

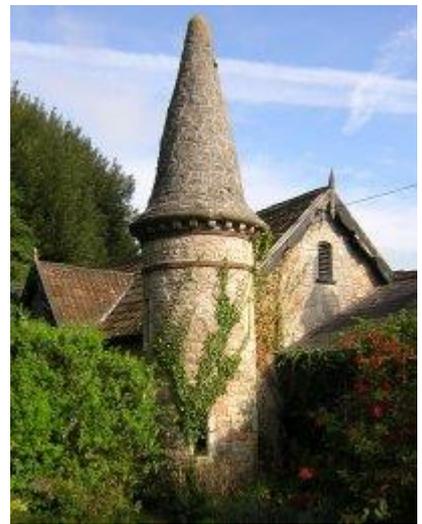
Finding the right solution for adapting a ruin is one of the greatest architectural challenges. Not only is the form of the structure often uneven and the materials compromised by years of exposure to the elements, but the philosophical challenges of how to approach the design and how to touch the existing fabric lightly, are complex and highly contentious.

Interaction with heritage is a source of deep drawn inspiration in determining the objectives of the schemes and architectural designs and our cities today need urban architecture reflects the interaction between the ancient civilization to the deep roots of the history and the new Renaissance. It is challenging the chart designers to create national privacy for the urban contemporary movement, particularly when taken into account our environment and our own culture, consequently our great heritage and history blend with science and new ideas for green cities and sustainable development principals in one crucible to get modern cities in sync with the present and future, not neglected and do not take long from her past.

## An introduction to building types

Buildings are usually created for a specific purpose, which influences its design. Form follows function is seen as a Modernist credo, yet the concept is purely practical and centuries old. So the first clue to use is simply what the building looks like. Some types have a characteristic form which is hard to mistake, for example castles or dovecotes. But certain plan elements, such as the rectangle and the quadrangle, are so practical and versatile that they crop up again and again in different building types. In that case functional details may provide a clue, or the setting may be revealing.

Then again buildings may be whimsical, incorporating features for the fun of it, rather than any practical necessity. Perhaps the architect wanted to experiment, or the patron wanted to gaze out upon a romantic scene. So a summer house might be disguised as a Greek temple or Chinese pagoda, or a Victorian lodge may look like something out of Disney World (see right). Taken to extremes this tendency produces the folly - a class of building so eclectic that it almost defeats description.



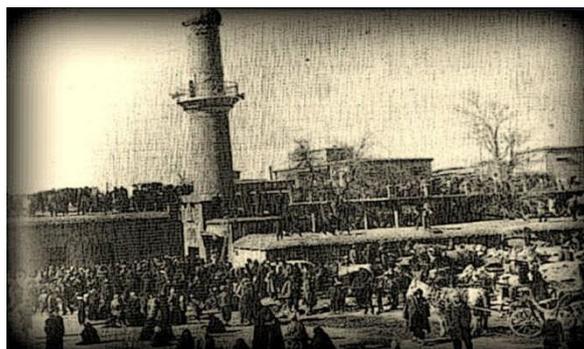
Focusing on more commonplace structures. Each type is explored separately. Yet so often buildings can be adapted for a new purpose, or serve more than one purpose simultaneously. For example an 18th-century town house could have had a shop, restaurant or bank on the ground floor, while today the whole building has become offices. So it is important to understand the original use of an historic building and how changes of use may be linked to alterations in the fabric.



Faysaliah school (not existing any more)

## How should we go about bringing new life to old ruins, and are some ruins just too precious to alter?

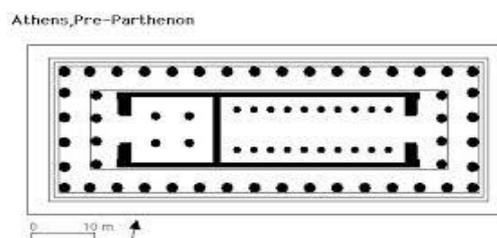
The importance of old buildings is not in question. Historic town and city centres across the world attract millions of visitors every year, and houses within areas that contain few post-war alterations command significantly higher values than similar houses in areas which are broken up by modern developments. Their appeal lies not only in their sense of history but also in their visual character and interest: the rich variety of colour, texture and form, the individuality of natural and hand-made components, the abundance of intricate details from fine glazing bars to decorative railings



### Assessment

The first step in any building conservation project is a sensitive assessment of its history and merits. As Every building has its own biography. Knowledge of the whole life of a building brings an essential understanding of its features and its problems.

As an example the Parthenon in Athens built between 447 and 432 BCE to serve as a temple dedicated to the goddess Athena, its purpose over time changed to Christian church, mosque, and powder magazine before it became one of the most famous tourist attractions in the world.



Once the assessment is complete, the next step is a thorough measured survey with a tape, rod and level. Modern measuring techniques, such as photogrammetry (the use of aerial photographs to make maps and surveys) and stereo photogrammetry, are also used today to increase accuracy. Once the measurements are complete, there is an analysis of the structural stability of the building and its living pattern of movement. No building is permanently still; soil and wind can affect building stability and need to be documented. Finally, the architect or surveyor tests the electrical connections, plumbing, and other utilities present in the building (this is more for historic and re-purposed buildings). For both ancient and historic buildings, lightning conductors and fire-fighting equipment are checked to make sure they can provide sufficient protection.

At the end of this assessment process, the conservator will analyse all the collected data and decide on a conservation plan based on available funding sources.



## Treatment

The phrase covers a wide span of activities, from the cleaning of the interior or exterior of a building — such as at St Paul's Cathedral in London — to the rebuilding of damaged or derelict buildings, such as the restoration of the Windsor Great Hall in Windsor Castle after a destructive fire in 1992. The 1985–1989 removal of 38 layers of paint and the cleaning and repair of the exterior sandstone walls of the White House in the USA are an example of building restoration.



Windsor Castle

Buildings are structures which have, from time to time, particular purposes. They require on-going maintenance to prevent them falling into disrepair as a result of the ravages of time and use. Building restoration can be thought of as that set of activities which are greater than year-to-year maintenance, but which by retaining the building are less than a demolition and the construction of a new building.



Serai Slemani Built (1838- 1849)

Not all building conservation seeks to follow the original design of the building. It is reasonably commonplace for the shell of a building — its external walls — to be retained whilst an entirely new building is constructed within. This approach is also referred to as adaptive reuse.

Although techniques of architectural conservation are improving, the action of cleaning or repairing buildings can, with hindsight, be seen to cause problems that at the time were unforeseen. A good example is the unrestrained use of sandblasting to clean smog deposits from soft-stoned buildings — a technique employed in the UK in the 1960s and 1970s — which has damaged the external faces of stonework to the extent that in some cases, later, the stonework has needed to be replaced. Contemporary building codes recognize such problems, and (it is to be hoped) mitigate poor outcomes.

### **Ways to Ruin an Old Building**

#### **Employ Architects and consultants who do not specialise in historic building work**

Despite extensive redevelopment which damaged so many historic centres, , almost all our towns and cities retain pre-20th century historic cores, and around one in five buildings today. In those urban centres where historic integrity is strong, the character is maintained not only by planning control but also by peer-pressure and increasing recognition that insensitive alterations will damage the financial value of the owners' properties. However far more old buildings have been hidden under a veil of alterations, and in many cases poor alterations and a lack of maintenance threatens their survival.



Today major redevelopment in historic building is rare, and the greatest threat comes from the small, insidious 'improvements' often made by well-intentioned but misinformed owners, their Architects and consultants, as well as from a lack of regular maintenance. Traditionally constructed buildings do not perform in the same way as modern ones and need to be treated differently, at every stage of their conservation and repair. Modern materials and construction techniques are often incompatible with traditional ones, and repairs which are suitable for modern buildings can lead to the deterioration of historic building fabric. Relatively few Architects and consultants have the expertise required to deal with the special problems of historic buildings, and even relatively harmless techniques can damage historic materials in the wrong hands.

## Carrying out any essential maintenance work

- If huge repair bills are to be avoided and important historic fabric protected, owners need to clear gutters of leaves in the autumn; roofing slates and tiles need to be replaced, flashings maintained and chimneys pointed and capped to prevent water entering the fabric of the building, causing decay.
- Air bricks and vents need to be kept clear of weeds to ensure that cellars and sub-floor cavities are kept well ventilated to prevent condensation, which also causes decay.



Pipes, washing machines, shower trays and other potential sources of water within the building need to be checked for leaks for the same reason.

## Paint or coat surfaces which were originally left natural

- Cementations coatings and most modern paints and stone consolidate are not porous and will lock moisture in the walls: evaporation is concentrated at cracks where any salts present crystallise, causing decay.
- Damp patches may appear on the inside wall as more moisture is forced to evaporate here.
- Certain materials will deteriorate rapidly as a result of the increased moisture levels, including cob, daub and other earth mixtures, and timber is more likely to rot.

All non-original coatings hide the original colour and pattern of stone and brickwork and modern coatings and claddings such as stone cladding, pebble-dashing, and other modern cementations coatings make old buildings look (at best) modern and ordinary.



Evaporation of moisture from a wall is concentrated by an impermeable coating at cracks, leading to localised stone decay due to salt crystallisation. The use of colour to emphasise the drain pipe is also questionable

## Introduce mix-and-match 'period style' detail

- The addition of reproduction features for uses never originally intended, such as 'carriage lamps' on either side of a front door, external shutters particularly where they are fixed to the walls and clearly serve no functional purpose, and 'bulls-eye' glass panes make old buildings look cheap and phoney.
- Poor 'period-style' features such as front doors with press-moulded panel mouldings, black rubber seals, fanlights within the door itself, stuck-on strips in imitation of leaded lights, and other fancy details look incongruous in a genuinely historic building.

The 'restoration' of features where they never existed confuses the history of a building; for example, the introduction of fine plaster mouldings in attic rooms, basements and other rooms where features were once simple and functional.



These details have been chosen to look 'quaint', but would be more in keeping with the character of a modern housing estate than this 18th century cottage

## Position modern services and equipment intrusively

- Satellite dishes, air-conditioning units and extractor fans are alien features, which, where necessary, can usually be positioned discreetly.
- Electricity wires, telephone cables, lightning conductors and other services need to be installed tidily without snaking across walls and decorative features; careful planning may avoid the need to chase service runs into the original structure.

Modern fixtures such as radiators, smoke detectors and other interior service fittings can be painted to blend with the prevailing colour of the wall to which they are fixed, and in some cases may be hidden altogether without affecting their performance.



## Replace original components unnecessarily

- Replacement windows are rarely necessary: decay is usually limited to the bottom few inches of the frame and new timber windows are liable to decay more quickly than the originals would if repaired.
- The removal of all timber within one metre of any visible sign of dry rot (which is still advocated by many) is excessively devastating and unnecessary as the reintroduction of dry, ventilated conditions alone will prevent its growth.
- Old and original structures which have distorted through old settlement and are now stable may need repair, but rarely need to be replaced.

Replacement plastic windows in particular (see right) fail to match the appearance of old windows: they invariably have larger, heavier sections than timber windows; black rubber gaskets are visible around the glass; and fine glazing bars cannot be incorporated convincingly. Their claim to be 'maintenance-free' is also misleading as plastic, like paint, becomes scratched and disfigured by dirt in time, and it will eventually need to be painted regularly to maintain its appearance.



New plastic windows in particular detract from the character of old buildings

## Overload an existing structure

- Replacing slates with concrete roofing tiles can cause rafters to bow and even collapse under the increased weight unless the structure is reinforced.
- Underpinning part of a building can move loads onto other parts of the structure, exacerbating settlement damage, and is often carried out unnecessarily.
- Removing low ties of a roof truss (the horizontal beams which run at eye-level across the attic, at right angles to the ridge) can cause the roof to spread and collapse.

Removing chimney breasts, walls and other structural features can also damage the structural integrity of the building.



The tie beams literally tie the two sides of the roof together. Their removal to make an attic usable can lead to the collapse of the roof (the location of the tie beams removed in the past is indicated by the dotted lines)

# New Life for Old Ruins

In recent years we have become less conservative about adapting and altering historic buildings and more accepting of the new roles they can play in a modern society. Of course, this view is not universal: there are still many preservationists around who think that we should pickle everything that has the word historic attached to it.



Sera, Slemani

Nevertheless, the concept of 'adaptive reuse' is embedded in current conservation thinking. The idea that redundant buildings are often redundant because their original use is no longer viable has taken root. Finding new beneficial uses for the redundant historic buildings has sometimes been a major challenge.

There is nothing new about breathing new life into old ruins. The Forum in Rome is one of the most famous ruins in the world and many of its buildings have been reused at some point. This reuse extended beyond the common practice of recycling the marble in new structures, and included the adapting of existing ruins for new uses. The Trajan Market, built in AD 107-110, was completely transformed for reuse in the Middle Ages. Sadly, the phases of medieval, and Renaissance building in the Forum were subsequently removed in the single-minded archaeological pursuit of the 'glories of imperial antiquity'.

One of the main arguments for intervention is the need for continual maintenance and the heavy costs that come with it. There are very few organisations with annual budgets dedicated to preserving and maintaining huge lumps of masonry just so visitors can wander around them on holidays. Indeed, those few that do increasingly have to take a commercial view of their building stock. But where ruins are in private hands the burden is even greater. Grants can be made available for initial repairs but it is on-going maintenance that presents the long term challenge. It is now generally accepted that a building with a beneficial use is far more likely to survive than one that has no use at all.



## APPROACH

There are many examples of redundant historic buildings being brought back into use, buildings that are largely intact and still present a commercially viable solution. However, ancient ruins present a different set of problems. The buildings, which have lain empty and roofless for decades or even centuries, are often scheduled monuments and therefore a more preservationist view is often thought to be appropriate.

Intervention is often a matter of degree. To what extent should the historic be compromised by the new? Can the new remain subservient to the old if the old is now in ruin and much is already lost?

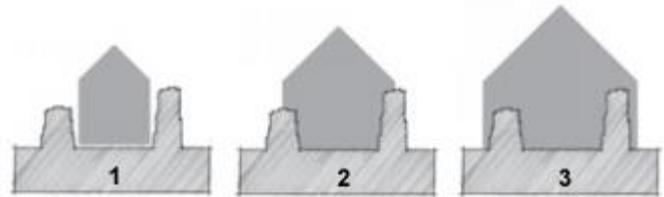
There are three particular issues that are of primary consideration when finding a creative solution for ruins:

### 1 Juxtaposition (see diagrams, right)

The visual impact of the new structure will largely depend on its relationship with the old. For example, does the new sit within the old as if it is growing out of it: the reptile in the process of shedding its old skin? Or does the new building sit directly on top of the old structure, either bearing on it or supported on a frame so that only the outer skin rests on the historic fabric? Or does the new building enclose the ruin: a new shelter that protects the historic fabric like an exhibit in a museum, as can be seen at Richard Meier's Ara Pacis Museum in Rome (right)?

### 2 style

The choice of materials and style will also have a significant impact on the ruins. Rebuilding in the same materials and style may ultimately produce a pastiche of the old building, while considerably reducing the significance of the original fabric. A more



#### **1. Building *inside* the ruin**

This method tends to express the ruin most fully but provides the greatest difficulty in making a weather-tight seal between old and new.

#### **2. Building *on* the ruin**

The ruin can be seen from both sides, but the interface between old and new often means that the 'ragged edge' of the ruin may be lost, as is the case with Norwich Cathedral's new refectory building.

#### **3. Building *over* the ruin**

This provides the simplest and least destructive solution. The ruin is enclosed inside a museum-like building. However, the ruin is now separated from its context.



successful approach that has been used in the past involves the introduction of a seam, such as a coloured line of stones, where the old and the new meet, which clearly delineates the join. However, a more widely favoured approach is to provide a clear contrast between old and new materials and styles, thereby accentuating the historic fabric against a contemporary backdrop. Even if the new building dominates the combined structure (as at the Columbia Museum, Cologne, discussed below), in a curious way it can also heighten the visual importance of the old.

### **3 Material interfaces**

The interface between the old and the new provides all kinds of technical challenges, not least keeping the weather out. Masonry ruins, especially rubble stonework, will often have irregular edges: a less than ideal surface on which to place new material. Dealing with existing openings such as unglazed windows can also present difficulties, particularly if they are stone and partly ruined.



Ruins of a school in Amedi

At Norwich Cathedral Refectory (discussed below), the approach was simply to build up the existing walls with a slightly different stone, creating a well-engineered surface on which the structural glazing could rest.

At Raglan Castle, the tops of the rubble walls were capped with concrete, with a soft membrane separating the two materials. Again, this provided a suitable level surface on which to build. A proprietary cloth fabric was used as a separating layer which allowed the new work to be totally reversible: the concrete can easily be removed at the separation layer without damaging the existing fabric.

In the process of trying to make a better join between old and new, is it acceptable to remove some of the existing fabric, particularly where it is common work and there is little to distinguish it? Alternatively, is there a tendency to be too precious about each and every stone? This represents an on-going dilemma in the management of change in the historic environment: is the approach just too conservative? Managing change is all about compromise. Bringing new life to a ruin has obvious benefits, but these must be balanced against the loss of a ruin as a piece of architectural sculpture that is in a state of on-going organic decay, and the loss of something that appeals to our artistic and romantic sensibilities.



## CASE STUDY 1: CANDLESTON CASTLE

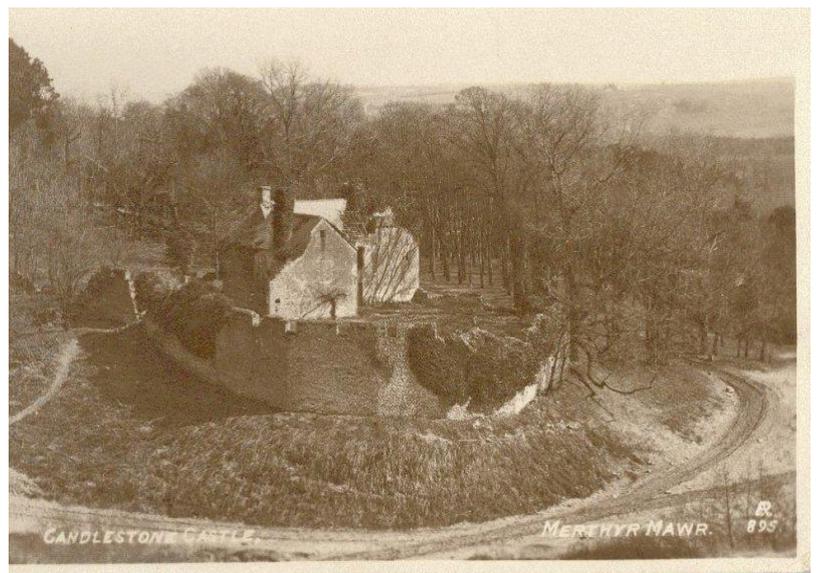
Candleston Castle (above) forms part of the Merthyr Mawr Estate in Glamorgan, and stands adjacent to a large range of sand dunes. The building forms part of the ruinous remains of a 14th-century manor house. The owners were committed to preserving the ruin but felt they needed to find a commercial solution to funding maintenance costs after the initial repair work had been completed.

Putting a roof back on the building and giving it a new beneficial use was considered, but this would have been expensive and was not commercially viable. The estate then considered another alternative: the domestic range of the castle forms one side of a walled courtyard and although the curtain wall is dilapidated there is still enough remaining to form a significant enclosure.



Candleston Castle, part of the Merthyr Mawr Estate in Glamorgan

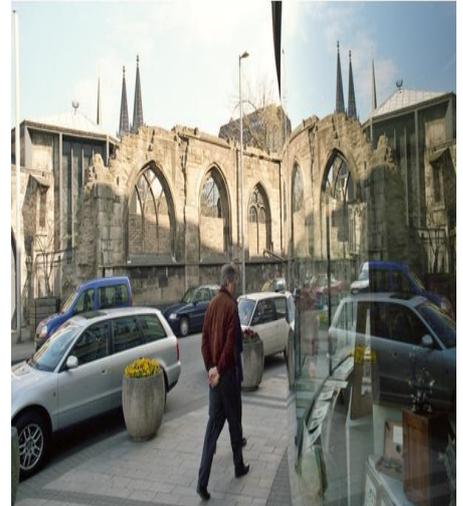
Using the romantic ruin as a backdrop, a marquee will be erected on the grassed courtyard space and hired out for wedding parties. This solution offers a commercial return to support the continued maintenance of the ruin, while involving minimum intervention in the structure itself. The marquee is a temporary structure so the setting of the castle is not compromised



## CASE STUDY 2: KOLUMBA MUSEUM, COLOGNE

This towering edifice, which almost completely engulfs the medieval ruins of St Columba's Church, takes an extreme and less sympathetic approach to building over ruins. Yet paradoxically it emphasises the special character of the ruins.

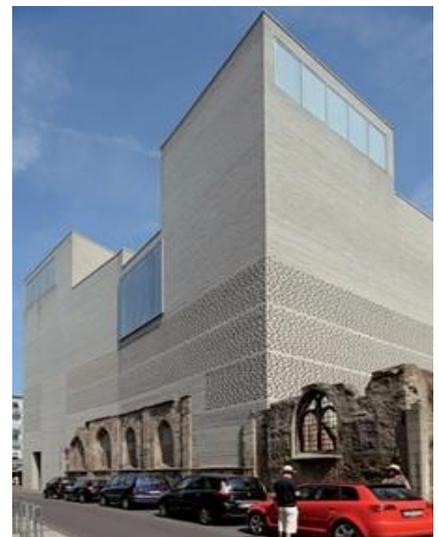
St Columba was badly damaged during the second world war and was transformed into a memorial garden during the 1950s. With the ruins becoming increasingly surrounded by commercial development and a collection of temporary roof structures protecting the delicate archaeological excavations, the Archdiocese of Cologne commissioned Swiss architect Peter Zumthor to build a new museum to house its collection of religious art with the ruins of St Columbia accommodated within it.



(c) Diaridh Maguin  
Foto 63694 www.flickr.com/photos/koeln.de (1999)

The new structure both incorporates and shelters the original. The contrasting light grey brick was developed for the project and provides a contrast in colour, in texture and in the monolithic simplicity of the massive new structure. But this is not an uncoordinated relationship between old and new: there is a subtlety to this holy alliance. Directly above the exposed ancient fabric, the weight of the new masonry is relieved by small perforations in the masonry that also admit a dappled light into the cavernous interior, where the remains of the old church lie.

The interface of the undulating rubble stonework and stone dressings of the old structure, and the small masonry units of the new brickwork, provides a workable junction for building new on old. The overall visual contrast is striking but, like many great buildings, new and old, this is one that needs to be experienced first-hand to fully appreciate the success of this approach.



Kolumba Museum, Cologne: the new structure is fused to the walls of the ruined medieval church that it protects (Photo: Yuri Palmin)

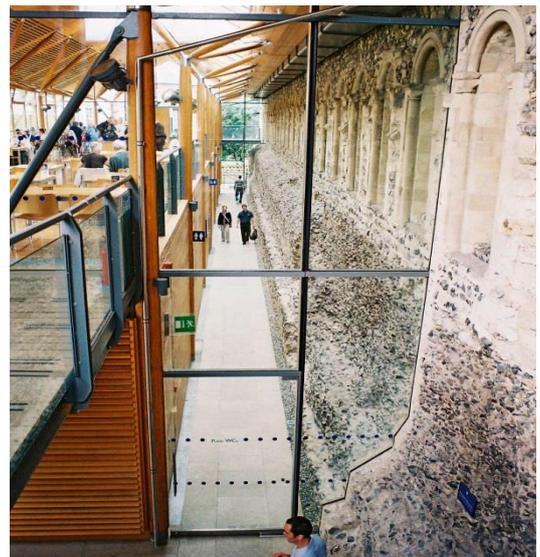
### CASE STUDY 3: NORWICH CATHEDRAL REFECTORY

The one-metre thick 14th-century walls of the library at Norwich Cathedral were deemed untouchable, structurally, by the Cathedrals Fabric Commission of England. As a result, designing a new £3.5 million refectory building within the ruins of the cathedral cloisters presented a delicate challenge. Michael Hopkins Architects' modern intervention appears delightfully simple and yet captures the essence of the cathedral nave with a treelike wooden structure supporting its lead roof.



Factory building built within the ruins of Norwich Cathedral's

The lightweight framed structure fits inside the original ruined building and its predominantly glazed outer walls sit effortlessly on the original fabric, minimising the load placed on the ancient rubble walls, both structurally and visually. However, the large sheets of rigid glass and the random composition of the walling material, which includes flint, brick and limestone, do not sit easily together. The clever part of this junction is the subtle introduction of another masonry walling material that bridges this difficult connection. Building up the flint walls with a new yet subtly different masonry solves two problems: it provides a practical solution for a difficult junction, and it provides an identifiable contrast between the old and the new, making it much easier to read the building's history.



Arguably, some uneasy questions remain. Has the ruin been partly obscured by the new design? Should the outline of the ruined fabric be more visible? Has the romance of the ruin been engulfed by the modern building above, the ragged outline lost under a veil? Inside, the ruin is more easily defined. Original fabric is clearly visible and has not been built over to the same degree. Overall, the effect is very pleasing and provides a bright and lively space of tremendous quality which provides the cathedral with another stream of income.

## CASE STUDY 4: DOVECOTE STUDIO

Snape Maltings is a complex of Grade II listed industrial buildings, many of them still derelict. The Dovecote Studio (below) forms part of the internationally renowned music campus founded by Benjamin Britten in abandoned industrial buildings on the Suffolk coast. A general strategy for regeneration of the Maltings was developed through close dialogue with the client, English Heritage, and Suffolk Coastal planning officers.



Dovecote Studio, part of the famous music campus at Snape Maltings

The regeneration strategy concentrated on preserving existing fabric, with all its patina of age and use, and adding to it – where necessary – in a legibly contemporary architectural language that should be as uncompromising and industrial as the original buildings, and should age gracefully to unite with the existing structures. Literal reconstruction of the dovecote would have contradicted this strategy. Instead, the new studio was conceived in a form that reflected the shape of the original building, but in a material, cortex weathering steel, that was strikingly modern. This form was seen as a separate structure that could be placed within the shell of the existing ruin, while leaving it untouched.

Although contemporary, Cortex steel weathers to a shade of rust-red almost exactly the same as the colour of Suffolk red bricks. Meanwhile, although its form echoes the shape of the old dovecote, its construction from a single material gives the new studio an enigmatic quality. The result is a building that from a distance evokes the ghost of the original structure, but, seen from close up, reveals itself as entirely new.



The Haworth Tomkins design complements the distinctive architecture of the Maltings in a way that is both sensitive and uncompromisingly modern. It solves the complex challenge of working within a fragile ruin without losing the essence of the ruin to the ambitions of redevelopment.

## CASE STUDY 5: BLENCOW HALL

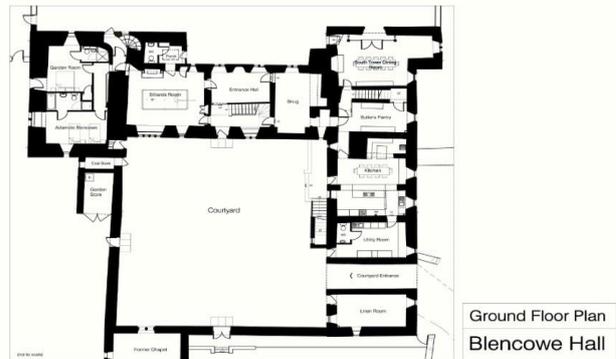
When the Grade I listed Blencow Hall (see title illustration) was acquired by the present owners, the central and south ranges were still in occupation but the two late 16th-century towers lay vacant and decaying.

The south tower was a roofless ruin and had sustained a large breach in its east wall, possibly as a result of ‘slighting’ in the Civil War (partial destruction designed to deny the use of fortifications to the enemy) combined with later structural settlement. Donald Insall

Associates, with local architect Graham Norman, devised a scheme to bring the towers back into use as part of a luxury country hotel, with a sensitive yet dramatic solution.

It was decided to retain the breach in the outer wall as it is part of the story of the building, and a steel frame was used to support the leaning external walls. The new glazed wall behind the breach was set back from the original walls, so that the raw edges of the broken masonry remained visible. The recreated rooms on all three levels within the south tower were designed to make the best advantage of the stunning views to the south east and they offer light open interiors that contrast with the more enclosed remaining rooms which retain their traditional windows.

Reinstating the original roof provided most of the necessary waterproofing for the tower, leaving only the junction between the new glazed wall and the old stone walls. The new wall is well set back behind the edges of the breach with the vertical abutments being protected by the small balconies and the overhanging roof. These abutments have been waterproofed with a



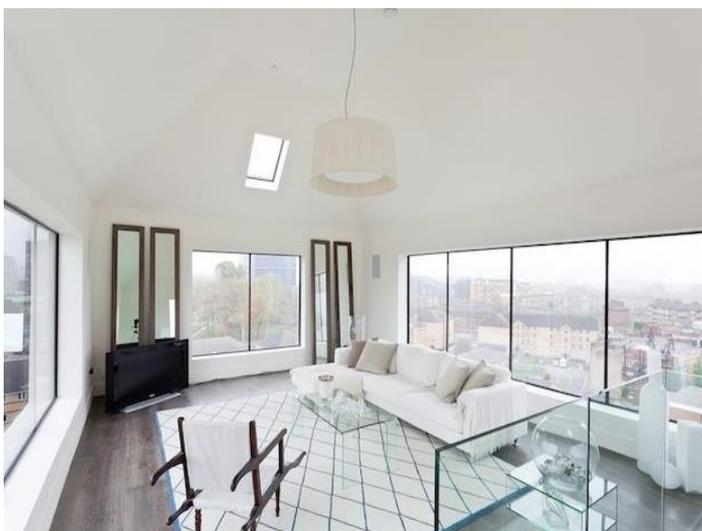
compressible water resistant foam seal strip to take up the irregular profile of the rubble stonework. Apart from the consolidation of the exposed ragged edges of the masonry, there was no intervention into the masonry structure either side of the breach.

The beauty of this solution lies in the clarity of the contrast between new work and old, and in the minimal intervention to historic fabric.

### More examples:

#### Trend Home: Water Tower Turned London Residence

With all the converted spaces of today, this London residence, a former water tower, In 2008, this 99 foot tall crowned with a huge steel water tank converted it into a luxury home. The brick building itself is quite beautiful, and mixed with the modern and clean interiors, the cool quotient on this one definitely sets the bar for these types of projects

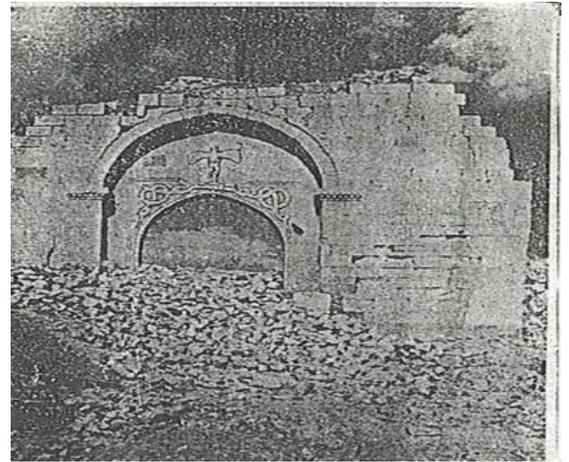


## The Princely House in Amedi

The Princely House is located in the North-East of the Amedi Castle and is an old building with antique and precious, described by Al rudaini and Henry as a two-storey square. The ground floor is intended for servants, and broken to the centre of upper barrier longitudinal which partitioned it into two parts:-• Diwan to the West and is connected to the large room overlooking the town. • Rooms for harem attending several balconies overlooking the Valley from the East



It was built in the time of Sultan Hussein and stayed to the 1950s. it was home headquarters of the reigning Prince and his family and subjected to demolition and sabotage after the fall of the Principality in 1843.



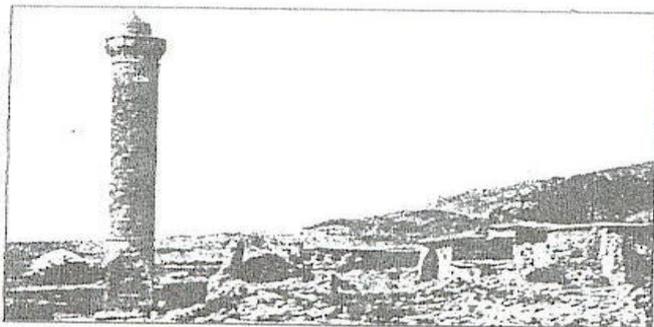
This important and great antique was demolished to build with its stones the new Government Headquarters in Amedy. Remains of it only a gate at that time

Followed by the demolition of the rest of it in 1971, to distribut its land as a residential parts to some of the residence of the city to build houses without thinking of the importance of this land and the site, nothing left from the ruin out of the logo of the Principality which was mounted on the gate and made from solid nailed .ebony.



## Amedi Mnare (Lighthouse)

Was built in front of the door of the mosque with white carved sculptures. The tall Mnare (Lighthouse) 31 meters high, consist of 101 stairs scroll down to the courtyard. The Church and the lighthouse, built by the architect Ali Bakhtiar xeftan (according to some older residence in -Amedi).the Courtyard of the Lighthouse when subjected to demolition, as a result of the bombing of Abdel Karim Kassem's aircraft in 1962, Abdullah Ali xeftan, a descendant of the same architect,, has reconstructed it, as well as building the badina west gate after the demolition as a result of the bombing.



منارة ناميدي ( هنري باتدر . 1887 )



## Resources:

- **The Science For Conservators Series: Volume 1: An Introduction to Materials (Heritage: Care-Preservation-Management)**  
By The Conservation Unit Museums and Galleries Commission
- **Conservation of Historic Buildings**  
By Bernard Feilden 2014
- **Historical Renovation: Everything Old is New Again.** By Dan Hounsell - April 2005 - [Educational Facilities](#)
- **Old House Handbook: A Practical Guide to Care and Repair**  
By Roger Hunt, Marianne Suh
- **Old Buildings as Ancient History? Hardly** By Dan Hounsell - April 2005 - [Maintenance & Operations](#)
- **Historical Renovations: Old Buildings, New Life**  
By Renee L. Shroades - June 2006 - [Design & Construction](#)
- **Extending Listed Buildings. Principles and Practice.** Richard MacCullagh. The Building Conservation Directory, 2013
- **New Life for Old Ruins.** Michael Davies. The Building Conservation Directory, 2011
- **Structural Repair of Traditional Buildings**  
By PEB Robson
- **A Heritage in Ruins. The Maintenance and Preservation of Ruined Monuments**  
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<https://www.facebook.com/slemanjran>

<http://trendland.com/water-tower-turned-london-residence/>