

# Temporary protection of wall paintings during building works

Practical Information Leaflet

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ENGLISH HERITAGE

# Context and purpose

This *Practical Information Leaflet* is intended as an aid for conservators to inform conservation officers, architects, contractors, property owners, and others entrusted with the care of historic buildings that contain wall paintings. Within this leaflet, English Heritage provides information on the protection of painted decoration when works are planned to renovate or alter a building. The leaflet identifies the situations in which the protection of wall paintings is likely to be required,

the methods available and their limitations, and the procedures necessary to ensure that the correct sequence of events occurs with the least interference to the paintings.

English Heritage has prepared this leaflet as one of a series of practical guides, aimed at clarifying different aspects of the conservation process and improving standards within the practice of wall painting conservation.

English Heritage strongly encourages the use of accredited conservators who have obtained professional recognition through the Professional Accreditation of Conservator-Restorers (PACR) scheme. Within the United Kingdom, this scheme is operated through the United Kingdom Institute for Conservation (UKIC), the Institute for Paper Conservation (IPC), and the Society of Archivists (SoA), and is overseen by the National Council for Conservation-Restoration (NCCR).

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# Introduction

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Wall paintings are integral to the fabric of the building in which they are located and are therefore directly susceptible to damage from exposure to building works and alterations to the fabric. Unlike other historically valuable material, which can be removed from a building during a period of such high risk, wall paintings must remain *in situ* in often hazardous conditions. In addition, the delicate nature of wall paintings renders them highly vulnerable; frequently found in poor condition, they consist of fragile and complex layers of paint and plaster, often on heterogeneous supporting materials. The need to introduce appropriate means of protection during renovation or other building work therefore becomes vitally important to ensure the preservation of this irreplaceable part of our heritage.

## Definitions

**Protection**, in the context of this leaflet, may be defined as any *temporary* measure undertaken to safeguard the structure of a painting from damage or related deterioration, including environmental changes, likely to be caused during alterations to the building fabric. Protection can be either direct – a protective system designed specifically for the painting – or an indirect procedure necessary to minimise any risk inherent in a particular intervention or circumstance.

**Building works** include any site-related activity that involves the alteration, repair or treatment of the building, both internally and externally. This work can range from surface cleaning, redecoration or routine maintenance, to the repair or renewal of fundamental components of the building fabric such as roofs, windows, and walls.

## Roles and responsibilities

Particular elements of the project design, including the implementation of protective measures, may require Planning or Listed Building Consent applications, or adherence to the ecclesiastical equivalent. There may also be specific insurance requirements, and all works – including the protective measures – will need to adhere to relevant health and safety practices. Failure to comply with any of these statutory procedures could result in the delay or prevention of the works, and if ignored can result in criminal prosecution. At the outset of a building works project, it is therefore vital to ensure that the appropriate level of consultation and collaboration is reached amongst all interested parties, and that their particular roles are clearly defined.

## **The role of the wall painting conservator in preventive protection**

### **Preliminary examination and planning**

- assess any likelihood of surviving decoration and undertake any necessary investigation to establish relative significance
- assess risk factors from building works programme
- advise on appropriate sequence to minimise risks

### **Condition recording and emergency conservation**

- undertake condition assessment and necessary documentation
- establish any need for emergency conservation required in advance of building works
- undertake agreed emergency conservation

### **Implementation of protective measures**

- advise on appropriate methods of protection
- carry out or supervise (as agreed) installation of all measures
- instruct site staff in risks
- monitor and review protective systems and agreed components of works programme
- carry out regular condition inspections in high risk situations

### **Post-works examination and project review**

- supervise or carry out removal of protective systems
- carry out post-works condition inspection
- produce recommendations for future maintenance and management procedures in light of work

# Identifying risks to wall paintings during building works

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'Internal walls in old buildings should always be investigated with care in advance of alterations in case ancient or interesting features are hidden in the plaster or behind the panelling or other covering.' (Planning Policy Guidance: planning and the historic environment, Department of the Environment; Department of National Heritage, Note 15 (PPG 15), HMSO 1994, London).

There are many ways in which wall paintings are susceptible to damage during building works, though in many instances the most dangerous factor is the lack of awareness or understanding of what is actually at risk. Wall paintings form an integral part of the historic building fabric, which extends beyond the surface decoration or paint layers to the physical support onto which they have been applied. They can be found on wall surfaces, structural elements (such as columns, beams, or window frames) and ceilings. Because of the changes made to the buildings over time, wall paintings may often be fragmentary, with some areas covered by later decorative layers of paint and wallpaper or hidden behind architectural alterations. The possible survival of original painted decoration, as well as other significant historic finishes, must therefore always be borne in mind before the planning of any building works. Wall painting conservators should be consulted to provide initial advice on the potential for survival, and the level and extent of pre-investigation that may be required. Once significant material is identified, it is essential that a wall painting conservator is commissioned to undertake a preliminary inspection and survey to establish the extent and condition of the decoration, and that he/she is involved in the development of the programme of intended works.

## **Building works likely to affect wall paintings**

### **Alterations and repairs to the fabric**

Alterations to doors and fenestration, the installations of new partitions, floors and ceilings, and other remodelling can all cause permanent damage to historic surfaces. External works, such as roofing or drainage repair; cleaning, or the repointing of masonry, can also put wall paintings at risk.

### **Plastering and/or redecoration**

Potentially damaging interventions include the stripping or removal of overlying wall coverings, paint layers and plaster; preparation such as keying, washing, or scraping, and the application of new materials.

### **Provision of services**

Works to services, including provision of lighting, security or fire detection (cabling and fixtures), heating or drainage systems, and other internal services can involve the alteration and removal of historic fabric with the potential for damage to paintings and surrounding historic plaster.

## Risk factors

Care should be taken to avoid or minimise any works-related activities that, by their nature, would endanger the wall paintings in any of the following ways.

### Use of water during works

Water used during works, even in small quantities, can cause damage to wall paintings. This could include staining and erosion, mobilisation of soluble salts, and micro- or macrobiological growth. Liquid water may be added directly as part of the works, such as through cleaning, repointing, rendering or consolidation of the fabric. In addition, care must be taken to manage water supply and storage on the site to reduce the potential for leaking or spillage. The introduction of water can also affect the surrounding environmental conditions (see *Environmental factors*).

### Vibration

Wall paintings can be susceptible to vibration, and any intervention adjacent to, or behind wall paintings, such as drilling or hammering, may loosen and dislodge vulnerable original plaster and/or paint layers.

### Mechanical damage

In addition to risks related to the specific nature of the works, wall paintings are susceptible to inadvertent mechanical damage such as abrasion, scratching or loss, especially when access through the building is limited or confined. This may occur when people brush past painted surfaces, when objects are stored or propped against walls, or from falling dust and debris.

### Deposition of materials

In addition to the risks from general dust, dirt, and falling debris, the substances used during the building works may damage wall paintings through staining and alteration of original materials. These substances include decorating materials and chemical treatments such as biocides, wood preservatives or paint strippers.

## Environmental factors

The environmental conditions of a historic building can often be difficult to determine. It may also be difficult to achieve a positive level of control. The internal decoration will, however, be accustomed to the existing conditions, and these can be considered its equilibrium state. Building works can impact on this state of equilibrium in a number of ways, and it is important to consider the potential changes that can occur in order to assess their impact on the wall paintings. If possible, activities that will change conditions should be minimised, with an emphasis placed on the reduction of rapid or extreme fluctuations over brief or repeated intervals.

### Temporary exposure

Should the works result in a building remaining roofless or without adequate fenestration for any period of time, the wall paintings would be highly vulnerable to the harmful effects of moisture, salts, air movement, frost damage and light.

### Temporary heating and dehumidification

Additional heating, introduced to improve working conditions, or to speed up the setting or curing of materials, will alter the environment. This can result in general changes in ambient conditions, or more localised fluctuations, both of which can adversely affect the paintings.

Dehumidification is often suggested during works to dry out a building, for example after flooding or fire. This too can cause extreme and adverse changes in the prevailing environmental conditions, to potentially disastrous effect. In addition to heating and dehumidification, any activity that encourages the rapid drying out of the building fabric should be avoided.

# Developing a protection strategy

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The approach towards the protection of wall paintings can be largely summarised as the development of a mitigation strategy with three primary aims:

- reducing the hazards
- actively managing any risks
- protecting during the works

The most effective means of protection is the identification and elimination of aspects of the works that are considered to be potentially damaging. Through careful management, a protection strategy must also aim to mitigate the adverse effects of the building works, thereby minimising their impact on the wall paintings.

So that the appropriate levels and methods for the protection of the wall paintings can be determined, a series of key issues needs to be addressed. **These involve close communication with all relevant parties, and should ideally occur early in the project planning stage to avoid rushed and potentially ill-informed decisions.**

## Defining the scope of works and associated risks

### **What is the nature of the proposed works, and could anything be modified to reduce risks?**

Early review of the proposed works can identify potentially harmful activities, which can be re-examined and adapted to ensure the minimum risk. These might include the use of tools known to cause high levels of vibration, the application of inappropriate materials, and the alteration of fabric supporting painted decoration. In certain instances, the conservator may determine that the proposed works are not appropriate in relation to the long-term preservation of the wall paintings, or that protection may also put the paintings at undue risk.

### **Has the location of all areas of significant decoration been defined?**

Agreed demarcation of the actual areas requiring protection needs to be clearly established at a preliminary stage. This must include areas of the building which may retain hidden historic decoration, and areas of unpainted historic surfaces.

### **How long will the protective system be required?**

Depending on the project, the wall paintings may require long-term security, significantly influencing the choice of the most appropriate form of protection. For example, placing a covering material adjacent to a decorated surface may not be an appropriate long-term form of protection, as it could fall away or be pulled down. Alternatively, if a painting is boxed-in, it may be necessary to incorporate access so that its condition can be assessed, especially if there is a risk of the protection creating adverse environmental conditions.

## **Assessing the condition and any particular risks to the wall paintings**

### **Have all wall paintings been adequately recorded and their nature and condition assessed?**

As part of the risk assessment, the wall painting conservator should identify any recording, investigation and/or intervention deemed necessary prior to the building works.

### **Is there a requirement for any emergency stabilisation prior to building works?**

Subject to the findings of the preliminary investigation, some remedial work may be necessary before the installation of any particular protective measures. Any conflicts this may pose for the programme of building works will need to be considered, and re-scheduled accordingly.

### **What are the particular risks and vulnerabilities associated with the wall paintings?**

Certain types of painting will tend to be at greater risk than others from particular hazards, which will in turn dictate the type and nature of any protective measures. This information should be identified during the preliminary assessment stage; it may also help to re-define the works.

# Methods and approaches

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Determination of an appropriate protection method will necessarily be dependent on the site and the specific nature of the project. For larger projects, or those involving complex works, it may be prudent to consider the protective measures as part of an overall heritage impact assessment, which can establish the potential impact of both the works and associated protection on the special interest of the historic building and its environment.

Development of the project design should be preceded by a detailed preliminary assessment of the extent and condition of the paintings, and there should be input from a wall painting conservator regarding the design, implementation and monitoring of the protective system.

Protection can be largely divided into two main types – indirect or passive, and direct – and it is likely that elements of both will be useful for most projects. Importantly, there should always be an attempt to minimise any invasive measures, as these are in themselves potentially damaging to the building and its decoration.

## Indirect measures

### **Awareness of the wall paintings**

To avoid inadvertent damage or loss, all parties involved must be made aware of the presence and importance of any wall paintings and the need for their care and protection. The preliminary documentation prepared by the conservator should be made easily accessible to anyone working on site, and it may be useful to provide verbal instructions about any necessary precautions. In addition to the agreed programme of monitoring and supervision, it can be useful to install displays or signs that clearly identify and warn of the presence of historic wall paintings or other significant surfaces, along with instructions to avoid causing vibration or mechanical interference.

### **Project design**

Many of the risks involved with building works can be minimised through the careful review and assessment of the specific methods and materials proposed. It is the role of the wall painting conservator to determine the best methods for conserving the wall paintings, including ensuring their protection. His or her recommendations need to be integrated through discussion with the other building professionals – including the architect, works supervisor and the client – to identify the safest approach. The implementation of a ‘watching brief’ may also be useful to monitor or regulate working methods during the project, which might determine that additional measures are needed, such as introducing extraction equipment to control dust and dirt levels and discouraging the use of temporary heating systems or dehumidifiers.

### **Controlling access during works**

Rooms containing wall paintings that do not form part of the building works should be closed-off if possible. Where access through a decorated space is necessary, physical barriers should be installed to prevent direct contact with the paintings, and depending on the circumstances, additional direct protection may be required.

### **Care with scaffolding**

Scaffolding is one of the most risky aspects of the building works and requires careful planning and supervision to avoid damaging wall paintings through physical contact and abrasion. In addition to conforming with health and safety requirements, it is essential that the design of any scaffolding is carefully reviewed and that both the installation and

dismantling are properly supervised by a wall painting conservator or informed site manager. Specifications should stipulate that scaffolding poles and boards must be clean and dry to avoid added dust and moisture. Particular attention must be paid to ensure that poles are completely clear of walls, and that ladders are never leant against vulnerable surfaces.

### **Containment of the works**

In situations where the work is localised, or at some distance from the painted decoration, it may be possible to introduce measures that can reduce the spread of materials and dust beyond the works area. This could include the wrapping of scaffolding, installation of boarding or enclosures to contain supplies or reduce the chance of spillage, and the use of deflection boards. Extraction equipment or the use of dust bags on tools can also be used to reduce levels of dirt deposition.

## **Direct protection methods**

Most of the indirect methods of protection serve to mitigate the damage to wall paintings during the works, however; this may not always offer adequate protection from certain activities, and more direct physical protection may be required. When necessary, these forms of protection can themselves pose risks to the safety of the decoration, and will require more direct involvement from the wall painting conservator.

### **Emergency stabilisation**

The conservator may determine during his/her assessment that the condition of the wall paintings is not sufficient to withstand the building works without some emergency conservation. Treatment should be minimal, necessary and only what is required, although complete conservation may be deemed the only feasible option. Where complete treatment is not desirable, such as when its efficacy may be affected by the building works, emergency conservation needs to ensure that the wall paintings are stable enough for the safe installation of any required protection. A wall painting conservator must undertake this specialist work.

### **Installation of protective materials adjacent to the wall paintings**

To reduce exposure to dust and debris, and deflect liquid materials away from the wall paintings, protective materials can be secured at a distance from the surface. Selection of a suitable material, and its distance away from the surface, will need to be based on a set of agreed performance criteria. These will depend on the specific nature of the decoration, and the proposed building works, and could include any combination of the following:

- flexibility/rigidity
- impact resistance
- weight
- transparency
- liquid water and water vapour permeability
- water retention properties
- fire retardant properties
- costs and availability

The extent to which the protection is sealed to avoid dust will affect the degree of change to the microclimate directly adjacent to the wall paintings. A risk assessment should be made by the conservator regarding the duration of the project, the protection system proposed, and the existing environmental conditions.

It may be difficult to secure the protective sheeting in place adequately and safely, especially when it is not possible to attach fixings to any elements of the historic fabric. In these instances, freestanding or supporting devices may need to be considered. For this type of protection, it is essential that the covering material is not allowed to come into direct contact with the painted surface, and that the system is secured against inadvertent physical contact.

When there is a risk of more substantial debris, such as falling plaster or masonry, or there is extensive exposure to the exterior, it may be necessary to consider a more secure system of protection, using solid materials. The incorporation of access points, such as hinged panels, is useful for monitoring condition during the project, and may be necessary if the enclosure is left in place for some time. When considering the installation of protective coverings, it is important to evaluate the likelihood of creating an adverse microclimate between the enclosure and the protected surfaces.

Installation of any of these protective systems will pose risks and should be closely supervised by a wall painting conservator.

### **Protective facings**

Facing materials can be applied directly to all or part of the surface to protect the paint and plaster layers. However, the application of facing materials, and their subsequent removal, must only be carried out by a specialist wall painting conservator, following a risk assessment to the paintings. Although such a method can provide effective temporary protection, the facing material can become strongly adhered to the surface over time and therefore more difficult to remove, risking damage to the painting. Facing is too often considered a routine intervention for the protection of wall paintings. Such an invasive technique should however only be reserved for situations where it is considered essential by the wall painting conservator advising on the project.

# Implementation and essential procedures

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The successful implementation of protection for wall paintings within any programme of building works is dependent upon maintaining appropriate communication and collaboration between all parties involved in the project, and ensuring that their roles are defined and understood. Moreover, this must be established early in the planning stages, along with recognition of the associated costs. As has been stressed throughout this leaflet, there must be an awareness of the need for appropriate continued involvement from the conservator throughout the works programme. Depending on the scale and complexity of the project, allowances may need to be made for inspection and adaptation of the protection as the project progresses.

For larger projects, the following is a sequence of the key actions that would form part of a building works programme involving wall paintings:

- preliminary examination of the site by a wall painting conservator to establish the survival, extent, significance, and condition of any wall paintings or historic surfaces
- if required, planning a meeting with conservator, client, site architect or conservation professional responsible for coordination of works to review proposed works
- undertake risk assessment to wall paintings and agree recording and documentation requirements
- assess all components of the building programme which may impact detrimentally on the paintings in the future
- determine emergency conservation requirements
- agree the appropriate protection measures
- devise a schedule of works, including the identification of components requiring specialist supervision or monitoring (the 'watching brief')
- undertake any necessary recording and emergency conservation work in preparation for the building works
- implementation of protection, including agreed preventive measures, schedule of specialist supervision of site work, and installation of any agreed protection
- inspection and/or monitoring of the project, the protective system, and wall paintings depending on the duration or type of works
- removal of protective system by a wall painting conservator, or under his/her direct supervision, along with works-related materials and equipment that may pose risks to the wall paintings
- re-examination / inspection of the wall paintings to assess their condition after completion of the works, and before the final certificate has been signed, and before the production of any conservation proposals and long-term recommendations



## Acknowledgements

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Adrian Heritage/Robert Gowing  
Building Conservation and Research Team  
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**Authors:** Adrian Heritage and Robert Gowing,  
English Heritage Building Conservation and  
Research Team

**Editor:** Margaret Wood, English Heritage  
Academic and Specialist Publications Branch

**Designer:** Clifford Manlow, English Heritage  
Publications and Design Department

**Printer:** Arkle Print, Northampton

## Further information

English Heritage is the government's statutory advisor on archaeology and the management of the historic environment in England. Further information can be obtained from:

### **English Heritage**

23 Savile Row  
London W1S 2ET  
Telephone: 020 7973 3000

### **National Monuments Record Centre**

Kemble Drive  
Swindon SN2 2GZ  
Telephone: 0870 333 1181

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We also have nine regional teams. In addition to the London regional team, at the London address above, regional teams can be contacted at:

### **South East**

Eastgate Court  
195–205 High Street  
Guildford GU1 3EH  
Telephone: 01483 252000

### **South West**

29/30 Queen Square  
Bristol BS1 4ND  
Telephone: 0117 975 0700

### **East of England**

62/74 Burleigh Street  
Cambridge CB1 1DJ  
Telephone: 01223 582700

### **West Midlands**

112 Colmore Row  
Birmingham B3 3AG  
Telephone: 0121 625 6820

### **East Midlands**

East Midlands  
44 Derngate  
Northampton NN1 1UH  
Telephone: 01604 735400

### **North East**

Bessie Surtees House  
41–44 Sandhill  
Newcastle upon Tyne NE1 3JF  
Telephone: 0191 269 1200

### **North West**

Suites 3.3 and 3.4  
Canada House  
3 Chepstow Street  
Manchester M1 5FW  
Telephone: 0161 242 1400

### **Yorkshire**

37 Tanner Row  
York YO1 6WP  
Telephone: 01904 601901

