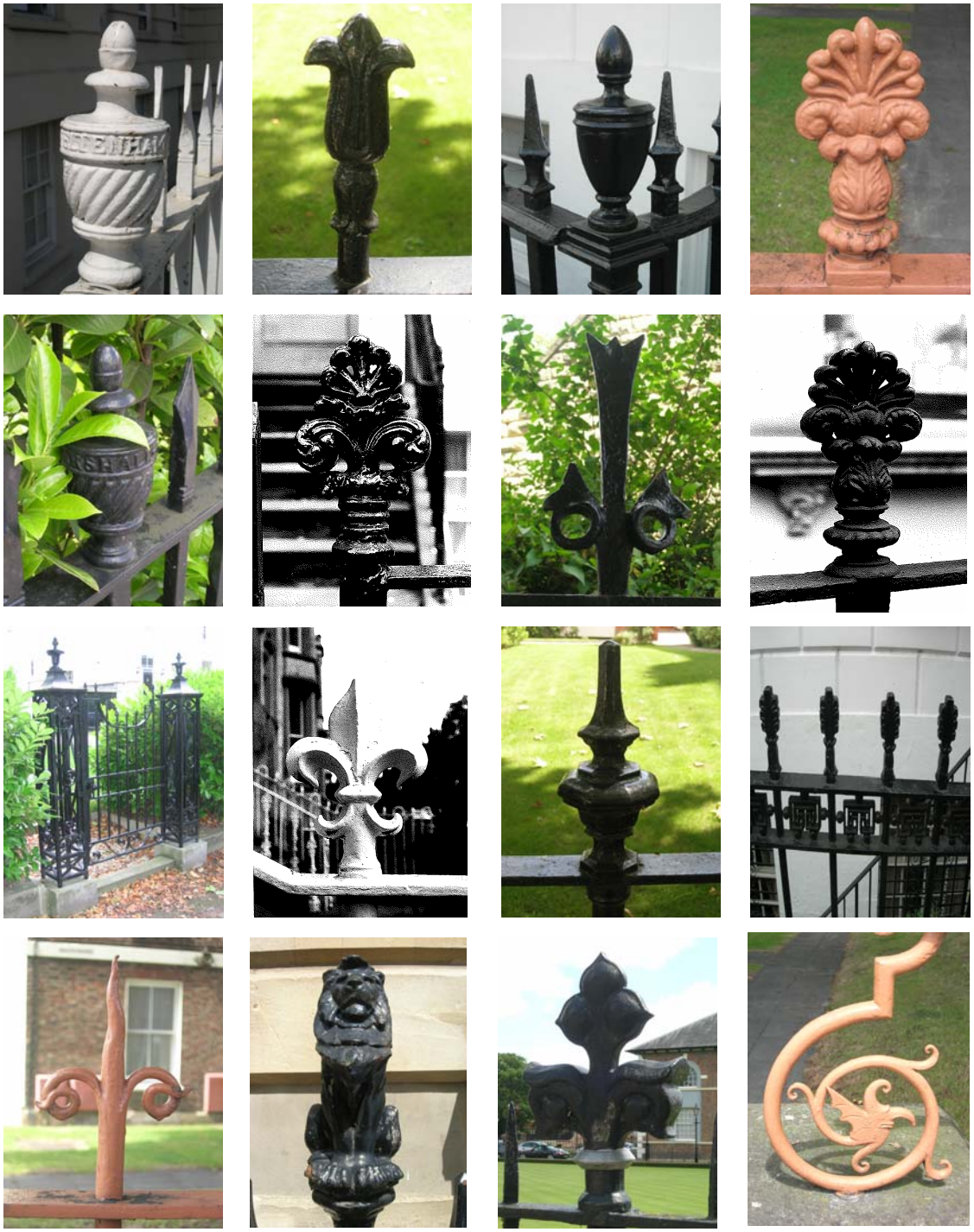
The Conservation and Renewal of Historic Ironwork



CHELTENHAM
BOROUGH COUNCIL

Built Environment Division

This leaflet provides design advice to property owners and those seeking to either repair or reinstate traditionally designed railings on properties. It provides a brief history of railings, advises on best methods to maintain historic ironwork; analyses the materials and characteristics of various types of railing and looks at historic examples of ironwork within Cheltenham. It is essential reading for building owners, architects and others who are responsible for the care of historic buildings.

1) INTRODUCTION

This leaflet provides guidance on the design, construction, installation and maintenance of historic and traditionally designed ironwork, with a particular emphasis on boundary railings. It is designed to be a useful reference source for those wishing to repair or reinstate historic and traditionally designed railings.

Historic railings and gates dating from the 19th century are predominantly found on the front boundary of 19th century terraces and houses in Cheltenham.

2) BACKGROUND

Railings form a key component in establishing the historic setting of buildings. They provide a traditional and attractive form of boundary enclosure. Railings largely contribute to the character of historic buildings and usually form part of their curtilage. In the case of listed buildings, these railings are curtilage listed structures, which have the same protection as listed buildings. However, many railings are also listed in their own right due to their historic and architectural interest.

Boundary railings act as an important element in the street scene, which separate public and private space. They emphasise the principles of composition, such as symmetry, hierarchy and uniformity in the design of terraces and the appearance of streets and whole areas. The retention of period features such as gates and railings enhance the appearance and value of historic buildings. A recent survey of estate agents carried out by English Heritage revealed that 82% felt that original features tended to add financial value to properties and 78% felt that they helped a property to sell more quickly. Railings also establish an element of continuity which often characterises whole streets and areas of the same period, style, or historic development. They provide rhythm within the street scene and help form consistency and a relationship between buildings.

Within Cheltenham, railings and other ornamental ironwork are one of the most important elements of the town's historic architecture and townscape. Referring to Cheltenham's ironwork, Amina Chatwin states that *"No other town in the country seems to have such a wealth and variety of ironwork."*[1]

Across the country, many wrought and cast iron railings were removed for scrap during the Second World War. There is evidence throughout Cheltenham of the loss of historic railings. The majority of these have failed to be replaced or have been replaced with frequently inappropriate and untraditional boundary treatments such as timber fencing.

3) DESIGN ADVICE

Cheltenham Borough Council requires that all new and replacement railings are designed appropriately, in order to preserve or enhance the historic character of buildings and the townscape overall.

<u>New and replacement railings: some points to consider</u>:

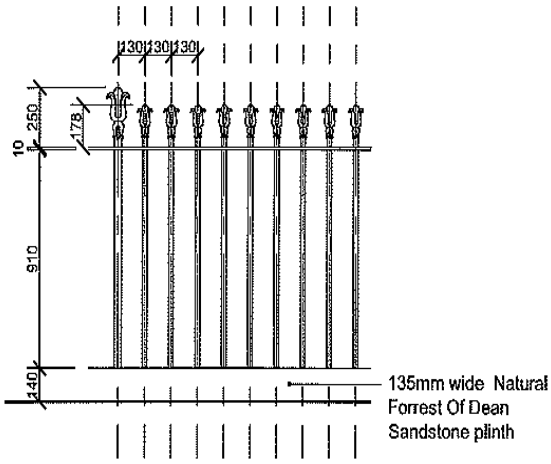
- It is important that new and replacement railings are designed accurately to complement the historic buildings. Where possible, the same design and material of the original railings should be used to produce an accurate copy. Where none of the original railings exist, it is advisable to closely examine original railings or similar buildings in the same or nearby streets, to give an indication of the

[1] Chatwin, A. <u>Cheltenham's Ornamental Ironwork</u> pg. 8

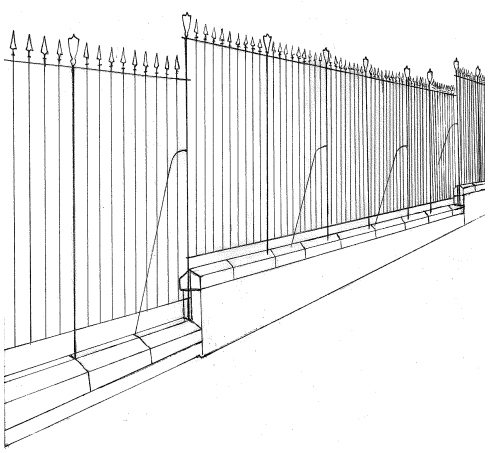
original design;

- The age and design of the historic building should be considered, where railings are to be introduced, to ensure the design of the railings is authentic;
- As a general rule, the height of the front boundary enclosure should reflect the scale of the building;
- When reinstating new railings, their correct proportion and detailing is particularly important to consider. Vertical bars should be individually set into the stone plinth. Most original railing designs have all the vertical bars set individually into pre-drilled holes in the top of the plinth;
- The plinth should be Forest of Dean sandstone and uniform grey in colour;
- Critical to the appearance of the railings (and the building to which they belong) is the spacing of the bars. This is determined mainly by the railing finials which should be appropriately spaced from each other, and by the width of the bars. As a general indication of the spacing, bars should be approximately 140mm apart (between centres) if they are approximately 25mm thick (this should always be adjusted to individual designs);
- A horizontal bottom rail is not acceptable. Railings must be individually set into the plinth with a molten lead socket;
- The plinth should be approximately 250 to 300mm in height and at least 150mm wide;
- Most plinths should not have chamfered shoulders, although where the proposed design of railings is of a 19th century replica Gothic Revival then the plinth is chamfered;
- The type and size of the railing finials and other individual features of replacement railings needs to be carefully considered;
- The type/method of construction and fixing needs to be carefully considered;
- Standards, usually with back stays are often of a wider section than the vertical bars and frequently have a different or larger finial;
- Railings should be on average 1.1 to 1.2 metres in height;
- Railings should be cast or wrought iron; however mild steel railings are acceptable in some circumstances. Each application will be judged on its own, individual merits;
- The railings and plinth should follow the slope of the road and not be stepped;
- The most appropriate colour for railings (including finials) to be painted is black, although sometimes green is suitable;
- For new replacement railings to replace existing railings on listed buildings, listed building consent will normally be required. However the preferred option is for the historic railings to be repaired rather than replaced. Please contact the Conservation Team to see if you will need listed building consent prior to carrying out any works. Before determining applications involving existing historic railings, the local authority may require a specialist's report to confirm the type of metal, the condition of the existing railings and the necessity for their total replacement. It is advisable that the type of metal is the same as that used originally.

Good example of replacement railings, with tulip bud and urn finials set in Forest of Dean sandstone plinth. Railings are located outside Summerfield House, Bayshill Road.



Good example of replacement railings with tulip bud finials set in Forest of Dean sandstone plinth, outside The Limes, Bayshill Road.



Poor example of replacement railings with inappropriate stepped and chamfered plinth and railings set into bottom rail rather than individually set into plinth. Where the ground slopes the plinth and railings should not be stepped, but should follow the line of the slope.

4) LEGISLATION

The main statutory planning provisions affecting boundary treatments including railings are contained in:

The Town and Country Planning Act 1990, in respect of the requirements for Planning Permission.

The Planning (Listed Buildings and Conservation Areas) Act 1990, in respect of the works affecting Listed Buildings and buildings in Conservation Areas, and dealing with requirements for Listed Building Consent and Conservation Area Consent.

The Town and Country Planning (General Permitted Development) Order 1995. This Order deals with types of development which can be carried out without requiring planning permission.

The Town and Country Planning (General Permitted Development) (Amendment) (No. 2) (England) Order 2008. Amendments to the Order which deals with types of development which can be carried out without requiring planning permission.

Planning permission

Planning permission is required for the construction of any boundary treatment (i.e. gate, fence or wall) which is over 1 metre in height and next to a public highway, or over 2 metres in height elsewhere, or is anywhere on the boundary of the site of a listed building. For further advice, please contact the Planning department on 01242 264328.

Listed buildings

Listed building consent is required for any repairs or alterations which would affect the character of a listed building. Walls, railings, gates and boundary treatments which physically touch a listed building are also listed at the same grade as the building. Some original boundary treatments are listed in their own right. Consent would be required for their alteration or removal. Boundary treatments within the grounds of listed buildings which form part of the curtilage and have done so since before 1st July 1948 are curtilage listed and listed at the same grade as the building. They would require listed building consent for their alteration/removal. Please note that it is a criminal offence to carry out any works to listed buildings without obtaining listed building consent prior to works.

Walls, railings, gates or other means of enclosure are usually important elements of a listed building and its setting. It is usually inappropriate to remove them and alterations should be very carefully considered.

Locally listed buildings

Cheltenham Borough Council's Index of Buildings of Local Interest contains buildings and structures which are locally important to the town but which are not worthy of statutory listing. They are protected by a Supplementary Planning Document. Although there are no extra planning controls for locally indexed buildings, alterations should be considered in the same way as works to listed buildings. Their boundary treatments may often be historic and form an important element of the building and its setting. The removal, alteration or reinstatement of boundary treatments may require planning or conservation area consent as appropriate. It is essential to check with the planning department whether you will need any permissions prior to carrying out works.

Conservation areas

For unlisted buildings located within conservation areas, the substantial or total removal or demolition of any buildings or structures requires Conservation Area Consent. This includes the removal of any boundary treatments. Planning permission and conservation area consent will normally be refused for proposals which would harm the character or appearance of a conservation area.

Relevant Local Plan policies

Policy BE 5 – Boundary enclosures in Conservation Areas

In conservation areas:

a) boundary enclosures should be preserved in their original form; and

b) new enclosures should be in a historically appropriate form.

Policy CP 3 – Sustainable Environment

Development will be permitted only where it would:

a) not harm the setting of Cheltenham, including views into or out of areas of acknowledged importance; and

b) not harm landscape character; and

c) conserve or enhance the best of the built and natural environments; and

d) safeguard and promote biodiversity; and

e) not give rise to harmful levels of pollution to land, air or water (surface or ground); and

f) minimise the risk of flooding.

5) MATERIALS AND CHARACTERISTICS OF RAILINGS

Wrought iron, cast iron and mild steel

In broad historical succession, three main types of metal were used for the construction of railings – wrought iron, cast iron, mild steel.

Characteristics of wrought iron railings often have a hand-beaten or rolled surface. They are shaped by hand and because of the fibrous structure of wrought iron, these railings are found in a wide variety of designs with members of varying thickness and elegant forms, often depicting foliage or other 'free' natural themes.

Due to the specific craft skills involved in its working, slight variations of pattern and design are typical.

Examples of wrought ironwork in Cheltenham can be found on the gates to St Mary's Mission on the High Street, No. 79 Bath Road, Wellington Lodge on Wellington Square, Nos. 13 to 27 and 29 to 57 St George's Road and St Margaret's Terrace on St Margaret's Road.

Characteristics of cast iron railings are usually more massive in appearance and more repetitive in design and construction. They frequently have heavy uprights with arrowhead finials. Mould (seam) lines are usually visible on cast iron sets. The surface of a cast iron member will usually reveal blow holes, casting flows or 'inclusions'. The connections between cast iron sections are usually simple sockets, spigots and wrought iron bolts.

Cast iron railings invariably have the characteristic of mass production and mechanical repetition. Because the pattern can be re-used, designs often tend to be composed of repeating, identical sections.

Examples of cast ironwork in Cheltenham can be found on Royal Parade on Bayshill Road, Nos. 15 and 17 Rodney Road, Oriel Terrace and Columbia Place on Winchcombe Street.

Characteristics of mild steel railings have a very smooth finished texture and the colour of unpainted metal is normally a homogenous ash-grey.

Differences between wrought and cast iron

The differences in the method of production result in the very different properties of wrought iron and cast iron. Through the process of becoming molten, cast iron has a much higher carbon content than wrought iron. Wrought iron is highly malleable and can be bent, twisted, split, cut or welded. Whereas cast iron is highly brittle. It cannot be twisted and is very difficult to weld. Having been cast it can only be re-worked by being re-melted. Cast iron is also more susceptible to rust than wrought iron. Cast iron cannot produce the delicacy of much scrolling wrought ironwork.

Properties of wrought iron

Wrought iron is a relatively soft metal. When heated it becomes pliable and is easily hammered into shape.

Properties of cast iron

Cast iron was largely used for decorative purposes, which, in the Victorian period, was very commonplace. The rapid growth of the architectural cast iron industry coincided with the steady development of more elaborate tastes and designs in the second half of the 19th century.

Cast iron is vulnerable to corrosion and is renowned for its brittleness. Proper maintenance, involving regular painting with an appropriate material, can ensure that the iron is completely isolated from damaging elements.

As a material, cast iron is weak in tension and strong in compression. It has a fine-grained texture which makes it very easy to cast. Under extensive tension, cast iron members break, with very little prior distortion.

Properties of mild steel

The most obvious visual characteristic of mild steel is its very smooth texture. It does not lend itself so readily to welding in the fire, compared with wrought iron. Mild steel is more prone to rust than wrought iron. Mild steel bars tend to be used in standard section sizes which results in a uniform appearance which lacks the character of early, hand forged bar work.

6) HISTORY OF RAILINGS

Ironwork became an essential element of Georgian and Victorian architectural styles. The functional purpose of railings was to mark property boundaries and provide security.

History of the use of ironwork

In the terraces and squares of Georgian and early Victorian towns, ironwork was a key component of the architecture of the terrace. Its repeated use on a street frontage unified the terrace, making an architectural whole from a number of individual houses. It provided rhythm along with the few other repeated elements such as windows, doors and fanlights. The ironwork typically took the form of 'area railings' (enclosing the boundary and open spaces in front of the basement rooms at street level), the railings on each side of the steps leading to the front entrance, and the balustrades of the first floor balconies. Wrought iron was increasingly replaced by cast iron because it could be produced in identical form by the yard.

The late 19th century saw the return of wrought iron rather than cast iron as the material for fashionable railings. This was particularly a reaction to what was produced during the Industrial Revolution. The return to the use of wrought iron was encouraged by William Morris and the Arts and Crafts movement, which favoured the individually crafted product of the smith over the product of industrial mechanisation and mass production.

Wrought iron

Most early railings (late 17th century) were made of wrought iron; this is iron in an almost pure form, with less than 1% carbon content. Until the middle of the 18th century, wrought iron railings were plain spiked bars supported by a plan top rail. The only ornaments on them were the finials on the structural standards.

Cast iron

At the end of the 18th century, the extensive use of cast iron made the design

of railings for domestic buildings more formal, but at the same time more standardised and repetitive. Stylised ornamental patterns were used extensively, secondary low bars, forming decorative patterns were introduced between the main bars ('dog bars'). Structural elements, such as 'dog-leg' brackets and wall supports became more elaborate.

The peak of the production and use of cast iron came with the Industrial Revolution.

Mild steel railings

Mild steel was used extensively for the manufacturing of domestic railings in the last part of the 19th century and is currently in use for the production of replica replacement railings.

7) LOCAL CONTEXT

Cheltenham has a large variety of ornamental ironwork, from boundary railings, to gates, verandahs and balconies.

The design of Cheltenham's ironwork has been strongly influenced by Neo-Classical design, particularly in the latter half of the 18th century. Neo-Classicism attempted to return to a simplistic and pure form of design from the highly rich and decorative baroque and rococo designs of the 17th to late 18th century.

Amina Chatwin has written a useful and detailed guide to Cheltenham's ironwork, entitled 'Cheltenham's Ornamental Ironwork.' The guide looks at different examples and designs of ironwork throughout the town from various periods and studies the ironmongers involved in designing this ironwork. Amina Chatwin states that *"No other town in the country seems to have such a wealth and variety of ironwork."* [2]

The Heart and Honeysuckle pattern was a popular design in balconies and verandahs of buildings dating from around the 1820s. The name strongly associated with this pattern is that of W. Wheeler. The Heart and Honeysuckle panels were used on the earliest houses to be built in Lansdown Place. This design can be also be found on Cambray Place and Oriel Terrace.

The early 1830s saw the introduction of the Anthemion or Honeysuckle flowers made by heat welding wrought scrolls together. This design can also be found on the 1st floor verandahs to Nos. 2-34 Evesham Road and the east and north sides of Imperial Square. The heart and honeysuckle design comprises of two hearts pointing inwards to the centre of the panel with anthemion or honeysuckle flowers on either side. The last terrace in the town to use Heart and Honeysuckle was Queen's Parade in 1840-44. Although it was cast the Heart and Honeysuckle design followed the wrought tradition.

Front boundary railings in Cheltenham tend to have spear-heads. Finials tend to be urns or anthemion. There are frequently anthemion to the stanchions, which are the vertical supports and there are supporting dog bars.

Cheltenham's ornamental ironwork was produced with either wrought iron or cast iron. The iron came from the Forest of Dean and South Wales. The River Severn provided an important transport link between the Forest of Dean, Gloucester and Cheltenham before the arrival of the railways.

The ironwork was either completely cast, or wrought by hand throughout, or drop-forged and hand finished. Amina Chatwin explains the difference between wrought and cast iron, by stating that: *"Whereas cast (iron) panels can be reproduced without variation, wrought iron panels are individually made by craftsmen, and even when the design aims to be symmetrical the human element will out and show itself."*[3]

The type, design and level of ironwork on a building frequently reflects its status, importance, use, and historic and architectural interest. Front boundary railings are often simple in design and provide a function, by offering security and a distinctive boundary to the curtilage of properties. Although front boundary

[2] Chatwin, A. Cheltenham's Ornamental Ironwork pg. 6

[3] Chatwin, A. Cheltenham's Ornamental Ironwork pg. 13

railings are frequently simple, gates would often be more elaborately designed with great attention to detail. Front boundary (area) railings may be more elaborate in design on civic buildings e.g. around some school grounds and churches such as Cheltenham College, Cheltenham Ladies' College, St Gregory's Church, All Saint's Church and St Mary's Mission Hall. Similarly, handrails either side of front boundary steps tend to be simple and functional in design. On some buildings the handrails extend from the area railings, which create continuity in design. Hand rails; however, do not tend to form a key element in the architectural detailing of a building, in comparison with area railings, balconies and verandahs. Iron verandas and balconies are typically more decorative and ornate in design as they form part of the building and contribute to its architectural interest. When viewed from a distance, iron verandahs, balconies and window guards for example, are a very prominent and striking feature on the front elevation of buildings.

Examples of varying designs of ironwork between area railings, handrails and balconies/verandahs

The varying designs and styles of ornamental ironwork on buildings can be clearly seen on the terraces of Cambray Place and Oriel Terrace, for example. The buildings on Cambray Place have spearhead railings with urn and anthemion finials. The anthemion pattern is reflected on the heart and anthemion to the balustrades on the iron verandahs. This repetition creates a unified identity for the terrace by connecting various elements of its detailing. On Oriel Terrace, the first-floor verandahs have Carron Company double heart and anthemion motif to their balconies and the gates to Nos. 1 and 2 have fleur de lys finials and urn finials to the stanchions.

Cambray Place

Oriel Terrace

Where railings have been removed from a terrace or pair of houses, proposals to reinstate railings should carefully replicate the style of existing historic railings, to maintain cohesion along the street frontage. The 'Design Advice' section provides further detail.

Hygeia House, now Vittoria House on Vittoria Walk, provides the earliest accurately dateable ironwork in the town.

The colonnade at the rear of Hygeia House provides the earliest accurately dateable ironwork in the town

There were three main ironmongers and suppliers of ironwork within Cheltenham – Wheeler, Marshall and William Churchill. There were also firms producing ironwork in the town. Marshall also made ironwork, as well as Letheren and H. H. Martyn.

Wheeler supplied the railings and heart and anthemion motif on the verandahs to Nos. 6-11 Cambray Place, and the forecourt and gates to Oriel Terrace, Oriel Road and to the last house in Wellington Street and outside the Masonic Hall on Portland Street and Regent Street.

Marshall supplied the railings outside the Municipal Offices on the Promenade, where his name is stamped on the urn finials. His name can also be found on the urn finials of the area railings outside Oxford Parade on London Road and on the junction of Andover Street and Suffolk Road, outside No. 66 Suffolk Road.

Additionally, Bradley **Worcester** designed the railings outside Royal Crescent, which form part of Cheltenham's early ironwork. He worked in Worcester as an ironmonger from 1807 until at least 1837.

Examples of urns finials on railings in the town, supplied by Marshall

Design of verandas

Verandas were typically constructed from standard cast-iron elements supplied by foundries. The most popular finish was a bronze-green.

Design of balconies

All the early balconies in Cheltenham were simple patterns, mainly built on vertical rods, and enriched with small lead castings of tassels, flowers and stars.

Design of gates

"Early 19th century gateposts were often hollow in form, made of four panels of wrought ironwork, usually with a cast iron top. They can still be seen at 16 and 25 Park Place, and Halsey House, Pittville Lawn. They seem not to have been very strong and few have survived. "[4]

Hollow wrought iron gateposts outside No. 25 Park Place (left) and Halsey House, Pittville Lawn (right)

[4] Chatwin, A. Cheltenham's Ornamental Ironwork pg. 57

8) MAINTENANCE

Repair

Ironwork should be regularly checked for signs of decay. Where railings need to be repaired, it is important to retain as much of the existing fabric as possible. Any replacement material must be the same material as existing.

When a section of railing is defective and beyond repair it should be replaced with a new section of the exact same dimensions and characteristics as the old one and fixed in the same way.

Painting

The primary function of painting is for protection not decoration. Prior to 1861, railings were painted in a variety of colours, which included dark-grey (early 18th century), grey-blue, patinated bronze (late 18th century) and dark green. The universal use of black as a colour only happened as a mark of respect on the death of Prince Albert in 1861. Black became more common in the 19th and 20th centuries. The painting of finials in a different colour to the railings i.e. in silver or gold is inappropriate for railings and gates in Cheltenham. The entire railing, including finial, should be painted in black.

Painting is, in many cases, the best protection that can be given to railings, if it is done regularly and effectively. Correct surface preparation is key to the success or failure of a painting operation. The preparation of a sound surface for painting usually involves one or more of the following: removal of old paint; removal of rust; removal of loose metal flats or 'mill scale'; removal of soluble salts, solidified atmospheric dust and other substances. Corrosion begins at the breaks in the surface of the protective paint and then spreads beneath it. Paintwork on iron should be maintained annually. Old paint and any rust should be completely removed before railings are repainted.

Rusting

There are a variety of paints available that help reduce the risk of rusting. These are epoxy resin based or in the form of red lead or zinc rich undercoats. Specialist advice should be taken prior to painting to ensure correct methods and paint type. Surfaces should be painted carefully, taking care to cover the underside of any ornamentation. All rust and loose debris must be removed before painting. Normally, one metal primer followed by two undercoats and one topcoat is sufficient.

Corrosion

Ironwork suffers from deterioration – the most common forms of deterioration being corrosion, structural damage and poor previous repairs.

Corrosion

Corrosion is the formation of iron oxide (rust) by the reaction of iron with oxygen and water. Prevention of water penetration and retention is, therefore, a vital aspect of rust prevention. The application of paint has long been recognised as the most practical method of protecting iron railings from corrosion. Rusting metal expands, and where metal work is fixed into masonry, rust can cause problems with masonry failure.

Structural Damage

Vandalism or vehicles are the most common cause of structural damage to railings. Wrought iron can absorb considerable physical damage due to its fibrous structure. In contrast, if subjected to tension, cast iron railings will break with very little prior distortion.

Poor Previous Repairs or Maintenance

Poor repairs or incorrect maintenance done in the past, are amongst the common reasons for serious deterioration of railings. Poor previous maintenance usually involves very long intervals between proper maintenance works or painting without proper surface preparation.

Warning signs of corrosion include:

- Uneven surface known as 'pitting';
- Rust-coloured staining;
- An oily residue visible on the surface of the paint;
- Blistering paint;
- Plant growth.

Inappropriate, poorly designed repairs and replacements can be severely damaging to ironwork and will detract from the character and appearance of historic ironwork.

Replacing parts of old railings

The most common parts of railings to be affected by corrosion are footings, fastenings, interlocking parts and water traps such as bolts and rivets, because they are the most vulnerable. It is advisable that even small new sections of railing are made of metal of the same type as the existing railings.

9) CONTACTS

For additional historical or technical advice, please contact:

Cheltenham Borough Council Conservation Team
Tel: 01242 775218 / 775219
Email: conservation@cheltenham.gov.uk

English Heritage
1 Waterhouse Square
138-142 Holborn
London
EC1N 2ST
Tel: 020 7973 3000

British Cast Iron Research Association
Alvechurch, Birmingham B48 7QB

British Foundry Association
Ridge House, Smallbrook, Queensway, Birmingham B5 4JP

Worshipful Company of Ironmongers
Ironmongers Hall, Barbican, London, EC2Y 8AA

The Welding Institute
Abington Hall, Abington, Cambridge, CG1 6AL

Paint Research Association
Waldegrave Road, Teddington, Middlesex, TW11 8LD

10) RECOMMENDED READING

University of Greenwich, The Brooking Collection – Period Cast Iron: 18th Century and 19th Century

John and Nicola Ashurst, *Practical Building Conservation Vol 4: Metals*. English Heritage Technical Handbook, Gower Technical Press, Hants 1988

Chatwin, A. (1975) *Cheltenham's Ornamental Ironwork* Cheltenham, Amina Chatwin

Raymond Lister, *Decorative Wrought Ironwork in Great Britain*. David & Charles, Newton Abbott 1970

Interior of Ironworks: H. H. Martyn & Co. Ltd., Sculptors, Carvers, Art Workers in Metal, Sunningend Works, Cheltenham

William Letheren, 1836-1910. Metal worker of Cheltenham with the panel which won the gold medal at the Paris Exhibition of 1866. Photograph by J. Humphreys of Montpellier Walk, Cheltenham. Image provided by Cheltenham Art Gallery & Museum.

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