



ENGLISH HERITAGE

ENGLISH HERITAGE GUIDANCE NOTE

THEFT OF METAL FROM CHURCH BUILDINGS

September 2011 replacing the 2008 guidance note

ENGLISH HERITAGE POLICY

English Heritage's policy is that lead should be retained wherever possible. When replacement is necessary it is desirable to use lead on a like-for-like basis, with appropriate security measures installed to deter theft. English Heritage strongly supports the installation of security systems where appropriate to protect roofs and will include the expense of these as an eligible cost when assessing applications to the Repair Grants for Places of Worship Scheme.

In some circumstances like-for-like replacement following a theft is not prudent. In such situations, we will consider supporting proposals for the replacement of stolen lead with an alternative material after one incidence of theft, if we are persuaded that security measures are unlikely to prevent further attacks and the proposed alternative material is suitable.

In offering advice to congregations English Heritage will try to balance the ideal - which means like-for-like replacement to maintain the significance of a building - and the pragmatic, which recognises another material might be more likely to secure the continued use of the building. Where change is proposed, any harm done to the significance of the building would need to be outweighed by the good done in ensuring its long-term wind- and water-tightness in order to be justifiable.

THE PURPOSE OF THIS GUIDANCE NOTE

This guidance note sets out English Heritage's¹ response to the epidemic of lead theft² which is affecting historic buildings and, in particular, parish churches³. We recognise that any theft brings frustration, expense and inconvenience to congregations. Preventing future thefts is paramount, but dealing with the unfortunate aftermath in an appropriate way is also very important.

This guidance is in two parts: the first outlines English Heritage's approach and our advice for congregations on the significance of lead, how to protect it, and how to respond to thefts; the second offers detailed practical information about selecting the material to be used for historic church roofs and making it secure.

¹ In accordance with the Code of Practice for the Ecclesiastical Exemption para 4 (ii) footnote 25, English Heritage would expect to be consulted on proposal to change roofing materials on grade I or II* churches.

² In this note, we refer to "lead" as most metal stolen from church roofs is lead, but the principles apply to any metal used to cover buildings. The principles also apply to the theft of other metals, lightning conductors, brassware, monumental brasses as well as stone roofing slates and paving, and clay edging, all of which have been stolen from churches. Appendix 1 gives some background to the current spate of thefts.

³ In this note, "church" is used to refer to a place of worship used by Christian denominations. Other places of worship may be targeted, but the overwhelming majority of thefts are from listed parish churches.

PART ONE

1. Why is the lead roof so important?
2. What should we do to protect our metal from theft?
3. What should we do if a theft occurs?
4. What is English Heritage's approach?
5. What does English Heritage need to know if we want to use a different roof covering and why is this information needed?
6. What else can we do to help stop lead theft?

PART TWO

7. Why is lead used on churches?
8. How can we make roofing materials more secure?
9. What about precautions when other repair work is underway?
10. Changing the roof covering

Summary

Appendix I. Why is lead theft happening?

Appendix II. A simple risk assessment

This note is a pragmatic response to the present crisis, which is putting important historic churches at risk. It will be regularly reviewed and updates will be posted on our website www.english-heritage.org.uk⁴

⁴ This guidance, and all English Heritage advice is consistent with *Conservation Principles* (2008) www.english-heritage.org.uk/professional/advice/conservation-principles/ConservationPrinciples/

PART ONE

I. WHY IS THE LEAD ROOF SO IMPORTANT?

The roof of any building is always an important element in its design, structure and appearance. In the case of an historic church it is likely to be a major feature in the way it was constructed, its appearance, the impact it has on the local streetscape or landscape and the way in which it protects the fixtures and fittings inside. All these practical elements are part of what makes it valuable within a particular place. These things, together with the building's historical associations with individuals and the community, the archaeological remains that lie under it or have been incorporated into it, and its sheer beauty, come together to make it significant. In the case of 14,500 places of worship, the significance is such that it has been formally designated as of national value and listed as grade II, II* or I.

A roof that has been covered in lead for centuries was probably designed specifically for that material and that is therefore the best choice for re-covering. Changing the material could detract enormously from its significance. This is why English Heritage starts out with the position that like-for-like replacement is highly desirable.

Any proposals to change from lead to another material will have most impact on the building's appearance where the roof is visible from the ground or surrounding high ground or buildings. There are cases where even lead that is not visible will be significant in its own right, for instance where it is very old or where there are historic plumbers' marks, graffiti or particularly fine detailing.

Congregations using buildings that have lead roofs are strongly advised to prepare a brief statement of significance as soon as possible, which can be used to inform decisions in the event of the building being attacked. This might include any known information about when the lead was laid, if there are any particular details, graffiti or marking and photographs showing the whole roof and any specific areas of special interest. If the lead is stolen, this record will help the architect or surveyor specifying the repairs or re-covering and the contractors undertaking the work. In the event of a change of material, it will also help the local authority, English Heritage and denominational advisory bodies to give well-informed advice. Photographs may also help the police to identify the metal if it is found before being smelted.

2. WHAT SHOULD WE DO TO PROTECT OUR METAL FROM THEFT?

Prevention and security has to be carefully tailored to particular buildings in specific locations, taking into account the resources that congregations have available. **The purpose of this section is to encourage everyone to take simple, low-cost measures and to seek advice from their architect/surveyor, insurer and the police about what is feasible and appropriate.** More detailed information is on page 9 while more expensive measures such as alarms/detectors are discussed on page 13.

In order to prevent the theft of metals it is important to understand the circumstances which lead to them being stolen:

- the asset value
- its vulnerability
- the threat posed by criminals

The first two can be dealt with together by assessing risks to the site. Think about the value of the asset - the type of metal, its quantity and ease of removal are all important. It is also worth inspecting the building and grounds to quantify the metals, note where they are located and assess how easy it would be for a vehicle to collect it and take it away. How easy is it to climb onto roofs? Would a thief be seen? A sample risk assessment can be found in Appendix II.

Preventing crime is about making life as difficult as possible for the criminal. Basic and inexpensive measures - such as keeping wheelie bins secure, so they cannot be used to help criminals onto the roof or to wheel removed lead to waiting vans - apply to most buildings. In rural areas farmers have a lot of experience of obstructing vehicular access to land and property, which might also provide simple, practical options for churches. Equally, in an urban situation, making all users of the building and neighbours aware of the need to be alert could make all the difference. Wherever the building is sited, developing good relationships with the local policing team should be beneficial. To identify your neighbourhood policing team go to www.churchcare.co.uk/building.php?CDOD

The criminals carrying out this crime broadly fall into three categories:

- Chaotic offenders - typically youths carrying out low-level opportunist crimes, stealing only what they can carry by hand
- Local career criminals – more organised, using vehicles and stealing greater quantities
- Organised criminals – travel long distances to target the most lucrative sites.

The metals are disposed of via two main routes, either by selling to scrap-metal dealers or by shipping them abroad in containers. Organised criminals arrange or carry out their own smelting.

Any building is at risk from metal theft; not only the insecure or remote ones are threatened. Typically, buildings with highly valuable fittings and fixtures are most likely to be targeted by organised thieves, irrespective of their location. Organised thieves will plan an attack and try to find ways to overcome security measures. Chaotic offenders are likely to be less discriminating and may target any vulnerable and accessible source, which is why regular reassessment of basic security is important.

The police are increasingly aware of the problem and are mounting a number of operations to intercept materials. Nonetheless, the prime responsibility for preventing theft usually lies with the building occupier.

3. WHAT SHOULD WE DO IF A THEFT OCCURS?

Theft of metal from roofs often goes undetected, because it is hard to see what damage has been done until the rain starts dripping onto the congregation. English Heritage encourages all congregations to get into the habit of checking roofs, rainwater goods and lightning conductors regularly to minimise any damage caused by rain and wind where lead has been stolen.

In the event of a theft of metal we suggest the following immediate actions:

- Following a theft, the immediate need is to get the building protected on an emergency basis, using tarpaulins or plastic sheeting. This is a top priority as water ingress, even where a small amount of flashing has been stolen or displaced, can cause enormous damage very quickly.

- Notify the police and obtain a crime reporting reference.
- Notify your insurance company.
- Notify your architect or surveyor so s/he can inspect the damage and help you arrange emergency coverings to minimise further damage.
- Ask a contractor to inspect the damage and surrounding area and implement short-term repairs to prevent water ingress. It is strongly recommended that competent, experienced leadworkers are employed; Lead Contractors Association (LCA) members receive specialist training and have their work vetted and guaranteed.
- Church of England congregations should also notify their Archdeacon and Diocesan Advisory Committee Secretary so they can offer immediate advice and support. Baptist Union, Methodist, Roman Catholic and United Reformed Church congregations should notify their respective Advisory Committees.
- If your building is listed grade I or II* seek advice from English Heritage
- Tell neighbouring congregations what has happened, as they are likely to be at heightened risk.

When a theft has taken place, there is a strong possibility that thieves will return, particularly if they have left rolled metal for later collection. It is well worth reassessing your security arrangements to minimise the risk of further thefts. Your local Neighbourhood Police Team can advise on minimising the prospect of further attacks and, if they know thieves are in the area, should be on the alert. You can contact your team via www.police.uk/ or go to your local police service website or police station.

Helping the police and courts to understand the importance of what has happened is crucial. They may not understand the significance of a church or monument, or the effect the crime has had on a local place or community. Preparing a Heritage Crime Impact Statement, to spell out the full implications will personalise the crime and its impact on the church and/or surrounding community. This is a simple way of getting across the message that theft of lead from churches is not a victimless crime. Guidance on preparing such a statement and an example of one used in a successful prosecution is available at: www.churchcare.co.uk/building.php?CDOD

If re-covering the roof in lead, tene-coated stainless steel or slates or tiles is going to take several months whilst funds are raised and permissions gained, a short term covering such as felt might be appropriate. Denominational advisory bodies are able to advise congregations in this position and, where appropriate advise on consultation with English Heritage and/or the local authority.

4. WHAT IS ENGLISH HERITAGE'S APPROACH?

English Heritage is extremely concerned about the current problem both because of the damage suffered by historic buildings and the additional burdens that this type of crime imposes upon congregations. The impact on the wind- and water-tightness of buildings is severely compromised, but so too are the resources and the morale of those who care for them.

English Heritage continues to encourage the use of authentic and appropriate metals, particularly on roofs. There are very strong reasons why authentic materials such as sand-cast and rolled lead sheet are regarded as being the most

appropriate for important historic buildings, not least in terms of technical performance, appearance and the significance of the building. It is also good practice to repair historic buildings using traditional methods and materials.

Every case is assessed on its merits, but we appreciate that there will be instances in which a change of material will be appropriate, especially when the area of roof is not visible from ground level. After a theft, the first priority must be to provide emergency cover whilst the permanent replacement is arranged. In some situations, a durable replacement such as terne-coated stainless steel, tiles or slates, rather than lead, might be the most prudent way to repair the building. In rare circumstances, short-term coverings may be necessary whilst the permanent solution is identified and funded, but support for the use of plastic or other non-traditional materials would be exceptional. These alternatives are discussed fully in Part Two of this note.

5. WHAT DOES ENGLISH HERITAGE NEED TO KNOW IF WE WANT TO USE A DIFFERENT ROOFING MATERIAL - AND WHY IS THIS INFORMATION NEEDED?

In line with our Charter for Advisory Services, English Heritage aims to provide advice on applications for replacement of lead within 21 days from the date when sufficient information has been received; the table below lists what information we need in order to offer sensible advice and why.

INFORMATION REQUESTED	WHY WE WANT TO KNOW
1. Details of the number and approximate dates of thefts that have occurred at the church and which roof was affected (porch, aisle, nave etc.).	Has theft already occurred, and if so how many times and from how significant a part of the church?
2. A description of security measures in place at the time of the most recent theft, e.g. roof alarm systems, SmartWater®, security lighting, restricted vehicle access.	Is there a realistic prospect of preventing further lead thefts? Have the obvious solutions been tried? Are the circumstances exceptional?
3. Whether any grant-aid for repair of the church roof was received in the last 10 years under the English Heritage/HLF Repair Grants for Places of Worship Scheme.	Could like-for-like replacement be required under the grant conditions? Would it be fair and reasonable to do so?
4. Any financial information that might be relevant, e.g. capping insurance pay-outs, recent expenditure on other repairs or works arising from the Quinquennial Inspection Report, the current financial situation.	Is there an exceptional financial case to be made?

THEFT OF METAL FROM CHURCH BUILDINGS

- | | |
|--|--|
| 5. Photographs of the church from surrounding viewpoints (e.g. from the road, the churchyard and surrounding tall buildings) to enable us to assess how visible the roof is within the local area. | Would a non-lead replacement take away from the character and appearance of the church or of the surrounding area? |
| 6. Clarification of whether lead survives elsewhere on the church and whether it is to be retained. | Would any remaining important leadwork be kept in situ? |
| 7. A close-up photograph of the roof area affected. | Where exactly is the replacement needed? |
| 8. Details of the replacement material proposed for the roof, and whether the roof slope is suitable for this material (based on consultation with your church architect or surveyor). | Would a non-lead replacement perform its job satisfactorily? Is there an exceptional case for a short-term covering? |
| 9. Description of security measures proposed to be installed with the replacement roof and to protect any remaining lead roofs. | What would be done to reduce the likelihood of further loss? |

6. WHAT ELSE CAN WE DO TO HELP STOP LEAD THEFT?

The Alliance to Reduce Crime against Heritage (ARCH) is a new voluntary national network, spearheaded by English Heritage, the Police and the Crown Prosecution Service, is taking forward initiatives to galvanise local and national action against heritage crime. The overriding objective of the group is to reduce the amount of crime that causes damage to or interferes with the enjoyment of heritage assets in England.

Several Diocesan Advisory Committees and the Church Buildings Council are members of ARCH. Any congregation can also be a member and contribute to the fight against heritage crime, including metal theft from churches. Members look out for signs of crime in their own neighbourhoods and share that information with each other and the local police.

Congregations are also advised to contact their local police to find out when and where the next neighbourhood policing team meeting or surgery will be held and to attend. Churches might also get involved with the neighbourhood policing team panel, which sets local priorities for the police and has a say in the kinds of work being done by convicted criminals serving community sentences.

For more information, go to: www.english-heritage.org.uk/professional/advice/advice-by-topic/heritage-crime/arch/

To become a member of ARCH please contact English Heritage's Customer Services Department (contact details on p.24).

PART TWO

7. WHY IS LEAD USED ON CHURCHES?

Lead is a sustainable material that can be re-used repeatedly. Whilst this, as well as the price and the ease of disposal, is what makes it attractive to thieves, it is also what makes it a good investment for a church as it can be recycled to offset the cost of re-covering the roof. It has been used and re-used on roofs for centuries and has a proven track record. Lead performs well, looks attractive and is generally the material for which the roof structure was designed.

LEAD

Advantages of lead

- Lead is the historically correct material, for which the roof was designed
- Highly resistant to atmospheric and bi-metallic corrosion
- Proven longevity (apart from theft); often over a century
- Aesthetically attractive
- Can be easily shaped and worked to any manner of difficult details without fracturing
- Much easier to shape on roofs with complicated detailing than cut/fix of hard metals
- Best performer on low-pitched roofs with less risk of water ingress, because it is dressed more tightly
- Likely to be more secure in extreme weather conditions anticipated by climate change
- Highly sustainable – all roofing lead sheet is fully recyclable
- Easy to repair on site compared to stainless steel
- Has a value when it is recycled and is re-used (increasingly important)
- Hollow rolls can be difficult to remove – a deterrent to theft
- It is heavy so only small amounts tend to be stolen in one visit

Disadvantages of lead

- Attractive to thieves and can be easy to remove so consequently more damage to the building
- Often more expensive to install than hard metals
- More skills needed in installation and repair than with hard metals

8. HOW CAN MAKE ROOFING MATERIALS MORE SECURE?

Possible security measures are listed below, starting with the lower cost options. They are most effective when used in combination, rather than in isolation. English

Heritage fully appreciates that there is no “one size fits all” answer to the challenge and what is feasible in one place will not work in another.

The main security options are:

- Awareness and surveillance
- Physical security measures
- Property marking
- Electrical systems

AWARENESS AND SURVEILLANCE

- Contact your local Neighbourhood Police Team www.police.uk/ and make sure the police are aware of your circumstances and the value of any metals on the site. Try to find out how they deal with such problems and ask their advice about prevention. Check whether there are particular problems with metal theft in the locality. Ask if there is a Key Individual Network, in which your church could be a partner.
- Consider all the preventative measures described in section 2 (page 4) and seek advice from your insurer and denominational advisory body. If a new roof is being partly funded by a grant from the Repair Grants for Places of Worship Scheme, appropriate security measures will be expected to be part of the proposal; the cost of installing an electrical security alarm system will be eligible for grant-aid.
- Maximise surveillance levels of the property, including cutting back tall trees and vegetation close to buildings, which could provide a screen to hide criminal activities. Consult the local authority to find out what approvals (if any) are needed from them in relation to trees. Church of England congregations should also consult their Archdeacon in case the work requires authorisation by faculty.
- Consider the installation of security lighting, particularly at roof level where metal roof coverings are present. Fittings should be inaccessible and/or vandal resistant. Advice on siting lights should be obtained from a security expert, to ensure they do not create shadow areas where a thief can operate or escape unseen. Avoid lighting areas that are secluded and not overlooked – you might be assisting the thieves’ activity. Check what consents may be needed with denominational advisory bodies, the local authority and your architect/surveyor.
- Encourage members of the local community to keep a vigilant eye on the building and to report any suspicious activity immediately to the police, particularly the unexpected arrival of workmen or unknown vans parked near the church at night. Even if suspicious individuals can give a plausible answer when approached, ask for proof of identity. If none is offered take the number of their vehicle and alert the police. Genuine contractors will not be offended if you make telephone calls to check who they are.

The best way of engaging with the community will vary, but might include leafleting local households, giving brief presentations to groups that use church premises and displaying posters.

One particularly resourceful churchwarden has created and is prominently displaying his own warning notice, requesting that members of the public call the police if they see vans or workmen around the building between 6 p.m. and 8 a.m., as they are probably stealing the lead roof.

PHYSICAL SECURITY MEASURES

Part of any security strategy involves making it more difficult to get at the valuable items, as well as limiting the escape routes open to a thief caught in the act. The following are low cost suggestions that might be considered:

- Make the thieves' job more difficult by removing any easy access onto building roofs, such as water butts, waste bins and tall trees located in close proximity to the building
- If there is statuary or other metal objects, including railings around tombs, in the curtilage of the building, make sure they are well anchored to the ground or to a fixed structure. Steel armatures or dowels can be fitted retrospectively, but it is advisable to consult a security specialist on what should be used. A suitably experienced craftsman/tradesman could do this work, although it might need to be undertaken by a conservator if the item is fragile, valuable or of historical importance. Listed building consent or denominational permission may be required for this work.
- Consider planting beds of dense prickly bushes to reinforce existing boundaries, for instance by growing alongside perimeter fences. They could also be used more strategically and make access routes onto roofs less attractive. Use wide, low beds where it is important to retain good views. It is best to avoid planting close to the building or where shrubs will make access for routine maintenance more difficult. Church of England congregations must check with their Archdeacon to find out if they need permission for such planting.
- Store ladders in a secure place to prevent their unauthorised use. Special precautions must be taken when building works are in progress (see section 9 on page 14).
- As far as it is safe to do so, conduct regular checks of roofs so the theft of roofing materials is detected at the earliest opportunity. This will also identify action to prevent rainwater from entering the building, causing further damage. Do not forget that the great weight of lead means that thieves often only remove a small amount at a time and expect to make a number of repeat visits. Being aware that the roof is an active target gives the police an opportunity to apprehend the thieves when they return.
- Apply anti-climb paint to drain pipes, roof guttering and sections of scaffolding to restrict access to roofing. Regulations say that the paint should not be applied below a height of 2m and that a warning notice indicating it has been applied must be prominently displayed.
- Protect the lower section of lightning conductor ribbons using a metal cage or sheath securely fixed to the fabric of the building.
- Keep gates locked and generally restrict vehicular access to the site. Consider some means of blocking approaches, whilst making it possible for legitimate traffic to get close to the building e.g. funeral and wedding cars. In urban situations, installing telescopic bollards might be appropriate, but in rural areas, other options will be more suitable.
- If sheet lead is to be put back on a roof, consider having it fixed using hollow rolled sheet rather than wood-core rolled sheet. The copper fixings used to secure hollow rolled sheet lead make it more difficult to remove. For further information on hollow rolls, see *Rolled Lead Sheet – The Complete Manual 2003*. The Lead Sheet Association, page 32.

- If lead is to be used for replacement, discuss security measures with the local Neighbourhood Police Team. Consider all the preventative measures described above and seek advice from your insurer and denominational advisory body. If the new lead is being partly funded by a grant from the English Heritage/HLF Repair Grants for Places of Worship Scheme, the cost of installing an electrical security alarm system will be eligible for grant-aid.
- Another option is to consider using mechanical fixings such as LedLok that make it more difficult to remove lead. Such fixing systems anchor the lead, but still allow thermal movement. Visually they are relatively unobtrusive, appearing as a series of small butt-welded patches. It can be fitted onto existing roofs, although this does mean lifting all the sheets. For further information go to www.ledlok.co.uk. Your architect or surveyor may be able to offer advice on this.

PROPERTY MARKING METAL GOODS

There are three techniques available when using marking metals:

- a. forensic marking to provide unique identification
 - b. forensic grease that marks the thief as well as the metal
 - c. simple mechanical stamping
- a. There are a variety of products available to uniquely identify items so that if they are stolen and recovered they can be traced back to their owner. SmartWater® is an academically-proven crime reduction strategy based on forensic technology, which includes property marking. It is now a requirement for Ecclesiastical's policyholders to use it and it has been adopted widely by the police in the UK. As a result of the overt police support, it has been adopted by Scottish Power, United Utilities and CE Networks to protect copper cable and Ecclesiastical Insurance Group to protect the lead roofs of client churches. The police are carrying out spot checks on scrap metal looking for SmartWater®, making it risky for thieves to keep stolen material. There have been over 600 successful prosecutions in UK as a result of SmartWater® and it retains a 100% conviction rate. An explanatory video can be found at: www.smartwater.com/Video.aspx (NB SmartWater® is one of a range of forensic property marking products available which can be used to mark property. A list of such products can be found at www.securedbydesign.com/companies and click on *Forensic Marking*)
 - b. The marking material can also be applied as a grease that provides transference from the metal to the thief. This means that both the item to be protected and the thief are likely to be marked and linked to the same crime-scene. Because of its cost, it would not normally be applied as complete coverage, but at the points where access is most likely to occur e.g. on lower-level roofs such as vestries or porches, above oil tanks. Two companies provide this product: www.selectadna.co.uk and www.redwebsecurity.com.

Both these products are invisible to the naked eye, but fluoresce under ultraviolet light. The starting price for the applied products is around £500, but some insurers have made special low-cost arrangements for their clients. It is vital that congregations register the use of forensic marking so that stolen metal can be traced back to the particular church.

- c. As a low-tech option, metal can be indented with marks of ownership using a simple hand stamp and hammer. The design of these stamps can be tailored to the church or diocese and can form an attractive feature if used in a repeated design. As a visible presence these stamps will be particularly useful where the disposal route is a local scrap metal dealer. Several engraving services provide custom hand stamps for metal including: www.pryormarking.com and www.eyreandbaxter.co.uk

Where security marking is to be applied at height, a risk assessment should be completed to identify a safe system of work which will be followed during its application. Some gutter clearance or maintenance schemes offer the application of forensic marking as part of their contract.

Congregations are advised that warning notices alerting thieves that security marking has been used are usually prominently displayed around the building. This will act as a deterrent.

ELECTRICAL SYSTEMS

- English Heritage advises that, where circumstances make it appropriate, metal roofs should be protected by alarms. Where a roof is to be re-covered using metal, whether as part of planned repairs or because of a theft, we encourage congregations to include the installation of an appropriate system, ideally before the new roof is put down so that it is protected during building works.
- Where systems are being installed on existing roofs, English Heritage is content for the installation to be authorised by denominational authorities (e.g. De Minimis in Church of England parishes) without prior consultation with us, subject to the church architect or surveyor supervising cable routes and fixings to ensure damage to historic fabric is minimised.
- In cases where the new work is being partly funded by the Repair Grants for Places of Worship Scheme English Heritage will include the cost of an appropriate security system as an eligible item in assessing the project.
- An electronic security system has been trialled on churches in areas where lead theft is rife and it has prevented thefts. It uses wireless technology and when activated, raises a local audible/visual alarm and remote transmission to a 24-hour, manned receiving centre. Action is then taken in line with customer instructions. The system is virtually invisible, reversible with minimal intervention into the fabric. A factsheet is available at www.ecclesiastical.com/theftofmetal. Other contractors may offer similar systems.
- If a security system is installed using lighting as the form of alarm it might be possible to consider using strobe lighting, which hinders rather than helps thieves and is more likely to attract neighbours' attention than a steady continuous beam.
- An alternative approach is to install vibration detection to the underside of the roof substrate. Depending on the substrate characteristics, each detector will cover a radius of about 2m. In considering this approach, it is important to bear in mind that each device will need to be accessible for maintenance. Wire-free movement detectors may be the most appropriate for protecting historic buildings. They are also more quickly deployed.

ALARMS

- Alarm signalling can be automatically linked to a 24 hour manned alarm receiving centre, or directed to the telephones or mobiles of appointed keyholders.
 - Not all congregations will be able to manage/afford sophisticated alarms.
 - Bells/sirens on their own may be effective in built-up areas, where a reasonable level of surveillance can be expected. Additionally, the alarm could activate a flashing floodlight. This approach will require a good level of community participation and is not suitable for isolated sites.
 - Whatever system is used, congregations are advised that all keyholders need to be briefed by their neighbourhood policing team on their appropriate response so that they do not put themselves at risk in responding to the alarm.
 - Alarm systems should be installed and maintained by an NSI or SSAIB approved company. To find details of approved companies in your area visit www.nsi.org.uk and www.ssaib.org.
- Consider installing a closed circuit television (CCTV) system, incorporating movement detection, linked to a remote video monitoring station. This could also include loudspeakers. The operator will be able to warn-off intruders and call police to site. Systems should comply with BS 8418. Warning notices should be displayed prominently around the site. Remember that some form of lighting will be required in most cases. As a guide, even a simple system is likely to cost at least £12,000, plus £3,500 annual monitoring and maintenance cost. Motion sensor alarm systems may be more cost-effective.
 - In some cases, less sophisticated monitored CCTV (costing around £4,000) has proved to be effective as a deterrent, as have others where cameras simply watch vehicular approaches and record vehicle number plates. Be aware that if thieves are climbing on the roof and the cameras are accessible, they might steal the cameras as well as the lead.

9. WHAT ABOUT PRECAUTIONS WHEN OTHER REPAIR WORK IS UNDERWAY?

SCAFFOLDING

- Before installing any scaffold it is important to check your building insurance policy. Some policies have clauses that specifically exclude cover for roofing materials whilst scaffolding is in place, even if the work being done has nothing to do with the roof. This makes it even more important to protect the scaffolding in order to prevent theft.
- Given this difficulty congregations are advised to discuss what they could do to minimise the risks, such that their insurer would provide cover during works, albeit for an additional premium.

THEFT OF METAL FROM CHURCH BUILDINGS

- It may be possible for the contractor to be responsible for cover during the works. The cost will still be passed on to the congregation, but the responsibility to find an insurer and meet the standards of site security will then rest with the contractor.
- As well as intruder alarm protection on the scaffolding, the following precautions will also help reduce the risk of thefts from roofs:
 - Only erect scaffolding where it is needed for any particular phase of work. Phased scaffolding reduces the vulnerability of the whole building.
 - Bolt corrugated iron sheeting or solid timber boarding around the base of the scaffold to a height of 3.5m to deter climbers.
 - Remove all ladders to a secure point at the close of work each day. If, for some exceptional reason it is necessary to leave a ladder in place, make sure protective sheeting is securely locked or fixed in place, overlapping the sides of the ladder as well as the rungs up to a height of 3m.
 - Remove all old lead or copper from the site at the end of the day. Only bring enough new material for each day's work to the site each morning. Display notices explaining this.
 - Scaffolding boards put down in each bay of newly laid lead or accessible old lead, strapped down with scaffolding poles and clips at the end of each working day make it harder to remove lead and may prevent theft.
 - Erect Heras®-type fencing panels around the work site to a height of at least 2m. In some areas, where theft is prevalent, 3m or even 4m would be recommended.

OTHER MEASURES

- Consider introducing lockable trap doors at each lift. Each trap door to be locked on departure from site. This would prevent access via ladders.
- Advise the local police and all neighbours of building work, the name of the contractor, the times that he will be on site and who to contact if something untoward appears to be happening.
- Ask church staff and volunteers, all members of the PCC, parishioners, local dog-walkers and other users of the building and its surroundings to keep it under extra surveillance whilst the works are in progress.
- Consider using security patrols or manned guarding, undertaken by National Security Inspectorate (NSI) approved and licensed security personnel. For details of local NSI approved companies visit www.nsi.org.uk.

10. CHANGING THE ROOF COVERING

GETTING PERMISSION

Listed buildings are protected by legislation which requires authorisation for any works which would affect their character as buildings of special architectural and historic interest. This protection is exercised through the consent processes of local authorities or, for those covered by the Ecclesiastical Exemption (i.e. ecclesiastical buildings of the Church of England, Roman Catholic Church, Methodist Church, Baptist Union and United Reformed Church) the equivalent process of their denomination.

The consent processes in respect of works to grade I and II* churches require consultation with English Heritage, where the character of the listed church would be affected. For reasons outlined elsewhere in this guidance note, the significance of roofing materials is such that their replacement with an alternative would normally affect the character of a building and hence we would expect to be notified. In respect of grade II listed buildings, English Heritage would not expect to be notified of proposals to change a roof covering.

English Heritage strongly advises that a durable, long-lasting material is chosen for re-covering roofs. In most cases where like-for-like replacement of lead is not practical this will meanterne-coated stainless steel or slates or tiles where appropriate and suitable for the roof construction.

The issues needing to be addressed are outlined above in section 5 (page 7), but English Heritage will pay particular attention to:

- How visible the roof is from the churchyard and surrounding streets;
- The feasibility of implementing affordable deterrent measures to prevent further thefts and their likely effectiveness;
- The particular significance of the part of the building which has been attacked.

STAINLESS STEEL

Terne-coated stainless steel is the most popular long-term alternative to lead and offers many advantages over other options, including a reasonably similar appearance. The same applies to zinc or aluminium, but both of these can be subject to underside corrosion and are unlikely to last as long.

Stainless steel is currently about 40-50% cheaper than lead, but laying it is more expensive on a roof with traditional detailing, as the substrate will have to be altered to receive 'long strip' fabrications. This alteration often outweighs the price difference between the materials. The fact that the roof is less likely to be damaged or stolen means many congregations regard this as the most responsible option.

STAINLESS STEEL

Advantages of stainless steel

- Lightweight and cheaper to install in long lengths than lead, where there are few complicated details
- Good longevity; examples have survived for at least 50 years
- Longer sheet lengths allow retention of historic detailing
- Continuous refinement and development has improved longevity, appearance and ease of installation
- Terne coating now in tin, not lead, which is considered to be less hazardous in manufacturing and installation
- Less prone to thefts (and therefore further damage), because it is difficult to remove and cut and terne coating reduces its scrap value
- Not usually prone to underside corrosion

Disadvantages of stainless steel

- Whole sheet usually needs replacing – minor repair not possible apart from soldering small patches
- Still best to use lead for flashings
- Steel is not as malleable as lead and its not possible to boss and detail as well as with lead
- Laid traditionally it is more prone to leaks as it does not dress tightly, particularly on low pitches at height – as cited by contractors, but may be due to workmanship
- Extreme rainfall can lead to swamping of seams at the base of sheets unless adequate apron flashings are fitted; the on-site profiling machine for 38mm seams needed for extremely low pitches is not yet available. Other areas can suffer from inadequate seaming
- Tape and mastics regularly used have relatively short lifetimes
- May not last as long as lead – manufacturers say 60 years
- Can suffer from pitting & brown discoloration – needs regular washing; although the 316 grade which is now widely used appears to perform well
- Replacement sheets may not be the same – constantly changing design and composition of coatings over time
- May be mistaken for lead on roof and therefore attacked
- Can be noisy in rain – a soft underlayer, such as geotextile, can lessen this effect
- Questionable whether it does satisfactorily replicate lead visually – lead is no longer used for terne coating
- More susceptible to effects of dramatic weather events – particularly wind lift

OTHER OPTIONS

Some congregations are considering non-metal roof coverings because of:

- the low level of insurance cover for lead roofs
- the opportunity this gives to make a medium-term repair, in the hope that lead can be reinstated in the future when prices are lower
- the removed threat of theft and further damage

Some non-metal systems such as asphalt have proven longevity, although its installation on top of any remaining lead drastically reduces the resale value and its suitability for recycling. A complete new mastic asphalt roof can give up to 50 years of service. Built-up felt roofs have also been used for many years and give reliable service for a decade or so, although they can be detrimental to the appearance of the building.

SHORT TERM ROOFING AND MODERN REPLACEMENTS

Today there are an increasing number of new roofing systems being marketed as alternatives to lead, many based on modern plastics or rubber with claimed life expectancies of 25 years or more. Some will have laboratory certification, but few will have been experienced the harsher climate often found on exposed church roofs. English Heritage would not normally support their use on any part of a listed building.

Most of these alternatives are visually inappropriate and will still be relatively expensive to install, even using a material such as felt, which should last for 10 years.

Questions to consider when contemplating using these materials on roofs include:

- what tests were carried out and how did the product perform?
- is there any experience of its longevity and use on churches?
- can the detailing accommodate the many complications found on church roofs?
- does the colour remain consistent in different light, weather and over time?
- how easy/expensive is it to install in terms of scaffolding and access?
- how easy/expensive is it to maintain and repair?
- how does it deal with problems e.g. exceptional weather, sitting water, dropped scaffold clips etc?
- what does the guarantee cover?
- are specialists needed for installation and repair?
- how long has the company been in business?
- is the system likely to be refined in future, resulting in a lack of spare or replacement parts?

NB: none of these systems replicate the appearance of lead.

SUMMARY

1. English Heritage understands the enormous pressures on congregations caring for historic buildings that have been victims of metal theft, including the increased costs of insurance.
2. All feasible security measures should be put in place to prevent theft before a change of material is considered and a replacement roof fixed.
3. Following a theft, emergency covering should be installed and advice sought about both minimising the risk of further attacks and the permanent re-covering of the roof.
4. Before making any decisions about replacing the stolen metal, the congregation should seek the advice of an architect or surveyor with conservation expertise, the local authority, its denominational advisory body and, if the change will affect the character and significance of a grade I or II* listed building, English Heritage.
5. In some circumstances, it will not be reasonable to expect like-for-like replacement. In such cases, English Heritage would normally recommend that a long-term durable material with a known standard of performance, such as terre-coated stainless steel or slates or tiles would be the most appropriate alternative.
6. Only in the most exceptional circumstances would English Heritage consider the use of plastic or other non-traditional materials to be acceptable on a listed place of worship.
7. In situations where a permanent repair cannot be organised quickly, a short term covering of roofing felt might be necessary.

WHY IS LEAD THEFT HAPPENING?

Thieves continue to target many types of metal, principally lead and copper. Whilst roofs are the most likely targets, particularly on churches, other sources of metal such as rainwater goods, lightning conductors and churchyard features are all at risk.

By the end of 2010, Ecclesiastical, the main insurer of churches, reported claims of over £22m (see www.ecclesiastical.com/theftofmetal for their advice on prevention). Lead sheet was the main target and a significant proportion of this cost was making good damage caused by the thieves and the subsequent ingress of water. The dramatic increase in theft has come about because of spiralling prices caused by worldwide demand for lead-acid batteries, both for vehicles and UPS (uninterrupted power supplies) and, more recently, because of speculator activity that this rising market price has attracted. Prices started to fall in 2009 and as a consequence, so did the incidence of theft, but these have returned to previous levels with the renewed rise in commodity prices.

This problem is not new. In the early 1980s, churches were targeted, but a concerted campaign by the insurers to encourage church authorities to carry out simple preventative measures proved successful and the numbers of attacks fell dramatically. English Heritage is working with the Home Office, the police and many other partners to try to achieve the same positive improvement as quickly as possible.

A SIMPLE RISK ASSESSMENT

Item	Management of risk				
	Satisfactory condition?			Proposed action to be taken against	Check for
	Yes	No	Don't know	No or Don't know	
Boundary treatment					Does the building have a well defined perimeter fence? Could a vehicle be brought on site? If so, how close to the building? Check for holes, gaps under gates and climbable sections of the fence.
Surveillance					Is the property overlooked by neighbours or passers by? Are overlooked areas adequately lit at night? Is it likely that a thief would be seen? Are secluded areas kept dark to discourage youths congregating? Have neighbours or building users been primed to report suspicious activity?
Grounds					Is the terrain flat and easy to move over or sloped/stepped? Are there valuable metals, such as statues or garden furniture?
Building access					Is there easy access to upper storeys via lean-to roofs, escape stairs or rainwater goods?

THEFT OF METAL FROM
CHURCH BUILDINGS

Metals					<p>How easy to remove are the metal assets? How portable are the metal assets? How close are they to the likely points of vehicular entry?</p>
Security systems and management					<p>Does the building have an effective intruder alarm system? Is there a guaranteed response to activations? Is the building unoccupied for long periods? Is there CCTV? Are there security patrols? Are there any building works being carried out? Will these be supervised? How well known is the contractor?</p>

ENGLISH HERITAGE OFFICES

North East

English Heritage
Bessie Surtees House
41 - 44 Sandhill
Newcastle upon Tyne
NE1 3JF
Tel: 0191 269 1200
E-mail: northeast@english-heritage.org.uk

North West

English Heritage
3rd floor Canada House
3 Chepstow Street
Manchester
M1 5FW
Tel: 0161 242 1400
E-mail: northwest@english-heritage.org.uk

Yorkshire

English Heritage
37 Tanner Row
York
YO1 6WP
Tel: 01904 601901
E-mail: yorkshire@english-heritage.org.uk

West Midlands

English Heritage
The Axis
10 Holliday Street
Birmingham
B1 1TG
Tel: 0121 625 6820
E-mail: westmidlands@english-heritage.org.uk

East Midlands

English Heritage
44 Deragate
Northampton
NN1 1UH
Tel: 01604 735400
E-mail: eastmidlands@english-heritage.org.uk

East of England

English Heritage
Brooklands
24 Brooklands Avenue
Cambridge
CB2 8BU
Tel: 01223 582700
E-mail: eastofengland@english-heritage.org.uk

**THEFT OF METAL FROM
CHURCH BUILDINGS**

London

English Heritage
1 Waterhouse Square
138 - 142 Holborn
London
EC1N 2ST
Tel: 020 7973 3000
E-mail: london@english-heritage.org.uk

South West

English Heritage
29 Queen Square
Bristol
BS1 4ND
Tel: 0117 975 0700
E-mail: southwest@english-heritage.org.uk

South East

English Heritage
Eastgate Court
195-205 High Street
Guildford
GU1 3EH
Tel: 01483 252000
E-Mail: Southeast@english-heritage.org.uk

The Conservation Department

English Heritage
Room 2/20, NMRC
The Engine House
Fire Fly Avenue
Swindon
SN2 2EH
Tel: 01793 414963
E-mail: conservation@english-heritage.org.uk

Customer Services

English Heritage
The Engine House
Fire Fly Avenue
Swindon
SN2 2EH
Email: customers@english-heritage.org.uk
Telephone: 0870 333 1181
Minicom text telephone for the deaf or hard of hearing: 0800 015 0516

English Heritage is the Government's statutory adviser on the historic environment. English Heritage provides expert advice to the Government about all matters relating to the historic environment and its conservation.

Published by English Heritage September 2011
www.english-heritage.org.uk

If you would like this document in a different format,
please contact our Customer Services Department:

Telephone: 0870 333 1181

Fax: 01793 414926

Minicom: 0800 015 0516

E-mail: customers@english-heritage.org.uk



ENGLISH HERITAGE