style that is appropriate to the building and the mortar should be an appropriate colour and texture. Often examples of the original unweathered joints can be seen in protected areas of the building, such as under the eaves. The joints in a stone wall should be less abrasive than the stone.

The correct mortar mix varies between buildings, but the rule is that the mortar must be weaker than the surrounding stone. A possible mortar mix for use in repointing is 1:3 lime and sharp washed sand (sandy) graded from fine to coarse material.

Wide publicity has been given to the benefits of using lime mortar when repointing older buildings. Ordinary Portland cement mortar is strong, inflexible and impermeable and traps moisture that has entered the wall through cracks or through the stone. As this moisture evaporates through the softer stone, it causes decay and deterioration. Lime mortar is softer, can accommodate movement, and allows moisture to evaporate through the joints. More builders are developing skill in the use of lime mortar, but it is always advisable to ask for a sample panel before the builder starts work on repointing a sensitive wall.

**Galleting.**

Galleting is the practice of inserting small pieces of stone into these joints while they are still soft. It was common in the parts of Surrey, Sussex and Kent that lie between the North and South Downs, but there are large parts of the country where the practice is unknown. Although galleting was of structural significance, it has also been used decoratively.

Many sandstone cottages in the Surrey area have their masonry blocks surrounded by gallets. Galleting is a distinctive local practice that adds to the character of the area.

If repointing is necessary, it should be done in a style that is appropriate to the building and the mortar should be an appropriate colour and texture. Often examples of the original unweathered joints can be seen in protected areas of the building, such as under the eaves. The joints in a stone wall should be less abrasive than the stone.
Flint walls

Flints are impervious and very hard, but do not need to be set in a very strong mortar. Strong cement pointing is strong as well as ugly, as the water that enters the wall through tiny cracks must be allowed to dry out. Each flint should be kept completely trigged in mortar to prevent the flints falling out, but the mortar should be recessed leaving the flints prominent.

A flint wall that has been repointed.
The area in the centre of the photograph has been incorrectly repaired with hard cement ribbon pointing, in contrast to the original style of the surrounding wall.

The Treatment of Weathered Sandstone.
The blocks in a stone wall may become decayed and before deciding on the appropriate treatment it is essential to establish the cause of the deterioration.

Damage to the stonework may be caused by damp from leaking gutters, downpipes, defective flashings or copings; by hard cement-rich mortar used for pointing; by moisture trapped by the application of silicone or linseed oil treatments and by masonry bees causing damage to the pointing. The blocks in a sandstone wall may be of varying quality.

Remedial works may be necessary to prevent further deterioration of the stonework. The value and function of the damaged stone should be assessed. Very damaged structural stone may need to be replaced by compatible stone inserted correctly into the wall. Replacement stone does not need to be discoloured as it will weather in.

For small areas of decay, plastic or special mortar repairs may be made. This method of filling small cavities left by decayed stone is often compared to dentistry. It should be used sparingly and undertaken only by a skilled stone mason. Redressing a weathered stone wall is justified only if the face of the stone is badly disfigured by blisters, splitting, spalling or poor repairs.

The Treatment of Weathered Flints.
The most effective method of treating weathered flints is to grout and make mortar repairs, to apply several coats of limewater to consolidate the flints, and then to apply a shelter coat. The shelter coat is sacrificial and will need to be re-applied from time to time. It can be coloured to match the weathered flints.

Flint Walls

Repairs to flint walls should be made using flints of a size and type similar to those in the existing wall and laid in a similar style and density. The flints should be knapped or unknapped as appropriate. Generally flint houses in the Surrey area tend to use random, densely laid unknapped flints. In the Upper Hale area of Farnham, flints are laid with brick bonding courses and dressed with brick quoins.

Plastic repairs in a flint wall

The Investigation of Bulges and Cracks in Stone Walls.

A bulge in a stone wall can indicate a serious structural problem and needs to be explored. Bulges can be caused by failure of the rubble core in a flint faced wall; facing stone may not be properly tied into the wall and may begin to come adrift; hidden structural timbers or ferrous metal ties may have decayed and are no longer performing their functions.

Cracks in walls may be caused by movement that may be due to subsidence, heave or structural failure in the building.

Significant bulges or cracks in a stone building need professional investigation in order that appropriate action may be taken.