LONGNOR HERITAGE

Conserve, Comply, Construct

GUIDE ONE

Working With Old Buildings

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Contents

Why we wrote this

Most of the serious damage we are called to put right in traditional buildings was not caused by neglect. It was caused by competent modern practice applied to a building that works on entirely different principles.

Cement pointing on soft brick. An impermeable render over a solid wall. A chemical damp course injected into a rubble core. Insulation boarded onto the inside face of a wall with joist ends buried in it. Every one of those is correct practice on a modern building, and every one of them does measurable harm to a pre-1919 one.

We are a contractor, not a consultancy. This guide exists because the jobs that go well are the ones where the specifier and the people on site are working from the same understanding of how the building behaves. It sets out that understanding: the physics, the materials, the regulatory position and the economics, in the order that matters on site.

It is written for architects, surveyors and conservation officers, and for anyone briefing a contractor on a listed or traditionally constructed building. It is not a substitute for inspecting the building in front of you.

1. How Old Buildings Actually Work

Solid walls, sacrificial materials, and the moisture physics that modern construction forgot.

Almost every serious defect we are asked to inspect in a pre-1919 building has the same root cause, and it is not age. It is a well-intentioned repair carried out to a standard that would be entirely correct on a modern building.

The reason is a single conceptual difference that is rarely taught explicitly. Modern buildings keep water out. Traditional buildings let water in and then let it out again. Everything else follows from that.

Two entirely different strategies

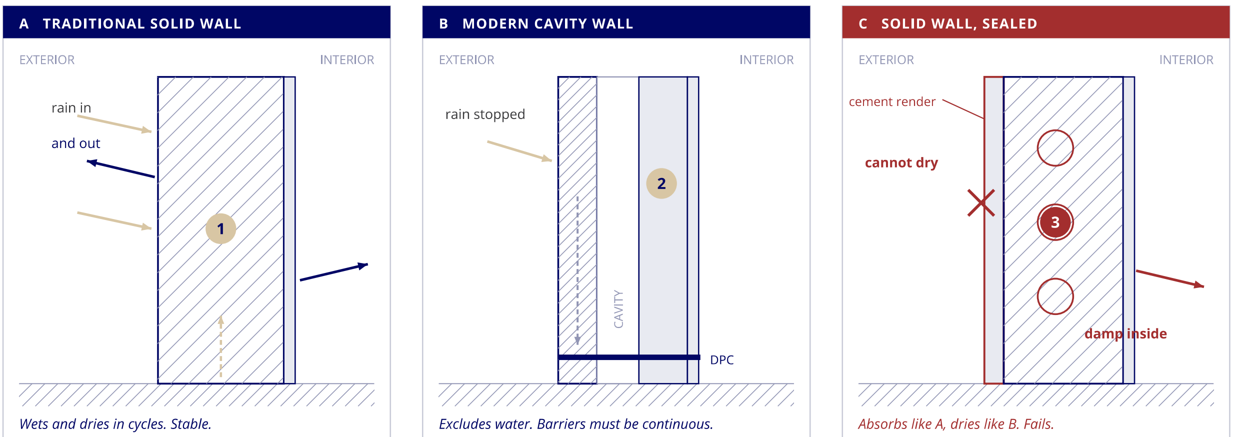
A modern cavity wall is a barrier system. The outer leaf is expected to get wet; the cavity interrupts the path; the damp-proof course and membrane provide discontinuities that liquid water cannot bridge. Performance depends on the continuity of those barriers. Breach them and the wall fails.

A solid masonry wall built with lime mortar has no barriers and needs none. It is a moisture buffer. Rain is absorbed into the outer surface during wet weather, held in the pore structure, and released by evaporation when conditions dry. The wall is wet and dry in cycles, and it is designed to be. What matters is not whether moisture enters but whether the rate of evaporation keeps pace with the rate of absorption over a season.

Get that balance right and a wall lasts four hundred years. Interrupt the evaporation side of the equation and the same wall will show damp internally, decay its embedded timbers and spall its face within a decade or two.

How three walls handle water

Section through the external wall.



1 Evaporation from both faces is the moisture control system

2 Performance depends on barriers being unbroken

3 Sealed outside but still wetted: moisture concentrates

KEY POINT
The failure in panel C is a repair, not neglect: a detail from B applied to A.

Figure 1. The traditional wall (A) and the modern wall (B) are both coherent systems. The damage occurs when a detail from B is applied to A, producing the hybrid in panel C — which has the absorption characteristics of a solid wall and the drying characteristics of a sealed one.

Photograph 1. Cement pointing has not failed. The stone has. The mortar is now harder than the masonry, so movement and salt are relieved through the stone face.

The hierarchy of sacrifice

The second organising idea in traditional construction is that materials are deliberately graded by hardness, and the softest is always on the outside. Limewash is softer than the render beneath it. The render is softer than the masonry. The mortar is softer than the stone or brick it beds.

This is not an accident of primitive technology. It means decay happens where it is cheapest to fix.

When a lime-mortared wall is stressed by movement, salt or frost, the mortar gives way and can be raked out and replaced for a modest sum. When the same wall is pointed in cement, the mortar is now harder than the masonry — so the stress is transferred into the stone or brick faces, which spall. You have converted a repointing job into a masonry replacement job.

Cement pointing does not fail. That is precisely the problem. The masonry fails instead.

Photograph 2. Lime pointing on comparable masonry. The joint is sacrificial and the arrises of the stone are intact.

Movement, and cracks that are not structural

Traditional buildings are flexible in a way that modern ones are not. Shallow foundations, no movement joints, timber that shrinks and swells with the seasons, and a mortar that can accommodate small differential movement by micro-cracking and — in the case of non-hydraulic limes — partially re-healing through recarbonation.

The practical implication for anyone writing a condition report is that a crack in an old building is not automatically a structural defect. It may be long-settled historic movement, seasonal, or a route that has been quietly working for two centuries. What matters is whether it is live, whether it is admitting water, and whether the pattern indicates a load path problem. Monitoring over a full seasonal cycle costs very little and prevents a great deal of unnecessary underpinning.

The thermal performance you are told these walls have is probably wrong

This matters commercially, and it is about to matter a great deal more. The reduced data assessment procedure behind domestic energy certificates assigns pre-1919 solid walls a default U-value of 2.1 W/m2K. Peer-reviewed in-situ measurement work has consistently found real values averaging closer to 1.3 W/m2K, with a spread of roughly plus or minus 0.4 — around a third better than the default.

The discrepancy comes from the fact that solid walls are rarely uniform. Rubble-cored stone walls contain voids, variable mortar, and thicknesses that a desktop assessment does not capture. Earth, cob and wattle-and-daub are worse still. RICS has documented the systematic underestimation.

Since the automatic energy performance certificate exemption for listed and conservation-area properties is being removed, buildings that were previously invisible to the energy regime will start receiving ratings — and, more importantly, recommendations — generated from those defaults. Recommendations produced on that basis routinely include exactly the measures that cause the damage in panel C above.

DIAGNOSTIC DISCIPLINE

Never diagnose damp from a surface conductance meter alone. A pin-type meter calibrated for timber reads salts and conductive materials as moisture. Use it as an indicator, then confirm with a drilled sample profile or calcium carbide test before specifying anything.

Establish where the water is coming from before deciding what to do. Penetrating, ground, condensation, plumbing and hygroscopic salts all look similar at the wall face and demand completely different responses.

Rule out the boring causes first. Blocked gully, cracked hopper, raised external ground level, cement plinth, blocked subfloor vents. These account for the overwhelming majority of 'rising damp' callouts.

Treat an injected chemical DPC in a rubble-filled wall as ineffective by default. The injection cannot form a continuous barrier through a heterogeneous, void-filled section.

What to carry into the next job

Water

Modern assumption Keep it out

Traditional reality Let it in, let it out faster

Materials

Modern assumption Match or exceed strength

Traditional reality Deliberately weaker than the substrate

Cracks

Modern assumption Defect requiring repair

Traditional reality Possibly the movement joint doing its job

Coatings

Modern assumption Seal and protect

Traditional reality Must be more permeable than what is below

Ventilation

Modern assumption Controlled and minimised

Traditional reality Essential to the drying mechanism

None of this makes traditional construction fragile. Buildings that have stood for three or four centuries are demonstrably robust. They are robust on their own terms — and the single most useful thing a modern practitioner can do is learn what those terms are before specifying the repair.

2. Lime Is Not One Material

From lime putty to NHL 5 — and why specifying the wrong one is worse than specifying nothing.

'Use a lime mortar' is now standard wording on conservation-area repair schedules, and it is nearly meaningless. The lime family spans materials that behave completely differently, and the strongest of them is closer in behaviour to a weak cement than to a traditional bedding mortar.

The consequence of getting it wrong is not a cosmetic mismatch. An over-strong lime mortar transfers stress into the masonry exactly as cement does, just more slowly. We have taken out NHL 5 pointing that had spalled the arrises off soft handmade brick within eight years of being applied.

Where lime comes from, and why the set matters

Lime is a cycle rather than a product. Limestone or chalk — calcium carbonate — is burnt at around 900°C, which drives off carbon dioxide and leaves quicklime, calcium oxide. Add water and it slakes violently to calcium hydroxide, either as a dry hydrate powder or, with an excess of water, as lime putty. Mixed with aggregate and placed in the wall, it then slowly reabsorbs carbon dioxide from the atmosphere and reverts to calcium carbonate. The mortar in the joint is, chemically, becoming stone again.

That last step — carbonation — is slow, requires access to air and a degree of moisture, and proceeds from the surface inwards. It is why lime work is seasonal, why it needs protecting and damping down, and why a thick lime render does not gain its full strength for a year or more.

Hydraulic limes contain clay impurities that produce reactive silicates and aluminates during burning. These set by reaction with water rather than with air, so they gain strength faster, work in damper conditions, and end up harder. That is useful in a chimney or a plinth, and unhelpful almost everywhere else.

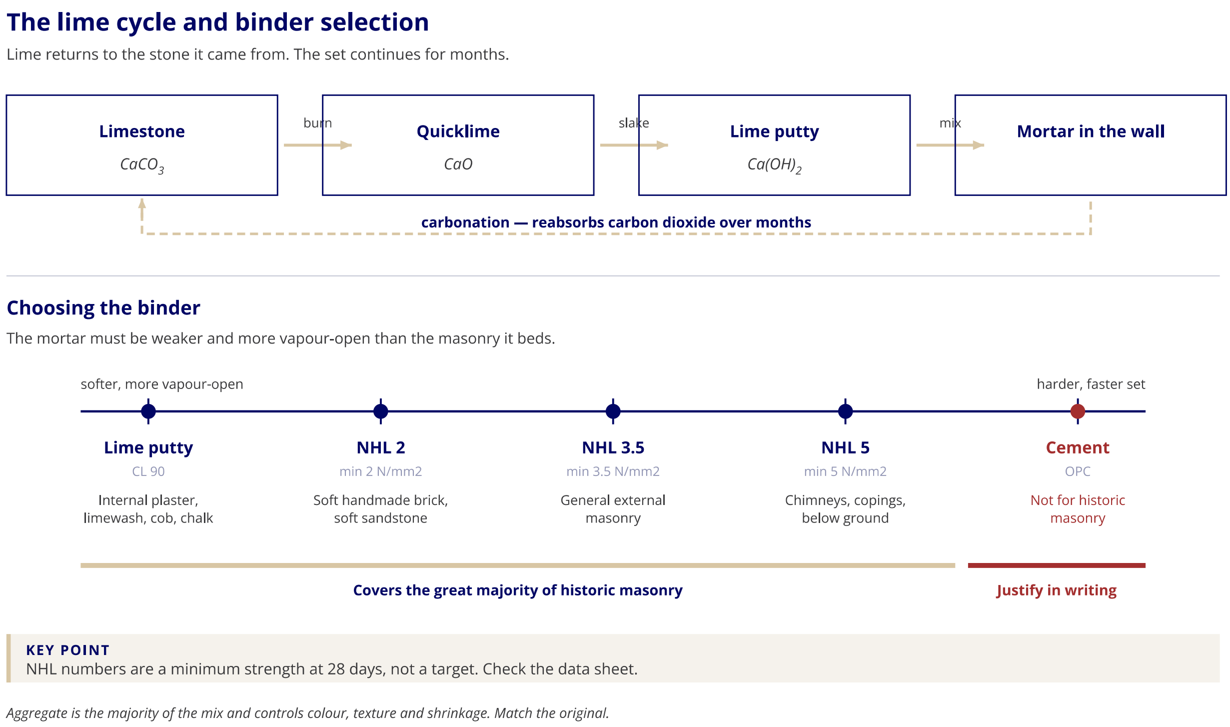


Figure 2. The positions on the scale are indicative of behaviour, not linear measurements. The important reading is the direction of travel and where the burden of justification sits.

Photograph 3. The panel is approved dry. A wet mix tells you nothing about the finished colour or texture.

The specification error that keeps recurring

NHL 3.5 has become the default. It appears on schedules, in planning conditions and in merchants' recommendations as though it were the neutral choice. It is not — it is a mid-strength hydraulic binder that is too hard for a great deal of the masonry it gets used on, particularly soft handmade brick, chalk, cob, and the softer sandstones and limestones.

Two further points are worth knowing. First, the NHL number is a minimum, not a specification: a product classified NHL 3.5 may test considerably above 3.5 N/mm2 and still be compliant. Second, there is a live and well-documented argument within the sector that the current standard is a poor fit for conservation purposes, because it classifies by strength rather than by the properties that actually matter for historic fabric — porosity, vapour permeability and flexibility.

Specify the behaviour you need and a sample panel to prove it. A product name on a schedule is a guess dressed as a decision.

Photograph 4. Quicklime and damp aggregate, gauged and ready to be turned. The reaction is exothermic and vigorous, and it is done in full protective equipment.

Hot-mixed lime, briefly

Hot-mixed mortar — slaking quicklime directly with the damp aggregate, then using the mortar warm — has returned to mainstream conservation practice over the last decade, and for good reason. Analysis of historic mortars indicates it was the normal method for most of the period we are repairing. It produces a mortar with good workability, a degree of early set from the heat, excellent bond and a forgiving pore structure. It also has genuine hazards: quicklime is caustic and the reaction is exothermic and vigorous. It is not something to attempt without training, PPE and a competent operative.

Photograph 5. The aggregate is the majority of the mix and controls colour, texture and shrinkage. Matching it matters at least as much as choosing the binder.

Aggregate does at least half the work

People argue about binders and then order whatever sand the merchant has. This is backwards. In a typical mix of one part binder to two and a half or three parts aggregate, the aggregate is the majority of the material and controls the colour, texture, shrinkage behaviour and pore structure.

What you want is a sharp, well-graded, washed aggregate with a spread of particle sizes — not a uniform building sand. Fines-heavy soft sand gives high shrinkage and a weak, dusty mortar. Wherever possible, match the original by taking a sample of the existing mortar and having it analysed, or at minimum by picking it apart and matching the aggregate visually. Local sand is usually the right answer, because it was the original answer.

GETTING LIME WORK TO SUCCEED ON SITE

Season matters. In the UK, external lime work realistically runs from spring to early autumn. Frost on green lime mortar destroys it. If the programme forces winter work, budget for full enclosure and heating, and expect to be asked why.

Prepare the background. Rake joints to at least twice their width, remove all cement residue, dampen thoroughly. Lime placed against dry masonry loses its water to the substrate and fails to carbonate.

Aftercare is the job, not a courtesy. Damp hessian, protection from sun, wind and rain, misting for days rather than hours. More lime repairs fail from being left to dry out than from any error in the mix.

Build in the wait. Do not paint, limewash or load new lime work early. Carbonation proceeds from the surface inwards at a few millimetres a month.

Always do a sample panel. Colour and texture cannot be judged from a wet mix — lime lightens considerably as it dries and carbonates. Approve the panel dry.

A short specification checklist

Binder type Strength and porosity of the masonry unit, plus exposure. Weaker than the unit, always.

Aggregate Analysis or physical match of the existing mortar. Sharp, washed, well-graded.

Ratio Typically 1 : 2.5–3 binder to aggregate by volume; adjust for the specific grading.

Joint finish Match the original profile. Never weather-struck or ribbon-pointed on a wall that never had it.

Aftercare Named in the specification with a duration, not left to the contractor's discretion.

Approval Dry sample panel signed off by client and, where relevant, the conservation officer.

Lime is not a difficult material. It is an unfamiliar one, and it punishes the assumption that it behaves like cement with a longer set time. Treat it as its own system — slower, softer, more dependent on weather and workmanship — and it will outlast anything you could put in its place.

3. The Cheapest Intervention Is Almost Always the Right One

Minimum intervention gets filed under philosophy. On site it behaves like risk management.

Everyone who works on historic fabric has had the same conversation. The client wants the render off and the wall rebuilt. It has been priced that way. The conservation officer wants to know why a repair that could have been done in a fortnight has turned into a rebuild.

Somewhere between those three positions sits a principle that has been in circulation for well over a century and is still routinely mistaken for sentimentality. It isn't sentimentality. The conservation hierarchy — do the least that will work, and escalate only when the lesser option genuinely fails — is the most reliable cost-control device available on a historic building project.

Why over-specification is the default failure

Modern construction training runs the other way. If a component is degraded, you replace it. That instinct is correct for a building assembled from manufactured, warrantied, like-for-like parts. It is wrong for a building whose components were shaped in place, whose materials are no longer commercially available in the same form, and whose value is bound up in the fabric itself rather than its performance.

Figure 3. Loss of fabric, cost and irreversibility all rise together as you descend. The bars are indicative, not measured — the point is the shape of the curve, and that movement is one-way.

Photograph 6. Rung four of the ladder. The decayed section has gone and everything sound around it has stayed.

Significance is the thing you are protecting

The ladder only tells you how much to do. It does not tell you what matters. That is a separate exercise, and it is the one most commonly skipped.

The standard shorthand is a framework of heritage values: evidential value (what the fabric can tell us that documents cannot), historical value (association with people and events), aesthetic value (design and the accident of age), and communal value (what the place means to the people who use it). A building rarely carries all four evenly. A vernacular farmhouse may be almost entirely evidential — its significance lives in the joints, the smoke blackening and the sequence of alterations, not in its elevation. Strip those out and you have preserved a picture of a building while destroying the building.

The practical use of this is triage. Once you know where significance is concentrated, you can be relaxed about the 1970s lean-to and rigorous about the roof structure. Without it, you either apply the same caution everywhere — which is unaffordable — or the same carelessness everywhere, which is where enforcement notices come from.

FOUR HABITS THAT KEEP PROJECTS OUT OF TROUBLE

Record before you touch. A dated photographic sequence costs an hour and has settled more disputes than any specification clause. It is also the only evidence of what was there if the works are later questioned.

Open up early, price late. Provisional sums for opening-up are cheaper than variations. The condition of a wall plate is not knowable from the ground.

Specify by performance, not product. 'Mortar weaker and more vapour-permeable than the surrounding masonry, sample panel to be approved' survives a change of supplier. 'NHL 3.5' does not, and is frequently wrong.

Use sample panels, and get them signed off. Three square metres approved by the client and the conservation officer removes the single largest source of late-stage argument.

Photograph 7. Two approaches on one elevation. The indents read as repair; the replaced panel reads as a scar and will for a century.

What this looks like on a real job

Inception

Conventional approach Measured survey

Conservation-led approach Measured survey plus phasing and significance note

Design

Conventional approach Full replacement specified

Conservation-led approach Repair schedule, item by item, with escalation triggers

Consent

Conventional approach Justification written after refusal

Conservation-led approach Justification already exists from the escalation triggers

On site

Conventional approach Variations as fabric is exposed

Conservation-led approach Provisional sums against a known defect schedule

None of this requires anyone to be a purist. It requires treating historic fabric as what it is: an irreplaceable, poorly documented, structurally interdependent asset whose failure modes are not covered by the usual assumptions. The restraint is a response to uncertainty, not to nostalgia.

4. The £200 Repair You Didn’t Do Is Now a £95,000 One

Maintenance is the highest-return work in the sector and the hardest to get funded.

There is a defect we encounter so often it has become a diagnostic shortcut. A section of gutter, usually behind a parapet or at a valley, has been blocked for several years. Nobody has been up to look, because getting up there means a tower or a cherry picker and it has never seemed worth the mobilisation.

By the time the damage announces itself internally, the wall head is saturated, the embedded wall plate has decayed, and a job that would have cost a couple of hundred pounds has become a structural repair requiring scaffold, consent and a specialist contractor.

This is not a story about neglectful owners. It happens on well-managed estates, in churches with active fabric committees, and in the homes of people who care a great deal about their buildings. It happens because the economics of maintenance are counter-intuitive and the incentives are all pointed the wrong way.

Water does nearly all the damage

If you strip out fire, subsidence and vandalism, the overwhelming majority of defects in traditional buildings come down to water arriving somewhere it was not meant to and staying longer than the fabric can tolerate. Rot, beetle infestation, salt crystallisation, frost damage, corrosion of embedded ironwork, and the failure of lime mortars all require sustained moisture.

Which means the entire maintenance discipline reduces to a single objective: keep the water moving, off and away. Roof coverings shedding, gutters and downpipes clear and running, gullies flowing, ground falling away from the building, subfloor vents open, chimneys capped and flashed. Everything else is secondary.

Photograph 8. This is the defect at year zero. Nobody sees it from the ground, which is the whole of the problem.

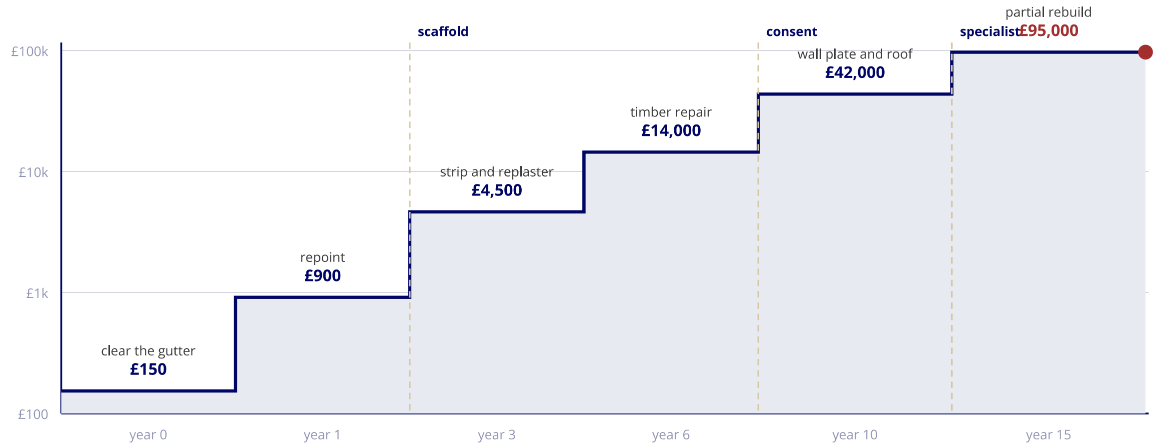
The cost curve is stepped, not gradual

The reason deferral is so expensive is that costs do not rise smoothly with time. They jump, and they jump at thresholds. Each threshold brings in a category of expenditure that was not present before, and once crossed it does not go away.

The first threshold is access. Below a certain point a defect can be addressed from a ladder or a tower; above it you need scaffold, which for most buildings is a four-figure sum before anyone has done any work. The second is consent: a repair becomes an alteration, and now you are in a planning process with a heritage statement and an eight-week determination period. The third is specialism: once structural timber or masonry is involved you are no longer using a general builder.

One blocked gutter, fifteen years

Cost of putting it right, on a logarithmic scale.



Blocked gutter → saturated wall head → internal damp → decay in timber → **structural failure**

> **KEY POINT**
> The axis is logarithmic: each gridline is ten times the one below it.

Figure 4. Costs are illustrative orders of magnitude for a modest building, not quotations — the shape is the point. Note the vertical axis is logarithmic: each gridline is ten times the one below it, so the apparently gentle slope represents a return on the year-zero intervention of several hundred to one.

Photograph 9. The same defect further down the curve. By the time it shows internally the structural repair is already necessary.

Why nobody does it

Understanding the failure of incentives helps you design around it. Maintenance is invisible when it works. There is no photograph of the disaster that did not happen, no before-and-after for a committee report, and no satisfaction in it. Capital repair, by contrast, is legible, fundable and photographable. Grant regimes have historically rewarded crisis rather than prevention, though this is beginning to shift and several funders now expect a maintenance plan as a condition.

Then there is access. The genuine barrier for most buildings is not the cost of clearing a gutter but the cost of getting to it. A tower or a mobile elevating platform for a day may be several hundred pounds regardless of whether the work takes ten minutes. The rational response is to batch: one access visit, one comprehensive inspection, everything at high level dealt with at once.

Do not sell a gutter clean. Sell an annual access day, with a schedule of everything that gets done while the platform is there.

A workable regime

The ecclesiastical sector has had this right for decades. The quinquennial inspection model — a qualified professional reporting on condition every five years, with a prioritised schedule of work — is the single best structure for keeping a historic building in repair, and it transfers readily to secular buildings of any scale.

After every storm

Task Ground-level walk-round: slipped slates, displaced flashings, overflowing hoppers, blocked gullies

Who Owner or caretaker

Twice yearly

Task Clear gutters, valleys, hoppers and gullies. Late autumn after leaf fall is the critical one

Who Contractor with access equipment

Annually

Task High-level inspection during the access visit. Photograph everything. Check subfloor vents are clear

Who Contractor, ideally with a surveyor present

Every 5 years

Task Full condition survey with a prioritised, costed schedule of repairs

Who Conservation-accredited surveyor or architect

MAKING IT STICK

Build a photographic baseline. A comprehensive set of dated images, elevation by elevation, taken once. Every subsequent inspection compares against it. This turns 'the crack looks worse' into evidence.

Keep a defect log, not a report. A living list with location, date first observed, severity, and action taken. Reports get filed; logs get used.

Prioritise ruthlessly and honestly. Distinguish 'will cause damage this winter' from 'should be addressed within five years' from 'cosmetic'. Clients lose faith in surveys that treat everything as urgent.

Attach the access cost to the year, not the task. Budgeting a single annual access day makes the arithmetic obvious in a way that pricing each small job never will.

Put the regime in the handover. At the end of a repair contract, leave a one-page maintenance schedule specific to that building. It protects the work and it is the cheapest marketing there is.

The argument to make to a client

Avoid the moral framing. Owners do not respond well to being told they have a duty of care, and it is not usually true that they lack one.

Frame it three ways instead. Financially, as the chart above — the return on a year-zero intervention is enormous and the downside risk is uncapped. In terms of control, because a maintained building is repaired on your programme with your chosen contractor, while a failed building is repaired on the building's programme with whoever is available. And in terms of consent, because maintenance and like-for-like repair sit at the top of the intervention ladder where the regulatory burden is lightest.

5. Consent, Liability and the Grey Zone

What needs consent, who carries the criminal risk, and why 'like-for-like' is not the defence most people assume.

Two facts about listed building law are consistently underestimated on site. The first is that carrying out unauthorised works to a listed building is a criminal offence, not a planning irregularity — and liability falls on the person doing the work as readily as on the owner who instructed it.

The second is that, unlike an ordinary planning breach, there is no period after which unauthorised works to a listed building become immune from enforcement. A local authority can act on works carried out decades ago. Neither of these is obscure. Both routinely come as a surprise to competent contractors who assumed that replacing something with an identical item could not possibly require permission.

What listing actually covers

The commonest misconception is that listing protects the exterior, or the important bits. It does not. The listing applies to the entire building — inside and out, front and back, the Georgian staircase and the 1960s boiler room — and it extends to objects and structures fixed to the building, and to free-standing structures within its curtilage that were in place before 1 July 1948.

That last provision catches people out regularly. A brick outbuilding, a boundary wall, a set of gate piers or a former stable can be protected by the listing of the principal building without appearing in the list description at all. The list entry is a finding aid, not a schedule of what is protected.

The absence of a feature from the list description says nothing whatever about whether it is protected.

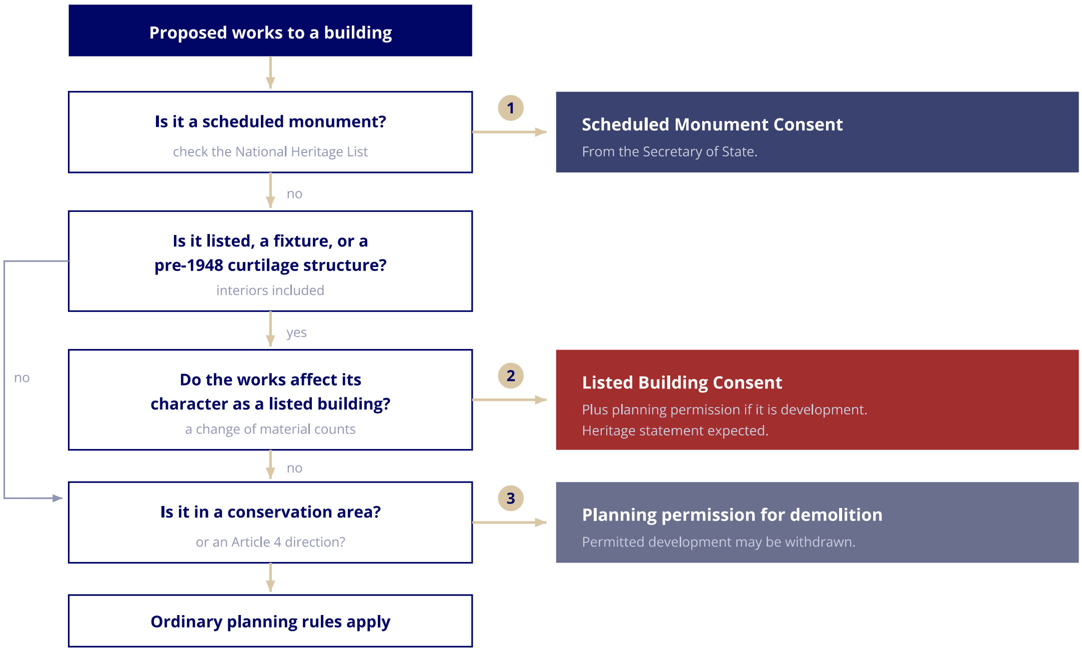
The consent question, decided properly

Listed building consent is required for works of demolition, alteration or extension that would affect the building's character as a building of special architectural or historic interest. Pure repair — genuine like-for-like, same material, same detail, same profile — does not in principle require consent. The difficulty is that a great deal of what gets called repair is in fact alteration.

Repointing in a different mortar is alteration. Replacing a slipped natural slate roof in fibre cement is alteration. Renewing a single-glazed timber sash in double-glazed timber is alteration, even where the sightlines are matched. Removing a partition that turns out to be original is alteration. In each case the person doing it may reasonably have believed they were repairing.

Which consent regime applies?

Simplified for England. Building Regulations apply in every branch.



KEY POINT
Listing is not an exemption from Building Regulations. It is grounds for a relaxation you must evidence.

Figure 5. Simplified for England. Wales, Scotland and Northern Ireland operate comparable but separately legislated regimes with different terminology and thresholds. When the answer is genuinely unclear, that is what pre-application advice is for.

Get the consent reference before you start. Ask for the decision notice and read the conditions, which frequently require sample panels, method statements or archaeological recording before work commences.

Put it in writing when you disagree. If a client instructs works you believe need consent, say so in an email. It will not remove your liability but it will materially change your position.

Treat 'we've always done it this way' as a warning. Precedent on other buildings is not a defence, and neither is a previous unauthorised alteration on the same building.

Building Regulations: the exemption that isn't

The belief that listed buildings are exempt from the Building Regulations, and from Part L in particular, is remarkably persistent and simply wrong. There is no blanket exemption. What exists is a provision allowing energy efficiency requirements to be relaxed for historic and traditionally constructed buildings where compliance would unacceptably alter character or appearance, and — importantly — where compliance would risk long-term deterioration of the fabric.

That is a considerably better provision than an exemption, because it is a reasoned judgement rather than a loophole. But it has to be argued and documented, usually with input from the conservation officer, and it does not arrive automatically because the building appears on a list.

The change worth knowing about now

Since 2012, buildings protected for their special architectural or historic merit have been exempt from the requirement to have an energy performance certificate. In practice this covered essentially all listed buildings — roughly 380,000 in England — and many conservation-area properties.

In its partial response to the energy performance of buildings consultation, published on 21 January 2026, the Government confirmed that this exemption will be removed in full. Heritage properties will require a valid certificate when sold, let or marketed, in the same way as any other dwelling. The implementation timetable has since slipped, with reformed certificates now expected in the second half of 2027, but the direction is settled.

Two safeguards were announced alongside it: recommendations will be tailored for heritage properties, and a 'negative impacts' exemption under the minimum energy efficiency standards will let a landlord evidence that a specific measure would damage the building. Existing exemptions where listed building consent for a measure is refused are retained.

The practical consequence is that clients will start arriving with a certificate whose recommendations — generated in part from default assumptions that understate solid wall performance — may include exactly the measures that damage traditional fabric. Being able to explain, in writing, why a recommendation is inappropriate for a particular building is about to become a routine part of the job.

Who to have on the team

Architect AABC registration, or RIBA Conservation Architect / Specialist Conservation Architect

Building surveyor RICS building conservation accreditation

Structural engineer CARE — the Conservation Accreditation Register for Engineers

Heritage consultant IHBC full membership

Contractor Demonstrable lime and traditional-materials experience, and references you actually call

6. Retrofit Without Wrecking It

A risk-ordered approach to energy efficiency in traditional buildings.

The retrofit conversation has reached traditional buildings, and it is arriving in the worst possible order. The regulatory driver landed first. The technical understanding of how traditional fabric responds to insulation is arriving second, if at all.

The result is a live risk of well-funded, well-intentioned damage at scale. Anyone working on pre-1919 buildings should be able to hold a competent conversation about this, because clients are going to ask.

The physics problem, stated plainly

Chapter One set out how a solid wall manages water: absorption on the outside, evaporation from both faces, wet and dry in cycles. Insulation interferes with that in two ways at once.

First, it changes where the dew point sits. Insulating the inside face of a solid wall makes the masonry colder in winter, because it is now outside the thermal envelope. Warm, moisture-laden internal air that reaches the cold masonry — through gaps, at junctions, around joists — condenses within the construction rather than on the visible surface. This is interstitial condensation, and by definition you cannot see it happening.

Second, it slows drying. A wall that absorbed rain and evaporated it now has an insulating layer over one face, reducing both temperature-driven and air-movement-driven evaporation. If the insulation is also vapour-resistant — most petrochemical foam boards are — you have added the panel C failure from Chapter One to the dew point problem.

The classic serious outcome is decay of joist ends and wall plates embedded in a wall that has just been internally insulated. The occupants report a warmer, drier-feeling house. The structure quietly rots for a decade.

The dangerous measures are the ones that improve the felt comfort of the room while worsening the moisture condition of the structure.

The building is probably performing better than its certificate says

The reduced data assessment procedure behind domestic certificates assigns pre-1919 solid walls a default U-value of 2.1 W/m2K. In-situ measurement studies have repeatedly found actual values averaging around 1.3 W/m2K — approximately a third better than the assumption. Stone walls diverge further still, because thickness, rubble core composition and mortar all vary and none of them are captured by a desktop assessment.

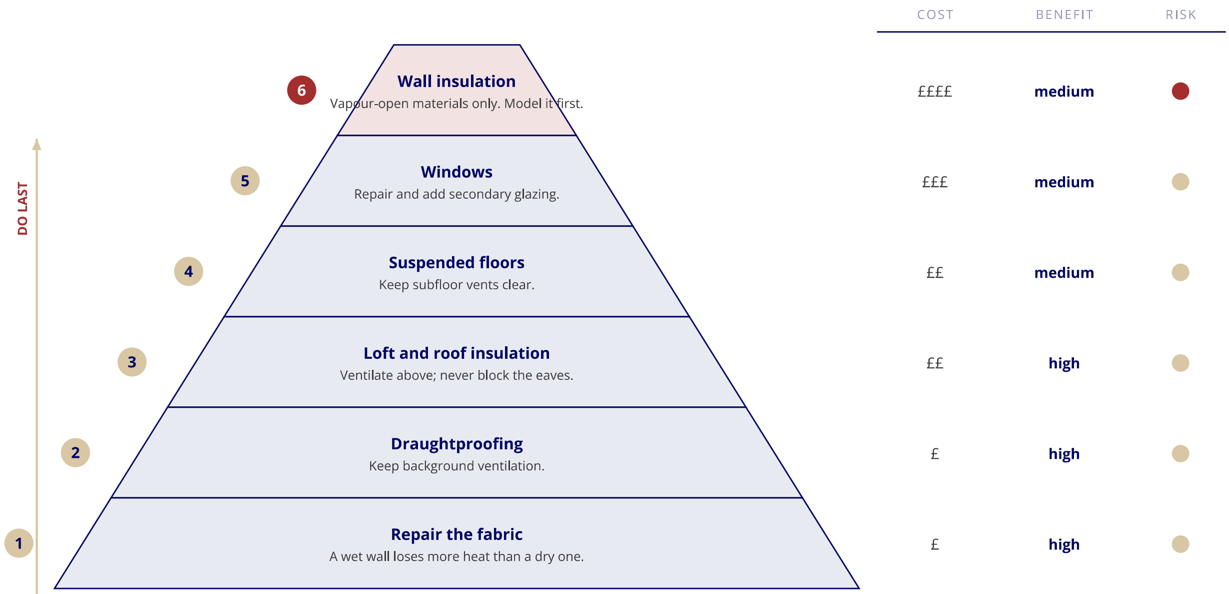
The forthcoming Home Energy Model is intended to allow dwelling-specific inputs rather than pure defaults, including wall thickness, which should help — but only if assessors have the training to use it, and that training is currently proposed as optional. The practical point: a poor rating on a traditional building is partly an artefact of the method. It is legitimate, and often correct, to commission measured U-values before accepting that a wall needs insulating at all.

Work from the bottom of the pyramid

The ordering below is by risk-adjusted return. It puts the cheap, safe, high-yield measures first and the expensive, risky, lower-yield ones last — which is close to the exact inverse of a standard recommendation list.

Retrofit priority, by risk-adjusted return

Complete each tier before starting the one above it.



KEY POINT
Services come after fabric. A heat pump sized against an unimproved heat loss will be oversized.

Tier by tier, the things that go wrong

Fabric first is not a slogan. Moisture in masonry increases its thermal conductivity substantially — a saturated wall can lose dramatically more heat than the same wall dry. Fixing the gutter is an energy efficiency measure, and it is the cheapest one available. It is also a prerequisite: insulating a wall that is being wetted by defective rainwater goods guarantees the failure you were trying to avoid.

Draughtproofing delivers the largest comfort improvement per pound spent in almost every traditional building. The caveat is that uncontrolled air leakage is currently doing part of the ventilation job. Seal the unintended gaps — around sashes, at floorboards, up chimneys — but provide deliberate, controllable ventilation in its place, particularly in kitchens and bathrooms.

Airtightness without ventilation converts a draughty house into a mouldy one.

Roof insulation is high-return and moderate-risk. The risk lives at the edges: insulation pushed into the eaves blocking ventilation, and cold roof spaces that become colder still once insulated, so that any moist air reaching them condenses. Ventilate above the insulation, and seal the ceiling plane against air leakage from below.

Floors pay back well when they are already lifted for other reasons and are hard to justify on their own. The absolute rule is that subfloor ventilation must be maintained — insulating between joists while blocking or reducing the airbricks is a reliable way to rot the joists you have just insulated around.

Windows are where the most damage is done for the least benefit. Whole-window replacement in a traditional building is expensive, removes historic fabric and glass, usually needs consent, and typically saves less than the combination of repair, draughtproofing, working shutters and slimline secondary glazing — which is reversible, cheaper and often better acoustically. A repaired historic sash with secondary glazing outperforms most of what it would be replaced by.

Walls last. If wall insulation is genuinely justified after everything below it has been done, the rules are non-negotiable: vapour-open materials throughout the build-up (wood fibre, hemp-lime, cork-lime, lime plaster finish), no foil, no polyisocyanurate, no cement. Detail the junctions — especially embedded joist ends — as the critical points they are, and have the build-up assessed hygrothermally rather than assuming it works. Simplified condensation checks are not adequate for a moisture-buffering wall.

FIVE RULES THAT PREVENT MOST RETROFIT FAILURES

Fix the water first. No insulation goes onto fabric that is being wetted by a defect.

Breathable in, breathable out. Every layer of the build-up must be at least as vapour-open as the one outside it.

Ventilate whatever you insulate. Roof voids, subfloors, and the occupied rooms themselves.

Prefer reversible. Secondary glazing, loft insulation and draughtproofing can all be undone. Internal wall insulation cannot.

Measure, then model, then monitor. In-situ U-values before you decide; hygrothermal assessment before you build; humidity and moisture monitoring after.

Sources and further reading

Energy performance certificate reform

Reforms to the Energy Performance of Buildings Regime: partial government response, published 21 January 2026. Confirms removal of the heritage exemption. Implementation of reformed certificates subsequently deferred to the second half of 2027. GOV.UK.

Solid wall U-values

The 2.1 W/m²K figure is the RdSAP default for pre-1919 solid walls. In-situ measurement studies reporting values averaging closer to 1.3 W/m²K are summarised in RICS and Historic England guidance on the thermal performance of traditional buildings.

Part L and historic buildings

Historic England, Energy Efficiency and Historic Buildings: Application of Part L of the Building Regulations to Historic and Traditionally Constructed Buildings.

Listed building consent and offences

Planning (Listed Buildings and Conservation Areas) Act 1990. Designation can be checked free of charge on the National Heritage List for England.

Lime classification

BS EN 459-1 defines the CL and NHL classes referred to in Chapter Two. The class number is a minimum compressive strength at 28 days, not a target value.

Heritage values

The four-value framework used in Chapter Three follows Historic England's Conservation Principles.

Further reading

Hunt and Suhr, Old House Handbook, and the companion Old House Eco Handbook. Historic England's Practical Building Conservation series for depth on individual materials.

Disclaimer

This is general guidance, not advice on your building, and nobody has inspected it. Some of the work described is hazardous — take advice from someone qualified before acting on any of it.

We accept no liability for reliance on this guide.

LONGNOR HERITAGE

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What we do

Lime, masonry and pointing

Lime mortars matched to the original and mixed on site, including hot-mixed work. Repointing, lime plastering and rendering, limewash, stone and brick repair, indent and splice work.

Roofing and rainwater goods

Natural slate and clay tile, stone slate, leadwork and flashings, cast iron and lead rainwater goods, chimney repair and repointing, valley and parapet gutters.

Joinery and windows

Sash and casement repair, splice repair to decayed sections, draughtproofing, secondary glazing, doors, and structural timber repair to wall plates, joist ends and roof members.

Maintenance contracts and surveys

Annual access visits with a full high-level inspection, gutter and gully clearance, photographic condition records and a prioritised defect log you can budget against.

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