



# Conservation Principles for Heritage Forged & Cast Ironwork

## Endorsing Organisations:



## **INTRODUCTION**

The National Heritage Ironwork Group (NHIG) was formed in 2009 to raise awareness and understanding of the importance of the various forms of heritage ironwork in the historic environment, as opposed to other types of fabrication which involve different skills and techniques.

All heritage forged and cast ironwork is an integral part of the historic environment, both in terms of functional parts and decorative elements.

To ensure that the skills of the Heritage Ironworker and Blacksmith are recognised, preserved and promoted, the NHIG intend to set up a nationally accredited training and development programme.

It is the duty of all professionals and practitioners to promote good conservation practice in order to safeguard the long term survival and integrity of heritage ironwork. This document has been developed to enable blacksmiths to uphold best practice in the care and conservation of heritage ironwork, and to be shared with clients in the commissioning process.

The following principles have been endorsed by the membership of the NHIG and leading conservation organizations as set out in Appendix B, and have been peer reviewed.

### **Core Principles:**

- **To analyse, understand and assess the significance of the object prior to undertaking any decisions regarding intervention.**
- **To record the object as found and at all stages of work.**
- **To care for and maintain the object to halt or minimise ongoing deterioration.**
- **To retain maximum original / existing material.**
- **Interventions should be reversible, but where this is impossible, interventions must respect the significance of the object.**
- **Professionals and practitioners must be competent in ironwork conservation and source specific expertise where needed.**

# Good Practice

## 1. Consideration and understanding of significance

This is fundamental to the practical application of our Core Principles.

**Significance** is the historic, aesthetic, technological or social value for past, present or future generations in terms of:

- Age.
- Uniqueness of design, scale, materials, etc. when originally made.
- Rarity as a survivor of its type.
- Example of past style, design, innovation, use of materials, constructional practice, etc.
- Association with people, places or events.
- Contribution to its setting or context.
- Spiritual, political, or cultural significance.
- Exceptional aesthetic qualities of form, colour, decoration, etc. and the contribution made to the immediate environment or landscape.
- Condition, extent of the original material and ability to perform its function.

## 2. Retention of as much existing material as possible

This is a fundamental requirement of conservation work and takes priority over cost, serviceability and aesthetics.

The following increasing degrees of intervention should be followed:

- 1) Minimal intervention or alteration of existing material, form and evidence.
- 2) Minimal disturbance, with work carried out in-situ where practical.
- 3) Stabilization (eg. propping, improving the environment, removal of rust and similar holding operations).
- 4) Strengthening where structurally inadequate.
- 5) Restoration should only be undertaken where all other options have been discounted.

If all options for treatment of the original have been exhausted an object may be retired and archived, and only then may new or replica elements be considered.

Wasted, holed and cracked components must be repaired by patching or reinforcing in preference to being renewed. Fastenings must be repaired and re-used where possible.

Non-reversible techniques may be used only where this is unavoidable, to allow retention of a component or assembly of greater significance.

## 3. Use of techniques and materials as originally used

Details of the original materials and techniques used should be identified and preferably adopted for new parts. However, if the original type, section, or grade of material is permanently unobtainable, or service requirements make

its use inappropriate, the material with the nearest physical properties may be used.

Decisions on the use of materials and techniques must at all times respect the principles of minimal intrusion and loss of evidence.

- New components should exactly replicate the method of construction, form and detail of originals, including joint and fixing details, and should be identified by discreet date stamps where possible.
- Castings should be replicated in the same method and grade as originals and cast in sand moulds using originals as patterns where possible.
- Fixings should be by the method and material used originally where possible.
- The recipe of bedding and 'rust-joint' compounds must be analysed and re-used wherever possible.

#### **4. New material should be identifiable**

The name of the Conservator and the date of the work should be identified on replacement components where practical.

For example:

- By stamping onto replacement forged components.
- By raised lettering and numerals on new castings.
- By use of brazing to distinguish a new patch from original wrought iron.

This information must also be recorded in conservation records.

#### **5. Parts and materials that cannot be re-used**

Components, including wasted / rusted fragments, and samples of original materials that cannot be retained in use, must be stored in a secure and stable environment, preferably close to where they originated. Where possible entire parts should be stored; otherwise good representative samples.

The original location of stored items must be identified by individual tags or labels, and full details included in the conservation record.

#### **6. Improvement of immediate environment**

Where practicable, the environment of historic ironwork should be improved by protection from the elements, covering, coating, packing, dehumidification, reduction of pollutants, control / removal of vegetation, debris etc, and by measures to prevent de-stabilisation or theft.

#### **7. Relocation to a less destructive environment**

Historic ironwork should be retained in its original location, protected from damage, deterioration and theft.

If, after extensive efforts at preservation in situ it is generally agreed that relocation is the only practical means of ensuring medium-term survival, ironwork and its context should be recorded fully, fixings carefully released, and ironwork moved as short a distance as practicable to stable and secure conditions by skilled operatives.

Ironwork should be moved in sections as large as practicable with minimal dis-assembly. Components must be tagged, recorded and reassembled fully at the new location without delay.

All stages of the work should be recorded fully and records archived.

## **8. Protection of surfaces**

The corrosion of surfaces is a threat to the survival of ironwork in an exposed environment. Surface coatings were commonly used and are historically important, so past coatings should be retained if sound, and localized defects made good where possible.

Paint samples should be taken and analyzed before any intrusive work takes place, and samples should be retained as part of the conservation record.

In general the original type and colour of coating should be used. However, if difficult access or severe conditions make it unlikely that the medium-term preservation of historic ironwork will be achieved using traditional paints, a modern substitute may be used, preferably retaining existing coatings in full or part if sound. Past finish colour, decoration and level of sheen should be adopted.

Where removal of existing coatings is unavoidable, only techniques that minimise the risk to the surfaces may be used. The least intrusive/risky cleaning method consistent with achieving a stable, clean surface should be selected.

Soundly adhering forge-scale on wrought ironwork, foundry scale on castings and surface evidence generally should be retained where possible.

Paints must be applied in accordance with the manufacturer's instructions by skilled operatives. Where modern-specification paint is applied over a traditional paint, adhesion and stability should be tested by sample areas left to weather over several months.

## **9. Use of additional materials or structure for strength or support**

Where ironwork is weakened or subject to increased stresses that cannot be relieved, structures may be strengthened by applying additional props, stays, ties or materials bonded on. These should be minimally intrusive and reversible where possible.

Care must be taken to avoid water traps and damaging point-loads where the new structure fixes to the original. Stiffening flexible structures and changing stress regimes in a way potentially damaging to the ironwork must be avoided.

## **10. Use of replicas**

In exceptional circumstances use of replicas may be considered, for example where ironwork is subject to wear, or is at risk of serious damage and corrosion or theft, its on-going preservation may best be achieved by creating a replica, and retiring the original from service.

This must not be promoted if it is liable to result in the care and maintenance of the original being neglected.

A replica must remain distinguishable from the original after it has aged or weathered, so may need to be stamped or signed and dated with the new installation date. Replicas are of particular value where service-requirements have increased, compromising the integrity or safety of the original object or originals are missing.

## **11. Planned maintenance**

Maintenance is vital to minimise the rate of deterioration of historic materials, and should be:

- Planned to allow advance allocation of resources.
- Regular, so that it is not forgotten.
- Adequately funded.
- Thorough and effective.

The long term preservation of ironwork can only be achieved through regular and thorough inspection by competent practitioners.

A condition survey should be undertaken to:

- Identify present and potential deterioration, damage and loss.
- Recommend a course of action.
- Facilitate the budgeting and carrying out of maintenance and conservation work.

Inspection and maintenance should include:

### **ANNUALLY**

- Thoroughly inspect all ironwork for defective coatings, corrosion, discolouration, damage, distortion, instability, build up of water, dirt, debris and biological matter.
- Remove dirt, debris and biological matter.
- Clear hopper-heads, rainwater pipes, drains, etc.
- Clean local defects in coatings, fill as necessary, prime and re-coat.
- Fill water-traps and joints, ensure interiors are drained and ventilated.
- Record the work carried out and materials used, archive the records.

### **EVERY FIVE YEARS**

- As ANNUALLY, and;
- Carefully inspect, prepare and re-coat the object if necessary.
- Record the work carried out and materials used, archive the records.

### **LONGER TERM**

In the long term more intrusive work may be required including repairs to components and removal of accumulated coatings. Advance warning of this should be given to the ironwork's owner / guardian.

## **12. Selection and proper training of suitable practitioners**

Craftspeople, managers and professionals must be competent in the theory and practice of ironwork conservation and have good knowledge of:

- Core principles and good practice in conservation.
- The properties and uses of historic and contemporary materials.
- The manufacture, designs and applications of traditional metals and associated materials.
- Historic ironworkers and the designs / techniques they used and design history of the period.
- The mechanism of corrosion and methods of controlling it.
- Repair and conservation techniques.
- Coating / finishing traditional ironwork.

Practitioners must continually update their knowledge and understanding of best conservation practice.

## **13. Detailed recording**

An historic object, and all work to it, must be recorded before, during and after conservation to enable our successors to:

- Understand the object's history prior to our intervention.
- Understand its current condition.
- Understand the changes we implement.
- Understand the nature and rate of deterioration the object is subject to over a long period.
- Make wise and informed decisions on the on-going care of the object.

Photographs and sketches supported by notes and dimensions are recommended as quick and effective methods of recording.

Records are to be stored in a registered archive such as the County Records Office, or the registered archive of the organisation commissioning the work. Records are of no value if they deteriorate or are lost, so must be stored securely in stable conditions, preferably close to the object to which they refer.

Technology advances and digital records may become difficult to read, so should be backed up by paper, the most long-lived recording technology to date.

## **14. Comprehensive written maintenance schedules and operation guidelines**

These are needed to:

- Facilitate planned maintenance (see Clause 11).
- Minimise the potential deterioration and damage to historic ironwork.
- Minimise the danger to those who use or come into contact with the ironwork.

## **15. Specification of all stages of work in accordance with good conservation practice**

Specifications, drawings and schedules of work define the scope and standard of work required and provide a basis for payment. Documents forming the basis of a contract must be:

- Based on good ironwork conservation principles and practice.
- Sufficiently detailed to avoid misunderstandings.
- Supported by adequate funding and terms of contract.
- Based on adequate knowledge of current condition.

If the current condition of ironwork or the scope of conservation work is not fully known, a preliminary survey at the Client's expense may be needed. It is the responsibility of the conservation specialist to highlight this need.

Inadequate specifications risk damage being done to the ironwork and strained contractual relations between employer and ironworker.

Clients would be wise to allow for reasonable provision for contingencies.



## Appendix A: Definitions

**Cast iron** is a form of iron whose shape is produced by pouring liquid metal into moulds.

**Conservation** is the careful management of change, ensuring that the significance of an object are understood and protected with minimal loss of evidence, to be enjoyed by present and future generations. Conservation stabilises the object in its existing state, maintaining its materials and slowing deterioration.

**Maintenance** is the periodic inspection and care of an object, with routine attention to defects as they occur.

**Material** is the physical substance of which the object is made, including its surface finish.

**An object** is an historical item which may be anything from a single small detail to a monumental structure.

**Pure iron** is pure metallic iron with traces of carbon, manganese and other elements.

**Restoration** is returning the object to a known earlier state with minimal introduction of new material.

**Stabilisation** is the prevention of on-going degradation by removal of, or protection from, adverse conditions.

**Stainless steel** is a form of iron with alloying elements to provide some degree of resistance to corrosion.

**Steel** is a highly refined alloy of iron and carbon, commonly available for structural purposes from the late nineteenth century.

**Strengthening** means providing structural adequacy.

**Wrought iron** is a mixture of iron and slags produced by direct reduction in a charcoal furnace or by puddling in a reverberatory furnace.

**Wrought ironwork** refers to decorative objects made by a Blacksmith.