



Technical Guidance Note No. 2

Assessment of Ironwork.

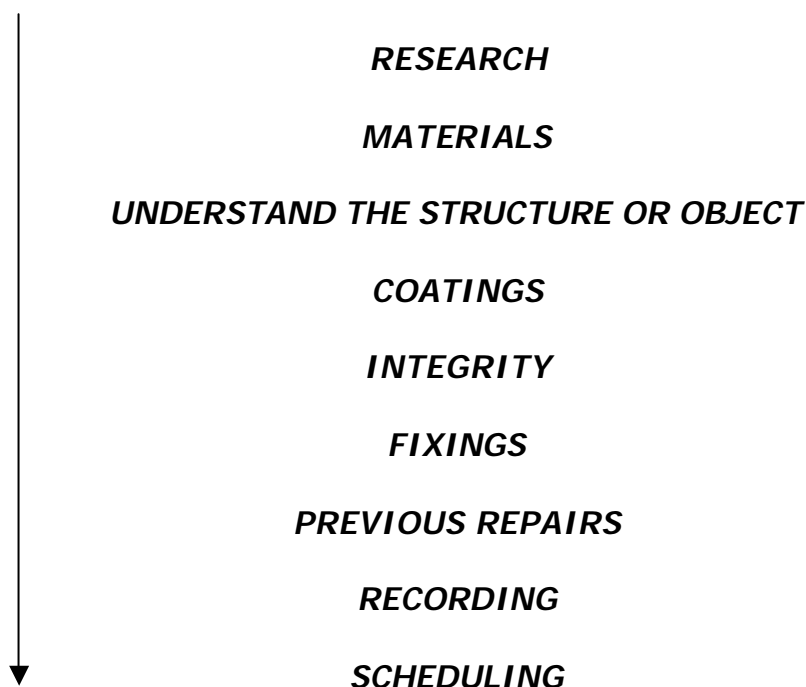
1.0 Introduction

The assessment of ironwork structures generally requires the services of an experienced practitioner. An expert in this field will have a good knowledge of the materials, manufacturing techniques, conservation and restoration issues, and the practicalities of undertaking such works.

However, initial assessments can be made with the aid of a simple checklist which should inform thinking. This is no substitute for the services of an experienced individual, however, particularly when issues of safety and structural integrity are factors. A sample checklist is enclosed.

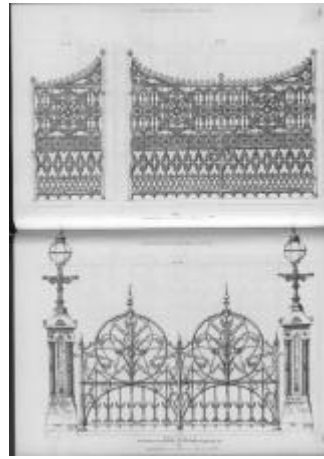
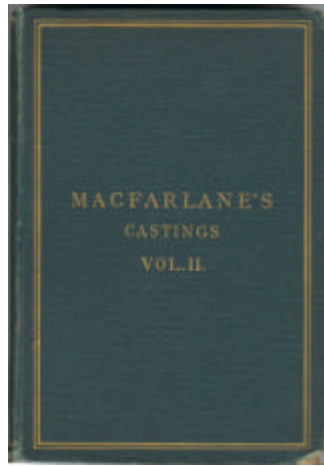
2.0 Process

The Assessment process may be summarised as follows :



2.1 Research

Prior to undertaking any assessment, it is important that relevant research is undertaken. For simple structures such as railings this may be confirming the original design in a pattern book or photograph (since fragments are often lost, damaged or 'trimmed' off).



Pattern Books are particularly useful.

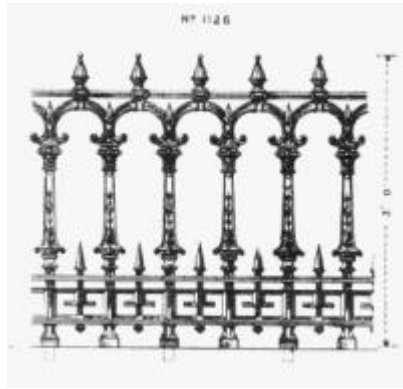
More complicated structures, such as fountains might follow the same route, but be backed up by construction drawings or layout plans. Council minutes and period press reports are very useful since they often provide relevant technical and quantitative information. Photographs, even in black and white can indicate configurations of colour schemes.

2.2 Materials

Ironwork structures generally comprise of cast iron (generally grey iron for ornamental work unless more contemporary), wrought iron (of various grades and qualities), mild steel, and mixtures of all three on occasion. Bronze and copper decoration has also been found in predominantly ironwork structures, buried beneath layers of paint.

Identification is often down to experience, but depending on the design, it can even be difficult for the experts sometimes !

Wrought iron decorative forms are very much three dimensional and exploit the properties of the material in it's willingness to be shaped and formed into organic shapes. Cast iron has limitations relating to the moulding and casting process, although some of the finest work, or where the object is an assembly of components are impressive. Generally, however, the repetition of design and the joint lines of the moulding process may be identified by the trained eye.



Cast and Wrought forms aid identification to the trained eye.

Mild steel is generally more common in 20th C repairs or more modern installations, but can often be found in structural components – bridges etc.

Material sampling is a luxury, perhaps, but an advantage where the materials cannot be identified. Material testing labs can provide comprehensive analysis. Generally however, wrought iron will deform or bend, whereas cast iron will give only a little under tension prior to fracturing. It is important not to have set rules about classification, since you may often be proved wrong !

2.3 Understand the structure or object

In order that you can assess an object, you must first understand how it functions. This is more difficult than you might imagine. Even relatively simple runs of cast iron railings can have complicated junctions, joint details and assembly details between panel to panel, and where capping rails are fitted.



Ross Fountain – large and complex structure in cast iron

A large wrought iron gate or gate pier is much more difficult, since many start with a frame which decoration fits onto, but have often been assembled in a particular order. This is an important consideration. To get at that small leaf it may be necessary to dismantle the entire gate !

2.4 Coatings

This is important and should never be overlooked for reasons of cost. Ideally a paint specialist can take samples and provide cross sections, identifying stratigraphy and colours. More simply, a flake of paint removed with a scalpel can be fixed using resin to a board and sanded at an angle to reveal layers of paint. Even a chipped section - perhaps on a cast iron column, might clearly reveal original colours.

Remember that you might have to consider many areas on a decorative feature since details may have been picked out for highlighting or gilding. Often this is a case of common sense – column capitals or central panel motifs are often picked out. Bear in mind that you should leave an original sample of paint intact somewhere and record this for future techniques to tackle.

And finally - don't assume all ironwork is black – that's an urban myth !

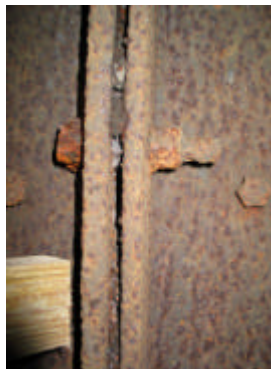
2.5 Integrity

This is primarily concerned with the structural integrity of an object or structure. Ground movements, impact damage, corrosive expansion of fixings, serious corrosion and vegetation damage can all effect the structural integrity of an object.

Take a step back and look at the general alignment – look along a run of railings – is the cope sinking and taking the cast iron railings with it ? Has many years of asphalt on the pavement caused the cope to deflect ? Are fascia panels fractured due to wrought iron corrosion ? has a vehicle hit a set of gates and distorted them – do they close and meet face to face ? Has paint loss or poor drainage created a weak point ?

2.6 Fixings

A common problem for cast and wrought iron structures where wrought iron fixings have been used. Wrought iron fixings will corrode and expand, often failing – causing structural problems through bolt failure, or causing cast ironwork to fracture under stress.



Wrought iron bolt failure in cast iron structure

Wrought iron fitting strips under cast iron copes cause similar problems.

2.7 Previous Repairs

It is important to identify repairs which have previously been undertaken. These may be fine or terrifying (repairs with cement have been seen!), but you should be aware of such repairs in your assessment.

2.8 Recording

It is most important to record the existing condition during your assessment. This provides a useful reference when sitting at your desk preparing your report, but will also form part of the object record. How useful would such a record be for you at this stage if recording had been undertaken 50 years previously.

The degree of recording to be undertaken depends on the nature of the survey. Photographs are extremely useful as long as they are properly referenced to location, and digital image manipulation opens up a realm of possibilities. Drawn survey can be difficult for highly ornate wrought iron structures, and often requires a high degree of skill, however, sketches of joint assemblies and fixing details provide a level of detail that photography cannot.

Simple arrangement drawings with critical sizes are useful as a reference, and for later working out weights, surfaces areas for coating etc.

You should consider the assessment the first stage in creating an object history which shall record where you started from, work undertaken, and the finished result. In 100 years, someone will find this work very useful – unless of course they can't read your digital information !

2.9 Scheduling

As a final stage, prepare a repair schedule. This really moves from assessment into specification but is useful to consider.

Using digital imaging or drawn survey, identify all components. This can be as simple as a chronological number sequence, or for easy reference might be RHSGP123 – Right hand side gate pier item 123. Prepare a schedule which states your expectations for each component.

Don't think you can allow for every eventuality at this stage. Anyone who works with historic objects knows 'the can of worms' scenario. It's consistently apparent – so allow for it.

We would suggest that the fairest way of executing such a project is to ask for a price based on a repair schedule with a good specification – the contractor will be delighted to price on a level playing field.

The sequence should generally be :

Recording	Fixed cost to specification.
Dismantling	Fixed cost to specification
Assessment	Fixed cost to specification
Agree repair schedule	Agreed cost to specification (budget allowed)
Re-assemble / coating	Fixed cost to specification
Install on - site	Fixed cost to specification

The repairs might come from a provisional sum allowed. Ask for sample rates for a particular repair – e.g. cost of re-making a particular component, or repairing using XYZ technique. This is a useful guide. The specification has to be tight and informed. Trust is a key issue here – if you feel you cannot trust each other before you start, you are in for a rocky ride.

3.0 Sample Checklist

ITEM	NOTES	CHECK
RESEARCH	Off-site Makers Marks visible ?	
MATERIALS	Identify materials used Cast Iron Wrought Iron Mild Steel	
UNDERSTAND THE STRUCTURE OR OBJECT	How does the object or structure work Constructional details How would it come apart On site or off site work ? Access issues ? H&S Issues ? Craneage and logistics	
COATINGS	Sample Stratigraphy Record Sample locations Gilding ?	
INTEGRITY	Visible stresses fractures External influences – drainage, subsidence, impact damage, stress fractures ?	
FIXINGS	Identify fixing materials Condition Structural integrity	
PREVIOUS REPAIRS	Identify Assess	
RECORDING	Photography Drawn survey	

