

Staffordshire County Council Guidance Note

Historic Structures and Areas Practical Conservation and Design



2015



Practical Conservation and Design

This advice is aimed at all general works of design, maintenance and repair to historic structures within the public realm, as well as advice on highway schemes.

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1. Re-Pointing

Pointing a masonry wall properly is of vital importance. More damage is caused to historic structures by incorrect re-pointing than by any other work of maintenance.

Loose or crumbly pointing lets moisture into the wall via the joints and eventually the wall will become unstable. Incorrect re-pointing can also damage stone or brickwork: if the wrong mix is used damage may be caused to brick and stonework and it may speed the rate of decay of the wall. If applied incorrectly, for example thick ribbons of cement over the joints, the appearance of the traditional structure can be severely harmed.

When to Re-point

- If the exposed mortar is soft, loose and crumbly and can be scraped or pulled out easily, re-pointing is essential.
- If the mortar is firm but slightly recessed it should be left untouched.
- Pointing that needs chiselling to remove it should be left alone except where hard cement pointing is damaging the softer stone or brick, though particular care must be taken not to damage the masonry.
- Re-pointing delicate ashlar joints is not recommended. The joints are often so narrow that pointing is unnecessary and if done could be detrimental to the overall appearance of the stonework.

Preparing Joints

1. Rake out the joints to a depth of 50-100mm in rubble stonework, or 25mm in coursed stone or brickwork.
2. Use a bent screwdriver or other spike. For very fine joints, a mason's saw or hacksaw can be used.
3. Take care to keep the edges of the stone intact – joints should never be widened.
4. **Power tools should never be used.** It is difficult to control the cut and the risk of damaging masonry is high.
5. Brush, then dampen or gently wash out the joints. Washing also helps new mortar to bond to the joints and prevents it from drying out too quickly.

Strength of Mortar

Mortar should always be slightly weaker than the walling material. Traditionally it was made from lime and sand or ashes. Modern mortars of a strong cement and sand mix are acceptable for modern mass-produced bricks but are too hard for stone and most older bricks, particularly those that were hand-made. As cement is virtually impervious to water, moisture in the masonry will not be able to pass out through the joints. It will therefore remain in the stone or brick, causing damage to stones through expansion during frost, spalling of brickwork, or gradual softening and erosion.

There are many mortar mixes which are suitable for use on historic masonry. The choice of mix will depend on various factors such as the width of joint, exposure to water or extreme weather, the nature of the original mortar. In the absence of a specification, there are two main types of mix that are generally considered acceptable for use on historic masonry: a combination of lime (hydraulic or non-hydraulic), cement, and sand can be used, or a cement free mix would also be appropriate. Where the stone is very soft, as is often the case with some gritstones, a slower-

setting, softer gauged cementitious mix may be needed. Softness and set can be controlled by using different grades of hydraulic lime (feeble, moderate and eminently hydraulic).

Appearance of Mortar

The colour of the sand used will determine the final colour of the mortar. Brick or stone dust can be added or used instead of sand to achieve the correct colour. Care must be taken, however, to achieve the correct colour for the wall. An orange mortar within a gritstone wall is entirely inappropriate, the colour should match either any old mortar surviving in the wall, or the colour of the stone itself.

Materials

Sand

- Sand or aggregate should be clean, well graded 'sharp sand'.
- Where thicker joints are required, for example in rubble walls, the aggregate should be coarse, ranging from 4mm downwards.

Lime

- Lime is usually supplied as semi-hydraulic hydrated lime.
- The lime should be prepared beforehand by adding to a container of water, mixing to a creamy consistency and then left, loosely covered for a minimum of 24 hours. This 'fattening' is important to achieve the correct set of the mortar.

Cement

- 'Waterproofed' Portland cement is not recommended.

Method

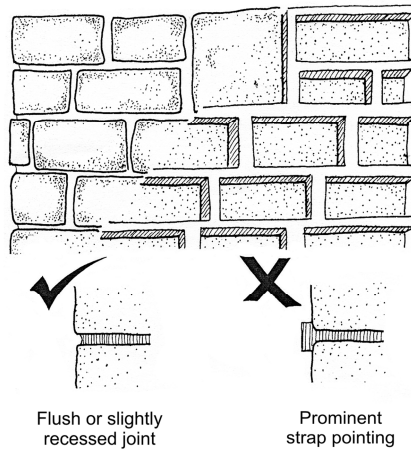
The best pointing is completely unobtrusive. The emphasis should be on the stone or brickwork and not the mortar.

Work should not be carried out when there is a danger of frost, which prevents setting of slow lime mortars.

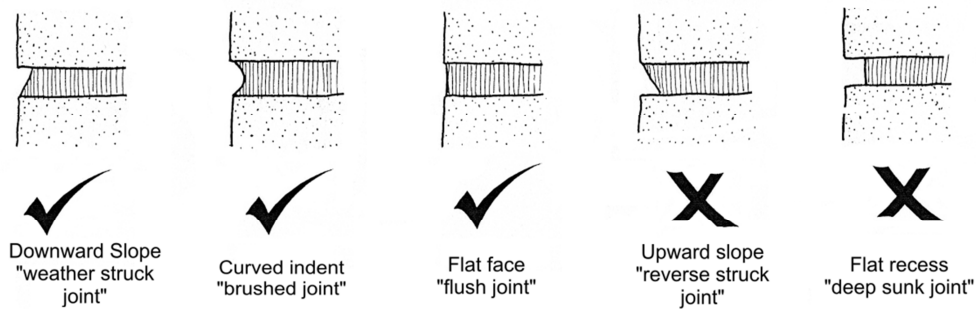
Brickwork and Coursed Stonework

1. The mortar should be rammed well into the joint with suitable pointing tool and left slightly recessed. The edges of the brick or stone should not be smeared over as this leaves 'feathers' of mortar which will eventually open up and channel water into the joints.
2. The pointing should be finished so that it deflects water from the bricks or stones rather than trapping it against them.

Pointing Coursed Stonework



Pointing Brickwork

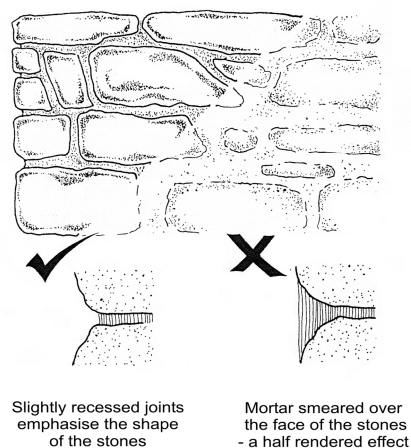


When the mortar begins to 'go off' its surface should be lightly brushed with a stiff bristle brush or some sacking. This gives a slightly roughened finish and removes any 'feathers' from the masonry. A ferrous wire brush should never be used as it will damage the masonry.

Rubble Stonework

Mortar should be recessed within the joints and not spread over the faces of the stones. This will produce a half rendered effect rather than emphasising the stones in addition to trapping water within the stones.

Pointing Rubble Stonework



Ashlar Stonework

Re-pointing is not recommended. The external gaps are very narrow; forcing mortar into these gaps is both unlikely to be necessary, and could be detrimental to the appearance of the wall.

Consents Required for Re-Pointing

Conservation Area	Not Required
Listed Building	Not required provided the correct method, mix and materials are used
Scheduled Monument	Scheduled Monument Consent always required
Building of Local Historic or Archaeological Interest	Not required, although always best to seek advice from the relevant local Conservation Officer .

For further advice on the appropriate methods, materials and mixes of mortar for a particular re-pointing job: Contact the relevant [local Conservation Officer](#).

2. Repairs to Masonry Walls

The failure to repair masonry walls can lead to structural instability and potential loss of historic fabric, but equally, incorrect or over-zealous repairs can entail irreversible loss of historic fabric and detail.

When to Repair

- Brick or stone masonry is perished to the point of loss of structural stability.
- Brick or stone masonry has perished to the point of loss of architectural detail.

In no other circumstances should masonry be repaired. Where masonry is merely weathered, but still serving its function, it should not be replaced or repaired. The texture and patina of aged stone or brickwork are integral to the character of historic buildings, whilst the traditional materials can rarely be adequately reproduced.

Extent of Repair

- Repairs should be confined to the minimum that is essential, leaving the rest of the historic structure intact.
- The appropriate extent of repair varies according to the particular case, and the advice of a conservation specialist should always be sought.

Selective Rebuilding

- As much historic fabric should be re-used as is possible.
- It may be appropriate to repair rather than replace individual stones, for example by pinning the shattered halves of a stone, or making a quality plastic repair (building up with an appropriate mortar).
- Any dismantling must be carried out with the utmost care so as not to cause unnecessary damage or loss of existing good masonry.
- The shortfall can be made up with either reclaimed materials, or new, provided it is an exact match in terms of materials, dimensions, colour, texture and method of finishing.

Reclaimed Materials

It is generally not good conservation practice to use reclaimed materials as this encourages architectural theft and the loss of historic character in the wider landscape. Instances where it is acceptable are:

- Re-use or re-dressing of materials from the same site/building.
- Often it is difficult to find an adequate and accurate modern match for historic bricks, so that reclaimed materials are the only option.

In all other circumstances new stone from an appropriate quarry, or a good match in new bricks, should be used for selective replacements and the reinstatement of architectural detail. In some cases it may be necessary for new 'specials' to be custom-made from a specialist brickworks.

Matching the Existing

A good match to the original or existing style and method of masonry construction is essential to the conservation of historic structures. The match must be in terms of:

- **Materials:** geological match, colour, texture
- **Dimensions:** of the structure as a whole, of individual stones or bricks, the profile of copings etc.
- **Method of construction:** the bond of brickwork, the coursing of stones, the appropriate use of mortar for joints and pointing.
- **Stone dressing:** ashlar, rock-faced, punch-dressed, herringbone, with or without margins etc.

Stone dressing is frequently overlooked in selective repairs to historic structures, but must be carried out correctly. Particularly in the case of Listed Buildings and Scheduled Monuments, incorrect repairs, including dressing, can count as 'unauthorised works', and the reversal of repairs can be enforced.



Bad Conservation

A hard cement mortar has been used both to repoint and butter over eroded stonework. Probably little of this work was structurally required, but the overall appearance of the façade is spoilt, the historic fabric covered, and accelerated decay invited. The poor work in this instance is irreversible as removal of the mortar would cause excessive damage to the historic masonry.

Good Conservation

The effects of the cement mortar on the soft gritstone is evident – lamination of the stone surface is occurring, causing both structural and architectural loss. An exemplary repair has been made:

1. It is selective: to retain as much historic fabric as possible, only those stones that were cracked or eroded beyond structural adequacy have been replaced.
2. A good geological match has been found. Although the contrast between old and new is stark at present, it is an 'honest repair' and will in time weather and blend in.
3. Punch dressed stones (quartered, and diagonal with drafted margins) exactly replicate how the historic fabric was originally dressed.
4. A slightly recessed lime mortar has been used.

Note: Existing pointing featured in this image is not desirable.



Bad Conservation



Appropriate care has not been taken in dismantling this bridge to enable strengthening works. Unnecessary loss of historic fabric has resulted, and substantial damage to the arrisses of many remaining stones. In reconstruction, replacement stones have not been tooled to match the originals, but have been left with an ashlar surface, whilst the pointing is in ungainly 'recessed strap' style. Frost attacked the slow setting mortar before it had properly set.

Consents Required for Masonry Repairs

In all cases of repair or rebuilding of structures that are Listed, Scheduled, or within Conservation Areas, the relevant [local Conservation Officer](#) should always be consulted at the earliest possible opportunity. The need for consent will vary according to the extent of intervention and the designation under which the structure is protected.

3. Cleaning Stone and Brickwork

Although cleaning masonry may freshen the appearance of an historic structure and enhance detail, if not properly carried out irreversible damage to historic fabric may be caused.

When to Clean Stone or Brickwork

The first question should always be “is it really necessary to clean?” The weathered appearance of historic masonry may well be a vital aspect of its character and appearance. Cleaning may remove a rich patina of age whilst causing irreversible damage to historic fabric and detail.

Where inappropriate paint or renders have in the past been applied to historic buildings, it is desirable to both reverse historically inappropriate treatment and halt the damage it is causing to the underlying fabric. Care must nevertheless be taken to ensure that such works do not cause more damage than they prevent.

Power washing

- High-powered dry or wet sand blasters or water lances will remove much of the surface of the brick or stone, and mortar, and should never be used.

Water Washing

- Simple water washing, perhaps with intermittent water sprays, is always the best method of cleaning brick or stonework, but is still best carried out by a specialist.
- Even water can erode the surface of stone and expose the vulnerable core underneath, or remove the tougher outer skin of bricks.
- Saturating the stone with water can also cause damp problems in the longer term, whilst creating areas that may be easily re-soiled.

Chemical Cleaners

- Hydrofluoric acid in dilution may be used for heavy soil, but even in solution is highly corrosive and must only be used by an experienced specialist.
- Other chemical cleaners generally contain soluble salts that help to erode the masonry.
- Caustic alkaline cleaners should not be used for stone or porous bricks as they are absorbed by the brick and stone and leave behind damaging salts. They may only be used on impermeable glazed bricks.

Poultices

- Poultices may be required for deeper stains or stubborn paints, made using powdered clay.

Laser and pressure air cleaning

- These methods may be suitable for particularly sensitive projects, and an appropriate specialist should be sought. This method is most effective where there is a contrast between dark dirt and a pale substrate.

Suggested cleaning methods

Cleaning Method		Materials											
		Stone					Metal				Timber	Brick	Concrete
		Limestone	Sandstone	Marble	Slate	Granite	Bronze	Brass	Iron	Lead			
Water Washing	Brushing with water	•		•	•	•	•	•			•		•
	Mist spraying	•		•	•	•						•	•
	Low pressure washing				•	•			•				•
	Steam	•		•	•	•	•		•	•		•	•
Mechanical	Hand-held	•	•	•	•	•	•	•	•	•	•	•	•
	Dry air-abrasive	•	•	•	•	•			•			•	
	Wet air-abrasive	•	•	•	•	•			•			•	
Chemical	Acid		•		•							•	
	Alkali	•	•		•	•					•		•
	Organic solvents	•	•	•							•		
Poultices		•		•	•	•					•		•
Special	Laser	•	•	•	•	•					•		•

© Historic England and the War Memorials Trust. 'The Conservation, Repair and Management of War Memorials' guidance

Consents Required for Cleaning Historic Structures

Conservation Area	Not Required
Listed Building	Listed Building Consent usually required
Scheduled Monument	Scheduled monument consent always required
Building of Local Historic or Archaeological Interest	Not required, although always best to seek advice from relevant local Conservation Officer

For further advice on the appropriate methods of cleaning masonry: Contact the relevant [local Conservation Officer](#)

4. Building Materials – Selection, Repair and Maintenance Guides

Historic England has published advice on the selection and use of materials when repairing historic buildings:

Stone Matching - <http://historicengland.org.uk/advice/technical-advice/buildings/building-materials-for-historic-buildings/stone-matching/>

Selecting Timber - <http://historicengland.org.uk/advice/technical-advice/buildings/building-materials-for-historic-buildings/selecting-timber/>

Stone Slate Roofing - <http://historicengland.org.uk/advice/technical-advice/buildings/building-materials-for-historic-buildings/stone-slate-roofing/>

Sourcing Lead Paint - <http://historicengland.org.uk/advice/technical-advice/buildings/building-materials-for-historic-buildings/sourcing-lead-paint/>

Historic Scotland produces a number of useful guides on the conservation, repair and maintenance of buildings. Although there is an emphasis on Scotland, the advice is relevant to all buildings.

Floors

Stone Floors - Historic Scotland Inform Guide (Jan 2010) -
<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=27899>

Foundations & Wall Footings – Historic Scotland Inform Guide (Dec 2008) -
<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=21438>

Ceramic Tiled Flooring – Historic Scotland Inform Guide (Jul 2007) -
<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=12591>

Timber Floors – Historic Scotland Inform Guide (Jan 2008) -
<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=19885>

Timber

Structural Joinery – Historic Scotland Inform Guide (Jan 2010) -
<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=27900>

Timber Staircases – Historic Scotland Inform Guide (Jan 2010) -
<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=27901>

Rot in Timber – Historic Scotland Inform Guide (Dec 2008) -
<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=21436>

Windows

Maintaining Traditional Plain Glass & Glazing – Historic Scotland Inform Guide (Nov 2007) -
<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=12589>

Maintaining Sash & Case Windows - Historic Scotland Inform Guide (Jul 2007) -
<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=12598>

Sash and Case Windows – Historic Scotland Inform Guide (Jan 2009) -
<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=12676>

Doors

External Timber Doors – Historic Scotland Inform Guide (Jan 2008) -
<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=19732>

Roofs

Bituminous Sheet Flat Roof – Historic Scotland Inform Guide (Dec 2008) -
<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=21435>

Roofing Leadwork – Historic Scotland Inform Guide (Jan 2008) -
<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=19735>

Finials & Terminals – Historic Scotland Inform Guide (Jan 2008) -
<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=19733>

Brickwork/Stonework

Indent Repairs to Sandstone Ashlar Masonry – Historic Scotland Inform Guide (Nov 2007) -
<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=12587>

Repairing Brickwork – Historic Scotland Inform Guide (Jul 2007) -
<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=12590>

Masonry Decay – Historic Scotland Inform Guide (Nov 2005) -
<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=12558>

Repointing Ashlar Masonry – Historic Scotland Inform Guide (Jan 2007) -
<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=21843>

Repointing Rubble Stonework – Historic Scotland Inform Guide (Jan 2007) -
<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=12563>

Cleaning Sandstone – Historic Scotland Inform Guide (Jan 2007) -
<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=12564>

The Use of Lime & Cement in Traditional Buildings – Historic Scotland Inform Guide (Jul 2007) -

<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=12595>

Ironwork

Maintenance of Iron Gates & Railings – Historic Scotland Inform Guide (Jan 2007) -

<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=21946>

Boundary Ironwork – Historic Scotland Inform Guide (Nov 2005) -

<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=12557>

Care & Maintenance of Corrugated Iron – Historic Scotland Inform Guide (Jan 2008) -

<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=19729>

The Maintenance of Cast Iron Rainwater Goods – Historic Scotland Inform Guide (Jan 2007) -

<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=12548>

Interiors

Interior Paint – Historic Scotland Inform Guide (Jan 2007) -

<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=12559>

Domestic Decorative Glass – Historic Scotland Inform Guide (Jul 2007) -

<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=12594>

Fireplaces – Historic Scotland Inform Guide (Jan 2008) -

<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=19734>

Miscellaneous

Bird Control on Buildings – Historic Scotland Inform Guide (Jan 2011) -

<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=32341>

Damp Causes & Solutions – Historic Scotland Inform Guide (Jul 2007) -

<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=12592>

Graffiti – Historic Scotland Inform Guide (Jun 2001) -

<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=12555>

Structural Cracks – Historic Scotland Inform Guide (Dec 2008) -

<http://www.historic-scotland.gov.uk/publicationsresultsdetail.htm?id=21437>

SPAB (Society for the Protection of Ancient Buildings) offer advice and guidance on caring for historic buildings:

http://www.maintainyourbuilding.org.uk/pages/advice_guidance.html

5. Energy Efficiency in Historic Buildings

Advice on energy efficiency measures in historic buildings can be found on Historic England's website - <http://historicengland.org.uk/advice/technical-advice/energy-efficiency-and-historic-buildings/>:

'For historic buildings and those of traditional construction an appropriate balance needs to be achieved between building conservation and energy conservation if lasting damage is to be avoided both to the building's significance and its fabric. Achieving an appropriate balance requires a thorough understanding of the building, particularly how it works as an environmental system and what makes it special.'

The following guides are available:

Roofs:

- **Insulating roofs at rafter level/warm roofs -**
<http://historicengland.org.uk/images-books/publications/eehb-insulating-pitched-roofs-rafter-level-warm-roofs/>
- **Insulating at ceiling level/cold roofs -**
<http://historicengland.org.uk/images-books/publications/eehb-insulating-pitched-roofs-ceiling-level-cold-roofs/>
- **Insulating flat roofs -**
<http://historicengland.org.uk/images-books/publications/eehb-insulating-flat-roofs/>
- **Insulating thatched roofs -**
<http://historicengland.org.uk/images-books/publications/eehb-insulating-thatched-roofs/>

Walls:

- **Insulating timber-framed walls -**
<http://historicengland.org.uk/images-books/publications/eehb-insulating-timber-framed-walls/>
- **Insulating solid walls -**
<http://historicengland.org.uk/images-books/publications/eehb-insulating-solid-walls/>
- **Early cavity walls -**
<http://historicengland.org.uk/images-books/publications/eehb-early-cavity-walls/>

Floors:

- **Insulation of suspended timber floors -**
<http://historicensland.org.uk/images-books/publications/eehb-insulation-suspended-timber-floors/>
- **Insulating solid ground floors -**
<http://historicensland.org.uk/images-books/publications/eehb-insulating-solid-ground-floors/>

Doors and Windows:

- **Insulating dormer windows -**
<http://historicensland.org.uk/images-books/publications/eehb-insulating-dormer-windows/>
- **Draught-proofing windows and doors -**
<http://historicensland.org.uk/images-books/publications/eehb-draught-proofing-windows-doors/>
- **Secondary glazing for windows -**
<http://historicensland.org.uk/images-books/publications/eehb-secondary-glazing-windows/>

Miscellaneous:

- **Open fires chimneys and flues -**
<http://historicensland.org.uk/images-books/publications/eehb-open-fires-chimneys-flues/>
- **Energy Performance Certificates -**
<http://historicensland.org.uk/images-books/publications/eehb-energy-performance-certificates/>

Advice on energy efficiency measures is also available on **Historic Scotland's Knowledge Base** –

<http://conservation.historic-scotland.gov.uk/home/publications.htm?callback=1&searchterm=energy+efficiency&submit=Search>

Sustainable Traditional Buildings Alliance (STBA) – Responsible Retrofit of Traditional Buildings - http://www.sdfoundation.org.uk/downloads/RESPONSIBLE-RETROFIT_FINAL_20_SEPT_2012.pdf

SPAB – (Society for the Protection of Ancient Buildings) – Energy Efficiency Project - <http://www.youtube.com/watch?v=2trqe3c3DBY>

6. Repairing and Maintaining Ironwork

Cast and wrought ironwork add particular character and detail to historic areas and buildings, as railings, lamp standards, mileposts, road signs, benches, etc. Basic maintenance and repair prevent loss of historic fabric and enhance the streetscape.



Repair

- Repairs should only be carried out in cases of structural or functional failure, or where architectural detail has been lost or damaged. Only the minimum repair work should be carried out, in order to keep the ironwork in good order. As much of the original material should be retained as possible.
- Before deciding whether to repair, it is vital to clean off all extant rust. Rust occupies seven times the area of unoxidised iron, so only slight decay may appear excessive.
- Repairs should be confined to the necessary, in order to retain as much historic fabric as possible.
- Traditional materials and methods must be used in repair. [Local Conservation Officers](#) can advise as to specialists in historic ironwork.

Maintenance

In the presence of water and oxygen, iron will corrode. Maintenance therefore involves the thorough removal of rust, and painting to keep water and oxygen away from the iron surface:

Cleaning

- It is not necessary to remove old paint, which may be rubbed down and used as a base for new paint. But all rust must be thoroughly cleaned.
- Manual cleaning by scraping, chipping and brushing, may be the only option where a structure is to remain in situ. However, only about 30% of rust and scale will be removed.
- Chemical strippers may be used, but any residue must be thoroughly removed with white spirit (not water) before repainting.
- Alternative methods include flame cleaning, acid pickling, dry abrasive and wet abrasive methods, all of which should only ever be carried out by specialists.
- Abrasive methods are inappropriate for wrought iron as they will remove or roughen the relatively soft milled or beaten surface, and also where a cast iron structure includes fine detail or lettering that may be damaged.

- Flame cleaning may be appropriate for wrought iron, but cast iron may crack under extreme changes of temperature.

Painting

- Painting ironwork should never be carried out when the iron is damp, or if painting in situ, when there is a risk of rain, frost, fog or snow.
- Two thorough coats of primer are recommended to provide a continuous film free from pinholes, and will result in a longer life of the whole paint system. This should be applied immediately after cleaning to give rust no time to develop.
- Historic England recommend a 'binder' coat of paint containing micaceous iron oxide followed by up to four applications of the top coat.
- Alkyd resin paints (e.g. Hammerite) are most commonly used, and give sufficient protection if applied in sufficient thickness and to a well-prepared surface. However, they do not generally give sufficient protection in continuously damp environments.
- There are many choices of alternative paint systems on the market, and manufacturers should be consulted regarding their suitability for a particular job.
- To give a thorough covering, and good adhesion to pitted surfaces, application by brush is recommended.
- Modern paints will give the best protection to ironwork, but this can be followed by an eggshell paint to give an authentic finish.
- Attention should be paid to the colours used. Railings, for example, have only recently been painted black; the Georgians favoured bright blues, lead grey, stone colours and olive greens, whilst the Victorians commonly used dark green, dark blue, red or chocolate brown.

Consents Required for Repair and Maintenance of Ironwork

Conservation Area	Not Required
Listed Building	Listed Building Consent usually required for repairs or for painting in a different colour
Scheduled Monument	Scheduled monument consent always required
Building of Local Historic or Archaeological Interest	Not required, although always best to seek advice from relevant local Conservation Officer .

For further advice on the appropriate methods of repairing or painting historic ironwork contact the relevant [local Conservation Officer](#)

7. Milestones and Mileposts

The vast majority of Listed Buildings owned by the Place Directorate are milestones and mileposts. Many more lie within Conservation Areas or are features of local historical interest in their own right.

The basic works required to maintain milestones and posts are:

1. Making them visible by clearing vegetation or resetting sunken milestones. This prevents unintentional damage both from and to grass cutters and hedge flails, in addition to enhancing the historic environment.
2. Clearing lichen and moss from stones that would slowly erode their surfaces.
3. Cleaning rust from iron mileposts.
4. Repainting.

Milestones

Some milestones are made of permeable stone and so will draw water up from the ground by capillary action. To prevent the accumulation of water within the stone, and potential frost damage, a permeable paint must be used to enable evaporation. Oil-based paints should never be used on stone, as they will accelerate long-term erosion of the surface.

- Clean off any heavy lichen growth and loose paint with a stiff (non-ferrous) brush, and rub down stone with a clean rag.
- Apply 2 coats of porous masonry paint.
- Lettering may be painted in a black water-based acrylic.



Mileposts

Mile-plates or posts are usually of cast iron; in the presence of water and air they will rust. In contrast to stone, moisture must be totally excluded. Several layers of a durable, water impermeable paint, such as Hammerite, are therefore recommended.

- The post should be thoroughly cleaned of rust before re-painting. Standard rust strippers may be used, but all residue must be cleaned away before repainting.

- Harsh treatments such as shot blasting or the use of wire brushes should never be used as they will damage the historic surface and erode lettering.
- Apply 2 primer coats and 2 coats of the background paint, and finally the letters in black acrylic paint.



Repairs

In some instances repair or reinstatement may be required. This could involve employing a specialist mason to re-face or engrave a stone, or fixing a newly cast plate. The use of alloys (usually aluminium based) generally gives an acceptable finish for non-listed plates, but any listed structure must be repaired 'like-for-like' in terms of materials.

Consents Required for Works to Milestones and Mileplates

Consent is not required for works of maintenance to historic milestones or mileposts, provided the correct methods are used. The relevant [local Conservation Officer](#) should always be consulted prior to any work on milemarkers. Consent is only required if the milemarker is Listed. For example, if the cast iron plate to a listed milestone has been lost and it is proposed to reinstate it.

8. Bridge Strengthening

Not all historic bridges are structurally adequate to meet the requirements of modern road usage. Where upgrading is required, a balance between conservation and function must be sought.

Alterations to listed bridges or bridges within Conservation Areas must protect the historic character of the bridge.

Sympathetic remedial measures are always preferable to complete reconstruction; they will retain the character of the building, and also prove more cost effective. Traditional materials should only be replaced where it can be proved that this is **essential** in the interests of structural stability.

Consents Required for Bridge Strengthening

In all cases of strengthening to structures that are Listed, Scheduled, or within Conservation Areas, the relevant [local Conservation Officer](#) should be consulted at an early stage. The need for consent will vary according to the extent of intervention and the designation under which the structure is protected.

Example: Victoria Road Bridge, Stafford

In this instance the bridge has been substantially strengthened, including increasing the capacity of the pipe bay and strengthening the parapet, but the outward appearance of the structure has been preserved.

The stone parapet was carefully dismantled and steel rods inserted into individual balustrades and top rail, and some selective replacements made of failed balustrades, in Portland stone to match the originals. The masonry piers were reconstructed as stone cladding to a reinforced concrete base, therefore retaining the original appearance. The cement render to the span was patch repaired, several samples tested until a like match was found.



9. Surfaces within Historic Areas

Historic paving and road surfaces form the foreground to any street scene. They are vital to the character of an area and provide a context within which its buildings are seen.

Historic surfaces can be important either as features of distinctive historic character within conservation areas, or as integral parts of historic bridges. Within Conservation Areas new materials need to be carefully selected in order to protect or reinforce historic character.

Preserve and Repair

Every effort should be made to preserve, protect or repair historic surfaces to Listed Buildings or within Conservation Areas; modern replacements or approximations should not be made. Where surfaces have to be lifted to facilitate maintenance or strengthening, the historic fabric should be carefully lifted, set aside and then re-laid using the correct method of construction. Some surfaces, such as flagged paving, may need to be recorded and numbered before removal, so that they can be replaced exactly as the original.



Cobblestones, Market Square, Leek

New Surfaces

Special care needs to be taken where a new surface is to be created within a Conservation Area. Roads and pavements have an extensive and immediate impact on the street scene, and a major consideration in their design should be the character and appearance of an historic area.

Reinstatement

Reinstating traditional natural materials is always the preferred option in historic areas. The costs may appear prohibitive, but they are more sustainable and are frequently better value for money as they are durable and improve with age. Short-life artificial materials require regular replacement, greater energy consumption, and deteriorate with age. Where finances are restricted, investment in a quality scheme of a smaller area will always be of greater value and appearance in the long run.

Arbitrary new patterns should be avoided, as should small unit blocks or pavements. Although brick pavements have traditionally been used for pavements and footpaths in some areas, they only occur in relatively small areas, and require exact matches in terms of material, dimensions and bond to be successfully reproduced.

Materials and Design

Clues for appropriate materials and styles should be taken from existing historic surfaces in the vicinity, surviving evidence of lost surfaces, and the character of the built environment as a whole.

Tarmac dressed with a suitable local aggregate can be an inexpensive and appropriate finish for many Conservation Areas, where rammed earth, hoggin or aggregate was the traditional surface. In rural areas kerbs are usually absent and the verge is defined with grass.

Where a street is pedestrianised it is important to retain the traditional relationship between footways and carriageways, including kerb lines. Wall-to-wall surfaces are rarely suitable, whilst the scale, texture, colour and laying patterns of any new material should be sympathetic to the area's appearance.

The design of dropped kerbs, ramps, tactile surfaces, cycle routes, speed humps etc will always require careful consideration in order to integrate into the historic environment.



Market Square, Stafford

General Principles – Historic Surfaces

- Retain and repair existing surfaces wherever possible
- Retrieve or reinstate lost surfaces of high quality
- Relate ground surfaces to the surrounding streetscape
- Respect proportional relationships between footways, buildings and carriageways
- Retain topography of street by maintaining kerb line and using dropped kerbs where necessary
- Avoid wall to wall surfaces
- Avoid arbitrary patterns

Conservation Officers should always be consulted where a new road or paved area is proposed within a Conservation Area, or over or adjacent to a Listed Building or Scheduled Monument.

**Consents Required for Works to Historic Surfaces
(Repair and Replacement)**

On, adjacent, or part of a Scheduled Monument	Scheduled Monument Consent always required
Part of or adjacent to Listed Building	Listed Building Consent usually required, seek advice of relevant <u>local Conservation Officer</u>
Within Conservation Area	Consent not required, but advice of relevant <u>local Conservation Officer</u> should be sought
Part of or adjacent to Local Historic or Archaeological Interest site	Consent not required, but mitigation may be required, seek advice of Principal Archaeologist

Further Guidance:

English Heritage: Streets for All, 2006.

10. Street Furniture and Lighting

General Principles - Street Furniture

- **Preserve or reuse historic street furniture in situ.**
- **Recast established local designs to reinforce local distinctiveness**
- **Ensure details are accurate and authentic**
- **Relate new design to the wider street scene and select designs and materials appropriate to both function and context**
- **Take a minimalist approach to reduce street clutter**
- **Use a single dark colour for all items**
- **Anticipate all requirements at a preliminary design stage**

The appearance of historic streets can be improved by preserving, repairing or reinstating such items as way markers, pillar boxes, telephone kiosks, drinking fountains, railings, lamp standards, etc.



Preservation and Repair

Existing features such as railings, way markers and lamp standards of traditional design should be preserved and well maintained. Regular cleaning and repainting will ensure the longevity of historic metalwork (see Section 6 above). Where repairs are required, specialists can be sought to carry out accurate repairs to cast or wrought ironwork.

New Design

Where upgrading or new features are required, then the design should be either based on sound evidence of earlier structures, or be of a simple design that is complementary to the character of the historic area.

New lighting columns within historic areas should be carefully considered. Off-the-peg 'period' columns and lanterns are rarely appropriate to historic areas, which have their own local design traditions. Any 'traditional' design must be based on sound evidence of original features or reflect established local styles. Where evidence is lacking, a simple modern design that complements the historic environment is more appropriate than a crudely detailed heritage approximation.

Reducing Clutter

The greatest blight to Conservation Areas in highway terms is 'clutter' of street furniture and road signs, which detract from the character and appearance of the area. A minimalist integrated approach will always be the most appropriate, designed to serve modern functional needs, but minimising the impact on the historic streetscape.

Further guidance:

English Heritage: Streets for All, March 2006.

11. Signs and Road Markings

Signing within the historic environment should always be kept to the minimum necessary to ensure safety and comply with legal requirements.

Signs within Conservation Areas, or close to, or attached to, Listed Buildings or Scheduled Monuments should be of an appropriate character and quality to the area or building.

Unnecessary duplication of signs and posts should be avoided, and wherever possible new signs fixed to existing posts or street furniture. Much can be achieved in the reduction of sign clutter by removing any redundant signs and combining separate signs onto a single backing board.

Signs that have reflective surfaces rather than internal or external lights are less bulky and cluttered in appearance. They also reduce the impact of non-historic features within an historic area.

Where the Traffic Signs Regulations and the Department of Transport's Traffic Signs Manual provide for flexibility in size, siting and colour, advantage should be taken within historic areas. For example, parking restriction signs can be fixed to a building to avoid the single pole, single sign phenomenon. Similarly no waiting lines can be narrower and of a different colour in environmentally sensitive areas.

General Principles - Signs and Road Markings

- **Avoid discordant bright colours for cycle lanes/bus lanes**
- **Reduce road markings and signs to a minimum**
- **Remove superfluous or redundant items**
- **Locate signs, street furniture, traffic signals etc on existing columns, posts or buildings**
- **Retain older signs that reinforce local character**
- **Restrict signs to convey only essential information**

Further guidance:

English Heritage: Streets for All, March 2006.



12. New Roads in the Historic Environment

NPPF Planning Practice Guide

'The conservation of heritage assets in a manner appropriate to their significance is a core planning principle. Heritage assets are an irreplaceable resource and effective conservation delivers wider social, cultural, economic and environmental benefits...

Conservation is an active process of maintenance and managing change. It requires a flexible and thoughtful approach to get the best out of assets as diverse as Listed Buildings in everyday use to as yet undiscovered, undesignated buried remains of archaeological interest...'

- In historic towns character and layout cannot easily absorb radical changes such as new roads, and alternative methods should always be considered.
- Parking and charging policies, park-and-ride schemes, and encouraging public transport are particularly relevant to historic town centres.
- Where new roads are unavoidable, a balance between conservation, other environmental concerns, economics, safety, and engineering feasibility must be sought.

Where a new road is proposed the Environmental Advice Team should always be consulted at an early stage.

Consents Required for New Roads

Where a new road impacts upon Listed Buildings or a Conservation Area planning permission and Listed Building Consent is required as for any other major development. Advice from Development Advice should always be sought.

Further Guidance:

Highways Agency: Design Manual for Roads and Bridges, Vol II, Section 3, Part 2, Cultural Heritage (Highways Agency).

13. Traffic Management

Traffic management can serve to protect historic areas and buildings in addition to improving safety and providing pleasant environments in which to work and live. Vehicle restricted areas, pedestrian zones and traffic calming are all possible options, but increasingly it is being recognised that the total exclusion of traffic can create sterile pedestrian precincts.

Traffic calming measures such as road humps, rumble devices, islands etc are effective in reducing vehicle speeds, but can be difficult to integrate into an older streetscape. Each feature or device should relate in design and materials to the overall townscape to reinforce rather than diminish local character. Historic surfaces such as cobbles and stone setts may in themselves prove effective in keeping down traffic speeds. In rural areas, pinch-points may relate particularly well to the existing historic streetscape, detailed to enhance local features or characteristics.

A profusion of bollards can create a particularly cluttered effect within the streetscape, and alternative means of traffic management, such as double height kerbs, should be considered first.

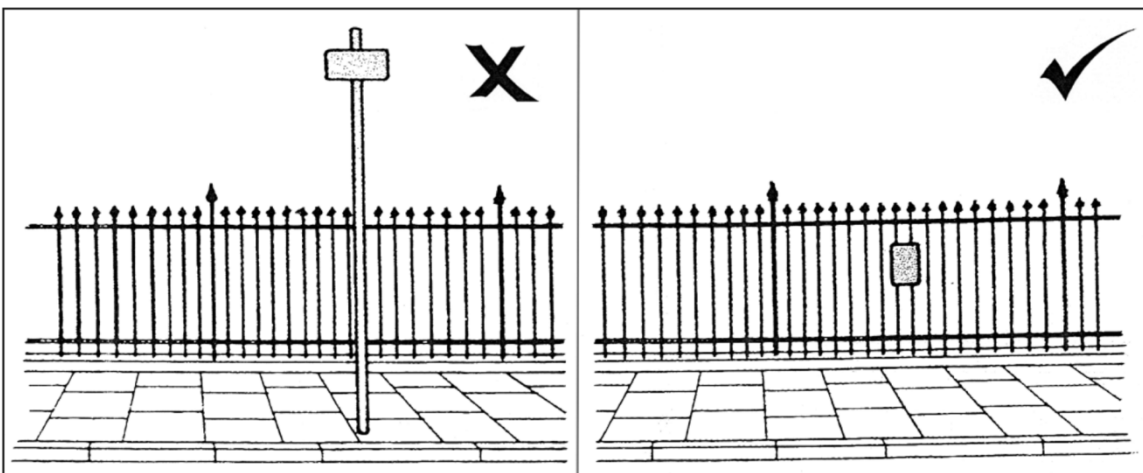
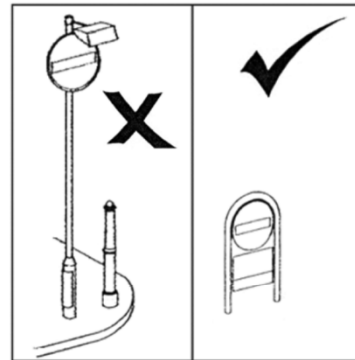
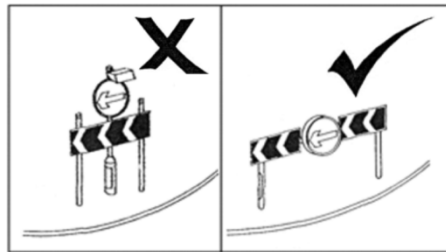
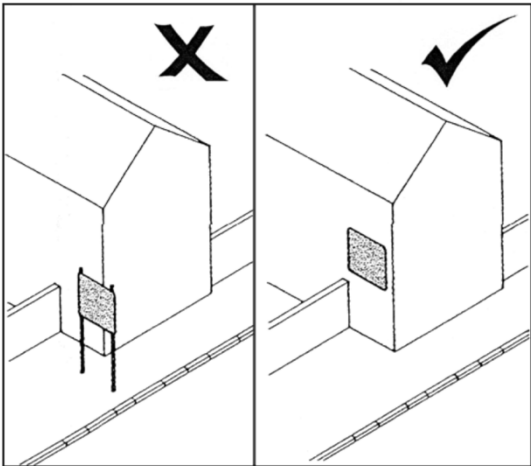
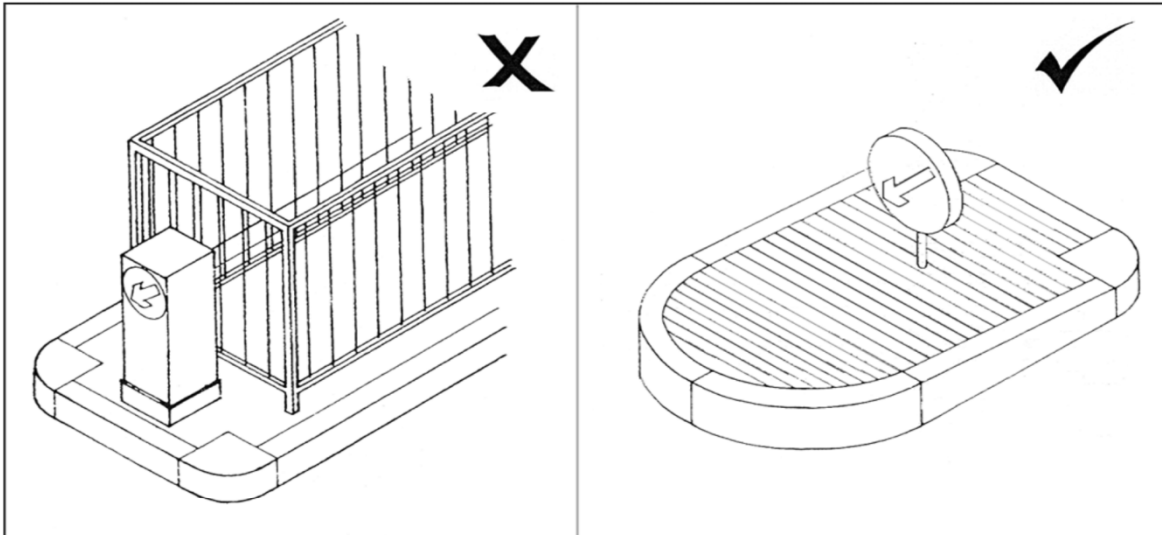
General Principles - Traffic Management

- **Develop an overall strategy for traffic calming for an area, including urban design analysis**
- **Adopt a minimalist approach to reduce clutter**
- **All new devices should reinforce local character by adopting materials or elements found in the immediate vicinity**
- **Reversing past alterations or making use of existing features may achieve the required calming**

Further guidance:

English Historic Towns Forum: Bus Based Park and Ride Good Practice Guide
2nd Edition (2000).

Reducing clutter within the highway



14. New Design in the Historic Environment: A Summary

Whether the structure in question is a fence, sign, road, lamppost or bench, the same basic principles apply to design within the historic environment

- The first option must always be to retain, repair or modify existing historic structures.
- Wherever possible existing historic features should be re-used or incorporated within the new structure.
- Where evidence (photographic, documentary or archaeological) exists for earlier structures, then accurate reinstatement should always be considered.
- If there is no evidence of any earlier structure, then the immediate historic environment should offer clues as to appropriate traditional design.
- Totally new design of structures may be required. Crude approximations and pastiches of 'heritage' features should always be avoided, but nevertheless the principal characteristics of the area should be reflected, i.e. basic form, materials, and architectural detail.
- Keep new design simple, avoiding transient fashions that can date rapidly.
- Adopt high standards of design and materials for lasting quality.
- Adopt an integrated approach to street furniture, lighting and signs etc to reduce clutter within the street scene.
- Adopt a phased programme, achieving the highest standards over a small area at a time, rather than an unsatisfactory and irreversible job over a wider area.

Appendix 1: Further Sources of Further Information

Further information on the issues discussed above may be found in:

Department for Transport: Guidance on the Procedures for obtaining orders under the Transport & Works Act 1992, relating to transport systems, inland waterways and works interfering with rights of navigation (DfT 2006) (Online: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/4502/procedures-guide.pdf)

English Heritage: Practical Building Conservation: Conservation Basics (Ashgate, 2103) (Website: <http://www.ashgate.com>)

English Heritage: Practical Building Conservation: Earth, Brick & Terracotta (Ashgate, 2015) (Website: <http://www.ashgate.com>)

English Heritage: Practical Building Conservation: Metals (Ashgate, 2012) (Website: <http://www.ashgate.com>)

English Heritage: Practical Building Conservation: Mortars, Renders and Plasters (Ashgate, 2015) (Website: <http://www.ashgate.com>)

English Heritage: Practical Building Conservation: Stone (Ashgate, 2012) (Website: <http://www.ashgate.com>)

English Heritage: Practical Building Conservation: Timber (Ashgate, 2012) (Website: <http://www.ashgate.com>)

Georgian Group: Georgian Group Guide 2: Brickwork. (Georgian Group 2005) (Website: <http://www.georgiangroup.org.uk/>)

Georgian Group: Georgian Group Guide 8: Metal and Ironwork. (Georgian Group 2005) (Website: <http://www.georgiangroup.org.uk>)

Highways Agency: Design Manual for Roads and Bridges, Vol II, Section 3, Part 2, Cultural Heritage (Highways Agency, Updated 2007). (Online: <http://www.standardsforhighways.co.uk/dmrb/vol11/section3/ha20807.pdf>)

Historic England/Department for Transport: Streets for All: West Midlands (June 2006). (Online: <http://www.historicengland.org.uk/images-books/publications/streets-for-all-west-midlands/>)

Historic England/War Memorials Trust (March 2014)

(Online: <http://www.war-memorials-trust.org.uk/>)

Historic Towns Forum: Bus Based Park and Ride Good Practice Guide 2nd Edition (2000). (Website: <http://www.historictownsforum.org/>)

National Planning Policy Framework (March 2012) (Online: <https://www.gov.uk/government/publications/national-planning-policy-framework--2>)

Society for the Protection of Ancient Buildings (SPAB): Technical Pamphlet TP/5, Re-pointing Stone and Brick Walling (2002) (Website: <http://www.spab.org.uk/>)

Street Design for All Guidance 2014 (Online:
http://www.civicvoice.org.uk/uploads/files/street_design_2014.pdf)

Tilly, Graham: Conservation of Bridges (Highways Agency/Gifford and Partners 2002).

Victorian Society: Care for Victorian Houses 6: Cast Iron. (Victorian Society 1994)
(Website: <http://www.victoriansociety.org.uk/>)

Appendix 2: District and Borough Conservation Officer Contacts:

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	Catherine Mate	Email: cjm@peakdistrict-mpa.gov.uk	Tel: 01629 816200
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	Katherine Bailey	Email: katherine.bailey@stoke.gov.uk	Tel: 01782 235023.
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