Corrugated iron buildings are particularly susceptible to damage from rain as the metal sheeting is exposed to rainout and capillary action. Any repairs should follow the philosophy of the minimum intervention necessary to reduce the loss of historic material. Where feasible the use of new or old, but compatible, insulation should be made. The provision of a protective coating should be sought to ensure that the iron does not place undue strain on other components.

Maintenance Issues

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Corrosion

Since all metals corrode, the primary problem in dealing with corrugated iron is to retard corrosion. Corrosion can lead to scaling, loss of mechanical strength or structural integrity. Different forms of the iron can lead to the complete loss of the sheet.

Since the iron is not permeable to moisture, condensation in and out of doors, and wetting and drying cycles remain the primary cause of decay—structurally and aesthetically. The quality of early galvanising was variable. The iron often fails, creating an electrolytic reaction (galvanic action) which is similarly harmful for many due to its natural eteration. In many cases the natural iron oxides will be an integral part of the local landscape. Rainwater run off over the rusty sheets onto masonry can be a problem. Where exposed stone surfaces. Effective coating requires the use of a primer layer, or the use of an etching primer for galvanised surfaces. Often, neither was used.

Coating Failure

Coating failures are common on galvanised surfaces. Effective coating requires the use of a primer layer, or the use of an etching primer for galvanised surfaces. Often, neither was used. Although there are some firms still making corrugated iron in sheet, it is important to retain the original sheets as, in many cases, the matching profiles and sizes may be no longer available. It is essential to ensure that this does not place undue strain on other components.

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Further reading and information


The Scottish Ironwork Foundation. Visit http://www.scottishironfounders.org

INFORM; Boundary Ironwork – A guide to re-instatement

INFORM; Iron Gates and Railings

Historic Scotland, 2004

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Introduction

With a pedigree of almost two hundred years, corrugated iron is a much undervalued material that was used extensively in traditional construction. The material is relatively light, portable and its adaptability means that it was often used to replace or cover a thatch roof, or construct a large agricultural or industrial building. This INFORM provides some historical background, and addresses the physical properties of the material and its uses. It also covers the conservation, repair and maintenance of corrugated iron in a variety of situations.

Materials

Corrugated iron was patented in 1828 with corrugations made in the thin sheets by passing the thin plates through rollers to provide rigidity and additional structural strength. Until the 1920s, corrugated sheets were manufactured by a broad range of ironworkers in various lengths, usually up to a maximum of ten feet. Sheet thickness varied from around 0.5mm to 1.5mm depending on the application. Galvanising of the iron with zinc became increasingly common at the end of the 19th century.

Sheet pitch and profiles

A wide variety of pitches was available, with standard dimensions varying from 25 – 153mm. For domestic purposes, a 76mm (3 inch) pitch was common. A range of profiles were manufactured, with firms such as FW Braby developing their own branded lines.

Coatings

A range of coatings was employed to protect corrugated iron from the elements. Oil (usually linseed) based paints were used extensively in conjunction with red lead paint, with pitch and bitumen to a lesser extent. The galvanising process involved the iron sheet being dipped into a bath of molten zinc to form a protective layer on the metal surface. The zinc coatingchemically protected the iron from corrosion.

There were a number of patented ‘rustless’ coatings developed in the late nineteenth and early twentieth centuries that formed protective oxide layers on the surface of the metal and were often known as the Barff process after the inventor.

Construction details and techniques

Supplied in a range of sizes and profiles corrugated iron was frequently used for roofing and walling, and to a lesser extent for fencing and other innovative uses.

Manufacturers quickly developed other components that allowed them to construct a building from a frame and corrugated sheet. This included ridging details, ventilators and windows. The retention of these pieces is especially important as most cannot be sourced now.

Specialist fixings were required to suit the corrugated sheets, including hooks and bolts (usually galvanised) with specially shaped washers with which to effect watertight seals – particularly on varying profiles. Where these remain, they should be carefully saved, cleaned and set aside for reuse.

In a prefabricated structure the corrugated sheets were secured to an internal timber or metal frame. This sheet metal was an industrial building. In this agricultural use, or for domestic needs internally insulated and covered in timber lining or plaster.

The sheet corrugations lend themselves well to lap joints, often overlapping by 150mm and by 1-2 corrugations where sheets are adjacent. As condensation was a major issue perforated sheets were also developed.

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