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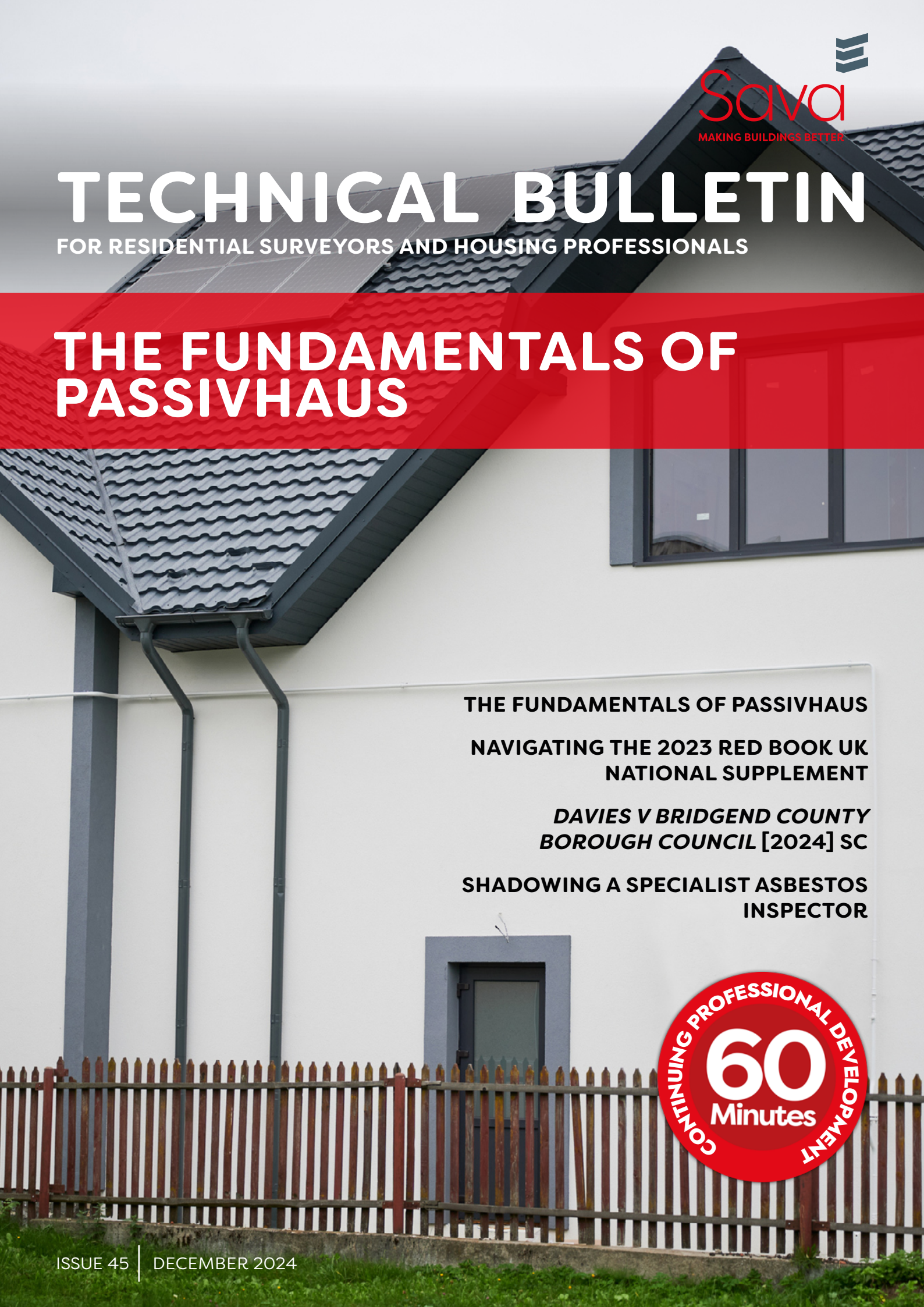
TECHNICAL BULLETIN

FOR RESIDENTIAL SURVEYORS AND HOUSING PROFESSIONALS

THE FUNDAMENTALS OF PASSIVHAUS



CONTINUING PROFESSIONAL DEVELOPMENT
60 Minutes

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THE TECHNICAL BULLETIN

FOR RESIDENTIAL SURVEYORS AND HOUSING PROFESSIONALS

Welcome to the Technical Bulletin. This Technical Bulletin is designed for professionals working across all housing sectors.

Produced by Sava, you will find technical articles, regulation updates and interpretation, and best practice. We hope you find this useful in your day-to-day work and we welcome any feedback you may have and suggestions for future publications.

Who we are

We are a team of building physicists and engineers, statisticians, software developers, residential surveyors, gas engineers and business management specialists.

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THE FUNDAMENTALS OF PASSIVHAUS

SAMUEL LOTT, DATA CONSULTANT (ENERGY), SAVA
DR NEIL CUTLAND MINSTP, SPECIAL PROJECTS DIRECTOR, SAVA

In this article, Neil Cutland and Sam Lott explain the fundamentals of Passivhaus. This article is an extract from the NHBC Foundation report titled 'The UK's progress towards a Passivhaus standard in new homes' which was researched and written for the Foundation by Sam and Neil and is downloadable here.

What is Passivhaus?

Passivhaus is an energy-efficient building design and construction concept that originated in Germany in the late 1980s. The concept is owned by the Passivhaus Institut of Darmstadt, Germany, which strictly regulates the certification of buildings and ensures that high-quality standards are upheld.

The fundamental principle behind Passivhaus is to create structures that minimise the need for active heating or cooling systems. By utilising a combination of design strategies and high-quality building materials, Passivhaus buildings aim to maintain a comfortable indoor environment while significantly reducing energy consumption. By definition, they focus on design features that are passive in functionality such as insulation, airtightness, and solar orientation. However, they also include active elements in design to ensure comfort for residents, most notably mechanical ventilation systems with heat recovery (MVHR). The overall aim of Passivhaus is to eliminate the need for traditional wet central heating systems. This is achieved by reducing the space heating load to a level where the required heat can be provided via the ventilation air alone.

The requirements of Passivhaus

Passivhaus requires a building to conform to strict requirements in order to be deemed Passivhaus compliant and achieve certification.[1] These requirements are as follows:

1. The space heating demand of the building is not to exceed 15kWh per square metre of net living space (treated floor area) per year per square metre or 10W per square metre peak demand. In climates where active cooling is needed, the space cooling energy demand requirement roughly matches the heat demand requirements above, with an additional allowance for dehumidification.
2. The Primary Energy Renewable demand (PER) for all domestic applications (heating, hot water, and domestic electricity) must not exceed 60kWh per

1. 'Passive House Institute, "Criteria for Buildings Version 10c," Passive House Institute, Darmstadt, 2023
2. Evidence for compliance with the non-renewable primary energy demand (PE) will still be accepted. In the Passivhaus Planning Package software the Passivhaus Institut have country-specific PE limit values based on primary energy factors. If no value exists for a country, then the default is a maximum of 120 kWh/m2yr.

square metre of treated floor area per year.[2]
3. The property must meet airtightness limits with a maximum of 0.6 air changes per hour at 50 Pascals pressure, as verified with several onsite pressure tests (in both pressurised and depressurised states).
4. Thermal comfort must be met for all living areas during winter as well as in summer, with the internal temperature not exceeding 25°C for a maximum of 10% of the hours in a year.
5. Requirement to record/photograph certain construction stages.

Passivhaus also offers a Passivhaus Plus and Passivhaus Premium standard, both of which incorporate the use of renewable energy generation in the certification assessment.

Passivhaus Plus and Premium

	Classic	Plus	Premium
Maximum Primary Energy Renewable (PER) demand (kWh/m²yr)	60	45	30
Maximum renewable energy generation (kWh/m²yr)	n/a	60	120

Table 1: Requirements of Passivhaus Plus and Premium

The Passivhaus principles

The PER demand focuses on the portion of primary energy use that is derived from renewable energy sources and is a subset of the total primary energy use.

In order to meet the rigorous standards of Passivhaus, intelligent design is imperative to reduce air leakage in the building and also meet the space heating demand target. There are, therefore, five key basic principles that apply to the construction of a Passivhaus building:

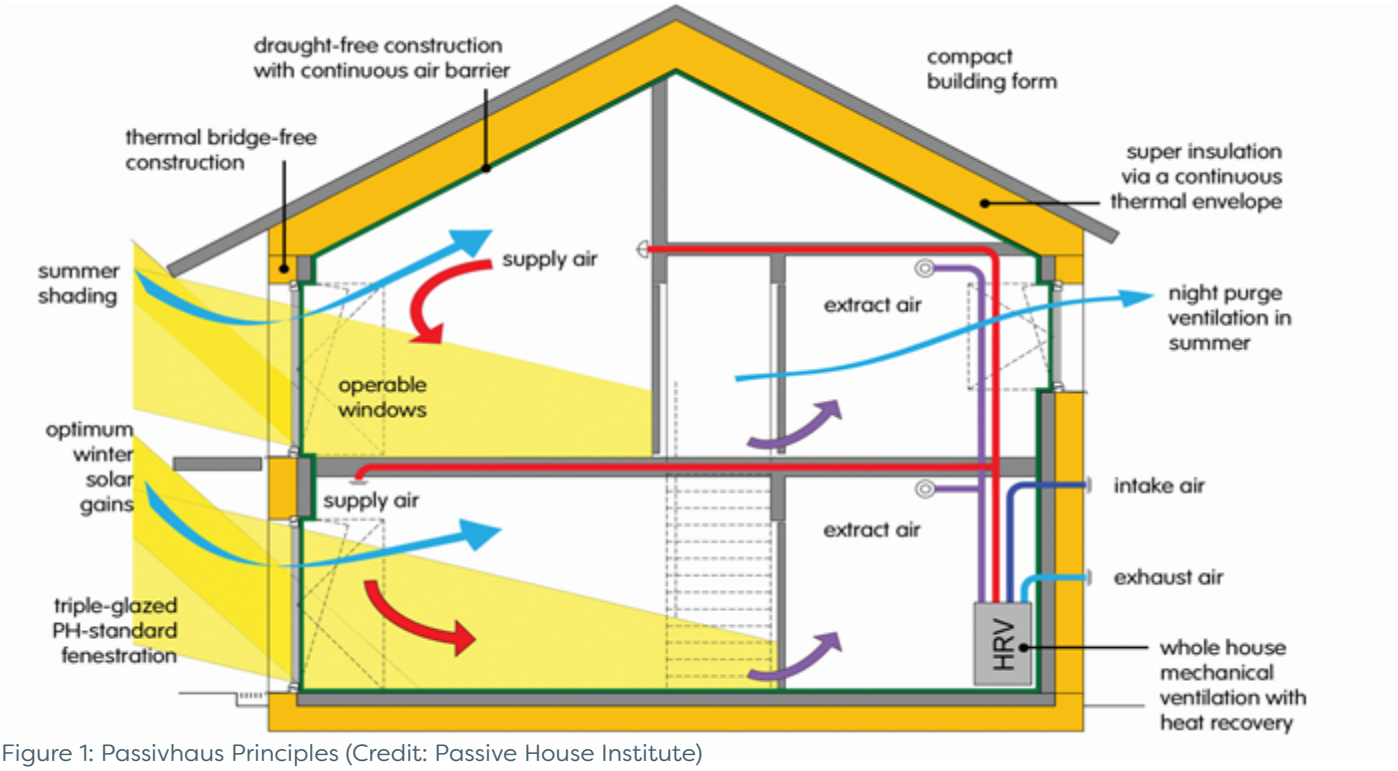

Figure 1: Passivhaus Principles (Credit: Passive House Institute)

Thermal insulation

One of the basic principles of Passivhaus design is a well-insulated building envelope. Typically wall, roof and floor elements will achieve a U-value of between 0.10 W/m²K to 0.15 W/m²K [3]. They will also achieve minimal thermal bridging and, in some construction types, provide an internal service void so that services do not penetrate the airtight barrier of the building. This internal service void is important as it means that once the building has been constructed there should be no need to disturb the envelope of the building hence disrupting the airtight membrane that has been installed. This allows for easier repairs from within the internal service void.

3. Heat loss is expressed as a measured or calculated U-value. U-values show how much heat in Watts is lost per square metre at a standard temperature difference of 1 degree Kelvin. To calculate the heat loss of an area such as a wall one therefore multiplies the U-value by the area and the temperature difference between inside and outside.

Passivhaus walls are generally thicker, varying from 300mm to 500mm depending on the construction method and insulation chosen.

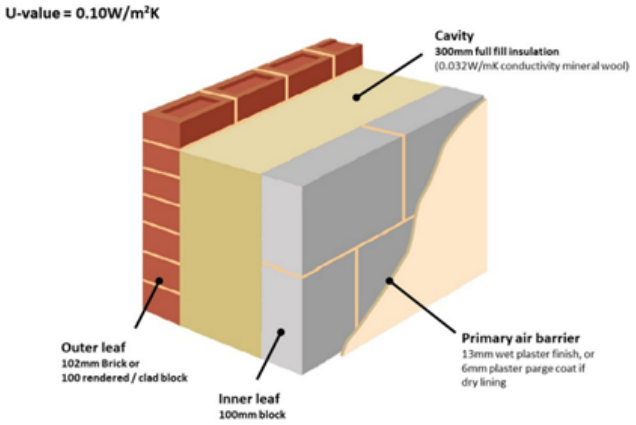

Figure 2a: cavity wall build-up of a Passivhaus (Credit: H + H UK Ltd)

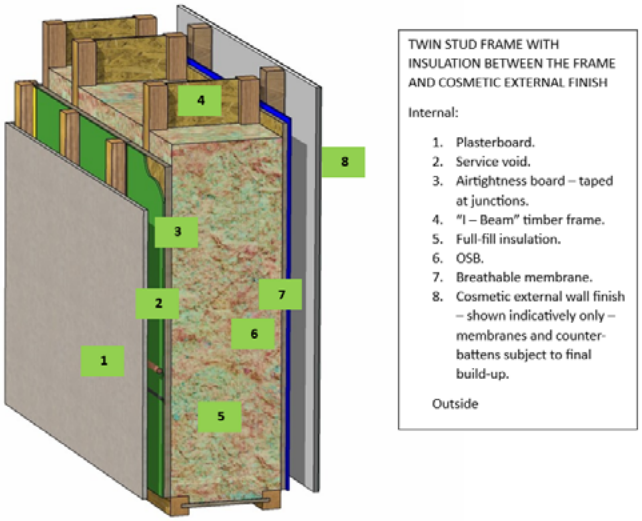

Figure 2b: timber frame wall build-up of a Passivhaus (Credit: Alan Budden, Eco Design Consultants)

Floors are often constructed from insulated slabs which allow for a continuous insulated area with no thermal bridging and complete airtightness. There are instances where beam and block construction are used, although, this often requires adaptation and extra insulation to ensure it meets the U-values required for Passivhaus.

Well-insulated roof systems also play a crucial role in regulating indoor temperatures, helping to keep homes warm in the winter and cool in the summer.

Thermal bridge reduced design

Thermal bridging, also termed cold bridging, denotes localised regions within a building's envelope where the insulation barrier is compromised, permitting an easier flow of heat compared to the surrounding materials. Essentially, thermal bridging represents a path of heightened heat conductivity that circumvents the insulation layer, resulting in an increased heat transfer zone between the building's interior and exterior.

Neglected thermal bridges can escalate heat loss from the building's structure by over 30%, primarily stemming from materials such as concrete or metal components, thereby impacting thermal comfort and potentially causing condensation.

Common instances of thermal bridges encompass structural components such as beams, columns, and studs in walls or floors, alongside areas surrounding openings like windows, doors, and vents. During cold weather, these zones may experience lower temperatures compared to the remainder of the building envelope, leading to heat dissipation, potential condensation, and occupant discomfort. In Passivhaus design, a strategic approach is adopted to eradicate thermal bridges through the incorporation of thermal breaks at vulnerable junctions, such as where steels connect to a concrete floor, ensuring optimal insulation continuity.

High-performance windows

Windows used in Passivhaus are designed to meet the strict energy efficiency and comfort standards of the Passivhaus standard. They achieve this by incorporating insulating frames with thermal breaks and typically triple glazing with low-emissivity coatings and gas filling.

Windows are sealed tightly to prevent uncontrolled air leakage. This involves using high-quality gaskets and sealing materials. They are also strategically sized and positioned to balance daylighting, solar gain, and thermal performance. Solar control is achieved by positioning windows to optimise solar heat gain during the winter and incorporating shading devices to minimise heat gain during the summer.[4]

Airtight construction

Ensuring airtightness is crucial to the fundamental principles of Passivhaus. This is achieved through the use of a continuous air barrier that envelopes the entire structure, from walls and roofs to floors and openings.

The design process identifies all potential air leakage paths and emphasises the sealing of joints and connections. The use of high-quality building materials including tapes and membranes ensures the airtightness of the building.

A breather membrane is often added externally, along with an airtight barrier which can be plywood, OSB, plasterboard or a flexible membrane. The airtight barrier is then sealed with specialised tape[5]. In masonry construction, the required airtightness is sometimes achieved using plaster alone.

Blower door testing is conducted to measure the buildings' air changes per hour under pressure. The

4. For more detail see 'Windows- making it clearer' (NF77), 2017
5. For further information see NHBC Standards chapter 6.2 – External timber framed walls.

maximum permitted is 0.6 ACH @ 50 Pa. Chemical smoke, thermographic cameras and anemometers may be used to search for leaks, which can then be plugged.

Adequate ventilation strategy

With the building now sealed for airtightness and minimal air leakage, the focus shifts to ensuring proper ventilation to keep the indoor air fresh. Stale air is removed from the building and passed through a mechanical ventilation system with heat recovery (MVHR). Here the heat is recovered from the stale air and transferred to the incoming fresh air. Passivhaus MVHR systems have heat recovery efficiencies ranging from 75% to 95%, with 75% being the minimum to meet Passivhaus requirements. The incoming and outgoing airstreams mustn't be allowed to mix, to avoid contamination between the two.

The Passivhaus Planning Package

In order to meet Passivhaus standards it is important to use a certified Passivhaus designer, architect, or consultant. In the UK such practitioners can be found on the Passivhaus Trust "members map"[6]. A Passivhaus designer will use the Passivhaus Planning Package software (PHPP) which will calculate the key parameters from the design plans, explore options for compliance and give recommendations for achieving the Passivhaus standard.

SAP or PHPP?

The Passivhaus Planning Package (PHPP) is an energy calculation tool based on an Excel spreadsheet developed by the Passivhaus Institut in Germany. The Institut exclusively authorises the simulation and certification of operational efficiency for proposed Passivhaus constructions. While PHPP shares energy calculation techniques common across Europe, like the UK's SAP, it also includes other factors such as household appliances. Moreover, it offers a deeper analysis of certain aspects of the computation, for example, thermal bridging.

Research conducted by the Passivhaus Trust, the Association for Environment Conscious Building (AECB) and Elmhurst Energy into PHPP and SAP concluded that the core of both models was very similar. However, the models are used for very different purposes.

SAP is a more standardised calculation tool used as a method of compliance. Its primary focus is to establish consistent regulations across the UK, potentially at the expense of precise data. As a result, SAP employs average UK weather data, which means that dwellings in colder regions do not necessitate extra insulation for compliance. PHPP on the other hand, always uses local climate data and includes further details in certain sections such as the calculation of shading for individual windows.

The key difference between the two models is how they are employed, rather than the accuracy of the models themselves. In essence, the underlying physics of the two methodologies give very similar energy results, but PHPP uses more precise data which can reduce the performance gap (see description overleaf).

At the time of writing the UK Government is consulting upon a replacement for SAP. This is currently referred to as the Home Energy Model (HEM) and is looking to make the calculations more accurate[7]. The core of the model will calculate the energy requirements of a dwelling in a similar fashion to SAP/PHPP: this will then be overlaid with 'wrappers', which will apply further steps in the calculation process to determine metrics associated with meeting the Future Homes Standard. Part of the validation process of this new model is comparing with outputs from the PHPP tool.

Passivhaus certification

The Passivhaus Institut has developed a quality assurance certification process to prevent false claims and abuse of the term 'Passivhaus'. The Passivhaus standard is based purely on building physics and the criteria for certification are performance-based, instead of relating to individual construction or technical details.

For certification to be granted, a building must first undergo modelling in the PHPP where checks are made to ensure the building complies with all criteria. This is the initial check, and if at any point it fails, recommendations are given to assist the designer in achieving compliance. Once an initial review has been done the design then goes through full PHPP verification. This is where designers will refine construction and select products to ensure compliance.

During the construction phase of a Passivhaus project, it is advised that Certified Passivhaus Tradespersons are used who are trained in the principles to ensure the correct implementation of the design.[8] Quality assurance measures are applied throughout construction, such as multiple pressure tests, detailed documentation of the MVHR commissioning, and photographic evidence of the as-built construction elements. Upon completion, an as-built assessment is carried out and submitted to an independent certifier, who has not been involved in the design of the building .[9] The building is then deemed a Certified Passivhaus.

In addition to certifying complete buildings, the Passivhaus Institut also awards certification to proprietary products and individual components such as windows, wall systems and MVHR units. These products are held on a database making it easier for designers to conduct quick comparisons between products and help with design. The use of certified products is not a necessity; however, penalties may be applied in cases where they are not used. In the case of windows, non-certified windows can be used if manufacturers supply data to EN 10077 so that the components worksheet in PHPP can be completed. Certifying products ensures quality and that materials will meet Passivhaus standards.

6. Passivhaus Trust, Members directory. Click here. [Accessed May 2024].
7. More detail on the Home Energy Model can be found at: gov.uk/government/consultations/home-energy-model-replacement-for-the-standard-assessment-procedure-sap
8.See passivehouse.com/03_certification/05_certified-tradesperson/05_certified-tradesperson.htm
9. See passivehouse.com/03_certification/02_certification_buildings/03_certifiers/01_accredited/01_accredited.html

The performance gap

The performance gap refers to the disparity between the anticipated energy efficiency and performance of a building as initially predicted during the design and simulation stages, versus the actual energy performance observed during its operational phase[10]. This discrepancy can arise due to factors such as construction quality, occupancy behaviour, system operation, or inaccurate assumptions in modelling. Studies have conducted post-occupancy evaluations and found energy consumption can be many times higher than compliance calculations made during design. This highlights the need for better alignment between design expectations and real-world outcomes to achieve intended sustainability and efficiency goals.

Figure 3: Passivhaus Certification

The importance of commissioning

Because a Passivhaus is exceptionally airtight, it relies heavily on the mechanical ventilation system with heat recovery (MVHR) to provide sufficient ventilation and prevent problems with indoor air quality and moisture. MVHR units are often installed in less accessible areas like the loft and usually operate quietly. Consequently, homeowners might not always know if the MVHR system is inactive, potentially leading to issues of condensation and mould.

It is crucial to conduct thorough commissioning of MVHR units. Additionally, a proper handover procedure post-commissioning is essential to educate homeowners about the system's functioning and correct usage, ensuring effective ventilation and optimal performance.

Is certification necessary?

Certification is essentially a quality control process that ensures that the building will not only perform as designed but also will last. The PHPP software can be bought for £170+ VAT, and the cost per unit of certification for a Passivhaus is between £1,500 and £2,500[11]. Passivhaus Certifiers, designers and tradespersons will incur their own fees for training and registration.

Non-certified materials and systems may be used in Passivhaus designs provided one can provide the necessary parameters in PHPP for the calculation to be accurate.

It is possible to design and build using the fundamental principles of Passivhaus but not achieve the very strict targets required for certification. In situations where efforts have been made to achieve the Passivhaus standard, but they haven't quite achieved it, it is possible to seek the Passivhaus Institut Low Energy Building standard (PHILEB). This is discussed further in Chapter 5 of the full report which can be found here.

Samuel Lott, BSc (HONS), MSc Data Consultant (Energy)

Sam Lott joined the Sava team in December 2022 as an Energy Data Consultant. His job is to work with customers to advise on the quality of their housing stock data and give advice on different ways in which they can work towards their zero carbon goals. He is working on broadening our consultancy services with a focus on sustainability and has a keen interest into how we can best advise our clients on retrofitting sustainably and the importance of electrification in the housing sector.

Before joining Sava, Sam completed a degree in Biological Sciences, followed by a Masters of Research in Biological science. This research focused on first time intracerebral haemorrhagic stroke, identifying risk factors that cause early onset and groups that are more predisposed to early onset.

Dr Neil Cutland MInstP, Special Projects Director

Neil Cutland joined the Sava team in 2022 after a long career as an energy and sustainability consultant, specialising in low energy buildings with a particular focus on housing. Neil is one of the authors of the BREDEM mathematical models that underpin the SAP, is a Member of the Institute of Physics and has sat on various Government and related advisory panels. Following his doctoral research on the thermodynamics of industrial heat recovery devices, Neil undertook extensive performance monitoring of the homes on the iconic Energy Park in Milton Keynes. He subsequently helped to develop and deliver the training programme for NHER energy assessors.

10. NHBC Foundation, "NF41: Low and zero carbon homes: understanding the performance challenge," 2012.
11. Costs are correct as at November 2023

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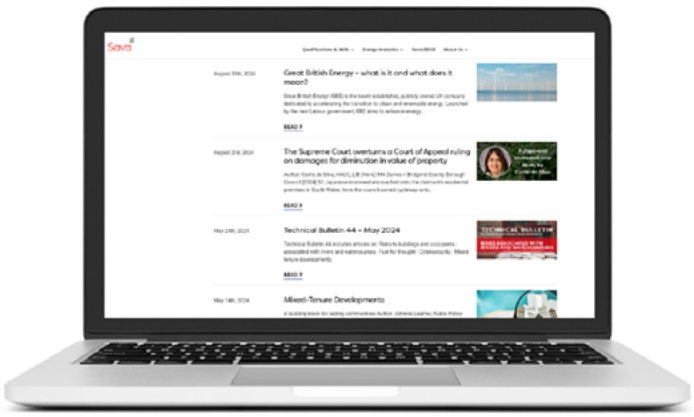

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NAVIGATING THE 2023 RICS RED BOOK UK NATIONAL SUPPLEMENT

FIONA HAGGETT BSC (HONS) FRICS, SAVA TRAINER AND HEAD OF VALUATIONS, BARCLAYS

Introduction

In the ever-evolving landscape of property valuation, the RICS Red Book stands as a crucial guide for professionals in the field. The latest iteration is the UK National Supplement, published in October 2023, and effective from May 1, 2024. This document serves as an essential subset of the Red Book Global Standards, which is under review and expected to be updated in early 2025. The UK National Supplement adapts the global standards for specific application within the UK, ensuring compliance with national laws and addressing unique market conditions.

The Structure of the UK National Supplement

The Red Book Global Standards cover the higher-level elements of valuation, but the UK National Supplement deals with the standards as they apply within the UK. It is the local application of the global standards for the UK, and it comes in four parts. (Note: if you go to the RICS website you will see that there are other local jurisdiction guides intended to reflect the valuation practice relevant for that jurisdiction.)

The UK National Supplement is divided into four main parts:

1. Introduction: This section provides a general overview but is less relevant for professionals already familiar with the Red Book.
2. UKPS (Professional and Valuation Standards): Here, valuers are reminded of their duty to comply with UK law, a fundamental requirement for all professionals.
3. UK VPS (Valuation Practice Statements): These are mandatory standards that must be adhered to by all valuers.
4. UK VPGA (Valuation Practice Guidance Applications): While these are labelled as advisory, deviating from them requires strong justification, making them effectively mandatory in practice. (An approach to take would be to take 'advisory' as being mandatory unless you have a very good reason not to comply.)

Key Focus on Residential Valuation

For residential valuers, the most pertinent section is UK VPGA 11, which addresses the valuation of UK residential property. This section is directly linked to VPGA 2 of the Red Book Global Standards, detailing how secured lending valuations should be conducted within the UK context. There are other sections relevant to housing and residential property, notably UK VPGA 14, which covers Valuation of Registered Social Housing for Loan Security Purposes, and UK VPGA 15, Valuations for Capital Gains Tax, Inheritance Tax, Stamp Duty Land Tax.

Uniformity in Valuation Advice

A significant emphasis of VPGA 11 is on maintaining uniformity in the advice given by valuers across the UK. Whether working for lenders or private clients, consistency in applying the valuation standards is crucial to ensure that valuations are reliable and comparable.

Role of the Valuer

The valuer's role, as outlined in VPGA 11, involves advising clients on the nature of the property, highlighting any factors likely to materially affect its marketability and value. This includes assessing market value, market rent (for buy-to-let properties), and noting any assumptions or special assumptions made during the valuation process. The focus is on identifying issues that have a material impact on value, rather than conducting a detailed survey.

Inspection and Investigation Guidelines

VPGA 11.2 covers the basis of valuation, with market value being the primary focus. The inspection process, outlined in VPGA 11.3, specifies that valuers should inspect all visible parts of the property from ground level and adjacent public areas. Roof space inspections are generally not required unless deemed essential by the valuer due to potential impacts on market value. Health and safety considerations may also influence whether such inspections are conducted. However, it is essential to remember that while a roof inspection may not be mandatory under VPGA 11.3 you may find that lender clients do require a roof space inspection, so it is always essential to check specific lender requirements before the job is undertaken to. Also, when you are completing the inspection, you should supplement what you see on site by additional information, often found online, which in your professional judgement is relevant to the service being provided.

VPGA 11.4 and 11.5 delve into the importance of identifying defects that could have a material impact on value. This is a valuation and not a survey so will not involve such a comprehensive inspection as, say, a Level 2 inspection carried out on behalf of a purchaser. Valuers must use their judgement to determine whether further investigations are necessary, focusing on defects which may have a material impact on value rather than minor issues. If you can't inspect a specific area, it is only appropriate to request further investigation if you have a particular concern or suspect a defect that could impact on value. There's no need to take extra steps just to cover yourself. Document any inaccessible areas in your site notes.

Assumptions and Reporting

Assumptions and special assumptions, covered in VPGA 11.6, should be used sparingly and only when necessary. Valuers are expected to make reasonable inquiries before resorting to these assumptions, and any assumptions used should be clearly documented in both the site notes and the final report.

The subsequent sections of VPGA 11 (11.7 to 11.12) address the reporting process, treatment of incentives, reinstatement cost estimates, and the implications of valuation within a defined marketing period.

Supporting Guidance

The UK National Supplement is supported by additional guidance documents that provide more detailed advice on specific valuation scenarios. These documents, previously separate from the Red Book, have now been integrated to ensure consistency and avoid duplication of information.

Conclusion

The Red Book UK National Supplement is an essential tool for valuers operating within the UK. It not only aligns UK practices with global standards but also addresses the unique legal and market conditions present in the UK. For residential valuers, understanding and applying the guidelines in VPGA 11 is crucial for delivering consistent, accurate, and legally compliant valuations.

As the global standards evolve, particularly with the upcoming 2025 update to the Red Book Global Standards, staying informed and adapting to these changes will be essential for all valuation professionals. The UK National Supplement provides a solid foundation, ensuring that UK valuers remain at the forefront of best practices in the industry.

Fiona Haggett BSc (Hons) FRICS

Fiona has 35 years' experience and is currently Head of Valuations at Barclays Corporate Banking. Her previous roles include residential valuer for Halifax BS, head office roles in Lloyds Banking Group (risk management, complaint investigation, health & safety, audit, lending policy and technical advice). She is also former UK Valuation Director at RICS.

DAVIES V BRIDGEND COUNTY BOROUGH COUNCIL [2024] SC

THE SUPREME COURT OVERTURNS A COURT OF APPEAL RULING ON DAMAGES FOR DIMINUTION IN VALUE OF PROPERTY

CARRIE DE SILVA LLB (HONS) MA, VISITING PROFESSOR, HARPER ADAMS UNIVERSITY, AND SAVA TRAINER

In this article, legal expert Carrie de Silva will explain the outcome of *Davies v Bridgend County Borough Council* [2024] SC, a case that was appealed and ultimately brought before the Supreme Court.

Japanese knotweed encroached onto the claimant's residential premises in South Wales, from the council-owned cycleway onto which the terraced house backed. The knotweed had been on the restored former railway line for a long time, acknowledged in the Court of Appeal to be 'well over 50 years'. Certainly long before 2004, when Marc Davies acquired his property.

It is well established that encroachment of Japanese knotweed can be an actionable nuisance, as seen in the Court of Appeal decision in *Williams and Wastell v Railtrack* [2018] CA.

It is also well established that, where a nuisance arises before a defendant was responsible for the relevant property, they can still be liable if the nuisance is ongoing and they do nothing to stop it, per *Delaware Mansions Ltd v Westminster City Council* [2001] HL (a case with reference to encroaching tree roots).

In the Court of Appeal (drawing on the reasoning in *Delaware Mansions,* that the defendant is responsible for ongoing nuisance, even if they had not caused the nuisance) damages were awarded for a residual diminution in value of the property. It was successfully argued that the property value would be diminished due to the property's association with knotweed, that diminution endured after remediation as it is considered that knotweed can never be fully eradicated. Even after an eradication programme, there would be limits to the owner's use and enjoyment of the property as they would not want to disturb dormant roots by significant construction or garden works. Thus £4,900 was awarded for the property being associated with knotweed, i.e. stigma or blight.

Unsurprisingly, the judgment led to a flurry of claims with the case giving an added dimension to knotweed nuisance litigation. But the effect was to be short-lived. In May 2024, the judgment with regard to damages for a diminution in

value due to the stigma of an association with knotweed was overturned in the Supreme Court. The reasoning was thus:

The diminution in value occurred well before the initiation of the legal action and even before the period of legal culpability. Japanese knotweed became recognised as an actionable nuisance in 2012, following the publication of the RICS Information Paper, 'Japanese Knotweed and Residential Property' (1st ed.), now superseded by the RICS Professional Standard, 'Japanese Knotweed and Residential Property, 1st ed., 2022'. The law allows a reasonable period to respond to such guidance, and the court determined that liability commenced in 2013, continuing until 2018—when the remediation was carried out.

The lack of action for the knotweed from 2013, the earliest date of liability, did not cause the diminution of value or any 'undue interference with the claimant's use and enjoyment of land'. That had happened due to the earlier, non-actionable encroachment of the knotweed. *Delaware* supports a claim where there is a continuing nuisance, but all the damage with regard to diminution in value had happened anyway with no element of causation or increase from 2013.

The key significance of the Supreme Court's decision was, essentially, an application of the standard "but for" causation test, a critical factor for establishing a claim in nuisance. The question considered was whether, "but for" the inadequate treatment from 2013 to 2018, the reduction in the property's value would have occurred or, to put it another way, would the damage have occurred but for the defendant's (actionable) behaviour? If so, there can be no claim.

Looked at in this way it was evident that there was no causal link between the breach of duty and the claimed loss in value. In this case, the council's lack of action from 2013 to 2018 had no impact on the diminution in the value of the property. There would be scope to establish that the lack of action has caused or enhanced the damage, but that argument was not made in this case.

A decrease in property value that happened in or before 2004—well before the Council's breach through inadequate treatment between 2013 (after the RICS report on knotweed) and 2018—cannot justify any compensation to the neighbouring landowner.

It is worth mentioning, as it is still often misrepresented, that it is no defence to argue that the nuisance arose before the claimant came to the land, that the claimant 'came to the nuisance'. The claimant can still bring action. Pre-existing nuisance may simply be a factor in the nature of the area but *Coventry v Lawrence* [2014] SC clearly ruled on this matter.
The key points are as follows:

- Allowing knotweed to encroach is actionable in nuisance.
- There can be a claim for diminution in value of property for the blight/stigma of association after the knotweed has been remediated, but only if there is a clear causal link between the diminution and the defendant.

It might also be noted that there is still differing expert opinion in this area. The botanists differ on the ongoing impact of a former, and well-remediated, knotweed infestation. And the valuers differ on the impact on value of current or former knotweed presence (see Savills' study: Japanese knotweed and prime property, July 2021, https://www.savills.co.uk/research_articles/229130/316128-0). But the Supreme Court acknowledged the potential ongoing blight. The lack of damages was simply due to there being no causal link between the diminution in the value of the property and the defendant's culpability, which did not kick in until 2013.

For those interested in court activity involving 'greenery', see *Trees and Plants Casebook: key court cases from the 18th to the 21st century* (£10 for electronic copy direct from the author: carrie@carriedesilva.co.uk).

Carrie de Silva LLB (Hons) MA

On graduating with a law degree from the University of Leicester, Professor Carrie de Silva worked in corporate taxation, initially for Arthur Andersen. She lectured in law and taxation to prospective rural chartered surveyors at Harper Adams University for over 20 years before being appointed as an Honorary Professor of Real Estate Practice Law at the Royal Agricultural University. She is course content writer and trainer on the legal elements of Sava courses.
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LEARNER'S LENS

SHADOWING A SPECIALIST ASBESTOS INSPECTOR

ELLA SOMERSET, SAVA LEARNER
CHRISTOPHER MORAN ASSOCRICS, SAVA GRADUATE AND DIRECTOR, CHRISTOPHER MORAN RESIDENTIAL SURVEYING

In this article, Sava learner Ella Somerset shares her experience of a day out with Specialist Asbestos Inspector Jim McKeon from Grosvenor Asbestos Solutions. Ella spent the day with Jim carrying out a management survey on a semi-detached house in Sale, where several samples of asbestos-containing materials (ACM) were taken for analysis.

Ella's mentor, Sava graduate and RICS Residential Surveyor of the Year winner Christopher Moran, also offers his advice as a practicing surveyor.

The Brief

I joined Jim on one of his asbestos inspection and sampling surveys to deepen my understanding of asbestos and the work of asbestos specialists. We explored the best practice principles when identifying asbestos, and the processes to follow once asbestos is found.

Jim's client wanted to purchase the property, but an initial condition survey advised it was likely that some of the building materials contained asbestos. This presumption was based on the property being constructed in 1836, with most of the modernisation taking place before 1999—the year asbestos was officially banned in domestic properties.

During the inspection, Jim collected various samples for testing, which were sent to an accredited lab. The results from the lab were analysed, with Jim producing a report to advise his client on the best remediation strategy for the level of contamination within the property.

What is asbestos – a reminder

All asbestos is hazardous; however, some forms are notably more hazardous than others. The three main types are chrysotile (white asbestos), amosite (brown asbestos), and crocidolite (blue asbestos). Of note, several less common asbestos forms continue to pose a significant danger, including tremolite, actinolite, and anthophyllite.

White asbestos is the most recognised, highly understood type, and therefore was the most used historically. It has subsequently been the most widely studied. Though still considered highly dangerous, other types of asbestos are considered even more lethal.

Both brown and blue asbestos (amosite and crocidolite) are known to be the most dangerous forms of asbestos; they are commonly found in loose insulation fabrics that may be more easily, or unintentionally disturbed. Therefore, extreme precautions when removing or handling are essential. Removal of blue and brown asbestos requires the highest level of care, employing dust suppression techniques to reduce fibre levels and specialised PPE.

Advice from Chris

It's crucial to always wear a suitably protective mask whenever entering areas that could contain asbestos, such as roof spaces and cellars. As surveyors, we are at a higher risk of being in places where asbestos could be present and it's very often not until we have been in those spaces for a while before we find the asbestos, putting on a mask only when we find it is too late!

The Process

Before attending the inspection, Jim conducted some desktop research. This was primarily based on the marketing material provided by the estate agent, as well as the client's instructions with any specific areas of concern which had been noted.

Upon arrival, Jim collected his tools from his van and put on his personal protective equipment before entering the house. This includes an asbestos-grade mask, goggles and gloves. He introduced himself to the property owner and explained the expectations of the appointment. It is important to obtain the owner's consent for small samples to be taken so that asbestos can be correctly identified.

Jim started his inspection upstairs, working his way down through the building. The first process was investigating the loft space with a torch, followed by systematically moving from room to room while investigating cupboards, underneath bath panels and around flues. This methodical approach is crucial when identifying where asbestos-containing materials are likely to be located.

Certain ACMs stand out more readily during an inspection—textured ceilings, for example. When Jim identifies a potential ACM, he carefully collects a sample (as shown in the photograph above) using a sharp tool and a secure grip-seal bag to ensure safe handling. These samples are then sent to a lab for testing.

To minimise any risk of asbestos fibre spread, Jim

meticulously cleans the sampling area with wet wipes and seals it with a layer of paint. This final step is crucial for maintaining the property's safety and ensures that no stray fibres remain in the air.

The Dangers of Asbestos

When ACMs are disturbed or damaged, they release loose fibres into the air, which, if inhaled, can cause serious and irreversible lung damage. Although these asbestos-related diseases often take years or even decades to develop, they are usually untreatable by the time they are diagnosed, and many can be fatal.

The Health and Safety Executive (HSE) reports that each year around 5,000 people in Great Britain die as a direct result of past asbestos exposure. Among the most serious conditions is mesothelioma, an aggressive cancer affecting the lining of the lungs (pleura) or the lining surrounding the lower digestive tract. Nearly always linked to asbestos exposure, mesothelioma is typically fatal once diagnosed. Another dangerous condition, asbestosis, results from lung scarring after prolonged and heavy asbestos exposure. Those with asbestosis often experience progressively worsening shortness of breath, reduced exercise tolerance, and fatigue.

The most infamous example of how dangerous asbestos can be was seen in Libby, Montana, USA. It was the site of one of America's worst man-made environmental disasters, with toxic asbestos dust from the vermiculite mines killing 694 residents, according to a 2021 study published in the Journal of Exposure Science and Environmental Epidemiology.

Approximately 2400 more people have been diagnosed with asbestos-related diseases since. When W.R. Grace & Company took over the operation of the mines in 1963, they already knew the vermiculite was contaminated with asbestos and that it could cause health complications. The

company didn't warn anyone about the perils of asbestos exposure and mining continued until 1990.

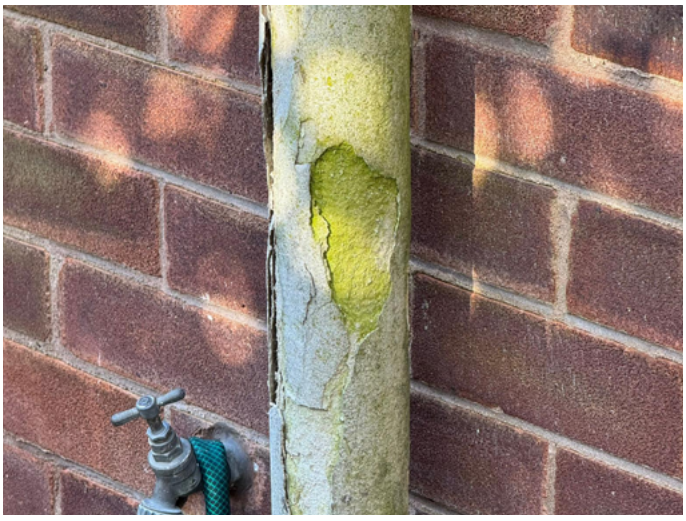
Works to clean up the town began in 2000. In 2009 the Environmental Protection Agency declared a public health emergency in Libby and called it the worst case of industrial poisoning of a community in U.S. history. The cleanup in Libby is the largest, longest-running asbestos cleanup project in American history and has cost over $600 million, the clean-up is predicted to continue up to 2030.

Where can asbestos be found within residential properties?

Almost anywhere!

Common examples include:

- Loft and wall insulation
- Roofing tiles, sheets and siding shingles
- Insulation to piping
- Gutters, piping, soil vent pipes
- Textured paints (Artex) and patching compounds used on ceilings and walls
- Surroundings near wood-burning stoves, gas and coal fires
- Flooring tiles, Vinyl sheet flooring backing and adhesives
- Sectional or hand-applied thermal insulation to pipes
- Electric fuseboards, water tanks, soffits and downpipes
- Underneath steel sinks and baths (which helped dampen the sound of the water against the metal)



Advice from Chris

A magnet is a helpful way to identify if a material might be asbestos. Rainwater pipes and soil vent pipes are often over painted, and it can be difficult to clarify the material. A strong magnet will stick to cast iron, but asbestos cement is not magnetic.

Following the Survey

Following the inspection, all relevant information is carefully compiled, including results from accredited laboratory analyses of the samples. The limitations of the management survey are also clearly stated, so that the client is fully informed on the scope of the survey and any areas of uncertainty.

The information is presented in a report format and sent to his client. Before sending the final written report, he prefers to discuss the findings over the phone, providing an opportunity to address any questions or concerns directly. This conversation helps the client gain a clearer understanding of the survey results and the most appropriate actions for managing ACM.

With the report, the client gains a thorough understanding of the ACM risks associated with the property, as well as the best strategies for addressing them. This knowledge enables the client to make an informed decision on whether the property remains a viable purchase.

Identifying Asbestos

With many fibres invisible to the naked eye, it can be very challenging to identify. Many ACMs will have textured dimples or a swirl-like pattern on the surface that can be recognised. Alternatively, check to see if the manufacturer, product name or date of manufacture are on a label in the material, allowing for a simple google search. If there is no label on the product, then the age of the building itself is usually a good indicator of whether there may be the presence of asbestos.

It's important to remember, you can't be 100% certain if a material contains asbestos just by looking at it. Identifying asbestos requires testing by an accredited asbestos lab.

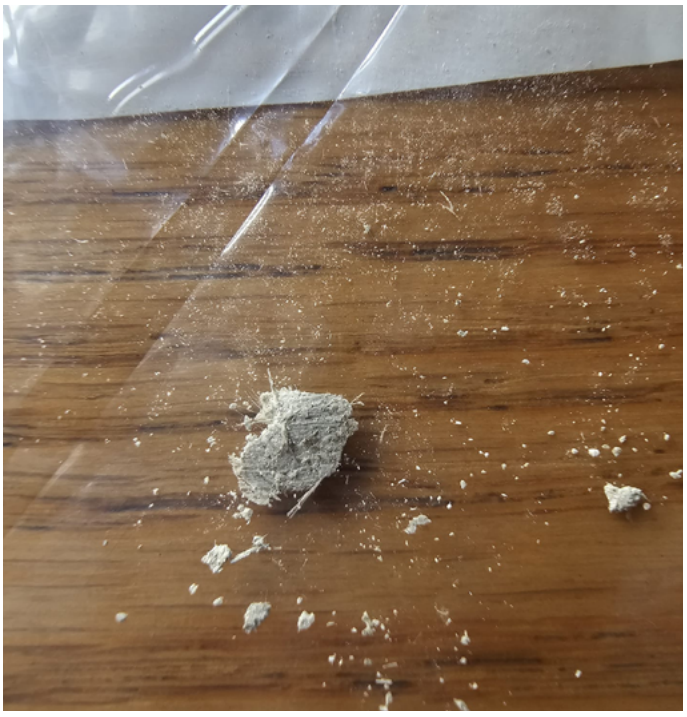
If you think it might be asbestos, in any doubt always treat it like it is, and recommend a licensed asbestos assessor for testing and potential removal.

Fig 2. Asbestos containing corrugated cement sheet, commonly found on garage roofs)

What next?
It is very important to ensure the safe containment or removal of ACM. This must be completed by a professional removal company that specialise in asbestos management services. These organisations are able to conduct precise asbestos testing to determine the type and amount of the material present within the property.

Does asbestos have to be removed?
Asbestos has been banned in the UK since 1999, making it illegal to buy, sell, import, export, or use asbestos-containing materials in any form. This prohibition extends to its use in building construction and refurbishment. However, despite the ban, there is no legal requirement for existing asbestos to be removed from buildings.

Homeowners can choose to manage asbestos-containing materials when removal is too disruptive or costly. One effective management approach is 'encapsulation', where a sealant is applied to the ACM to create a protective barrier. This sealant prevents asbestos fibres from becoming airborne if the material is accidentally disturbed. Encapsulation not only reduces the risk of exposure but can also enhance the appearance of the material. Once encapsulation is complete, clearly labelled warnings should be placed to indicate the presence of asbestos, helping to prevent unintentional disturbance. Additionally, the asbestos register should be regularly updated to ensure accurate, current information on the property's asbestos status.



Advice from Chris
If in doubt about PACM (potential asbestos-containing material), I always advise Condition Rating 3 and advise my clients to have a specialist inspect and sample the material. The cost of having a specialist visit and having the material sent away for testing is very minimal compared to the severity of asbestos-related health risks.

(Fig 4. Material taken from the edging of a fireplace; fibres can be seen within the sample taken)

Final Thoughts
Having an asbestos specialist explain the key considerations for condition reports was incredibly valuable, and observing the principles applied during a real inspection greatly deepened my understanding of asbestos management. As a future residential surveyor, I won't be taking invasive samples for testing, but this experience has significantly boosted my confidence in identifying potential asbestos-containing materials.

One critical takeaway from this experience is the importance of caution—if there's ever uncertainty, it's essential to take the necessary precautions and recommend professional testing. Additionally, understanding the correct personal protective equipment (PPE) for specific situations is crucial; protecting your health is paramount in a career that involves inspecting properties where asbestos may be present.

Further information
Further information about asbestos can be found on Sava EDGE: https://sava.co.uk/sava-edge/.

The Health and Safety Executive (HSE) also have useful information about asbestos here.

Ella Somerset

Ella is a Sava student studying Residential Surveying and Valuation, based around Greater Manchester with 11 years of experience within the property industry from her estate agency background.

Many thanks to Christopher Moran AssocRICS (Christopher Moran Residential Surveying) for assisting with this article and Jim McKeon (Grosvenor Asbestos Solutions) and for the shadowing opportunity.

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