



The National Self Build & Renovation Centre

Project Handbook | Issue 3 | 2026

Create your **Perfect Home**



0345 223 4455 | nsbrc.co.uk

Lydiard Fields, Swindon, Wiltshire, SN5 8UB (M4, J16)



£8.99



Fleming
Homes

This is the year you build the life you've imagined.

At Fleming Homes, we give you the freedom
to build your self-build home, **your way**.

Whether you're still dreaming,
already have land, or deep in planning,
**we're here with the support,
design expertise, and
construction knowledge to bring
your vision to life.**

From planning permission to
timber frame erection
— it's all in-house. **It's all for you.**



Design Service



Planning & Building Regs



Off-site Timber Frame Manufacture



Fast, Friendly Support at Every Step

Visit us at Stand 231

Let's build something extraordinary together!

For more information,
scan the QR code below:



A very warm welcome to the National Self Build & Renovation Centre

Every year we ask our visitors **what is it that motivates you to take on a self build or renovation project – and what stands in your way?**

Our 2026 Annual Survey results gives us a fascinating insight into the people embarking on substantial homebuilding projects across the UK. With 415 responses, it provides a useful snapshot of your aspirations, ambitions and challenges – and, perhaps most importantly, what you want your home to achieve.

And the message from this year's survey is wonderfully clear: **you want better homes.**

Our top motivation, scoring 4.75 out of 5, is to achieve a higher quality home than a standard new build. Closely following at 4.69 is the desire to create a home that is more energy efficient and cheaper to run, with having a home built to exact specifications coming in third at 4.61.

These ambitions remind us that self build and renovation is not simply about putting a roof over your head. It is about creating a home that works better, performs better and feels more personal – a home designed around the way you want to live.

It is particularly encouraging to see sustainability featuring so strongly. **90.4% of respondents have budgeted for higher levels of insulation**, while almost four in five are considering a sustainable heat source and more than three quarters are planning micro-renewables such as solar PV. There is also strong interest in battery storage, EV charging, mechanical ventilation and heat recovery, triple glazing and airtightness.

The aspiration is clearly there. The challenge, as ever, is turning that aspiration into reality.

When we asked about the biggest obstacles, Planning was the clear cause of most frustration. Around two thirds of respondents had experienced specific planning issues, with policies not supportive of self build, lack of response or resources, and inflexible officers or poor planning balance among the most commonly reported frustrations.

Finding the right plot can also be challenging. While 60% of respondents already own their plot, others have spent months – and sometimes years – searching. Estate agents and auctions remain the most common route, but garden plots, property websites and good old-fashioned local research all feature strongly.

This is why we believe the NSBRC has such an important role to play.



We see ourselves as a **hub for better, sustainable homes** – a place where you can gather information, explore ideas, ask questions, compare solutions and, importantly, talk to people who understand the journey you are embarking on.

Our doors are open six days a week and our programme of shows, events and courses is designed around our three promises: **to inform, inspire and provide impartial advice.**

While the internet is brilliant for research, and AI can certainly help you generate ideas, **nothing quite replaces a good conversation.** The Centre really comes to life when visitors, experts and fellow self builders start chewing the cud together. You can learn a great deal from someone who has already tackled the problem you are wrestling with – and equally, you can discover something simply by talking through an idea with an expert.

A self build or renovation project may well represent the single largest investment you make in your lifetime. So take your time, ask lots of questions and build a team of advisors, designers, trades and suppliers who genuinely understand what you are trying to achieve.

Whether you are looking for a plot, wrestling with planning, exploring funding options, seeking design inspiration or simply trying to work out where on earth to start – **you will find plenty here to help you move forward.**

Thank you for visiting. We hope you leave feeling informed, inspired and more confident about creating the home you really want.

Good luck with your project!

Harvey Fremlin MCIM
Managing Director



welcome

Visitor Information

Essential information that you will find useful during your visit to the centre



INFORMATION POINTS AND ORIENTATION

The Centre is packed full of useful information and the map on pages 10 & 11 of this handbook can help you find your way around. There are various courses, workshops and events that are run at the Centre and online, details of which are at the front of the handbook.



THE COFFEE HOUSE 10:00 - 15:00

Situated to the left of the entrance of the Centre as you go into the main hall, the coffee house is open from 10:00 - 15:00 and serves coffees, teas and light snacks.

A polite notice: only food purchased from the coffee house can be consumed in the Centre.



TOILETS

The Centre has two main toilet facilities:

- Entrance Area toilets - located adjacent to the main coffee shop area
- Build It Theatre toilets - located at the side of the theatre.



Disabled toilets are located in each facility. Baby changing is located in the entrance area toilets.



CHILDREN

Children are welcome to accompany you to the Centre.

Safety Note - the Centres exhibits are real elements of buildings showing cutaways and exposed materials. Please keep children supervised both for their safety and the enjoyment of other visitors. If you have a children's buggy or pushchair then all areas of the centre are accessible.



SMOKING

The Centre is no smoking or vaping throughout.



PHOTOGRAPHY

Photography for personal use is allowed within the Centre.

No photographs may be used for any public or commercial purposes whatsoever without our prior permission. If you would like to use any images please email marketing@nsbrc.co.uk.



HOTELS

There are three hotels within a short walk from the Centre.



WEBSITE

For the latest information about the Centre please visit: www.nsbrc.co.uk

HELPDESK

The Free Helpdesk offering impartial technical advice is usually staffed Wednesday to Sunday each week.

OPENING TIMES

Please always check our website before visiting for up-to-date opening hours.

The Centre is open:

**Tuesday - Saturday 10:00 - 17:30,
Sunday 10:00 - 16:30 ***

* Closed to the public on Mondays for business conferencing/
Bank Holiday Mondays

About Team NSBRC

The National Self Build & Renovation Centre opened in January 2007, which means in 2027 we'll be celebrating the first twenty years of our unique visitor centre.



We'll be marking the occasion in several ways (Team NSBRC never need much of an excuse to party!) and on page 17 you'll see our Winter Show advert featuring twenty images of NSBRC case studies, as part of our '20 stories from 20 years' campaign.

We have helped tens of thousands of people achieve their dream home, over the last twenty years and you can find dozens of fantastic case studies on our website – featuring new build homes and transformations of existing properties. We have highlighted one of these projects in this handbook. On page 44. Guy and Susan Hargreaves, based in Oxford, undertook a major renovation and extension of their mid-terrace home (originally built in 1906), achieving Passivhaus EnerPHit certification, blending modern sustainability with traditional character.

We hope you enjoy your visit. We always welcome (and actively encourage) feedback. If you have any views or ideas that might help us improve, we would be delighted to hear from you.

What did you learn in our educational zones? What new product or innovation have you discovered? What else would you like to see showcased at the NSBRC?

And who knows, your project might become a NSBRC case study of the future!

Team NSBRC

about us



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www.carpenteroak.com

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The Homebuilding Centre Limited



nsbrc
National Self Build & Renovation Centre
Lydiard Fields,
Swindon, SN5 8UB
www.nsbrc.co.uk





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benchmark

SETTING THE STANDARD FOR SUCCESSFUL SELF BUILD PROJECTS



**JUST
£249**
per
project

Exclusive Membership

Join our exclusive membership offering for highly engaged self builders, brought to you by the trusted team at The National Self Build & Renovation Centre.

Introducing Benchmark:

The demand for better quality housing shows no sign of waning and perhaps this isn't surprising. No longer are they simply a place of sanctuary for our families. Modern day homes support our lifestyles, remote working/ learning & social interactions.

At the NSBRC we believe people deserve better, more sustainable, homes. With over 80 members signed-up, we help people like you achieve this by providing inspiration, information and impartial advice. **This is why we have created 'Benchmark', a bespoke membership for highly-engaged self builders.**

So - how does it work?

Your two year membership includes a range of benefits...

-  **Personal shopper experience**
-  **Dedicated contact**
-  **Private consultations**
-  **30% off ALL courses**
-  **Financial health check-up**
-  **Online workshops**
-  **Premium Show access & Benchmark events**

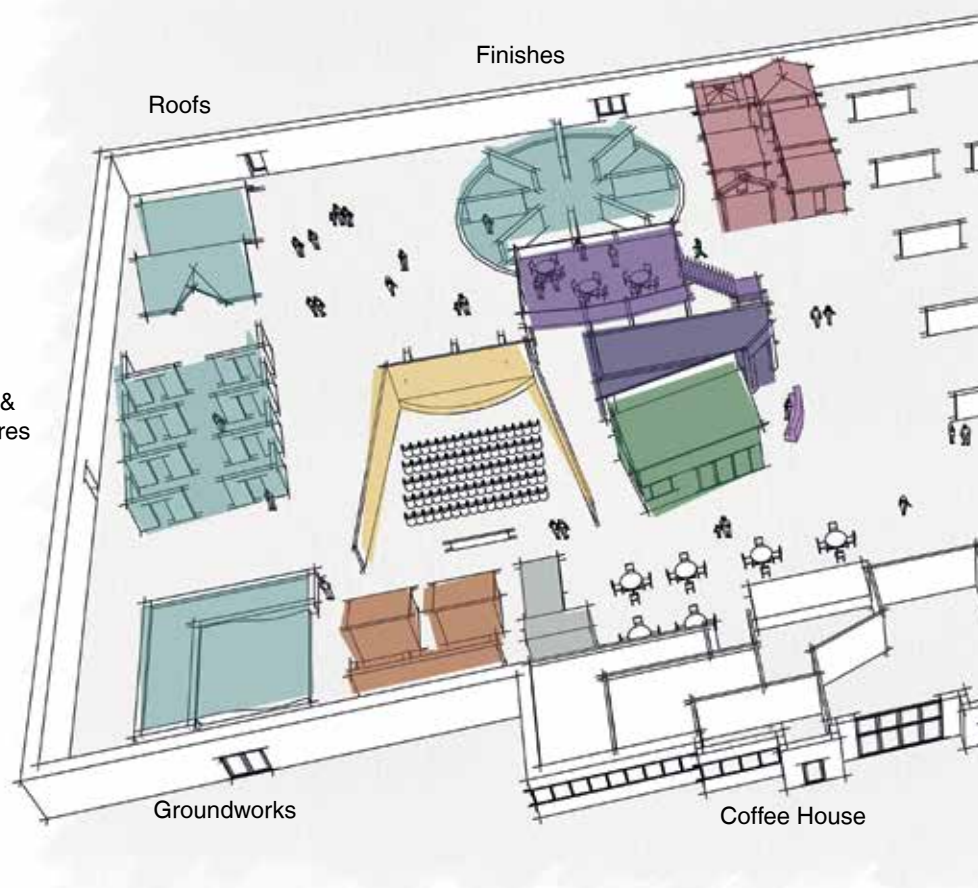
To sign up, email **benchmark@nsbrc.co.uk**
or talk to our team today



Proudly
employee
owned.



Centre Map





Buildstore



Retrofit Zone



Outdoor
Living



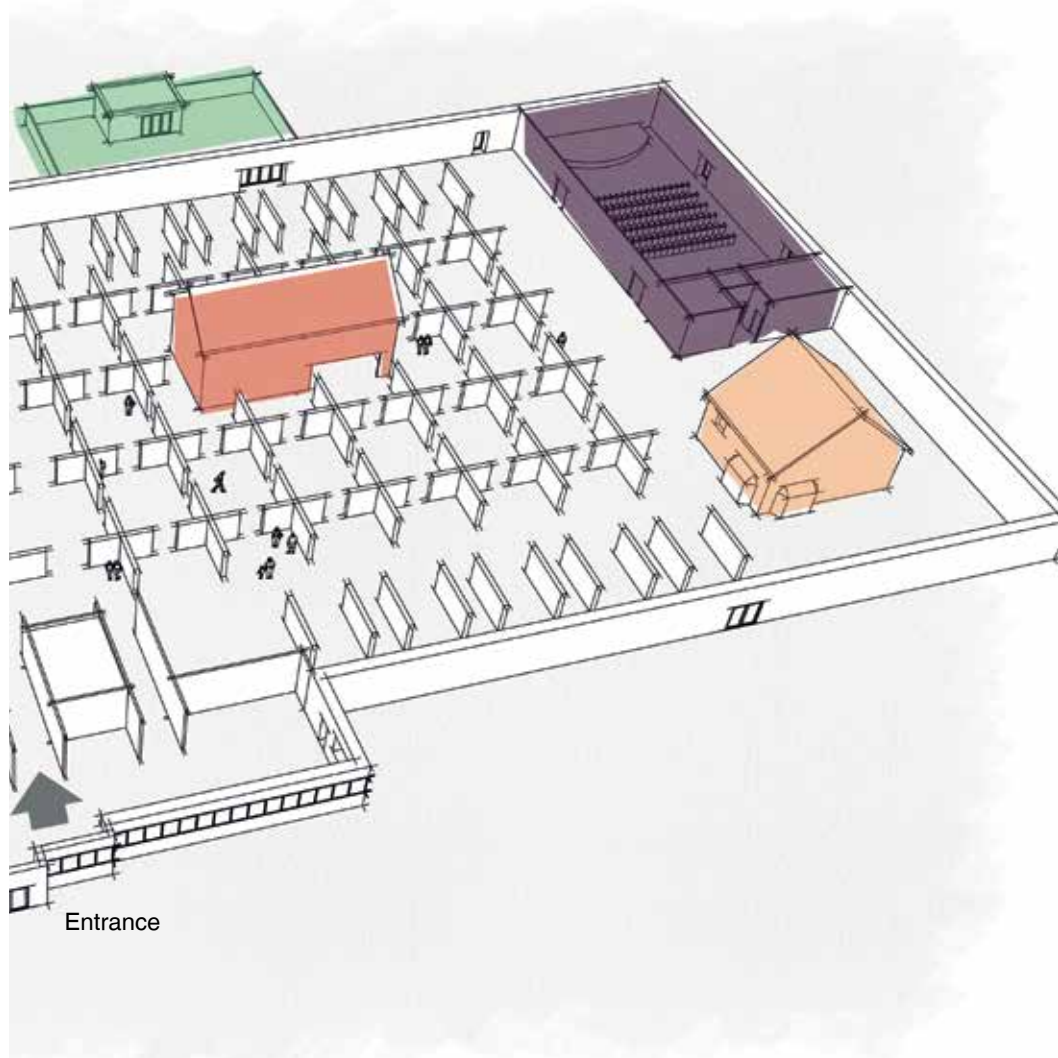
Zehnder



Renovation
House



Build It
Theatre



Essential Elements



Educational Journey - Walk through our educational zones, covering the five major stages of a building project. From footings and foundations to super-structure and services, our life-sized exhibits covering everything you need to consider when building your own house.



Professional Services Hub - The 'go to' hub for all your professional services and solutions. Including Architects, Project Managers, Surveyors, Building Control, Energy Assessors, Timber Frame Manufacturers, Design Solutions, Landscape Designers and Health & Safety.



NEW Retrofit Zone - Explore ways to make older homes warm, dry and comfortable to live in, whilst reducing running costs and being kinder to the planet. Build your knowledge of possibilities and considerations that apply to different types and ages of homes, and how they all fit together.



Renovation House - The Renovation House is typical of a property built in the inter-war years and has clearly had very little maintenance done to it. Listen to the audio guide as you progress through the construction site. *Sponsored by Good Energy.*



Land Finding - PlotSearch is the UK's largest and most accurate database of genuine self build land, renovation and conversion opportunities.



Financial Planning - BuildStore Mortgage Services is the UK's leading provider of exclusive mortgages for self build, renovation and conversion projects.



Trade Village - Visit over 200 company stands showcasing their products and services to see how they can help you with your project. Simply scan the companies you want to hear from.



Help Desk - Our team of independent experts are on hand to offer free advice and support on every aspect of your project



Requesting Information

Once inside the Centre you have access to vast amounts of information that will be useful to your project. Rather than picking up brochures you can collect what you need electronically. On entry to the Centre you will be issued with a bar-code scanner personalised with your visit ID – similar to the ones used in supermarkets. There are product information signs and 'Visitor Information Points' (in the Trade Village) allowing you to select specific product information, request a brochure or get the exhibitor to contact you. Within 7-10 days the information you requested will be sent.

To operate the scanner:

- 1) Position it approximately 15cm (6 inches) from the barcode
- 2) Press the button on the device *(do this a couple of times to 'wake up' the scanner if you've not used it in a while).*

- 3) A red line will appear
- 4) Move the scanner until the red line is fully over the barcode
- 5) The device will beep and a green light will flash to indicate that the barcode has been read

If you think you have scanned the same barcode more than once, don't worry, the system will only log one request.



 The National Self Build & Renovation Show	 The Self Build & Renovation Course	 Guide to Project Management	 Guide to VAT Claims
 Guide To Planning Permission	 Guide to Renovation Projects	 Guide to Finding Land	 Guide to Heating & Sustainability

OCTOBER 2026

Mon	Tue	Wed	Thur	Fri	Sat	Sun
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NOVEMBER 2026

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DECEMBER 2026

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28	29	30	31			

JANUARY 2027

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FEBRUARY 2027

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MARCH 2027

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29 Easter	30	31				

Please see our website for the most up to date course dates and information [nsbrc.co.uk](https://www.nsbrc.co.uk)

*Asterisk indicates the event is held online

Self Build Workshop

Renovation Workshop

Passivhaus Workshop

Drop in Clinic

Market Days

Benchmark Event

Bank Holiday Closures

APRIL 2027

Mon	Tue	Wed	Thur	Fri	Sat	Sun
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MAY 2027

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JUNE 2027

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JULY 2027

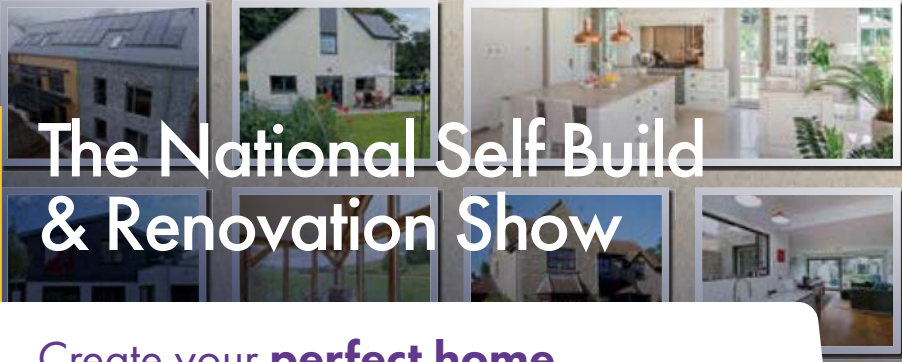
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AUGUST 2027

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SEPTEMBER 2027

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The National Self Build & Renovation Show

Create your **perfect home**

January 8th - 10th



The popular 'National Self Build & Renovation Show' returns in January, offering something for everyone interested in creating a well-designed, healthy and efficient home.

The show is an exciting, friendly and inspirational event. It's the perfect opportunity to discover how the concept of 'self building' your own home works or to simply explore the options for injecting new life into your existing home.

The show offers a packed three days of **live demonstrations, free seminars and case studies** along with an **unrivalled line up of experts** on hand to share their advice and knowledge.

From planning news to budgeting, plot finding and building regulations, the free talks are a great way to pick up a wealth of valuable information, for both newcomers and skilled professionals alike.

Over 200 exhibitors will be showcasing their latest products and technologies, with experienced representatives on hand to demonstrate, answer questions and offer their professional advice.

Our free guided tours of the NSBRC's fantastic educational zones are the perfect way to help visualise these products as part of your finished project.

The NSBRC's own team of impartial experts along with architects, project managers, designers, planners and eco consultants, will be on hand to meet for one-on-one sessions throughout the show. Offering free advice, they will happily talk through your ideas with you, no matter how big or small.

Show highlights:

- » 200+ exhibitors
- » Free one-to-one expert consultations
- » Live 'Question Time' style panel debates
- » Guided tours of the NSBRC's fantastic life-size educational exhibits
- » Free NSBRC Course Taster Sessions

FREE Tickets

The Show runs from Friday 8th - Sunday 10th January with tickets £12 per adult.

NSBRC visitors can book today for FREE at our front desk or on our website www.nsbrc.co.uk.



The National Self Build & Renovation Show

January 8th - 10th

**NEW
DATE**
for 2027

CELEBRATING

**20
YEARS**

Est. 2007

- » Over 200 exhibitor displays
- » New retrofit zone
- » Extensions & home improvements
- » Energy efficiency advice

- » Theatres with free seminars
- » Real life case studies
- » Guided educational tours
- » Free parking



More info & **FREE** tickets at
nsbrc.co.uk (£12pp on the day)
Fri & Sat: 9am - 5pm. **Sun:** 9am - 4pm.
Swindon M4 Junction 16





The Self Build & Renovation Course

Before you start work on your home, build your knowledge!

Thinking about embarking on a home building journey? We're delighted to offer a comprehensive three-day course designed specifically for aspiring self-builders, home renovators and retrofitters - with a range of experienced presenters covering everything from budgeting to the finishing touches.

With over 10 essential topics covered, this informal yet engaging course makes full use of the outstanding practical exhibits at the Centre, taking a 'fabric first' approach to building. You'll gain the insights and confidence needed to plan effectively, avoid costly mistakes, and take control of your homebuilding project.

Whether you're just starting out, or perhaps need a refresher, this course will equip you with the knowledge to make your plans run smoothly.



"I have learned more in three days than I would have done in years on my own"

"This course has provided me with a wealth of information about all aspects of self building, with helpful and knowledgeable presenters. It's great value for money and I now have a self build bible. I highly recommend it!"

Book for one,
two or all three days
PRICING STARTS FROM
£165
inc VAT
per person

Day 1

Early Stages: Project Planning and Preparation

Budgeting & Finance

Our finance expert will explain the different methods of raising finance and the importance of setting a budget and controlling costs throughout the project.

Finding & Evaluating Land

Finding a building plot is never easy, but there are ways and means to find that elusive dream plot.

Design & Specification

We explain the roles and responsibilities in the design process (including health & safety) and look at how to get the best design for your dream home.

Planning Permission

Our Planning expert will explain the intricacies of the planning process and how you can optimise your chances of getting approval for your dream home.

Day 2

Later Stages: Tendering to Completion

Building Systems & Construction Methods

We'll take you on a comprehensive tour of the build process, covering everything from clearing and setting up your site, laying the foundations and options for building the superstructure and roof. During this section, we'll utilise the life-sized exhibits - bringing the theory to life.

Building Regulations

We'll explain about building control procedures and the importance of building regulations.

Contracts & Tendering

We'll discuss the best way to find tradespeople, the trades you'll be hiring, when you'll need them and what they do.

Project Management & Site Management

Starting with the basic principles of managing the people involved in your build, through to budgets, basic contracting techniques, buying materials and site management.

Day 3

Heating and Sustainability

Energy Fundamentals

Our expert shows you how to lessen the impact your project could have on the environment; he looks at the incentives available and drivers for using various technologies, (solar, battery storage, heat pumps, etc.) comparative fuel costs and helps you understand how to calculate the payback terms. They will also consider the latest legislative requirements of Passivhaus, SAP ratings, and other potential incentives.

Design, Planning & Management

We will look at the different elements of the building to make sure they are designed, specified and installed to maximise their potential.

Heating Options:

Our expert will give the information you need to select the correct heating options for your home.

Course Dates 2026 / 2027

6th - 8th Nov '26

29th - 31st Jan '27

12th - 14th Mar '27

You can book a ticket to attend all three days, or build a bespoke package (e.g, attend Day 1 and Day 2 only - or just one day only). Select your tickets at checkout online.



For further information and to book:

Call **0345 223 4455** or visit **nsbrc.co.uk**



The NSBRC Guide to Project Management

We're with you every step of the way!

This classroom-based course is a must for anyone embarking on their first homebuilding project. Led by qualified Architect and experienced Construction Project Manager, Lucy Nylander, the day offers a comprehensive introduction to the fundamentals of project management, including build sequencing and management options.



You'll gain essential budgeting skills, learning how to manage expenditures, navigate insurances and warranties, and understand VAT reclaim processes.

The course also dives into trades and materials management, providing guidance on sourcing and pricing, setting up contracts, maintaining quality control, and ensuring efficient procurement.

Finally, site preparation will be covered in detail, with a strong focus on management, health and safety, and how to avoid common pitfalls along the way.

"It was a great course. Although I am not actually working on a project at the moment, I have a potential project on the back burner. The course has given me some inspiration and if I decide to go ahead with it, I shall definitely be revisiting the course. Thank you very much."

**1 DAY
COURSE**

£165

Per Person Including VAT

£85

*Per Device for Virtual Course
Including VAT*

Course Topics:

Project Management Basics

- » Sequencing your Build
- » Project Management Options
- » Build Routes
- » Programme Management

Budgeting

- » Setting and Establishing a Budget
- » Controlling Expenditure
- » Insurances and Warranties
- » VAT Reclaim

Trades and Materials

- » Sourcing and Managing Trades
- » Getting a Price
- » Contract Options
- » Sourcing Materials
- » Quality Control

Site Preparation and Set up

- » Site Management
- » Avoiding the Pitfalls
- » Health and Safety
- » Completion

"A really good course, very professionally delivered and brilliantly illustrated with real life anecdotes by a highly credible presenter"

Course Dates 2026 / 2027

17 th Oct '26	13 th Feb '27	12 th Jun '27
28 th Nov '26*	17 th Apr '27	24 th Jul '27*

* Asterisk indicates the event is held online

For further information and to book:

Call **0345 223 4455** or visit **nsbrc.co.uk**





The NSBRC Guide to Planning Permission

Your pathway to a perfect home!

How to successfully obtain planning permission for your self build project.

An important (and often stressful) part of any self build project is gaining planning permission.

Presented by Mark Doodes MRTPI, an independent Chartered Town Planner with over 25 years' experience in planning. Having worked in local and central government as well as private practice, Mark brings expert, impartial insight to the planning process. In this course, we take a deep dive into the planning system, explain how you can best prepare a successful application, be aware of common mistakes and avoid costly pit-falls. The session will be full of real-life studies and examples curated over many years in Practice.



Our course has been designed specifically for self-builders at early stages and is produced and delivered by independent planning expert Mark Doodes MRTPI. The course covers the key topics and features a Q&A session – so you can get your specific planning queries answered!

Topics Covered

- » Types of planning permission
- » Creating a successful application
- » Research
- » Design & Drawings
- » Reports
- » Forming your team of expert advisors
- » Legislation and Regulation
- » Conservation Areas & geographic variations

Without planning permission your project hasn't really started, and this course is designed to ensure you are not wasting time, effort and capital on sites or strategies that are unlikely to be fruitful.

The planning system is a complex and growing area with new Ecology requirements which recently came into effect. Use this course to get expert advice upfront with our great value half-day course.

- » Limited to just 30 delegates. Only £95 Per Person (Inc. VAT)
- » Half-Day session delivered in classroom style at the NSBRC
- » Exclusive course materials on a USB to access at your convenience
- » Opportunity to arrange a follow-up session with MDP at discounted rate*

**MDP are Chartered by the Royal Town Planning Institute and are on the National Planning Consultants Directory and on the Planning Portal. MDP take on projects all over England and are Insured up-to £1M in Professional Indemnity and Public Liability for site visits and meetings.*

Course Dates 2027

6th March 11th September
26th June

1/2 DAY
SESSION
9AM - 1PM

£95

Per Person Including VAT

For further information and to book:

Call **0345 223 4455** or visit **nsbrc.co.uk**





The NSBRC Guide to Renovation Projects



Renovate the past... build your future!

Delivered by Independent Heating and Energy Consultant, Rob Bohm, a leading authority in sustainable building and energy efficiency, this session is designed to empower you with the knowledge and confidence needed to manage your renovation project effectively.

Rob brings a wealth of expertise in building fabrics, heating systems, and energy-efficient design. Throughout the course, you'll gain practical insights into every stage of the renovation process—from planning and project management to working with the right trades.

A highlight of the course includes a guided tour of the NSBRC's unique Renovation House, where theoretical concepts come to life in real-world examples. Whether you're tackling a full-scale renovation or a smaller project, our training is tailored to help you make informed, sustainable decisions every step of the way.

"It's a sign of how good this course is that we have no house to renovate but still found it hugely beneficial, full of information and know-how that we can now apply to the wider task of house-building. They were such a great presenter and communicator which made the whole experience come to life. A wonderful course, thank you!"



The day covers many key subjects including:

Part one: Super structure:

- » Building Systems & Fabrics
- » Building Regulations & Legislation
- » Damp-proofing, cracking & subsidence

Part two: First and second fix:

- » Re-design and re-configuring
- » Plumbing & Services
- » Kitchens & Bathrooms
- » Can I do it?
- » What's the disruption?
- » What's the cost?
- » What's the time frame?

"An excellent course giving a thorough overview of eco renovation."

Course Dates 2026 / 2027

28th November 2026
3rd April 2027
12th June 2027
27th November 2027

1 DAY
COURSE

£165

Per Person Including VAT

For further information and to book:

Call **0345 223 4455** or visit **nsbrc.co.uk**





The NSBRC Guide to Finding Land & Appraising a Plot



This extensive in-depth and informative Masterclass will delve deeper into the challenging world of plot hunting to give you the expert advice and knowledge you need to find and determine the suitability of your ideal plot. This course is run by industry expert, Mark Stevenson.

You will leave with advice and tips on how to find and appraise a potential building plot.

“This was a FANTASTIC course, a goldmine of wisdom, you did a brilliant job, Mark – I’ve learnt so much and am now super eager to put it all into practice!”



Course Dates 2026 / 2027

23rd October 2026

5th February 2027

8th April 2027*

15th April 2027*

* Asterisk indicates the event is held online

**1 DAY
COURSE**

£165

Per Person Including VAT

£85

*Per Device for Virtual Course
Including VAT*

Course Contents:

Why are plots hard to find?

- » The Right to Build legislation
- » Competitors in land buying
- » Understanding the competitor advantage

How to get started

- » Understanding the difference between land and a building plot
- » How much land do you really need
- » What to look for when looking for a plot - different plot types
- » Plots to avoid
- » Specialist planning policies for exception plots

Top 20 ways to find a plot

- » Case study examples
- » How to identify plot ownership
- » Replacement dwellings
- » Replacement dwelling appraisal / Checklist
- » Custom build plots
- » Using online maps and plans
- » How to make your own plot
- » Live example of using online mapping to find a plot

The plot buying process explained Legal considerations explained

- » Option agreements explained
- » How to assess the viability of a plot
- » How to make sure you pay the right plot price
- » Plot valuation excel model
 - live demonstration

Assessing the planning potential of a plot

- » Planning appraisals
 - detailed considerations
- » Obtaining pre-application advice
- » How to prepare for a pre-application meeting
- » Identifying plot construction risks
- » Plot construction risks, detailed examples

Land yourself the perfect plot!

For further information and to book:

Call **0345 223 4455** or visit **nsbrc.co.uk**





The NSBRC Guide to VAT Claims

Your claims don't have to be taxing!

One of the many reasons to self build is that you can claim back your VAT. Under VAT Notice 431, any new dwellings are entitled to Zero VAT on materials and labour.

Andrew Jones – AKA, The VATman

Andrew is a specialist in processing VAT Reclaims all over the UK, with over 14 years' experience and has processed more than 13,000 claims to date (with a total value of claims over £35 million).

Who Should Attend?

This course has been produced by Andrew, and the team at the NSBRC, for private individuals creating a new dwelling for themselves or a direct family member, and not for someone doing a HMO or a developer building to sell.



Course Dates 2026 / 2027

21st November 2026
13th February 2027
3rd April 2027
3rd July 2027

**1/2 DAY
SESSION
£95**

Per Person Including VAT

Project types which this course would cover:

- » New build / Self Build
- » Demolition and rebuild
- » Replacement dwellings
- » Completing someone else's new build
- » An old house empty for 10 years or more
- » Converting a building not previously lived in
- » Commercial to residential
- » Barn Conversions
- » Disused places of worship
- » and more...

What will the course cover?

If you're doing a self build or a conversion (new build, knock-down and re-build, converting a church, chapel, barn) - creating any new dwelling which is for yourself or a family member - this course will help you understand VAT claims by covering:

- » When you should pay VAT and when you should not and at what VAT rate
- » How you achieve zero VAT on your project
- » Time frame to submit a VAT reclaim
- » Techniques for purchasing materials at the best rates
- » What can and cannot be reclaimed
- » Potential problems to avoid
- » Details of HMRC's procedure in relation to your reclaim
- » Purchases that carry other challenges and difficulties
- » The purchases HMRC will scrutinise the closest
- » The items where you're most likely to make a mistake & how to avoid this
- » Plus - lots of other insider tips to increase your VAT saving

We are confident that, in making the small investment to take this course, you will maximise your VAT claim, potentially saving hundreds if not thousands of pounds on your final budget.

For further information and to book:

Call **0345 223 4455** or visit **nsbrc.co.uk**





The NSBRC Guide to Heating & Sustainability

Build a better, more energy-efficient home

Our Guide to Heating & Sustainability is the specialist third-day programme from our highly regarded Self Build & Renovation Course.

Whether you're planning a self-build project, renovating an existing property, or simply looking to understand the latest heating and renewable technologies, this intensive one-day course provides practical, independent guidance to help you make informed decisions.

The course focuses on one of the most important aspects of any successful project: creating a comfortable, sustainable and cost-effective home.

You'll gain a clearer understanding of building performance, energy efficiency, heating systems and renewable technologies, helping you avoid costly mistakes and future-proof your investment.

Course Dates 2026 / 2027

8th November 2026

31st January 2027

14th March 2027

1 DAY
COURSE
£165

Per Person Including VAT

What will the course cover?

Energy Fundamentals

Our expert shows you how to lessen the impact your project could have on the environment; he looks at the incentives available and drivers for using various technologies, (solar, battery storage, heat pumps, etc.) comparative fuel costs and helps you understand how to calculate the payback terms. They will also consider the latest legislative requirements of Passivhaus, SAP ratings, and other potential incentives.

Design, Planning & Management

We will look at the different elements of the building to make sure they are designed, specified and installed to maximise their potential.

Heating Options:

Our expert will give the information you need to select the correct heating options for your home.

Meet the Presenter: Rob Bohm

Independent Heating and Energy Consultant



Rob heads up the energy and heating consultancy team at CLPM and is an experienced plumbing and heating engineer with expertise in renewable technologies. Rob joined CLPM in 2014 as a building project manager and over the years he has worked on all kinds of projects from residential building projects to commercial premises. However, the number of clients who need heating and energy advice has grown significantly and so Rob now spends all of his time carrying out heating or energy surveys, writing client reports and delivering sustainability advice.

For further information and to book:

Call **0345 223 4455** or visit **nsbrc.co.uk**





Self Build Workshop



Discover the **ABCs of homebuilding!**

Whether you're driven by creating a beautiful bespoke home which suits your lifestyle, or simply want to build better for less, our Self Build Workshops offer expert-led advice and inspiration to help you create a better, more sustainable home.

These Workshops will bring together leading industry professionals, covering the self build fundamentals, the latest construction methods & renewable technologies - all under one roof!



Workshop Dates 2027

20th February

19th June

3rd September



You'll learn about:

- » Funding & financing your self build
- » Design principles
- » The popular building systems in the UK - which one is right for you?
- » Key performance factors like airtightness & insulation
- » Cost, timescales, and planning implications
- » Specifying and buying materials
- » Finding good trades people & working with contractors
- » Integration of renewable energy & smart technologies

Each workshop will always offer a focus on energy efficient homebuilding. From sustainable building principles, air-tightness and insulation to renewable energy, heating systems and smart technologies.



**New Build
Zone Tours
Available**

For further information and to book:

Call **0345 223 4455** or visit **nsbrc.co.uk**





Renovation & Retrofit Workshop

Transform your home with confidence!

Whether you're extending your home, breathing new life into a tired property, or making energy-efficient upgrades, our Renovation & Retrofit Workshop offers expert-led advice and practical guidance to help you renovate smarter, more sustainably and within budget.

We have created this event for those who are interested in improving their homes to create more space, reconfiguring existing layouts, reducing energy bills or future-proofing for more accessible living.

Workshop Dates 2026 / 2027

21st November 2026

20th March 2027

18th June 2027

6th November 2027



You'll learn about:

- » Planning permission, building regs & permitted development
- » Upgrading insulation and improving airtightness
- » Windows & doors
- » Heating systems, ventilation & renewables
- » Cost planning, budgeting & avoiding hidden expenses
- » Finding good trades people & working with contractors
- » Choosing sustainable and cost-effective solutions
- » Improving layouts, lighting & internal finishes
- » Funding options and VAT considerations for renovations

*Speak to renovation specialists
during 1:2:1 consultations and
get tailored advice*

**Renovation
House Tours
Available
and
NEW:
Retrofit Zone**

For further information and to book:

Call **0345 223 4455** or visit **nsbrc.co.uk**





Photo credit: Brambles, Harpenden by Bere Architects

Passivhaus Workshops



We spend most of our time indoors, so buildings play an important part in our health and wellbeing. Join us at our **Passivhaus Workshop** as we explore how we can create homes that are designed to deliver comfort, quality and lower running costs, in any type of building.

Produced in partnership with the Passivhaus Trust, this workshop introduces the key concepts to passiv design and construction. This is a fantastic opportunity for professionals, trades and individual self builders to really understand Passivhaus.

Featuring: surgeries on design, airtightness, insulation, ventilation, windows & doors; a range of Case Studies; an interactive 'Question Time' session and much more.

Workshop Dates 2026 / 2027

20th November 2026

21st May 2027

19th November 2027

**FREE
ENTRY**

5 Reasons to consider building to Passivhaus standards:

- » **Good for comfort** - comfortable temperatures are easily maintained whatever the weather using very little energy
- » **Good for your health** - constant clean fresh air
- » **Good for your pocket** - 90% reductions in energy needed for heating
- » **Good for quality** - a rigorous quality control process requires craftsmanship and buildings that are built with care
- » **Good for your future** - the Passivhaus seal of approval guarantees certainty of performance

The most successful and cost-effective way of achieving Passivhaus is by incorporating the standard before your designs are complete. It's also useful if the Passivhaus elements are included in your planning application.

Take advantage of free guidance and ensure you have the right team behind you by meeting Passivhaus accredited experts and suppliers at our Workshop.



For further information and to book:

Call **0345 223 4455** or visit **nsbrc.co.uk**





Drop In Clinics



Our **Drop-in Clinics** are half-day events designed to give you a deep dive into topical homebuilding subjects. For each session, we select a theme to explore in more detail, often based on what's current or relevant. Previous themes have ranged from heat-pump integration, solar PV & battery storage and rainwater harvesting, to insulation, and design & finishes.

They're the perfect complement to our popular **Self Build** and **Renovation Workshops** which cover a broader array of topics. Keep up to date with the theme of our next Drop-In Clinic by visiting the 'Workshops' page on our website.



Who it's for?

Whether you're:

- » Planning a new build
- » Renovating or retrofitting an existing property
- » Simply researching or looking to reduce your home's running costs

What to expect:

- » Expert talks from selected exhibiting partners
- » Practical 1-2-1 advice to save you time and money
- » Insights to help you compare products and technologies with confidence

Get the most value from your visit to the NSBRC:

The Centre will be open from **9:00am – 5:30pm** on the below dates, giving you the chance to explore over **200 exhibition stands** alongside the clinic sessions.

Free entry. Free parking. Free advice.

2026 / 2027 Dates

5th December 2026

30th January 2027

6th March 2027

15th May 2027

3rd July 2027





Market Days

Join us for the next NSBRC Market Day!

On the second Friday of every month, many of our exhibitors will be at their displays to engage with you during our informal and relaxed 'market days'.

Enjoy networking with like-minded individuals and discover the latest innovations and solutions from industry experts as you explore a diverse range of products and services without the 'sales' pressure.

Whether you're just starting out on a self build, or are looking to improve your existing home, our exhibitors are here to share their knowledge and assist you in making informed decisions for your project.

Every Market Day features a free guided tour of our new build educational zone with our technical advisors.



If you're frustrated with the existing layout of your home, need more space but don't want to move, or perhaps have some self build ideas in mind but need some advice before putting them onto paper, our experienced professionals are here to chat design and constructions options with you.

*** Please note, to avoid disappointment on the day, appointments with an Architectural Professional must be booked in advance by emailing reception@nsbrc.co.uk or calling on 0345 223 4455.**



2026 / 2027 Dates

13 th Nov '26	9 th Apr '27
12 th Feb '27	14 th May '27
12 th Mar '27	11 th Jun '27

**FREE
ENTRY**

For further information and to book:
Call **0345 223 4455** or visit **nsbrc.co.uk**





Retrofit Zone – NEW!

We're excited to introduce our new permanent educational exhibit at the NSBRC.

The 'Retrofit Zone' is dedicated to helping you navigate potential solutions to increase your energy-efficiency, property value and quality of life.

Life-size cross-sections representing different types and ages of housing commonly found in the UK, will help you explore challenges you're most likely to experience, and potential solutions best suited for you and your home – with an emphasis on taking a fabric-first approach.

Build your knowledge on insulation, airtightness, moisture management, ventilation, heat and energy - balancing a 'whole home' approach, and navigating legislation. Whether you're looking for low-cost solutions or planning a deep-retrofit, this is the perfect place to start prioritising the most effective solutions for you, and to help your project run smoothly.

New Retrofit Zone



“

“The UK’s housing stock is among Europe’s least efficient, contributing around 13% of national emissions and leaving many households in fuel poverty.

Well-planned retrofit, reduces running costs and futureproofs against further cost of living increases - whilst making your home healthier and more comfortable to live in.”

”

To make the Retrofit Zone a well-rounded and cohesive experience, providing the best possible guidance for homeowners, we’ve collaborated with a wide range of leading industry professionals, independent experts and community groups. The development of this educational exhibit has been gratefully supported by our sponsors, as well as Wiltshire County Council and the Business Fit for Growth scheme.



We look forward to welcoming you to the NSBRC’s newest educational zone, and helping you take the first step on your retrofit journey!





Case Study

Guy and Susan Hargreaves



Fact File

Names: Guy and Susan Hargreaves

Occupation: Retired Banker and Engineer (Guy)

Project location: Oxford

What type of project did you undertake? Renovation and extension to Passivhaus EnerPHit certification

What construction method did you use? Multiple retrofitting methods

How would you describe the style of your project? A blend of modern and traditional - all in keeping with local townscape

When did you begin work? Planning started Dec 2019, work began Jan 2021

When did you complete - or when do you plan to complete if work is ongoing? Main dwelling finished Mar 2022, full practical completion Sep 2022

What is the floor area of your project in sq m? 2,400 sq ft.

Guy and Susan Hargreaves, based in Oxford, undertook a major renovation and extension of their mid-terrace home (originally built in 1906), achieving Passivhaus EnerPHit certification through multiple retrofitting methods, blending modern sustainability with traditional townscape character.

Before...



After...



Could you tell us any interesting facts or remarkable features about your project?

- The property is a 1906 mid terrace and not in a conservation area.
- Ground floor of main dwelling (being all levels ground and above) converted into open plan living, kitchen, and dining area across the full building footprint.
- Three bedrooms, bathroom, and laundry / utility on the extended first floor, and master bedroom and ensuite in an expanded dormer second floor.
- Basement converted into a self-contained apartment with separate kitchen and bathroom, with external access only.
- Airtightness tested to 0.94 ACH across both main and basement dwellings.
- Both dwellings ventilated via two separate MVHR systems.
- One ASHP providing hot water (through heat batteries) to both main and basement dwellings, and heating / cooling to the main dwelling through its ventilation system.
- Modern triple glazed tilt-and-turn windows and sliding doors to the rear.
- Mock-sash triple glazed tilt-and-turn windows have replaced all front and most rear original sash windows.
- The rear ground floor flat roof has an attractive sedum garden.
- Solar PV and battery providing 95% of the net electrical needs of the main dwelling across the seasons (excluding EV charging).
- EV charger and Oxford Gul-e trial allows EV charging on-street (no off-street parking).
- All electrical specification with gas closed off at the street main.

Guy and Susan's Experience at the NSBRC

How many times have you visited The National Self Build and Renovation Centre before? Three.

What would you say is the most helpful feature or resource at the NSBRC? Ability to view many different technologies and meet a range of professionals in one convenient space. EV charging. Close to Oxford!

Did you use any exhibitors at the NSBRC? If so, who? Yes, Eco Design Consultants (EDC), Worcester Renewables and Zehnder.

What did you enjoy most about your visit to the NSBRC? Listening to the many experts there, and learning about the latest products and techniques appropriate to our climate and conditions.

Would you recommend the NSBRC to a friend, and if so, what aspects of the Centre would you recommend and why? Highly recommend potential retrofitters spend time looking and learning about products of relevance to them. For me insulation, ventilation, and building materials were of great interest. Also I attended a Passivhaus Workshop where I met my architect and learnt more about the standard.





Guy and Susan's Self Build Experience

What first inspired you to undertake your project – what did you hope to achieve?

We bought our property knowing it needed a fair deal of renovation. As we worked through the project and developed plans our ambition grew, and we finally settled on aiming for Passivhaus standard. We wanted to fully electrify the property and futureproof it as much as possible for a warmer and more volatile future climate.

What was the cost & size of your building plot or conversion project?

We bought the property in late 2019, which in hindsight proved to be the post-Brexit low in property prices. We felt we paid a fully unrenovated price without premium. As a result, we felt confident we could spend a bit more than were we simply aiming to achieve standard UK building certification level, and not significantly overcapitalise the property. I would estimate achieving Passivhaus enerPHit standard added an additional 20-30% to

total costs. Separating Passivhaus from generic building costs differences is not easy – things like kitchens, fittings, and finishes can vary massively in cost depending on whether one specifies high or lower end products.

How did you find your land or conversion project? Do you have any tips for others currently searching for something similar?

My wife Susan put in a massive amount of legwork visiting properties before we found the right place in the area we wanted at a fair price. There is no substitute for hard work finding the right property in our opinion. We preferred properties with south or west facing gardens, which reduced the number of potential candidates a lot! We are from Australia and New Zealand, and when buying property down there we preferred north or west facing gardens, which served us well. Our philosophy is when buying property put in the time and effort to buy the right property, and it will more desirable and easier to sell when that time comes.





Did you have any issues getting your planning permission granted or with building control? If so – why was this?

As we were not in a conservation zone and were doing external works that had a lot of precedent in the area, we had no problems with planning permission. Our first approval took less than six weeks, and a subsequent variation to that approval took around a month.

What factors influenced the selection of your method of construction?

We were heavily guided by our architect Alan Budden of EDC. Alan's team were Passivhaus specialists so naturally specified plenty of insulation, airtightness and other such products. Where possible we used ecologically sustainable products, but at other times – e.g., the new kitchen floor slab – traditional concrete was used. The property was stripped back fully internally, but externally much less work was required minimising the carbon footprint of the project.

Did you use a project manager, or did you choose to self-project manage?

I was fortunate to be able to spend a lot of time onsite every day so in a sense I self-project managed it. We had a foreman from the primary contractor and EDC administered the contract, visiting every two weeks. No formal project manager was appointed.

What was your budget and were you able to stick to it?

We ended around 10% over budget, almost entirely by choice.

If you didn't stick to your budget, what was the main reason for the overspend?

We found three main surprises during the building works – a hidden steel joist needed moving upon discovery, the front bay window brickwork was in poor condition and needed pulling down and rebuilding, and the front basement level needed underpinning. All other overspend was from increased specification or some minor plan reworking.

What is the value of the finished project?

Probably around what we paid for the property plus the cost of the works we have done.

Did you reclaim the VAT, and if so, how much were you able to reclaim?

Being a retrofit there was limited scope to reclaim VAT. We did qualify for the Green Homes Grant to offset the cost of the ASHP.





What aspects of the process did you find stressful – and do you have any tips on how to avoid the pitfalls you encountered?

Generally I found the building process stressful, mainly because spending significant money on a project that can go wrong creates a constant amount of stress. We had a fixed price contract which reduced our uncertainty in overall cost, but whenever our own contractors e.g., the mechanical engineer, renewable installer, or window supplier caused any delay that could create costs for our primary contractor (builder). Fortunately all parties had similar delays, and so we all absorbed our own delay costs. Probably good luck over management! We built in 2021 when the COVID-19 pandemic was beginning to subside but the labour and supply markets were very dislocated. With a Passivhaus project there are a lot of additional requirements, and the most stressful of these for me was staying on track to deliver a high-quality airtightness result. This was a daily struggle, and I highly recommend asking the builder to appoint an airtightness champion whose only job is to focus on

ensuring all work done is airtight. This person could ideally report to the building company owner directly – similar to a compliance function. If airtightness quality weakens for any reason then action needs to be taken immediately before final finishes go on and the leaky areas become inaccessible. Airtightness testing will find 100% of the leaks, and it doesn't take much to fail Passivhaus certification. Happily our builder delivered a sound airtightness result.

What did you find most enjoyable about working on your project?

I enjoyed the science of building to Passivhaus certification. As a former engineer I found much of the design process very interesting. Seeing the project coming together was very satisfying, and while we were aiming for a new build Passivhaus airtightness result from the beginning, going through the build and recognising the practical difficulties of making a retrofit airtight meant when we got the EnerPHit result we were thrilled.





What is one of your favourite features about your project?

There is so much we love about living here now – the open plan style, the flexible lifestyle, the control over heating and cooling, the low energy bills, the freedom from gas, the EV charging, the consistent temperature throughout the house, the flexible use basement flat

How did you tailor your home to suit your lifestyle?

Open plan living with full height and width glass sliding doors flowing onto a stone patio and perfectly sized garden was how we loved to spend our days. The house is light and modern but from the outside fits the existing townscape beautifully.

Is there a possibility you would ever undertake another project in the future?

We may do a Passivhaus new build if we ever go back home to Australia. The project hasn't put us off property development, but it was stressful nonetheless.

If so, is there anything you would do differently?

New build with SIP construction just to simplify the building process. Otherwise I imagine the design and execution process would be similar.

What would your top tip be for other NSBRC Visitors about to embark on their first self build, conversion or home improvement journey?

Chase your dreams and don't give up. A beautiful, comfortable, future proofed home is worth every effort!





**BUILDING
BETTER
NETWORKS**

Est. 2007

Conference & Venue Hire

Did you know, aside from being a busy Visitor Centre, we also offer conferencing space? As an employee owned company our team shares a passion for delivering a brilliant experience for our guests.

We promise you will always have a dedicated contact, from your first enquiry, up until the moment your delegates leave us, ensuring that you feel the difference in the experience we offer.

We have a number of conference and meeting rooms accommodating 1 to 300 delegates in a variety of layouts. All rooms have been fitted with the latest I.T and AV equipment. We also have the added benefit of the Piazza & Oak Mezzanine within the Visitor Centre, an open space with two timber frame houses as backdrops, suitable for catering; break out space; networking and temporary exhibition space.

We are flexible with opening and closing times, catering requirements, refreshment areas and event set-up. We are essentially your extended team and will work with you to ensure that all of your needs are catered for.



To make an enquiry contact the conference team
on **01793 847 400** or **conferencing@nsbrc.co.uk**



“*“Exceptional service and professionalism throughout.”*”

“*“We recently hosted an event at NSBRC and couldn't be happier with the experience! The staff were incredibly supportive and professional, both leading up to the event and on the day. The venue's unique ambiance was a hit with our attendees, and its convenient location just off the motorway made it easily accessible for everyone. Highly recommend NSBRC for your next event!”* Rachael Booth – Total Guide To”

“*“The NSBRC is our venue of choice when booking an external conference facility in Swindon. The venue is excellent and the staff go the extra mile to ensure the event runs smoothly. Thank you.”*”

- » A unique & inspiring venue
- » A dedicated & passionate team
- » Flexible meeting spaces
- » Available 7 days a week
- » Exciting menu choices
- » Free Wifi & AV Equipment
- » Free parking (inc. 8 EV charging points)
- » All with great pricing & no hidden fees!

Maximum room capacities for meeting rooms

	Theatre Style	U-Shape with tables	Boardroom	Cabaret (tables of 10)	Classroom (2 per table)
Build It Theatre	240	45	55	120	48
Sustainability Theatre	150	22	28	60	24
Custom Build Suite	60	20	25	40	16
Renovation Suite	50	22	20	32 (tables of 8)	16
Dale Boardroom	N/A	N/A	12	N/A	N/A
Self Build Suite	N/A	N/A	10	N/A	N/A
The Think Box	N/A	N/A	4 (/6)	N/A	N/A

LAND SERVICES

Looking for a building plot?

Finding the right plot is key to any self build project. For an easier, more successful search, explore BuildStore's unrivalled land-finding services online or at the Centre.

PlotSearch from BuildStore is the UK's largest database of self build, renovation and conversion opportunities with planning already in place. With thousands of opportunities to choose from it won't take you long to find your perfect plot of land or project!

Think PlotSearch
Subscribe for free today

Visit plotsearch.co.uk



Site Insurance & Structural Warranty

Buildcare Site Insurance

You need site insurance as soon as your planning has been granted and you're ready to start your project, and lenders insist you have adequate insurance before releasing funds to you.

Buildcare Structural Warranty

Only a 10-year structural warranty will protect your project against a defect in the design, workmanship or materials on your self build or renovation project.

Get comprehensive and competitive cover for your project with Buildcare from BuildStore.

Visit buildstore.co.uk



Finance

After planning your budget and finding land, raising the finance is probably the most important aspect of planning a self build or renovation project.

While some people have enough cash to build their house, most people need to borrow. This could be long term in the form of a mortgage, or short term where you are looking to repay your loan when you sell your current house post build.

BuildStore has the mortgage for you whether you are building your own house, renovating or simply looking for a better rate on your existing house while you plan your project.

- Higher lending percentages - up to 95% on your land and build costs (compared with 75% with most lenders)
- Purchase land with just outline planning permission
- Better cashflow through every stage of your project
- Guaranteed stage payments based on your build costs in advance or arrears
- Expert help with costings and planning
- Stay in your current home as you build
- Choice of leading lenders, products and competitive rates

Call **0345 223 4888**
to speak to an adviser
Visit **buildstore.co.uk**



Residential Mortgages

Voted Best Specialist Mortgage Broker at the What Mortgage Awards for two years running, BuildStore helps clients with far more than self build and renovation finance. From residential mortgages and remortgages to buy-to-let, self-employed and contractor mortgages, our advisers have access to market-leading deals, including exclusive rates, to help you find the right solution.

Your home may be repossessed if you do not keep up repayments on your mortgage.

There may be a fee for mortgage advice. The actual amount you pay will depend on your circumstances. The fee is up to 1% but a typical fee is £495.

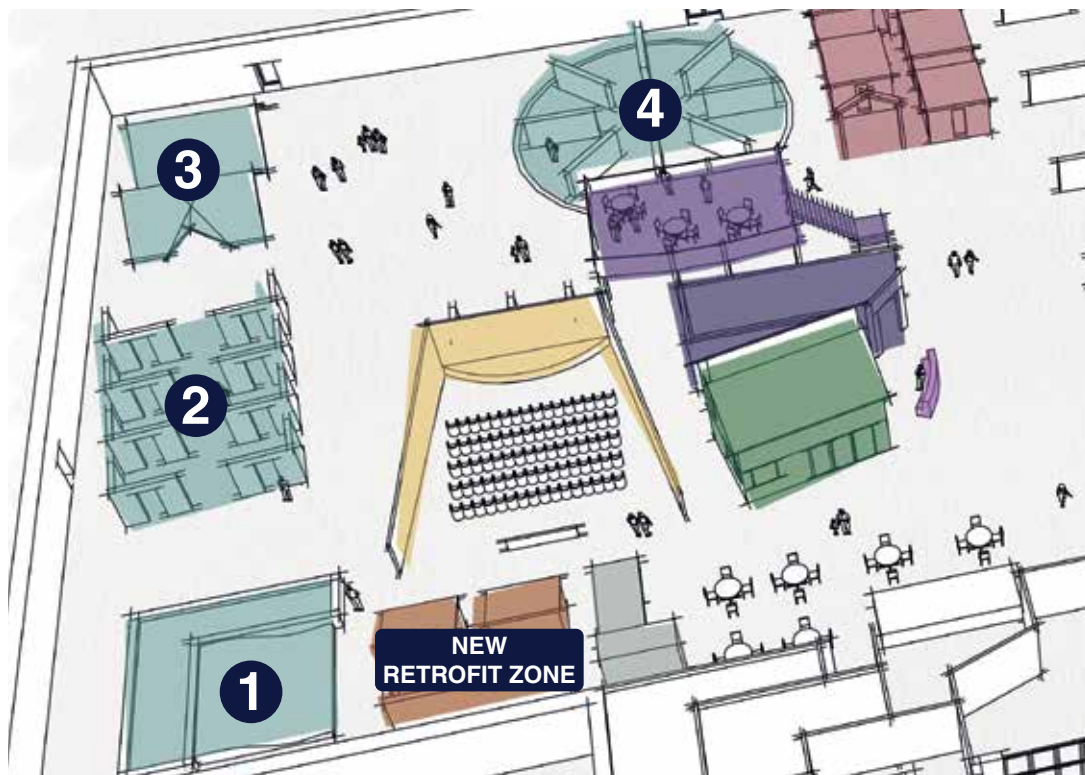


Best Specialist Mortgage Broker



Best Specialist Mortgage Broker

Educational Zones



RETROFIT ZONE – NEW!

Improve the efficiency and comfort of your home through a balanced combination of insulation, airtightness, ventilation, heating and renewable energy.



GROUNDWORKS

This zone is split into three exhibit areas:

- Foundations and excavations
- Underground Services
- Basements

1



WALLS & STRUCTURES

Explore eight construction choices for the structure of your new home.

2



ROOF ZONE

View four roof solutions and assess the range of external roof coverings on display.

- Green Oak
- Structurally Insulated Panel
- Attic Truss
- Fink Truss

3



FINISHES ZONE

View a wide range of internal finishes. Options include stair, floors, windows and doors. Sponsored by Pietra Wood & Stone.

4

Plant & Site Set Up

Before You Begin

When you have found your plot and obtained planning permission to build your dream home, the journey begins in earnest. Your plot will probably look quite daunting, either overgrown, scruffy or with an existing building that need to be replaced. You will be amazed at how quickly your site will progress, but it's important to plan ahead because things are going to get very busy very quickly.

Start as you mean to go on and ensure you run a safe and orderly site. Construction (Design & Management) (CDM) regulations

covering health and safety in construction changed in 2015 to encompass domestic clients, previously exempted from the CDM regulations. If you are using an architect or designer and a main contractor, they will automatically pick up your CDM responsibilities but if you are hiring the trades and managing the project yourself, you need to read up on the regulations. Go to www.hse.gov.uk and download a free copy of The Absolutely Essential Health & Safety Toolkit (INDG 344).



The 8 Principles of Low Energy Building

2 Airtightness

Airtightness is a vital element of a building, especially when constructing to the Passivhaus standard. Air leakage results in higher energy consumption and, under current building regulations, can contribute to as much as 50% of total thermal losses. Eliminating excessive air leakage is extremely important.

Buildings with less air leakage offer greater comfort to occupants and prevent structural damage caused by warm, moist air condensing in unintended areas. The likelihood of dust and spiders accumulating is also reduced.

Key areas to consider when assessing airtightness are windows, doors, junctions between the ground floor and wall, first floor junction, service penetrations, loft hatch and roof and eaves.

To find out how airtight your home is or to learn more about our design principles, call and chat for free with one of our Passivhaus Designers.

ecodesign
consultants
Architects & Environmental Consultants

Architects designing beautiful, comfortable and sustainable buildings.
Specialising in new build and retrofit homes to Passivhaus standards.

Call **01908 886 854** today to book your free consultation

studio@edc.eco | ecodesignconsultants.co.uk





Site Preparation

SERVICES - Speak to your service providers to arrange connection of water and sewerage, electricity, telephone and (if available) mains gas. A temporary supply for water and electricity will be very useful during the build and can be connected to the house as it nears completion.

ACCESS - Create a new access to the site if necessary and lay hardcore or chippings as a temporary hardstanding. Heavy vehicles will soon churn up bare earth.

DEMOLITION - If you are demolishing an existing structure, use a specialist contractor and make sure asbestos checks have been included in the contract. It's advisable to use the same contractor for demolition and groundworks.

SITE OFFICE - You will need a site office. Either hire a purpose built item or improvise by using a garden shed or an old caravan.

SECURE STORAGE - Hire a suitable container to keep valuable tools and materials safe. Keep flammables in a separate safe store.

SANITATION - A Portaloo will be required. Agree with the builder who is providing this.

TOP SOIL - Keep the topsoil in a pile out of the way when the site is levelled so you can use it again. It's expensive to replace.

FINANCES - Make sure your finances are available and that you have access to the funds.

ADVISE NEIGHBOURS - Let neighbours know you are about to start and let them have your contact details and those of your site manager so that any problems can be resolved quickly.

If you are using a main contractor, they will probably organise all of the plant, tools and services such as scaffolding and setting out equipment, but check that this is part of the contract to avoid delays. If you are providing the plant you will probably consider hiring the expensive items such as excavators, mixers and storage cabins but when it comes to hand tools, power tools and useful equipment like wheelbarrows and ladders, you will never have a better excuse to buy good quality equipment that will last for years.

Before you start, organise the site so you know where plant, materials and site offices can go. Remember to leave an unloading area where bulky items can be offloaded and think about how vehicles will access the site safely. A few sheets of ¼" steel plate can come in handy for bridging trenches or covering exposed manholes during the build.

Some sort of fencing, such as Herras fencing shown enclosing this zone is a good idea, especially if you are building in an urban environment. It won't keep out a determined thief, but it will show where the dangerous areas are to curious observers.

Before you start, make sure you have planning permission in place and that all conditions that must be addressed before work commences have been satisfied with your local authority. You must also notify building control at least 48 hours before you plan to start work on site.

One last thing: setting out the house is critical, so make sure it is in the right place according to the planning permission. Changing things after the foundations are in is expensive and time consuming!



Site Management

WASTE - Disposing of spoil or demolition material off site is expensive. If you can use it on site for soakaways or infill, you can save considerable sums in landfill tax.

DRAWINGS - Keep a master copy of the construction drawings available in your site office and make sure old versions are kept well away.

SITE DIARY - A site diary is a useful way of noting down what's happening and when deliveries are scheduled.

PERSONAL PROTECTIVE EQUIPMENT (PPE) - Buy a few hard hats, gloves, ear defenders and goggles for use by visitors to the site. Make sure everyone on site uses them.

SUPERVISE CHILDREN - Children love building sites, but they are dangerous places. Keep them closely supervised at all times.

CLEAR UP - One of the most useful things you can do is tidy up the site each day. Rescue usable materials and place rubbish in the skips.

TRENCHES - Keep out of trenches more than waist deep unless they are properly shored.

CONCRETE - Wet concrete burns if left in contact with skin. Wash off immediately – and don't let wet concrete get in your wellies!



Insurances and Warranties

SITE INSURANCE - Check that your builder has their own employers and contractors all-risks insurance in place. You should also take out site insurance to cover loss due to theft, fire or weather, as well as public liability and employers liability to cover anyone working for you on site. Site insurance will usually cover the contents of site huts, caravans and offer legal expenses cover.

STRUCTURAL WARRANTY - Your mortgage lender will insist on you having a 10-year structural warranty in place. This is effectively an insurance policy that will cover defects arising from construction. Even if you are a

cash builder and have no plans to sell, if you do find you have sell the house in the first 10 years of its life to someone who does need to borrow, a structural warranty will be required. It makes sense to get one.

ARCHITECTS' CERTIFICATES - Some lenders will accept an architects' certificate as the basis for lending, but be aware that this is not the same thing as a structural warranty. If there is a defect, you will have to sue the architect or designer for negligence against their professional indemnity insurance, which can be a costly and protracted exercise.



1 Groundworks Zone

Foundations & Floors

This zone will show you full-sized exhibits of the main foundation and flooring options available to you.

Ground works are a tricky part of your build because at the early stages, you have no idea what they are going to cost. The foundations you will require depend on a number of factors: what you are building, site conditions and what the soil conditions are like. The first step is usually to ask your local building control officer for advice as to what sort of foundations might be required in your area. They will have experience from other construction projects nearby and will usually have an idea what to expect.

They may ask you to dig a 1m deep hole in the ground near to where the dwelling will be located so they can see what the actual conditions are like. Often, this is all that is needed but if there is any doubt, you may well have to engage the services of a soil investigation company to undertake a more in-depth investigation to determine what is down there.

The good news is that just about every soil condition has a foundation solution, but the solutions can vary greatly in cost depending on the stability and strength of the underlying soil or rock. In an ideal situation, the conditions are loamy soil, compacted sand or gravel which are ideal for simple trench foundations and you require no more than the approval of the building control inspector to proceed. However, on some sites the composition of soil is complicated with a variety of strata and materials that require detailed analysis and the creation of a bespoke solution by a foundation specialist.

The main things to watch out for are sloping sites, the presence of trees and what is generally referred to as 'bad ground', which might refer to shrinkable clay, made up ground like in-filled quarries or unstable ground caused by past excavation, mining activity or water levels.





Problem Sites

CONTAMINATION - Some sites such as old petrol stations and industrial areas may have contamination issues and remediation may be required. Bioremediation using bacteria can be used to clear hydrocarbon contaminants. However, chemical or heavy metal contamination may require complete strip back, disposal and replacement of the contaminated soil.

TREES - The presence of trees, particularly thirsty varieties like willow and poplar combined with clay soils needs to be considered. Cutting trees down can also have an effect because water once taken up by the trees can be absorbed by clay soils and expand. The solution usually involves deeper trenches or, if trees are close, piling to avoid damaging root systems.

CLAY - Clay expands when it is wet and shrinks when it dries. This movement can put tension on concrete foundations, which can lead to premature failure. Some sort of compressible

barrier or slip membrane may be specified to line trench walls and mitigate any movement.

MADE UP GROUND - Usually refers to 'brownfield' sites containing old footings, drains and infill. Solutions can be as simple as using specially formulated concrete or as complicated as a fully piled foundation.

SLOPING SITES - Gentle slopes do not usually cause problems, but more severe slopes may require engineered solutions when building out of the slope and expensive retaining walls if cutting in.

UNSTABLE GROUND - Particularly found in areas of heavy mining activity. Usually countered by the use of raft type foundations.

HIGH WATER TABLE - A high water table means you will need pumps on standby when digging the trenches and you may need to dig deeper than usual or use a piled solution where concrete is poured as the auger is withdrawn.

In this exhibit, you can see examples of the sort of foundations you might expect to use on almost any self build project. In order of cost, these are the solutions you might consider:



Foundation Types

STRIP FOUNDATIONS - 225mm of reinforced concrete is laid at the bottom of a 1.2m deep trench. Foundation blocks are built off this strip, then the external walls to the damp proof course. The cheapest solution.

TRENCH FILL FOUNDATIONS - The same idea as strip foundations, but the entire trench is filled with concrete. More expensive because of the extra concrete required, but arguably easier to use because external walls are built up from the top of the trench, rather than below ground. Probably the most commonly specified foundation type.

DEEP TRENCH FILL - If bad ground, clay or tree roots are found, you might have to dig deeper trenches until good bearing ground is found. Concrete is expensive, so the costs can rise significantly the deeper you go. If you need to go more than 2-3m deep, other solutions might be cheaper.

RAFT FOUNDATIONS - A large continuous reinforced concrete slab that sits under the entire building. If the ground moves, the whole house moves with it avoiding point loading on the concrete. Costs more because each raft must be individually designed and lots of concrete is required.

PILE AND RING BEAM - Holes are drilled with an auger to the required depth and filled with reinforced concrete. A concrete cap is fitted onto which a steel or concrete ring beam sits. The house is built off the ring beam. Often the most expensive option requiring engineering drawings and expensive plant. May also be specified to avoid damaging tree roots.

HELICAL SCREW PILING - A more cost-effective piled option involves screwing immensely strong hollow galvanised steel screws straight into the ground. Can also be used to underpin buildings where the existing foundations have failed.

Flooring Options

On top of the foundation exhibits you will see examples of typical flooring options that will form the oversite. The oversite is the flat horizontal surface on which the final flooring materials will be laid. The most common option used to be the ground bearing slab, whereby the area within the foundation walls would be filled with compacted hardcore, covered with a protective layer of sand called 'blinding' and then topped off with a layer of insulation and a poured concrete slab. However, it is more common these days to see a suspended 'beam and block' flooring system, which is quick and easy to dry lay (i.e. without the need for mortars or adhesives) on top of the foundation walls. Some of these suspended floor options incorporate high performance foam insulation blocks instead of standard foundation blocks to form the finished surface, greatly improving the thermal performance of the house.

Services

Think about where the services will enter the property and allow for suitable lintels or ducting through the foundations through which the services and drains can pass. Leave a drawstring in every conduit so cables and pipes can be pulled through when needed.

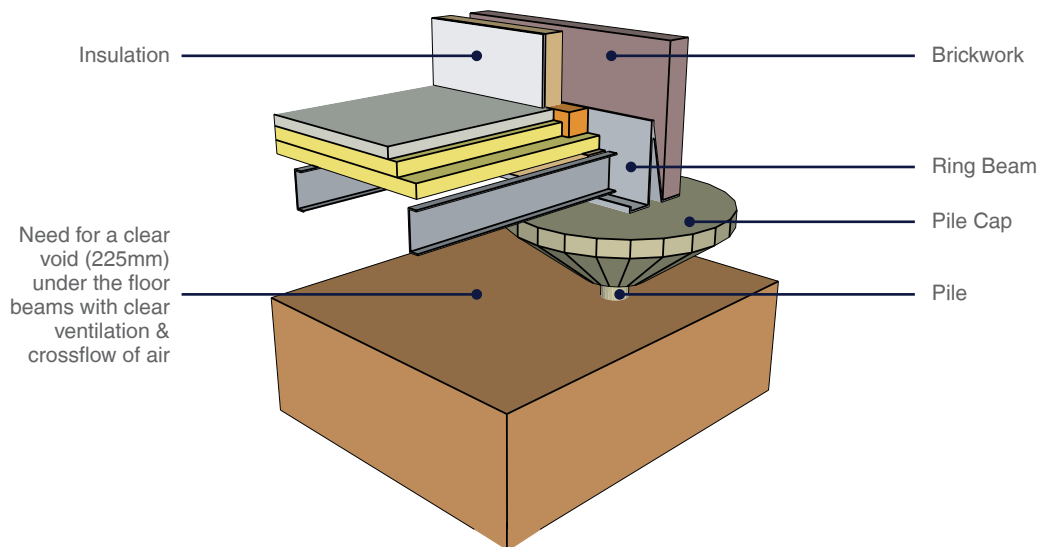


Foundations & Floors

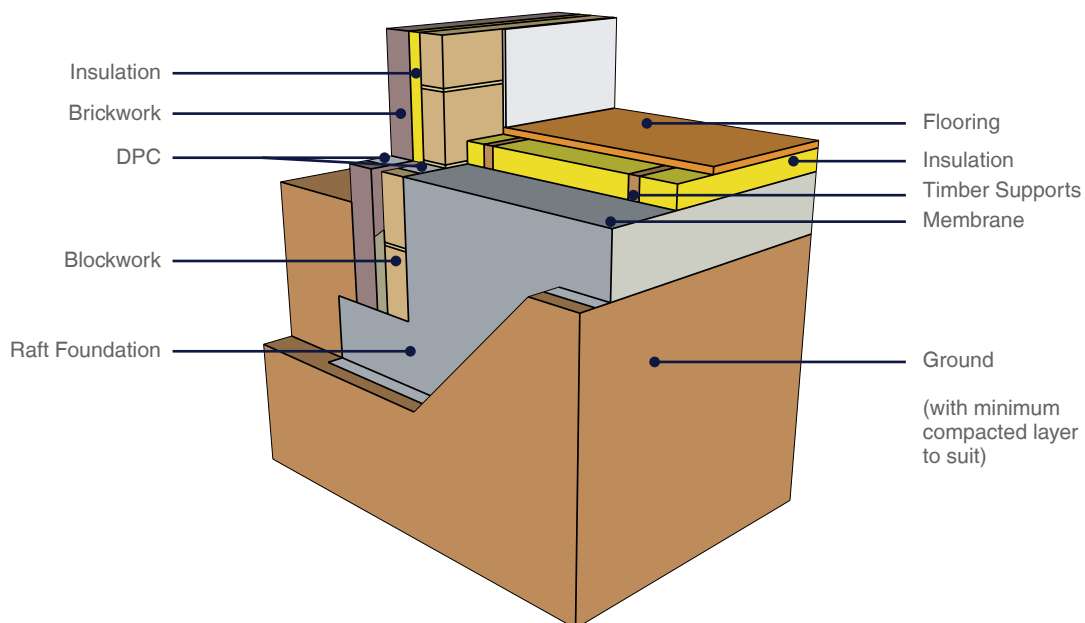
The exhibit shows four examples of foundation types. The strip, trenchfill and raft foundation exhibits each have two floor systems applied to them.

In the piled foundation exhibit, there are three types of floor systems being demonstrated. The following graphics show each of the foundation systems with one example floor type.

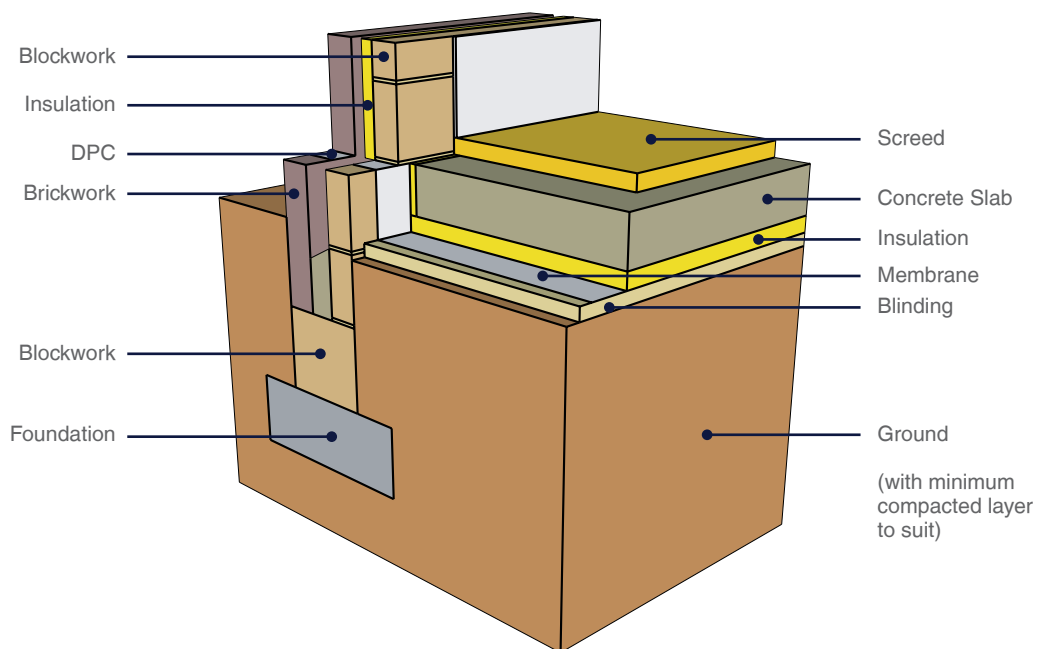
Piled foundation with an insulated steel flooring system



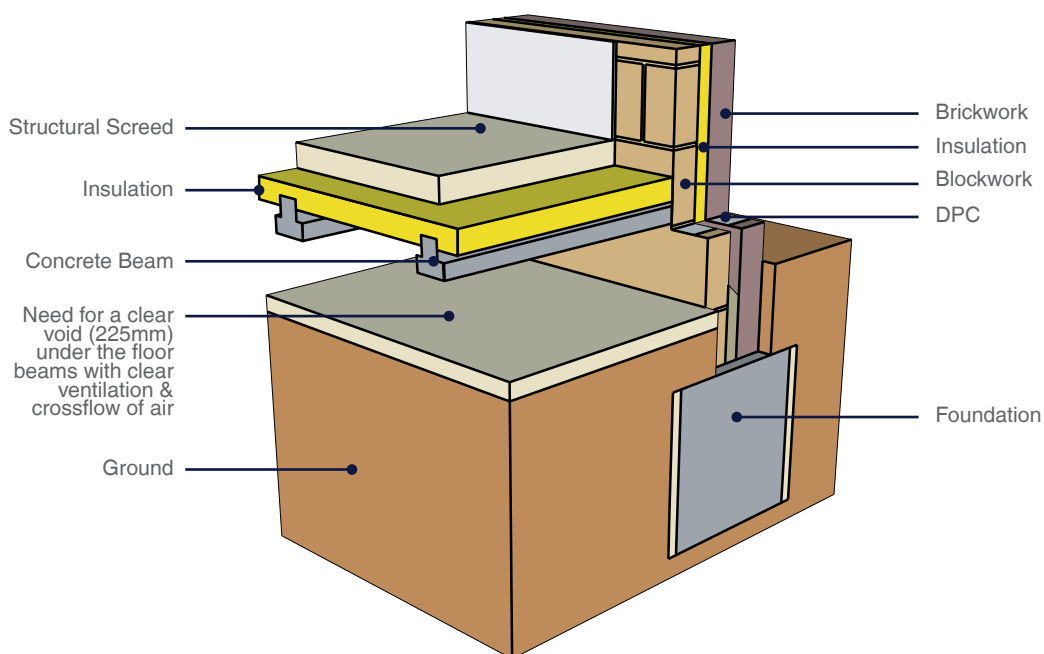
Raft foundation with a wooden floor



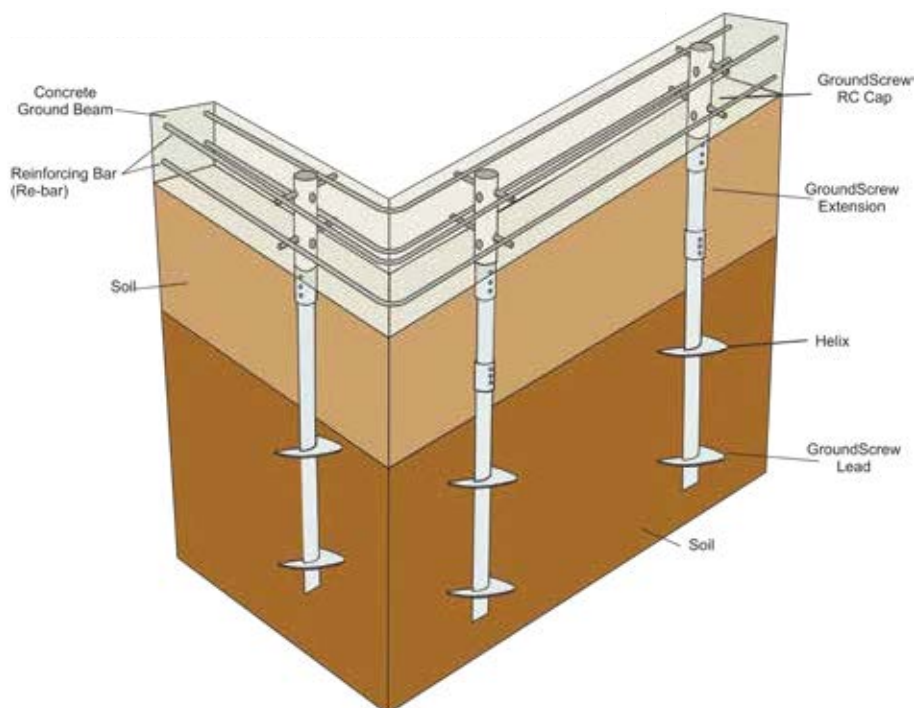
Strip foundation using a ground supported screed floor



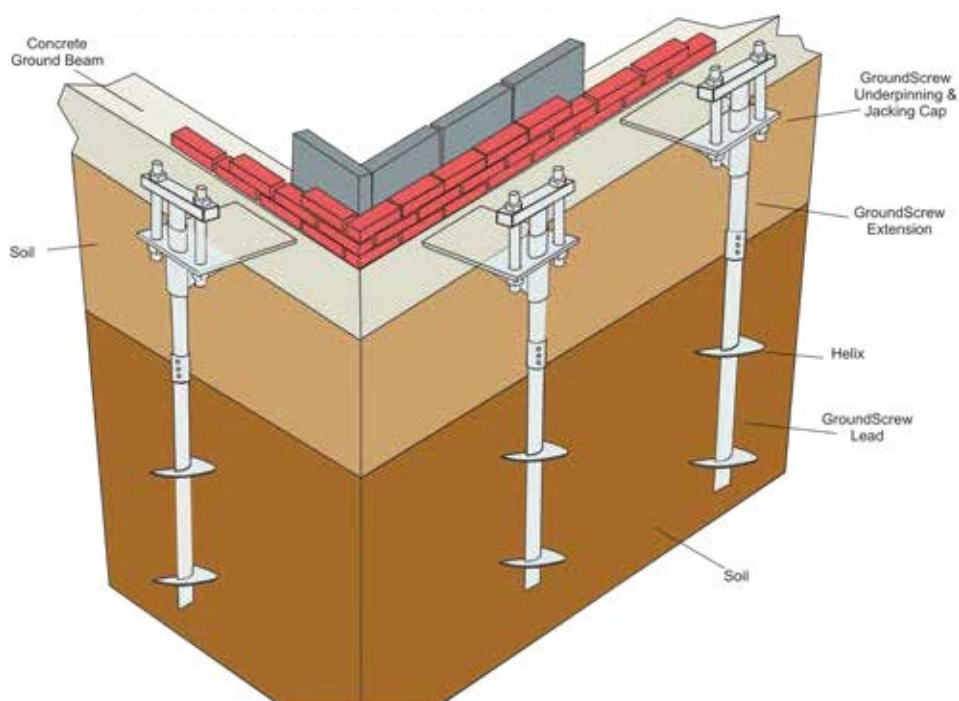
Trenchfill foundation with a 'beam floor' structural screed floor



GroundScrew Reinforced Concrete (RC) Foundations - RC Cap



GroundScrew - Remedial Underpinning - Jacking Cap



Underground Services

Underground services are an essential part of your home. A new house can't work without adequate drainage, energy and services connections, so you will need to think about where these will come from and how they will get to your property. In this zone, you can see how we have created a colour-coded 'underground map' of the services. At the far end of the exhibit, you will a large wall representing the external wall of a typical house. On one side, you can see the appliances commonly found inside your home and from here, you can follow each connection back through the wall and then underground through to where it connects with the incoming supply, tank or pipe.



Using a Groundworks Contractor

Think seriously about taking on a specialist groundworks contractor, and you will certainly need Building Control approval for the design and works you intend to carry out. A groundworks contractor would usually be involved in the following areas:

- ✓ Creating entry to the area
- ✓ Clearing the site
- ✓ Setting up access roadways and storage areas
- ✓ Topsoil strip away and its storage for reuse
- ✓ Levelling
- ✓ Setting out the house (in conjunction with a surveyor)
- ✓ Excavating trenches for the foundations
- ✓ Pouring concrete or installing the chosen foundation system and floor system
This may be done by specialist contractors
- ✓ Installing damp-proof layers
- ✓ Preparing all the trenches for the services and their backfilling once installed
- ✓ Installing drainage, manholes and other underground systems
- ✓ Landscaping, driveways, pathways, patios

Drainage

If you have access to mains drainage, then you will be expected to connect to it where possible. Part H of the Building Regulations deals with drainage and details the sizes, depths and gradients (or falls) allowed, so

your Building Control Officer will be able to advise what will be required. They will want to inspect the pipes and trenches before they are backfilled and will also want to test the drainage system to make sure everything works as it should.

Sloping sites can present a problem, but most issues can be resolved by the use of specialist pumps to move waste uphill, or by creating tumble chambers or drop-downs within inspection chambers where downward slopes are the problem. However, in some cases site conditions simply won't permit connection to a main sewer or the distances involved may be so great as to make connection uneconomic. In these instances, an off-mains solution might be a better answer.

Off-mains solutions are not new, and the basic cesspool has been used for centuries. However, while still an option for some, the modern cess pool tank requires frequent emptying and is therefore costly to run. A more desirable option is to install a septic tank or, even better, a treatment plant. Treatment plants use the anaerobic bacteria found in septic tanks, but also use a powered rotating paddle to introduce oxygen into the waste so allowing aerobic bacteria to thrive as well. This combination of friendly bacteria ensures that most of the waste is consumed within the tank so further maintenance is minimal. You do need to have free-draining ground and you have to be careful about what goes into the tank so that the bacteria that do the work are unharmed, but if installed correctly, these systems are hygienic, unobtrusive and comparable to being on the mains.

Surface Water

Surface water is not permitted to drain into foul sewers. Recent regulations aimed at reducing flooding also insist on using Sustainable Urban Drainage Systems (SUDS) for driveways and hardstandings. Permeable systems prevent surface

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water running back into the road and overwhelming public drains.

Rainwater Harvesting



Building Regulations PART H

- H1** Foul water drainage
- H2** Waste water treatment systems and cesspools
- H3** Rain water drainage
- H4** Building over sewers (public & private)
- H5** Separate systems of drainage (foul water and surface water)
- H6** Solid waste storage ("Bins" & "Recycling")

It's rather odd that we spend a fortune on buying treated drinking water then use it to flush our toilets with! Rainwater is a free and plentiful resource in the UK, so another popular option for self and custom builders is to fit a rainwater harvesting system. The water is held in underground tanks and pumped into the house where it can be used to flush toilets, run washing machines, water gardens or to wash cars. Water from driveways would not be diverted into these tanks as it risks being contaminated by oils and greases. Some high-specification sustainable houses extend this principle even further by reusing 'grey water' as well. Grey water is the lightly soiled water from sinks and showers and can be made reusable by passing it through a series of filters. Again, because of the risk of contamination from oil and fats, kitchen sink water would not be used for this. It is important that the water in these systems is clearly marked so as to avoid confusion with any potable water supply.

Energy

We are slowly moving towards creating energy efficient houses that are so well insulated and airtight that the need for additional sources of heat is reduced dramatically. However, most new homes will need to have some form of central heating in the form of traditional radiators or warm-water underfloor heating, and

that will require a boiler of some sort to supply the heat and domestic hot water on demand. Mains gas remains the cheapest and easiest energy source for most, but in rural areas where gas is less common, an alternative energy source may be required. Liquid Petroleum Gas (LPG) and oil are the most common alternatives but fluctuating prices and concerns over environmental impact lead many self-builders to choose a greener option. Biomass boilers, air source and ground source heat pumps offer a popular and effective alternative but must be correctly specified and installed. If you are thinking of installing a ground source heat pump, then this will need to be planned at an early stage as you will need to establish where the underground pipes or boreholes required will be situated. Although these alternative energy systems often cost more to install than standard gas or oil systems, the government's Renewable Heat Incentive scheme (RHI) has been created to help offset the additional costs involved.



Definitions

SUDS - Sustainable Urban Drainage Systems. Legislation designed to prevent flooding caused by surface water entering public drains.

FALL - The gradient of a drain to ensure free running within the pipes.

INVERT - The depth of a manhole or inspection chamber.

SOAKAWAY - An underground chamber where surface water is collected and from where it can disperse into the ground. The simplest are simply pits filled with rubble and covered over with geotextile material and topsoil.

Basement Stats

A basement can increase accommodation by an additional 50 per cent, permit a larger garden to be incorporated into your house plot and offer the builder an economic, speedy and thermally efficient solution to increasing your home's living space.

Because of the cost of land nowadays and because so many people choose to work from home, the choice of a basement to maximise the space within the footprint of your new home is becoming far more popular. Whilst this can be done retrospectively, the logistics and therefore the cost is astronomical. Even if the budget doesn't stretch to fitting out the basement with cinema, office, gym or swimming pool; it makes absolute sense to form the structure at the groundworks phase of your build.

Where ground conditions may otherwise have involved deeper foundations, a basement will capitalise on this. There are a variety of basement construction options such as masonry, poured concrete and pre-cast panel basements. There are all sorts of add-ons you can consider like light wells for natural illumination and ventilation or an external stairwell. Most are built on site but increasingly pre-fabricated options can speed up the process and provide specialist solutions.

With traditional construction methodology, a basement requires reinforced masonry or in-situ concrete walls plus internal plastering and external sealing (or tanking as it is known). Such a basement can take months to install, whereas a basement made from precast concrete panels can be installed in a few days, such as the one shown in our exhibit.



Design Considerations

- ✓ External staircase? If the basement is designated as habitable space it must have a secondary means of escape.
- ✓ Getting light into the basement? Is it fully or partially underground? Is the site flat or sloping?
- ✓ How big? It is usually more economic to include a basement under the foot-print of the whole ground floor.
- ✓ Using the basement - Cinema rooms, swimming pools, gym, home office, utility space
- ✓ Ventilating the basement. Windows, light-wells or mechanical ventilation.





Basement Construction

MASONRY - The basement walls which have to retain the surrounding soil, are built in either solid or hollow concrete blocks reinforced and with a concrete in-fill.

INSULATED CONCRETE FORM-WORK - Hollow polystyrene interlocking blocks laid to the shape and then filled with poured concrete, with reinforcement where necessary.

POURED CONCRETE - The walls can be shuttered with suitable form-work, usually plywood, before being cast in poured concrete with reinforcement rods set within it.

PRE-CAST CONCRETE PANELS - These are pre-fabricated off-site using waterproof concrete and then craned into place and sealed together to form the structure.

Some situations are so wet that water should be anticipated continually and your basement design will act like a reverse swimming pool.

All basements need to be waterproofed or tanked. Pre-cast concrete basements already have the tanking built in, but it is normal for a site application of additional tanking to be made. This can either be external or internal (occasionally both) and can be in the form of an applied liquid, proprietary tanking material or sticky sheets of bituminous material.

Alternatively, a corrugated lining to walls and floors can channel incoming moisture to a sump, from which it is then pumped to the drains. Both systems can be used in tandem.



Information for Specialist Basement Suppliers

- ✓ Scale drawing or sketch of basement with full dimensions.
- ✓ Ground floor plan.
- ✓ Method of superstructure construction (traditional, timber frame etc).
- ✓ Site plan showing access, trees, pylons, overhead cables.
- ✓ Road access to the site for large articulated lorries.
- ✓ Soil investigation report.
- ✓ Line loads on basement walls and floors.
- ✓ Status of planning permission, the timescale of the build, party wall issues etc.

New basement design can include continuous membranes underneath your structural slab, jointed with a vertical membrane around the perimeter of the basement. Porous material around them deals with ground water, which may also involve a pump.



Basement Tips

- ✓ Basements should always be designed by a specialist company or an engineer.
- ✓ There is an argument that tanking can never be totally guaranteed and that a sump and pump system either alone or in tandem is preferable.
- ✓ Soil types and, in particular, water tables can have a profound influence on cost.
- ✓ Basements do not come cheaply - they will always cost at least as much as any other part of the home.
- ✓ If the basement shows above ground level it may be possible to incorporate high level windows for light and natural ventilation.
- ✓ If the basement is completely below ground, then thought must be given to its ventilation by mechanical means.
- ✓ Basement constructions have a built-in thermal capacity, which may still need augmentation.
- ✓ If possible, consider the use of light wells to provide natural light, ventilation and means of escape.

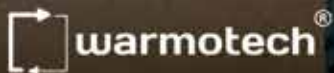
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2 Walls & Structures Zone

Building Systems



One of the main choices you will have to make is which building system to use. The building system is the method used to construct the superstructure of the house and is usually, but not always, made up of an inner and outer leaf. The inner leaf does the work, holding up the floors and the roof, while the external leaf is there to add aesthetic appearance and to keep the weather out. Some modern methods of construction use a 'monolithic' construction whereby a single waterproof wall does the job of both leaves.

In this section, you will see examples of 8 of the most popular building systems available, including some of the newest innovations.

There are no right or wrong choices, but there are systems that are more suitable for different projects and will have an effect on the planning, budget and performance of your new home. The vast majority of self builds are constructed using traditional masonry or a variety of timber framing, but as we move to requiring higher performing houses, there is more focus on the insulation and airtightness offered, leading to a rise in the use of modern methods of construction (MMC) such as Insulated Concrete Formwork (ICF) and Structural Insulated Panels (SIPS).

External Finishes

The external finish you choose will be subject to a number of factors, not least planning if you are building in a sensitive area such as a conservation area. Almost every external finish, from bricks, stone, tile, render and timber cladding can be used on any of the systems subject to obtaining planning consent. The monolithic systems often employ brick or stone 'slips' glued onto the external walls and pointed as for a standard masonry finish, making it almost impossible to tell the difference between a traditional method of construction and any of the MMCs on offer.

Off Site Fabrication

There has been a boom in self builders' options for pre fabricated buildings manufactured off site and delivered to your plot for erection in a matter of days. There is a price premium to pay for this option, but the quality, performance and speed of construction are often unbeatable. When using off-site prefabrication, you will need to do all your planning beforehand as it is difficult and often expensive to make changes once manufacturing has started.

Intermediate Floors

Any floor above ground level is called an Intermediate floor and one of the most irritating aspects of new mass-market homes is squeaking floorboards!

The good news is that we have several options to solve the problem. Squeaking floors are usually the result of shrinkage in solid timber joists as they dry out and change shape. By using engineered joists

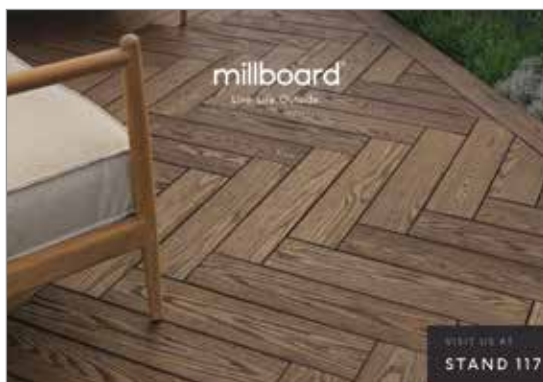
made from laminated timber and fabricated boards or open web spacers you can banish squeaks forever.

If you are using a masonry building system, you can also consider using concrete beam and block flooring which has the added benefit of increasing acoustic insulation and allows more flexibility with upper floor room layout as the whole floor becomes load bearing.

Internal Partitions

With timber frame, the usual option for non-structural partition walls is timber studwork with a dry-lined plasterboard finish, although metal 'U' Chancel is becoming a popular and economic alternative.

In sound sensitive areas, consider allowing for additional mineral wool insulation or double skinning the plasterboard to improve performance.



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If using a masonry system, like ICF or Thin Joint with beam and block intermediate floors, you can consider block partition walls upstairs for added acoustic insulation.

Other Options

We don't have the space to show every alternative building system here, but some systems are gaining in popularity and becoming more mainstream. Straw bales can be used for natural insulation and can even be used for structural walling with additional preparation.

Traditional building methods such as cob and rammed earth are returning into use as they utilise natural materials found locally and epitomise the ethos of low-carbon construction. Traditional building also means a return to traditional finishes, so to keep these buildings healthy, breathable materials such as lime plasters and lime washes are used instead of modern gypsum plasters and renders.

For more information on alternative methods of construction, look out for upcoming events held at the Centre, such as our Workshops & Shows.





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Building Systems

TIMBER FRAME - Perennially popular with self builders because of the low cost, speed of construction and eco credentials. Good for hiding service pipes and wiring out of sight.

PASSIVE HOUSE - Our exhibit shows both a masonry and timber approach to achieving Passive House levels of construction. Passive House demands high levels of insulation, almost total air tightness and a mechanical ventilation and heat recovery system to meet certification standards.

GREEN OAK FRAME - Beautiful, natural and reassuringly expensive, green oak guarantees a unique home everytime. However, it's a challenge getting this traditional method of construction through modern regulations so careful planning is required.

ICF - 'Grown up lego' is a term often used to describe ICF. A monolithic method of construction using hollow polystyrene blocks filled with poured concrete, ICF offers incredible levels of insulation and airtightness together with a rapid, low-skill build process.

DURISOL - A more environmentally conscious version of ICF that replaces the polystyrene with recycled timber but retaining most of the benefits. External finishes and internal plasterboard are easily fixed to the finished wall making for a simple construction popular with DIY builders.

STRUCTURAL STRAW PANELS - take all the advantages of straw bale building to the next level, where its modular system is easy and fast to construct -

insulated, passivH certificated and healthy houses can be erected in just a few days. Exceptional thermal performance and exceptional environmental credentials.

TRADITIONAL MASONRY - We have two masonry exhibits on display, this one shows the traditional method using mortar and insulated blocks. While cheap and well known to all UK builders, it can be slow and messy and the quality of build is down to the skills of your builder. Take a look at the next exhibit to see how things have changed.

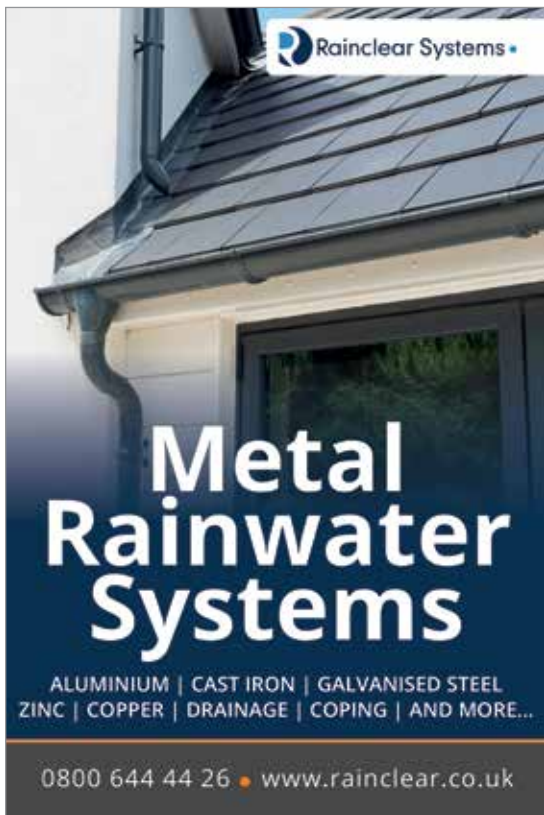
THIN JOINT MASONRY - Look! No mortar! The thin joint system addresses the drawbacks of traditional build by using oversized insulated blocks and an adhesive rather than mortar bed. This speeds up construction times, increases the accuracy of the build but retains the solidity and thermal mass of traditional masonry.

SIPS - SIPS takes timber framing into the modern era by using cassettes of high-grade insulation sandwiched by Oriented Stranded Board (OSB) to make a strong, flexible and high-performing structure ideal for contemporary and eco builds. SIPs roofs offer ready-made habitable living space in the loft.

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Building Blocks

Bricks are the most commonly used material for external walls in the UK. The Brick Library provides a chance to look at nearly 300 types of bricks from a range of sources. There are also some tile and cladding displays.

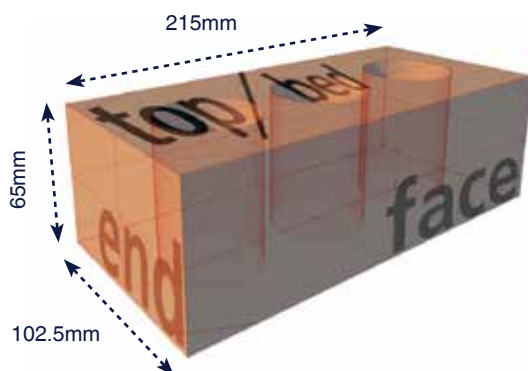
Bricks - A Quick Guide

Modern metric bricks in the UK are sized to create a modular format. The standard brick size is 215mm x 102.5mm x 65mm (face x bed x end), which with a standard 10mm wide joint gives a working size of 225mm x 75mm. There are many types such as 'solid', 'perforated' and 'frogged'.

Bricks are categorised by use. Facing bricks present the external face to the home. Common bricks are a cheap 'fill' brick.

Engineering bricks are very resistant to the elements and are typically used below ground as well as retaining walls where strength is required. Other types include concrete or calcium silicate (used in areas where clay is scarce); reclaimed bricks (salvaged from old buildings and cleaned);

and 'specials', which are basically anything that is not a standard shape. Bricks are further categorised by their durability. Their rating refers to their ability to withstand frost (F = frost rated; M = medium; O = not rated) and their soluble salt content, which affects colour over time.



Making Bricks

There are different ways of manufacturing bricks:

HANDMADE – Like stock bricks, hand-made bricks are made from a mould but as the process is not machine based, variations occur as the clay is less compacted and these bricks have distinctive creasings or 'smiles'! These types of bricks can be attractive but tend to be used on the higher end of the market due to cost.

LONDON BRICKS OR FLETTONS – Made from Lower Oxford clay found in the South East. As the clay contains coal, the firing process is shorter and the resultant facing can show different effects. The shorter firing process reduces the costs of this type of brick.

STOCK – Manufactured by moulding from wet clay, dried and fired. Although the process is automated the bricks are generally more expensive than wire cut.

WIRECUT – Made on a continuous extrusion process and then cut with wire like a cheese cutter. There is a great variety in texture and colours; usually they are the cheapest as the manufacturing process is highly automated.

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3 Roof Zone

Roof and Roof Coverings

Getting the roof right is important. You won't expect to be replacing a roof or it's covering for decades, so it's worth taking the time to research the very best options for your budget. In the Roofing Zone you will see examples of the most common type of roof construction, together with various options for roof coverings, rainwater goods, chimneys and flues. Don't forget to look on both sides of each roof section!

In the first Roof Zone section, you will see a green oak roof. This will be designed and manufactured off site for erection on site with the main frame of the house. An option for traditional masonry or timber framers is a cut roof, which is made on site from sawn lumber. While cheap on materials it is labour intensive, but using this method, it is possible to construct intricate roof profiles, dormers as well as creating living space if the roof is to be occupied.

Next you will see a SIPS roof. Structural Insulated Panels, known as SIPS, comprise a sandwich of high-grade insulation bonded

between structural boards. These large panels are craned up to rest on longitudinal joists called purlins, making a ready-made room in the roof. Roof lights and windows can be incorporated during manufacture. Note how the whole of the triangular roof space can be used giving a contemporary feel.

Looking further along, if you are using prefabricated trusses but are considering using the attic as habitable space, think about upgrading to attic trusses. These are much stronger than standard trusses and are designed to leave the centre space clear and to take higher floor loadings. They cost a bit more, but installing these now can save thousands of pounds compared to converting a traditional loft later on.

Finally, you will see Fink trusses, easily spotted from their distinctive 'W' supporting framework. These are the cheapest option, and as such are not designed for habitation, but they are fine for light loft storage loads.





Roof Coverings

Your planning department will usually have the final say over what roof coverings you will be allowed, but there are many options to consider. We've shown some of the more popular options here, but you can choose from the following options:

CONCRETE - Large format concrete tiles are the cheapest option because they are inexpensive to buy and easy to lay. Small concrete tiles are also cheaper than plain tiles. They are heavy, though, so be careful when replacing a lightweight slate roof with these – check that the old roof structure is strong enough.

PANTILES - Clay pantiles are another inexpensive option. Cheap to buy and quick to lay, they are more curvaceous than concrete tiles and add an elegant look to a roof.

PLAIN TILES - Smaller format tiles in clay can be machine made or, at more cost, hand made. They are slightly more expensive per m² and cost more to lay than large format because the work is more labour intensive. However, the effect is traditional and aesthetically pleasing.

NATURAL SLATE - This traditional roofing material, made from metamorphic rock, will never go out of style. It is a natural product that has a lifespan of over 100 years. Whilst Welsh slate's reputation is well known in the UK, it is also possible to import quality natural slate at a good price from places like Spain, as they have the world's largest metamorphic reserves.

STONE SLATES - This traditional form of roofing in the Cotswolds can be very expensive because each slate has to be selected, gauged and fitted by hand. The stone slates shown here are reconstituted stone – they look fantastic but cost a fraction of the real thing.

RUBBER TILES - These eco tiles are made from recycled car tyres and unless you touch them, you'd be hard pushed to tell them from real slate. Cost effective and eco friendly, they will last for decades.

STEEL ROOF - Traditionally associated with industrial buildings, coated steel roofs have become very fashionable with the rise of contemporary design. Steel is the most economic material to use, but more expensive versions can use non-ferrous metals like zinc and copper.

THATCH - Still a popular vernacular material. Warm in winter, cool in summer. Thatching needs regular maintenance, particularly to ridgelines, to maintain integrity.

METAL TILES - Standard tiles can only work well down to a certain pitch, usually around 22 degrees. Metal tiles are coated sheets of steel that look like clay tiles, but are nailed to the battens to prevent water ingress and lifting in high winds.

SEDUM - For a truly eco solution, you could opt for a sedum roof. Be warned that this is not just a case of replacing tiles with plants – green roofs must be carefully designed and constructed to avoid leaks while keeping the plants alive.

Sarking felt (or sarking boards in Scotland) will be fitted between the tiles and rafters, and these days, it is usual to install a quality breathable membrane that permits natural ventilation and allows moisture to escape naturally. This reduces the likelihood of condensation issues if the attic is used as a habitable space.



Roof Terminology

APEX - the triangular section above the window in a dormer.

BARGEBOARD - Timber masking the cut bricks or cladding at the top edge of the gable, and the gable ladder. Also keeps animals out of the roof space & cavity

BINDERS - Timbers fixed laterally through the roof timbers to provide stability

BRACINGS - Timbers fixed diagonally up the slope of a roof and within the trusses prevents wind deflection

CARCASSING - The main structural elements of the roof

CEILING TIE - The member forming the base of the roof triangle

CHEEKS - The sides of a dormer

COLLAR - The tie at ceiling level between the opposing rafters

DORMER - A window projection from the roof plane

EAVES - The lower edge of the roof where it meets the walling

FASCIA - The board masking the ends of the rafter feet

GABLE - The pitched end of a roof or building

GABLE LADDER SECTION - Producing an overhang at the verge

HIP - The sloping junction between the outside angles of two roof planes

PLATE - A timber used to support other elements

PURLIN - Support running laterally beneath joists or rafters

RAFTER - The member down the rake of the roof

RIDGE - The point of the roof

SARKING - Boarding giving racking strength to rafters (Obligatory in Scotland)

SOFFIT - Area beneath the rafters at the verge

TRUSS - A sectional roof component

VALLEY - The sloping junction between the internal angles of two roof planes

VERGE - The edge of the roof at the gable

WALL-PLATE - Longitudinal member fixed at the top of the wall to receive joists, trusses or rafters.

Flat Roofs

The days of constructing a flat roof using bitumen felt, hot tar and a bag of chippings are long gone. These days, better and much longer lasting alternatives are available. Options include non-ferrous metals like lead, copper and zinc which, while attractive, can be expensive and can be attractive to thieves, especially when fitted to single storey extensions.

Fibreglass is also a good option to consider. Fibreglass makes a solid waterproof layer that will not degrade, although some consideration must be given to protecting it if it is to be walked on if part of a roof terrace. Protective 'promenade' coverings and walkways are available to ensure the covering is not damaged and stays watertight.

A modern and cost effective option is single-ply thermoplastic membrane. Highly flexible and UV stable, this material looks similar to lead when applied. Intricate contemporary curved shapes can be covered and the chemical bonding process means that joints are permanent and waterproof.

Roofs like this are always constructed as a 'warm roof' with the insulation layer uppermost, just below the membrane. Fitting by a specialist installer is always recommended as the work will comply with Building Regulations and be covered by a guarantee.

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Guttering

Guttering makes sure that water is cleared away safely, either to a soakaway or to a rainwater harvesting collection tank. The cheapest guttering is usually plastic but will eventually fade and weaken with exposure to sunlight. More expensive systems that will last much longer and stay looking good are made of pressed steel, extruded aluminium or for the very best quality, cast iron. Steel and aluminium gutters can be anodised or resin coated in any colour you like to match your windows and doors and if you want the cast iron look but not the cost, heavy-duty plastic moulded gutters and hoppers are available. If you are in an exposed area, high capacity gutters may be required.

Chimneys

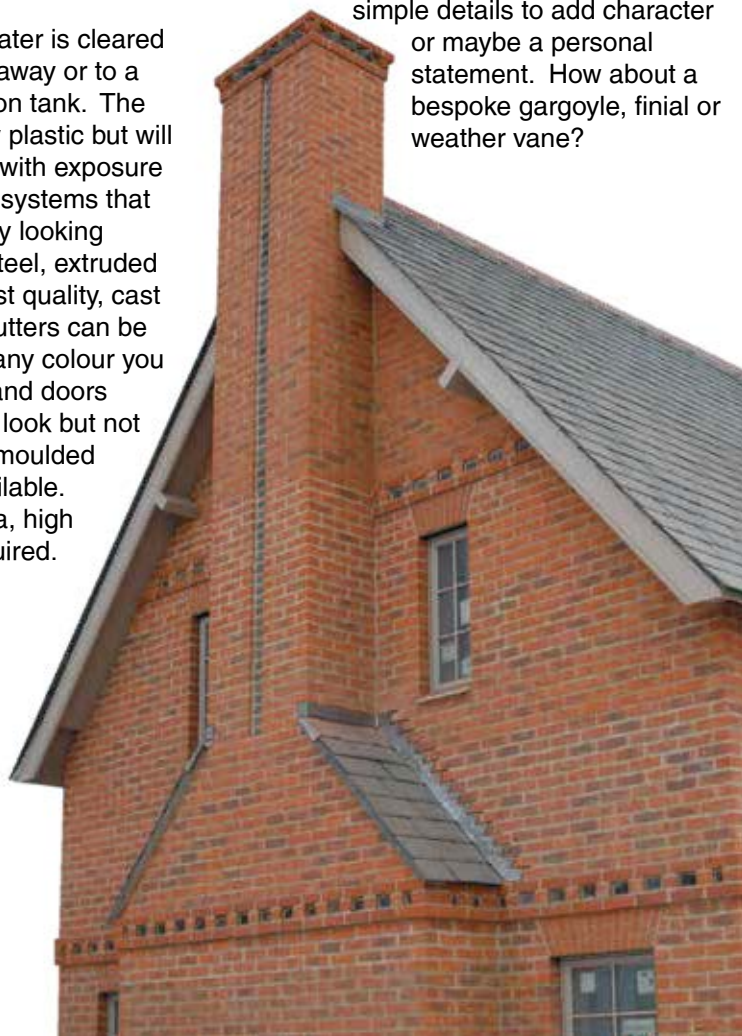
The need for chimneys has reduced as we rely more on central heating and flueless fireplaces. However, many of us like the idea of a fireplace as a focal point and while traditional open fireplaces are in decline, wood burning stoves have never been more popular so chimneys and flues are still much in demand. The

chimney is the external structure and the flue is the tubular sleeve within. When considering any chimney, flue, stove or hearth, seek the advice of a HETAS registered installer. And don't forget to cover the top of your chimney pot with a bird guard cowl. Jackdaws love building nests in chimneys!

Features

Various designs of fascias, soffits and bargeboards in MDF or low maintenance uPVC are available. If you really want the light to flood in, then you might consider a roof lantern like the one on display.

You can also personalise your roof with simple details to add character or maybe a personal statement. How about a bespoke gargoyle, finial or weather vane?



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Dormer Windows

Dormer windows add interest and character to a roof and are a great way of creating additional space following a loft conversion. On new builds, they can add considerably to the cost of a roof because most are made on site and are labour intensive. To save on costs, prefabricated dormers are available and examples can be seen on our exhibits. You can also see an extended rooflight that opens up to create its own balcony.

If you don't need a full dormer but do need additional light, roof lights are a fantastic addition. Unlike vertical wall mounted windows, roof lights let in much more light as the Sun's rays can enter from all angles, not just from above so even a small roof light can have a significant impact. They are relatively inexpensive and are very easy to install, even in an existing roof.

When adding a dormer window to an existing roof, you may be allowed to do so under permitted development rights, but these vary from council to council and there are often strict rules on what can be done without formal planning approval, so always check first.



Considering a Dormer?

PLANNING ISSUES MAY ARISE IF:

- ✓ You are in a conservation area. Most alterations in conservation areas require prior planning approval
- ✓ The proposed dormer extends above the general roof line
- ✓ The proposed dormer faces the highway. Dormers to a rear elevation are more likely to be allowed under permitted development
- ✓ The proposed increase in volume is incompatible with the existing house design.

DESIGN CONSIDERATIONS:

- ✓ Compliance with Building Regulations
- ✓ Insulation and impact on the overall performance of the house
- ✓ Waterproofing – leadwork and flashings
- ✓ Drainage – how will guttering and downpipes fit in with the existing house
- ✓ Sympathetic integration with the style of the original house, especially the existing roof.
- ✓ Ventilation. Trickle vents and eaves ventilation to avoid condensation issues.





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Heating and Ventilation

The Conversion of Fuel to Heat

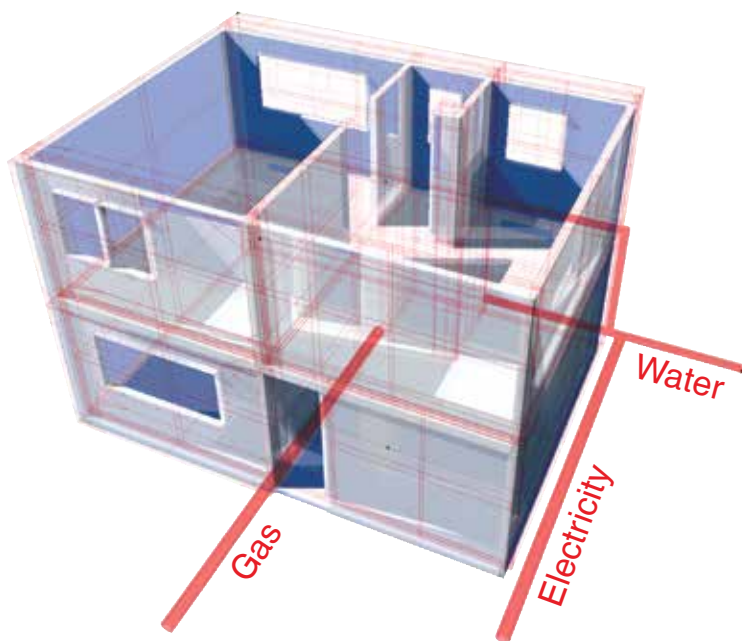
At the heart of any home is a heating system, which may be a simple gas or oil boiler but also could be a ground source or air source heat pump or possibly even infrared electric heating. Your choice of heating system can have a significant impact on the efficiency rating and running costs of your new home and must ideally be designed, specified and commissioned to compliment the fabric of the building and the lifestyle of the occupants. Gas and oil boilers are given a percentage rating according to their efficiency in converting fuel to heat. The lowest ratings fall into Band D and the highest in Band A (+90%). Heat pumps have an efficiency of over 300% but they are not burning fossil fuels, they instead use electricity to drive a compressor that moves heat from the source (Air, ground or water) to a more useful place. The higher the temperature is that you are trying to create the harder the compressor must work and therefore the lower the efficiency. It is therefore prudent to design the fabric of the home to be as efficient as possible before specifying the appropriate technologies to optimise the property.

Hot Water Systems

Before deciding on the heating and hot water system it is useful to have assessed your hot water needs correctly — how many people are living in the house, how many bathrooms etc. For a quick calculation this can be assumed as the number of bedrooms plus one.

The typical system in the UK uses a copper or stainless steel hot water cylinder heated by coiled tubes from inside which transfer heat from the boiler to the hot water. The domestic hot water never passes through the boiler at any time — this is known as an indirect system.

The main water feed usually has a very good pressure these days so it is no longer required to have a gravity feed tank in the loft. The expansion of the water, as it heats up, is also accommodated by an expansion vessel plumbed close to the cylinder. This is known as an unvented system.



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Biomass

Biomass boilers are often used for space and water heating as an alternative to oil or Lpg where high grade heat is required in larger properties or renovation projects where insulation is not feasible to install, and there is no piped gas. They use either logs, pellets or wood chips as the fuel and then store this heat in a large water tank or solid thermal mass.

Logs require a degree of manual labour to load and clean and if sized correctly you would expect to burn one batch every 3 days, depending on the heat load. Pellets and Wood chips can be automatically fed into the boiler for a steadier heat supply. First check that you have a local good source of fuel before installing a biomass boiler, otherwise this will not be a very sustainable heat source.



Boiler Types

- ✓ **COMBI-BOILERS** - heat your home by hot water through radiators and heating circuits. These boilers provide instantaneous hot water only when a water tap, shower, washing machine or dishwasher is turned on. This negates the need for a hot water storage cylinder and cold storage tank.
- ✓ **CONVENTIONAL BOILERS** - provide central heating by circulating hot water radiators and under-floor heating circuits. Hot water is provided by the boiler to a hot water storage cylinder; with the appropriate programme installed, your hot water requirements can be planned to suit your life-style.
- ✓ **ELECTRIC BOILERS** - are quiet, easy to service and work by hot water passing electric heating elements. Some examples provide central heating and domestic hot water with the same degree of comfort and control as a gas boiler.
- ✓ **BACK BOILERS** - usually found on 'Aga/ Rayburn type cookers or log burners; they combine a lifestyle look with a boiler, or 'wet-back' heat exchanger behind and they provide hot water and heating depending on the plumbing design. It is critical to get the design of these systems right to avoid overheating and wasted heat.



Renewable energy, solar PV and related options

Solar technology is being developed all the time and there are now more options available than there were 5 years ago. As well as in-roof based panels (in a moulding) or on-roof panels (mounted on aluminium rails), or solar tiles - you can install a static ground based array in your garden, or a higher output solar tracking system which will generate power from sunrise to sunset. You may find it helpful to ask an installer for advice, but some systems are available as self install up to the electrical wiring stage.

For optimum results / output, you will need either an unshaded south and west facing roof, or an unshaded area in your garden. (A small amount of shade can be mitigated by the use of micro inverters.) Once you have analysed your current energy usage requirements (heating, hot water, lighting, cooking, EV charging, home working and leisure technology etc.) you can start working out how many solar panels might meet your energy requirements; possibly used in conjunction with other renewable energy technology options e.g. a heat pump, solar immersion diverter, ceramic core radiators, thermal storage and batteries.





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Photovoltaic Cells (PV)

PV panels generate electricity from light, as opposed to solar thermal panels that need heat from the sun to make hot water. PV panels have no working parts, so they are very low maintenance installations, and have an average life expectancy of around 20 years. PV is the easiest way to generate renewable electricity in the home but due to the installation cost you need to make sure that you use the electricity generated in the normal running of the home.

As the technology advances, we are seeing PV tiles and integrated PV roofs. There is also the development of PV glass, which could replace large glazed areas. This technology currently benefits from the Feed in Tariff whereby the electricity produced is sold by you to the grid. Rates are continually changing and you only get the tariff that is current on the day the system is commissioned. It is therefore important to know what the tariff will be for your project before committing.

Solar Thermal Water Heating

Often referred to as Solar Thermal, Solar water heating systems use the heat from the sun to heat your domestic hot water. There are two types of solar thermal collectors/panels: flat plate and evacuated tubes. The evacuated tubes are more efficient but they are also more expensive. The rest of the system comprises a transfer unit (a high-recovery coil), a hot water cylinder to store the hot water and a controller that manages the flow through the panel and accommodates heat expansion. In the UK we use indirect solar thermal systems to protect them against freeze damage and also to pump the water through the system. In hotter countries the pump is not required because the power of the sun circulates the water in a thermo-syphon system.



Underfloor Heating

Underfloor heating has become extremely popular with self builders but it must be understood that it is not a one size fits all solution and also needs to have some early consideration to make sure it is designed to work properly and also will fit into the space discretely.

There are two types of underfloor heating: electric and water. Electric underfloor heating is effectively a lot of electric wires (or film) that are laid in the floor and through resistance they create heat. The water systems have a lot of pipes buried in the floor and the pipes then get connected in a loop to a manifold and warm water can then flow through the loop.

On the ground floor the underfloor heating pipes get buried in the screed and your floor finish goes on top. The harder the finish the better. As the pipes are in the screed you only need to be sure that the screed is thick enough (and strong enough) to cover the pipes and not crack when heated. On the upper floors the pipes can be either under the decking and between the joists or installed as an overlay system where the pipes are placed in a grooved panel that is on top of the floor deck. You then put your floorboards on top of the deck. This method will improve efficiency but will take up space and could result in an increase to the floor level of around 45mm. This must be specified early so that the door frames can be adjusted and the stairs can also be fitted correctly.

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Infrared

Infrared radiant heating can be used as a target heating solution for specific areas or potentially as a whole house solution. Infrared radiant heat is an even heat that heats up objects rather than the air around objects. The radiant infrared energy passes inertly through the air and heats up people or objects thus creating radiant warmth (just like the sun) but at a slightly lower air temperature which is ideal for localised heating. Radiant heat reaches temperatures very quickly so warm-up times are shortened, thus saving energy. Radiant heaters can be used either indoors or outdoors and can be mounted on the walls (as pictures, mirrors or coloured panels) or the ceiling, such as in bathrooms.

Radiators

Central heating radiators are common features in our homes and it is important to make sure that they will do their job. Radiators are available in many different shapes and sizes and there is a science behind specifying the right one. You may be forgiven for thinking that radiators were simply chosen according to the size of the window under which they were installed, but each radiator has an output rating which is set according to specific guidelines.

If you buy a 2kW radiator then that is usually specified to give 2kW of heat if the average temperature in the radiator is 50 degrees hotter than the room temperature. Therefore, if the target room temperature is 20° Celsius, then the average temperature in the radiator should be 70° Celsius. If the average temperature is lower, then you won't get 2kW. As an example, if the average flow temperature was 40° Celsius (20 degree temperature difference) then you would only get 600 Watts from the 2kW radiator. The temperature difference is referred to as Delta (Δ) T on the radiators and may have a kW or Btu rating. If you are planning to run the radiators cooler to save money then you will need to oversize them. The shape, size or design of the radiator does not really matter if the kW rating is correct. On older systems it is important to make sure that the radiator circuit is regularly serviced to make sure that the right additives are in the system to stop corrosion as well as making sure that the radiators are hydraulically balanced to ensure even flow of heat to all radiators in the circuit.



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If more heat is required in certain rooms than others, additional heat is supplied either through the filtered air in supply rooms via PTC terminals (heated valve elements) or through radiant heating panels, so that you can have convenient, responsive individual room temperature control.

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HPW 300 - combined heat pump with 300L domestic hot water cylinder



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The HPW 300 unit is a 300L cylinder with integrated heat pump to provide all your hot water requirements. The water stored, can transfer a limited amount of heat to wet underfloor heating, ie to warm a hard floor.

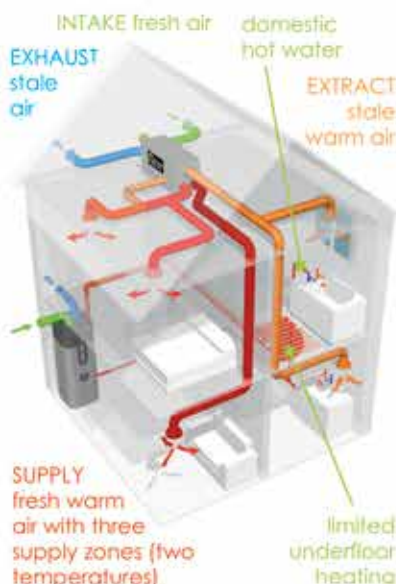
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With an air-source heat pump, you can reduce your heating bill by a third, slash carbon emissions and get a £7,500 grant! This is a heat source that can be 350% efficient, which doesn't need gas or oil to run and in well insulated renovations, can replace an inefficient boiler.

How does an ASHP work?

An air source heat pump sits outside and uses the heat from ambient air for heating and domestic hot water rather like a fridge, but in reverse. A pair of pipes from the ASHP serve your heating system via a buffer vessel and your hot water needs via an indirect cylinder. It is suitable for homes with a heat loss of approximately 5kW to 15kW. An MCS certified specifier can advise you on the correct size ASHP as a house with a heat loss of 9kW would need a 12kW ASHP to produce enough heat at -7°C from a cold start.

What is the best heat emitter for an ASHP?

ASHPs run at a lower temperature than a boiler, so the best heat emitter to combine with an ASHP is underfloor heating (UFH) because it has a much larger surface area than radiators. However, in a renovation project where you might not be digging-up floors, or upstairs timbers might not be suitable to hold the weight of wet UFH, you can use fan-assisted radiators as heat emitters. If you already have standard radiators in your house, they could be large enough to provide sufficient heat, if not, then you may have to install radiators that have three times the heat output.



How efficient is an ASHP?

Efficiency is measured by the Seasonal Co-efficient of Performance (SCOP); how many units of electricity used, compared to the units of heat produced. With a typical boiler, the SCOP would be 0.9, whereas an ASHP typically produces SCOPs of 3 & 4!

Government Grants for ASHPs

To aid the decarbonisation of buildings, the government is encouraging self builders and home owners (replacing existing fossil fuel systems), to install low carbon heating systems. They will provide £7,500 to overcome the upfront costs of installing an ASHP (or ground-source heat pump) under the Boiler Upgrade Scheme (BUS). Schemes entitled to support from the BUS must be in England or Wales and commissioned from 1st April 2022. To apply you will need to be the homeowner and have a valid EPC (Energy Performance Certificate) with no outstanding recommendations. The system must be correctly sized and fitted by a Microgeneration Certification Scheme (MCS) accredited installer who will also apply for the grant on your behalf.

Air to Water Heat Pumps

There are also air-to-water heat pumps which can take energy from the outside air and put heat energy straight into a water tank especially for your domestic hot water requirements. These units would normally be located in a plant or utility room, where the heat pump is integral to a tank of water. These heat pumps are so effective at the higher temperatures required for hot water, that COPs typically come out at 4.3.

VENTILATION

As you seal up and insulate your home more, so the indoor air quality in your home deteriorates. A constant cocktail of chemicals is emitted from curtains, sofas, laminates, cleaning detergents etc. Radon Gas, (the second biggest cause of lung cancer in the UK) mould, (caused by moisture from cooking and bathing) and Carbon Dioxide (from breathing) – all contribute to the air inside your home possibly having more pollutants, than the air next to a busy road.

Why Heat Recovery Ventilation?

Ventilating your home by poking holes through the skin with unfiltered trickle vents in window frames and noisy extractor fans in kitchens and bathrooms will not be adequate if you're really sealing it up. There are various methods of ventilating your home including Passive Stack Ventilation (PSV), Positive Input Ventilation (PIV) and Mechanical Extract Ventilation (MEV), but all of these are either uncontrollable, rely on air leakage, lose you heat or won't guarantee you enough fresh air. Still, these may be your only option to get some fresh air in your home should you be completing a renovation project.

However, Heat Recovery Ventilation or Mechanical Ventilation with heat recovery (HRV/MVHR) continuously extracts stale air out of wet rooms and draws fresh filtered air from outside whilst recovering up to 95% of the heat that you would normally lose through other types of ventilation.

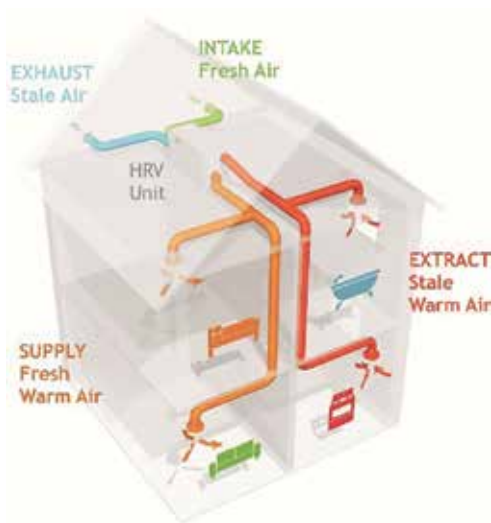
What to look out for in an HRV system

Good HRV systems will be Passivhaus certified, have an automatic summer bypass (no heat recovery in summer months), trap pollen and allergens and save about a third on heating bills. They should also have CO₂/humidity sensors and a controller ensuring the system is perfectly set up for your house and lifestyle with options such as a 24/7 timer, temperature monitor, boost function, data card, mobile app, cold weather reduced supply-rate function etc.

The best form of ducting is rigid-metal safe-seal, as it's naturally anti-bacterial, crush-proof, air-flows on paper happen in practice and mice can't nibble through it. Smaller bore plastic radial ducting is useful in renovations where ducting may be less easy to hide.

Heat Pump Ventilation

Even with the best HRV systems, there is still heat available to recycle. If you make your house airtight and well insulated, you may be able to take advantage of Heat Pump Ventilation (HPV) to provide a low energy heating solution as well. HPV integrates a micro heat pump within the HRV unit to harness even more energy from the outgoing air. It provides responsive individual room space heating, domestic hot water and some cooling too.



How a HRV/MVHR system works

Finishes Zone



Once your main structure is completed the last stage of the build is traditionally called the finish or second fix, hence the name Finishes Zone. It is split into two main areas – the main one comprising of door, floor and wall finishes and then there is the stairs exhibit, off to one side.

The finishes to your house are very important and will give the impression not only of your chosen style but also the feeling of the quality of the build.

Windows & Doors

The choices of your doors and windows may to some extent be dictated by planning and performance considerations. However, a house that features a large amount of glass will be scrutinised to ensure that the insulation performance of the home is not compromised.

It is impossible to outline the choices here but consideration as to material, performance and desired finish is a factor

– for example softwood windows are now pressure impregnated and treated to last around 30 years. Alternatively hardwood is more expensive and is often stained for effect rather than painted. When choosing metal, aluminium or steel windows, care must be taken to ensure that a thermal break is considered, to prevent what is known as cold bridging, which compromises the insulation of your house.

PVCu windows are popular as they offer a low maintenance solution, however you need to watch for discolouration and brittleness that can occur over time in cheaper varieties.



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Wall Finishes, Architraves and Mouldings

This area is mostly concerned with style. Skirtings, mouldings and architraves are purely cosmetic.

Costs can vary enormously depending on the materials; MDF features heavily in these areas as it is easy to engineer, however you may choose to go for plaster mouldings, which are more expensive but should not be discounted as an option.

Internal wall finishes – a basic choice is plaster or dry lining. The finish can be a simple paint where the options are between matt or silk. Don't forget the ceilings – artex has been very popular but it will need painting as well.

Wallpaper does not seem as fashionable as it was but it may have a place in your home depending on style – it is relatively inexpensive and if used over emulsion paint

throughout the house will only add a small premium to decorating costs.

Floors

There are a vast amount of choices in floor finishes and it is a huge area. The floor finish is likely to be related to the area you are designing for. Tiles in kitchens and bathrooms are very popular as they are practical. Note that most finishings are zero rated for VAT when used for new build purposes, – that is apart from carpets and curtains which are designated as movable items. Curtain rails and blinds however are!

There is quite a range of quality and materials for carpets, but you need to also factor in underlay – which can cost more than the carpet. Carpets in bathrooms need to be treated with care – woollen carpets can go mouldy.

Tiles come in all sorts of material options – vinyl, cork, ceramic or quarry tiles. Laying costs can be relatively expensive in some cases and with stone or colder types of

finishes some form of under-floor heating is useful to take the chill off the surface. Also with certain types of tiles you will need treatment after laying, in order to properly seal the material to prevent liquid spills from staining your beautiful finish.

Timber floors are currently very popular in contemporary style houses. Hardwoods although expensive are widely available. Slightly cheaper options will use a veneer which incorporate a 4-5mm layer of hardwood glued to a composite backing with the primary motive being strength and stability. Shrinkage is a factor on all wood floors and needs to be checked to avoid unsightly gaps appearing – this is less of a problem with certain types of hardwoods.

Whatever floor you choose, the substrate and preparation is important. With wood floors you don't want drafts coming through and with tiles you need to ensure they are bedded properly to prevent cracking.



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The main entrance door is of key importance, and a sympathetic design to your house style is an obvious thing to get right. Issues to consider are the amount of glass, thermal sealing, acoustic insulation, security and maintenance.

On the Inside

Interior doors are split between two basic types – solid and hollow. Hollow doors are effectively sandwiches with a centre fill similar to egg boxes. The areas where the handles are fixed are solid – so hanging them the right way round is essential. Hollow doors often feature some sort of veneer. Solid timber doors fall into two further categories – stainable and paint only, which are cheaper. Hardwood and glazed doors are also available – these are at the top end of the market.

Door furniture is everything to do with doors other than the door itself. Handles are the most visual and the only piece you might touch but some things you are not going to see, such as locks, seals and security also need to be thought about and chosen according to function.



Stairs

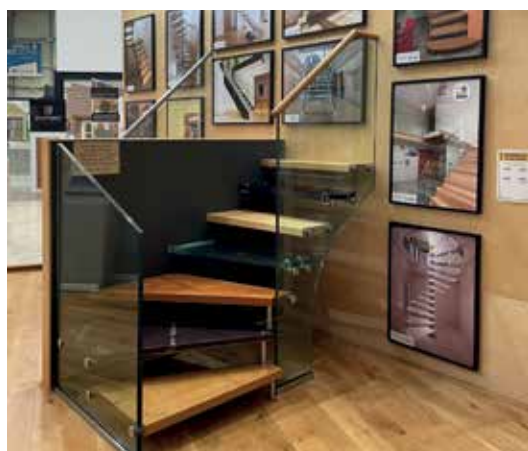
In a modern multi-level house the staircase is an essential structural component, which should also fulfil an important aesthetic function. The most simple form of staircases are those that go straight, however often there may be space or design issues to work around and there are a variety of options available from split stairs with half landings, turning the staircase with some 'winder' treads or even a full spiral staircase.

In addition there are other considerations such as galleries, handrails and balustrades.

Thoughts on the design, materials and layout need to be included in the early part of any design project. Clearly stairs need to be able to safely transfer people between floors with the minimum of risk as well as keeping the environmental and structural integrity of the house design intact. It is necessary to adhere to the building regulations.

Consider:

- The structural integrity and robustness of the construction design
- The safe access to the accommodation
- Safe means of escape
- Sufficient headroom
- Fire protection
- Tread and riser (step) conformity



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Renovation House

Turning Back Time

Renovating a house can be one of the most rewarding experiences of your life and with careful planning, can also be one of your best investments. The heady days of ever-rising house prices are gone and, whilst many people still managed to make money from renovation (despite making some questionable decisions) because of the rising market, the opportunity to make a profit while restoring an older property still exists. Of course, rather than profit, your motivation may well be to turn an ancient wreck into a family home for a minimal outlay. In either case, a tour of the Renovation House is a must. Using our audio tour, you can find out exactly how to go about bringing an old property back to life whilst learning about the problems you might encounter and getting top tips on how to make your own project a success.

The Renovation House is typical of a property built in the inter-war years and has clearly had very little maintenance work or modernisation work done to it. As a result, just about everything needs work to bring it up to standard. As you move through the house, you will be guided through identifying and resolving most of the common problems encountered during a renovation project from failing brickwork, dry rot through to a leaky roof. Using the advice of specialist surveyors, builders and other tradespeople, you can see the original dilapidated house magically transform into a modern and up-to-date home with added space from basement and attic conversions.

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Before buying a renovation project like this, either at auction or on the open market, a full structural survey is absolutely essential. A proper survey will help you to determine exactly what work needs to be done, and therefore whether the project is economically viable. Knowing what needs to be done will help you to set your price limit at auction, or to negotiate a fair price for the property so that you can avoid buying a 'money pit' that will cost more than its market value to restore. It will also give your builder a good idea of what work needs doing, so they will be able to give a far more accurate price for the work to be done.

Assessing the Property's Potential

Renovation is primarily concerned with making the existing dwelling into a better one. Conversion turns a property that was not previously used as a dwelling into something habitable. This may also encompass extending the living spaces and using attic or basement developments.

Much of the new build processes covered in the rest of the Centre can be applied to renovation, but a big difference is that you will need to assess the true state of the property and plan accordingly.

For any project you need to work out the possibilities, calculate the costs and understand the value your work can yield.

As in calculating the potential for a plot of land, you will need to get to know the local area; all the principles that apply to assessing the development value can be applied to renovation. Be wary of over-developing or specifying too high a quality home for the typical values in the neighbourhood.

The actual assessment of the property and its existing condition is likely to be a specialist task for a building surveyor and a full structural survey is always advisable. However even a surveyor may not be able to foresee all the problems once the strip-out of the property is underway. Unlike a new build, renovation costs are less precise and budgeting for potential issues is advisable from the start.

When assessing the economics it is advisable not to rely on house price inflation. Never build it into your figures other than as a possible up side. It is more often the case that this is eaten into by under-budgeting of contingencies. So in short ensure the development stacks up financially at current prices.



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One last thing is to allow for VAT. Unlike new build projects where VAT can be reclaimed against materials, this is not the case for most renovations. However, a change to the VAT rules allows a reduced rate of 5% VAT on materials and labour to be charged by a VAT registered builder if the house to be renovated has been unoccupied for 2 years or more before the work commences.

Doing the Work

A large part of good renovation redevelopment is about spending wisely. It is not necessary to spend a small fortune to make an impression or create a top-quality home. However, you may decide to install the latest technology in your home such as hi-tech audio and control systems for your own enjoyment.

With a high degree of strip-out and renovation there is a great opportunity to improve the performance of the property and reduce the running costs for energy by using improved insulation, solar power and other renewable technologies such as air source heat pumps.

Choices

While not a complete blank canvas like a new build, major renovation projects will throw up similar choices and many of the options available in a new build can be applied to a renovation project. Not only will you have to decide on finishes, but you may also want to look at different options for boilers, plumbing and fixtures, underfloor heating and so on.

Stages of Renovation

The Renovation House shows the 4 main stages you will need to follow, namely:

- Assessment and design
- Strip out/build down
- Renovation first fix
- Final finishes

Once you have completed the purchase of your renovation project, typically the stages to follow are:

- Secure the property – if vacant you need to prevent vandalism



Structural Survey

A detailed or structural survey can help you uncover hidden pitfalls and give you a better idea of what the potential for your property is.



- Full survey and assessment
- Apply for planning, Building Regs and listed building consent (in some cases)
- Prevent further deterioration – especially if water ingress has been a problem making it watertight
- Secure and isolate the services for works to commence
- Strip back and salvage what you are planning to re-use
- Site organisation and set up
- Stabilise the building if any works are needed to the foundations (underpinning or underbuilding)
- Damp Proof Course (DPC)
- Sub floors – damp proof membranes may need to be installed
- Stabilising the wall structures – may involve new brick and blockwork, re pointing and installing purlins and steel RSJs where the structure is being modified
- Plumbing wiring and underfloor fix – in some instances where layouts change the drainage will need modification
- Internal floors, staircases and first fix carpentry
- Roofs – may require re-roofing, insulation, installation of solar panels and even replacing parts of the structure
- Doors windows and openings – roof lights, doors, frames, double glazing, lintels and arch replacement in some cases
- Services - new heating, boilers or heat pumps and lighting and security
- Re-plastering wall finishes and ceilings
- Floor finishes, tiling
- Fixtures and fittings, decoration.

Professional Services Hub



House Design

An exciting aspect of any self build project is the chance to get 'hands on' and have a direct input into the building work. However, there are several areas where it is advisable to engage a professional. The hub features Architects, Project Managers, Surveyors, Building Control, Energy Assessors,

Timber Frame Manufacturers, Design Solutions, Landscape Designers and much more. The Professional Services Hub is a unique resource showcasing a wide range of specialist expert service providers, all available to advise and guide you through your build project.

Kitchen Design

What goes on in your kitchen today? What would you do with the kitchen of your dreams? These are the sort of questions you have to ask yourself when it comes to deciding on the design for what will be for many people the centre-piece of their home.

Because kitchens have the potential to be incredibly practical and versatile spaces, no two households use them in the same way. To help shape your thoughts here are some questions posed by many kitchen designers:

- Do you want to use the kitchen for dining?
- Will you want to use it for homework or socialising?
- Do you need an area in which you can work in the evening, prepare food quickly and also entertain?
- Do you want to add extra facilities like laundry, storage or even a wine cooler.



Design Checklist

UNDERSTAND YOUR REQUIREMENTS:

- ✓ How you want to use it?
- ✓ Who will use it/how much of the time?
- ✓ What special features do you want to include?
- ✓ What are your must-have appliances?
- ✓ Consider the triangle between cooker, fridge and sink.
- ✓ How many power points do you need and their key locations?
- ✓ What sort of lighting do you want?
- ✓ What about audio?
- ✓ How much storage will you need?
- ✓ Consider plumbing issues.

PLANNING THE DESIGN:

- ✓ Consider the style options.
- ✓ Use free design services from suppliers to evaluate options.
- ✓ Review storage innovations.
- ✓ Be inventive about sink location - don't just stick it under the window!
- ✓ Be critical of dead space - check all the space has a function.
- ✓ If the kitchen is small then consider the need for a breakfast table / bar.

Bathroom Design

The bathroom is usually one of the smallest spaces in your house but also needs to deliver one of the highest levels of functionality. If you are building your own house you have the luxury of planning the bathroom of your dreams. You can incorporate whatever features you desire to make your bathroom a haven of tranquillity and relaxation, a sanctuary for you to escape the outside world. You have the opportunity to include the perfect heating, lighting and storage systems from the beginning. Plumbing can be installed exactly where it needs to be and you could even incorporate entertainment such as a built-in television or music system.

What do you want?

There are actually a number of different types of bathroom – family bathroom, en-suite, shower room and cloakroom, and each will have specific functional requirements. Good planning is the key to designing your dream bathroom, then assess your needs and see what the options are. Ask yourself:

- How much space should you allocate?
- How can you maximise existing space?
- What is its primary purpose?
- What is your budget?
- What functionality is required?
- Is it relaxational or functional?
- What style suits the house?



Design Checklist

FIXTURES & FITTINGS - These will depend on how you use the bathroom, how much space you have and how you want it to look and feel.

HEATING & VENTILATION - Options for heating the bathroom would be under-floor heating, towel radiators (either as part of your central heating or electric) or radiant heating panels. Good ventilation will prevent mirrors steaming-up and condensation leading to mould growth. Basic ventilation would be extractor fans and trickle vents, but you lose a lot of heat this way and suffer the noise. Heat Recovery Ventilation is now considered the best ventilation in your home and removes all moisture from wet rooms whilst recycling the heat back into the habitable rooms of the house.

LIGHTING - An important feature to create atmosphere in your bathroom, transforming the room from bright to softly lit at the touch of a button.

STORAGE - This can be fitted or free-standing units, bespoke built-in cupboards and shelving systems. Plan in free-standing items from the beginning.

WATER SAVING - Try dual-flush WCs, delayed flush cisterns, low capacity baths, shower restrictors, ceramic disc cartridges or tap flow restrictors.



Planning – A Quick Guide

Planning Section compiled in conjunction with Mark Doodes Planning

If you are intending to build a new home, or looking to add a significant extension on your existing home, then you will likely need to obtain planning permission from your local authority. You may not need to apply for permission for minor works and small extensions under what are known as “Permitted Development Rights”. The Planning Portal has an excellent Interactive House Visual Guide, but there are a number of ways that these rights can be removed so it is always best to seek advice from your local authority before you start work. In nearly all cases, Building Control approval will still be required.

When considering a new build, particularly on a green field site, much has changed in the national policy arena in the last decade. Most notably, the National Planning Policy Framework (NPPF) was published in 2012, and updated in 2021, and streamlined much of the national guidance and introduced the concept of a ‘presumption in favour of sustainable development’. That said, planning remains a policy led system and each local authority will have an adopted local plan that details the strategic and specific policies that all submissions will be assessed against. The local plan can be one of a number of often competing factors at play: the NPPF, case law, nearby planning appeals, supplementary planning documents, housing land supply status and written ministerial statements all form part of the decision-making process. Indeed, the weight that is assigned to such policies can vary over time and this is why taking professional planning advice early on in your project is also advised as timing can be important too. Statistically, around 90% of all applications are approved, but remember numbers can be misleading as it includes many side extensions and other minor works.

Planning is concerned with how your new house or extension will sit in its environment

and the impact on neighbouring properties and the street scene, amongst many other factors such as access, flooding and ecology impact. Planning can also be a subjective process, so trying to do something out of the ordinary needs to be handled carefully and be well argued to avoid running the risk of refusal. Architects and Planning Consultants can be a real help with difficult sites and often work together to form a strategy and present the best possible case. Exercise great caution if contemplating buying land without planning permission, if you intend to build on it. The underlying agricultural value of land is around 5% of the value of a plot with permission, often less. Therefore, always offer to buy ‘subject to achieving the satisfactory consents’ required. Never take the word of a vested party in what the planning merits of a site are as it is not the role of a Conveyancing Solicitor to advise on planning prospects; talk to a Chartered Town Planner. A planning (feasibility) assessment can cost between £500-£1500 depending upon the level of research required. MDP charge around £850 plus VAT in most cases.

In England and Wales, full planning permission exists in two main forms and lasts for 3 years from the date of approval. Once a lawful start is made, you can take as long as you like to complete the build. There are some differences to the rules in Scotland and Northern Ireland, so check with your local authority if you are planning to build in these areas. Planning can take the following forms:

Outline Planning Permission (OPP)

OPP grants consent to develop a piece of land, here usually only the “principle of development” is addressed (often also with the means of access but other combinations of details can be provided up front also such as landscaping). The consent must indicate the use or uses proposed for the land and the amount of development and usually

includes an illustrative plan showing what is proposed and where. Outline permission, on its own, doesn't mean you can start works. You need to make a separate submission to cover the matters reserved from consideration at the outset called a "Reserved Matters Submission" (see below). Most of MDP's submissions are made in Outline.

Permission in Principle (PiP)

This can be useful in certain circumstances and was intended by government to be a "stripped down" version of a full planning permission. Importantly, a site can be sold with a PiP but be wary before buying a site with a PiP, as the elements of the consent which have been removed from consideration may turn out to be problematic to address, such as drainage. Take advice before buying. PiPs are intended for smaller sites of up to 1Ha (this would include the access road also, so don't just measure the site itself) and for 9 or fewer homes which can also include mixed land uses too, such as retail or commercial space. Once granted one then need to apply for a Technical Details Consent (TDC) before starting but we find that most clients opt for a Full Planning Permission at that stage in order to address as many potential conditions in one swoop. PiPs are particularly useful for brownfield sites. However, on greenfield sites, PiPs are often less compelling compared to Outline Planning Permission (Outline PP). While PiPs allow many considerations to be removed early in the process, this can be a double-edged sword: important environmental, economic, and social benefits may not be given the same weight as they would be through alternative routes.

Approval of Reserved Matters

This clarifies the details omitted at the outline stage and, when combined with an outline, forms (in effect) a "full" planning permission. Once granted, and conditions have been discharged, the project can lawfully start. Once applied for, the works must start within two years of the granting of the Approval of Reserved Matters.

Full Planning Permission

Effectively, this is a combination of OPP and Reserved Matters rolled into one application. A householder application is a sub-set of Full Planning Permission as it handles the principle and the detail simultaneously. It grants permission in principle and covers all of the required details. This process is cheaper as only one fee is payable, so if you know what you want to build, this is a popular route for Self Builders. However, most Developers will use outline permission so as to avoid preparing detailed plans if there is to be a dispute about the principle of development. Full planning permission lasts for three years.

Planning Conditions

The time, cost and expertise required to prepare and see approved conditions is a matter often overlooked by applicants. For example, a condition requiring further bat surveys to be submitted to the LPA (Local Planning Authority) on a consent granted in October may mean months delay, since bat surveys can only be undertaken at certain times of the year, starting in May. Allow time and budget for this important work. A start to works is not (in many cases) a lawful start without the conditions being dealt with first. Take advice and build a timeline. Don't leave this until the last minute.

Pre-Application Meetings

If you are looking to establish the viability of a plot of land, or you need guidance as to what sort of home you might be permitted to build in a certain area, it can be a good idea to arrange a pre-application meeting with your local authority. This will not grant permission or constitute a refusal in itself, but will give you an opportunity for you to discuss your plans and to ascertain the chances of gaining approval for what you want before paying for a planning application. Be prepared to argue your case, but also have a back-up position because some form of compromise may be required. The opinion of the local authority is important but may not take into account some of the wider, perhaps national, issues such as case law. For this reason, seeking

the input of a Chartered Town Planner can give a different perspective and perhaps a stronger steer as to the probability of success.



Common Failures With Planning Applications

1. Application contrary to the adopted local planning policy.
2. Failure to include the necessary documentation, including ecology or tree surveys.
3. Failure to address problems of access, visibility splays etc.
4. Insufficient on plot parking or turning space.
5. Design/scale/choice of materials ajar with surrounding properties.
6. Poor quality plans which don't adequately show the merits of your scheme.
7. Failure to make the right consultations with neighbours, local community groups etc.
8. Adverse effect on neighbouring amenities, including open spaces, listed buildings, conservation areas etc.
9. Failure to demonstrate the above via sections, drone images, CGI or artists impressions.
10. The expiry of the original consent or not discharging conditions.

Building Regulations

While planning is all about what a house looks like, Building Regulations (often shortened to 'Building Regs') are all about how a house is built. The Regulations ensure that new homes and extensions are safe, accessible and energy efficient. The regulations have evolved over many years and have become increasingly complex over time. The Regulations take the form of a series of 16 Approved Documents, each covering a specific area as can be seen on the panel elsewhere on this page. They are amended at regular intervals and because each is a hefty document on its own; they are best viewed online through The Planning Portal. The good news is that you, as the client, will not need to be familiar with the Regs, but your architect, designer and Builder most certainly should be. In Scotland, the Regs are known as Building Standards and will result a Building Warrant being issued on successful completion. The Standards cover similar topics but cover 8 categories from Parts 0 to 7 with 3 covering appendices.

While you will have had some drawings produced to get through the planning process, these will likely be of little use to a Builder. They will need to know the details of what is involved – what materials are being used, dimensions and where

useful information





Building Regulations

England & Wales

Approved Document A	Structure
Approved Document B	Fire Safety
Approved Document C	Site Preparation & resistance to Contamination and Moisture
Approved Document D	Toxic Substances
Approved Document E	Resistance to the Passage of Sound
Approved Document F	Ventilation
Approved Document G	Hygiene (inc Hot & Cold Water)
Approved Document H	Drainage & Waste Disposal
Approved Document J	Combustion Appliances and Fuel Storage
Approved Document K	Protection from Collision, Falling & Impact
Approved Document L	Conservation of Fuel & Power
Approved Document M	Access to and Use of Buildings
Approved Document P	Electrical Safety
Approved Document Q	Security

Note: Part N (Glazing) now subsumed into Part K

everything should go. Essentially they are a set of instructions to erect the house, a good quality set of drawings can assist in comparing like-for-like quotes and ensure the onus is on the Builder to demonstrate the plans were flawed in some way to justify additional building costs.

It is important to note that some work to your home that may not need planning permission will require Building Regulations Approval and, to a less common degree,

vice-versa. If in doubt, always check with your local authority as regularising mistakes can be time consuming and costly. For a new dwelling or a significant extension, your plans would be sent to Building Control for approval and once they are happy, they would agree an inspection schedule to check on the build as it progresses. A Building Control Inspector acts in your interest, no one else's. For smaller jobs, such as converting an integral garage into a home office, you may carry out the work under a Building Notice but whichever route you use, you must give 48 hours' notice of your intention to start work.

Building Regulations Approval has been deregulated, so you have a choice as to whether to use the traditional service offered by your local authority or to use the services of an Approved Inspector working for one of the private providers. Both routes have their merits: your Local Inspector will have local knowledge of ground conditions and will be able to drop into the site at short notice whereas an Approved Inspector can price the work based on risk which can be cheaper and they can also carry out structural warranty inspections so reducing the number of visits to the site. The choice is yours.



Energy Efficiency

The Approved Document that gets the most attention is Part L because it is all about insulation and energy efficiency. This Approved Document has become more stringent in recent years as the energy efficiency aspects of the Code for Sustainable Homes (CSH) have gradually been incorporated into Building Regulations to the point where CSH has been phased out. All new dwellings must now be at least 44% more energy efficient than a home built in 2006 and that has meant a radical change in the way we build and assess new homes.

As we strive to lower energy bills and reduce carbon footprint, traditional methods of building have been eclipsed by modern methods of construction (MMC) such as Structural Insulated Panels (SIPs) and Insulated Formwork systems made from polystyrene or recycled wood. While traditional methods like timber frame and brick and block remain popular, they need help to keep up with the inherent efficiencies of modern systems and may require significant extra work to meet the new standards. The modern approach to construction can be summed up by the phrase 'Fabric First'; in other words, get the insulation and airtightness right and the rest will follow.

Airtightness is a new tool in assessing energy efficiency. The idea is that heat will stay in a house unless it escapes, so by making the house more airtight by sealing joints properly and filling in the gaps around pipes doors and windows, more heat is retained and less energy is needed to replace it. This is tested at the end of the build when a big fan is placed over the front door aperture and air sucked out. The rate at which the air is replaced is measured to reveal how airtight the house is. Single houses currently have an exemption so airtightness testing is not yet mandatory, but in reality, the default settings used if you don't have one done makes complying with the regulations much more difficult so it's worth having one done anyway.

Standard Assessment Procedure

The main method for assessing energy performance of your new home under Part L of the Regs will be through a Standard Assessment Procedure (SAP). This document will be created by an approved SAP Assessor and submitted with the building regulations application at the start of your build. The SAP looks in detail at how the house is constructed, how airtight it is predicted to be, what materials have been used and what heating system or renewable energy sources have been specified. The end result is called the Dwelling Fabric Energy Efficiency (DFEE) rating and will be a number between 1 and 100, with 100 being the highest level of performance. This figure will be matched against one of a number of reference values on the Assessor's database based on a notional house of a similar size but built in a way that would pass the test. This reference value would, again, be a number between 1 and 100 and is referred to as the Target Fabric Energy Efficiency (TFEE) rating. The proposed DFEE rating you provide must be as good as or better than the TFEE number specified. If it fails, then you will need to look at improving your design (possibly by increasing the level or quality of insulation) until you meet the required standard.

Passivhaus

Passivhaus, or Passive House, is a building standard developed to enshrine the principles of airtightness and insulation. Coupled with a Mechanical Ventilation and Heat Recovery system to allow fresh air to enter the house without compromising airtightness (see Ventilation on p99), a Passive House is so efficient that it requires no additional heating systems, meaning incredibly low bills. Other build systems are available such as the Canadian Super E Standard, but Passive House has become the byword for a highly energy efficient building. Passive houses must be carefully designed and built from the very start and can cost much more than a standard build as a result, but it can be argued that the almost non-existent running costs justifies this expense over time.



Cavity Walls

Cavity walls are associated with insulation, but their main purpose is to stop water passing through the outer walls to the inside of the house. Here are some examples of how a cavity wall might be specified:

ICF –

Some modern monolithic structures, like Insulated Concrete Formwork do not require a cavity at all because the structure is waterproof and contains its own insulation.

TIMBER FRAME –

The cavity on a timber frame structure should always remain unfilled. The frame must be kept dry, and the cavity prevents the passage of water to the timber. With timber frame, the insulation is placed within the frame itself and there is usually room for lots of it.

MASONRY –

Modern masonry construction still demands that a cavity is used. Cavities of 50mm or less would normally be left

unfilled, but as the Regs become more stringent, cavities have become wider to allow greater levels of insulation to be fitted. A 150mm cavity is not uncommon. There are usually two options to consider:

FULL FILL –

With full fill, the entire cavity is filled, typically with slabs of mineral wool called batts. This is usually specified in temperate areas inland where weather is less extreme. Any moisture that permeates the external walls will quickly evaporate.

PARTIAL FILL –

Where high levels of intense weather may be experienced, such as in coastal areas, a partial fill may be specified. Here half the cavity will be filled with a high performance insulant like foil backed PIR foam while the rest of the cavity remains open. This allows any moisture that penetrates the external walls in severe weather to drain away while still achieving high thermal performance.



Your Project

Handy hints to ensure that your project is a success

There are a number of ways to set a self build or large scale renovation project up, almost all of which involve you taking on a management task.

Should you choose the route of employing a builder, depending on the size and scope of the work then they would invariably manage a large part of the project. However, you will (and should) manage the accounts, administration and take an active role in the decision making process.

Alternatively you may decide that you can manage the whole project – virtually a full time job – as you will need to manage the many trades people and sub-contractors that are required throughout the process. You also need to take responsibility for the site and draw on a high degree of technical

knowledge to manage the many decisions that have to be made through the project. The buck stops with you so clearly this option is one only for those with both time and expertise.

The difficult part of any house development is to get to the roofed-in and water-tight stage. As many as five separate trades and many materials have to be co-ordinated by the day and sometimes hour, you have to keep the building inspector happy too. For those of you with less time, this can make a strong argument to go down the main builder route until at least that point. Managing the remaining works is not easy, but is more realistic for the average self builder with a bit of expertise.



Spotting a Good Builder



- ✓ Keeping sites tidy
- ✓ Able to relate to the self builder (who tends to be quite involved)
- ✓ Looks ahead and provides timely advice
- ✓ Passes on knowledge (very useful on any future builds)
- ✓ Is up to speed on regulations, innovations and modern technology
- ✓ Open and helpful - self builders have a thirst for knowledge
- ✓ Good management ability - often keeping a number of jobs and trades going at once



Choosing builders is one of the most important management decisions and before you engage them, make sure you follow up references, talk to previous clients and see their work. Always try and obtain a fixed price and avoid letting the builder pass on measured rates that they may have been given from their sub contractors – if they are any good they should be able to add up the cost of the respective jobs properly.

There are two ways to arrange a builder to build a house for you – by using an architect to establish and supervise the contract (often after a tender process managed by the architect); or to do it directly and save around 10-20 per cent.

Negotiating the contract with the builder in an amicable way can be challenging. However you can use a standard contract for the home owner/occupier from a variety of sources including the Federation of Master Builders (FMB) or the Joint Contracts Tribunal (JCT). They clearly set out the work, price, terms of payment and various conditions.

In addition it sets out how extras (extra work elements outside the initial scope) should be handled. The downside of this route can be over specifying the job and missing important things, so setting out a general set of work tasks and establishing a good working relationship is often more effective. Some self builders keep it simple with an exchange of letters, plans and drawings no more detailed than those needed for building regulation approval.

Whilst you are at the Centre, try to find the time to talk to any of the experts who are on hand; if you are yet to decide which method of construction will suit your project best then take the opportunity to listen to the advice of people who have been there and done it. Increasing the degree of off-site manufacture will often increase the speed of the build and potentially improve the quality of the finish. Time on site costs money and if you're building through the winter, weather delays are potentially very damaging to progress, if one trade falls behind it can often cause a snowball effect of delays to several other trades; there is a good argument for getting a 'weatherproof' shell up as quickly as you can, work can then continue both inside and outside at the same time without any conflict between tradespeople.



Outdoor Living Zone

Stepping outside the centre you'll find the Outdoor Living Zone; split into several sections. Here, you'll find design ideas for the hard landscaping of your project, with displays of paving, fencing and other finishing touches all in situ, helping you understand how the different elements work together.

Veranda & Garden Rooms

Transitioning from the Centre into the Outdoor Living Area, you will move through the Veranda which was installed by Ultraframe to demonstrate how they can transform light and space in the home. Supply only or fully fitted, their accredited dealers can install stunning aluminium/timber windows as well as traditional conservatories, orangeries and glass extensions. The garden room features a working air source heat pump installed by Earth Save Products.

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When considering your driveway and paving options, bear in mind that legislation now requires any paving areas to be water permeable, unless the surface water is drained to ground within the curtilage of the property.



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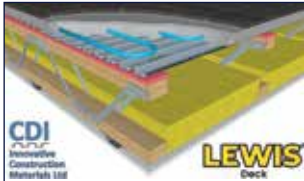
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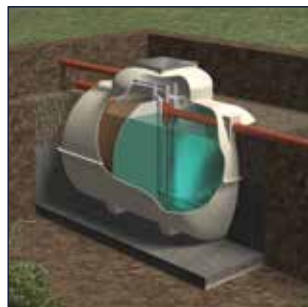
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Stand 88, 90 & Renovation House

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At Tile Energy, we prioritise quality and reliability in every solar solution. That's why we exclusively use Tesla and SolarEdge — brands synonymous with excellence in the solar industry. Each rigorously tried and tested product stands at the forefront of solar technology. This ensures our customers only receive the best performance and longevity. With these top-tier solar systems, you can empower your property with leading-edge clean energy.



Total Home Environment Ltd



Stand 58 & Renovation House

Swallow House, Cotswold Business Village, Moreton in Marsh GL56 0JQ

Tel: 0345 260 0123

Twitter: @TotalHomeEnviro

Email: info@totalhome.co.uk

www.totalhome.co.uk

Helping you create and enjoy an energy efficient, healthy home. Heat pump ventilation, heat recovery ventilation compact service units, central vacuum systems and air-to-water heat pumps. With over 25 years' experience in 3D system design, room-by-room heat loss calculations, installation, commissioning and servicing, we exceed expectations. Passivhaus Trust and NaCSBA members.



Ubbink



Build smart.

Stand 73 & Roof Zone

Tel: 01604 433000

Email: sales@ubbink.co.uk

www.ubbink.co.uk

Ubbink UK is a leading supplier of ventilation and energy-efficient building solutions. Its MVHR (Mechanical Ventilation with Heat Recovery) systems provide continuous fresh air while recovering heat from extracted air, improving indoor air quality, reducing energy loss, and supporting compliant, low-carbon, comfortable homes.



Unico Inc.



Piazza

Tel: 01384 422094

Email: unico@bellplumbing.co.uk

www.unicosystem.co.uk

The energy efficient Unico System is a simple solution offering heating, cooling and ventilation within your home. The central air distribution system can greatly enhance your indoor air quality by integrating fresh air filters and UV technology.



VAT Reclaims by Andrew Jones Professional Services Hub

Tel: 01269 825248

Email: andrew@vat431.co.uk

www.vat431.co.uk

UK Home Interiors

Stand 100

Tel: 0203 868 5013

Email: sales@ukhomeinteriors.co.uk

www.ukhomeinteriors.co.uk

Ultraline Finishes Zone

Tel: 0121 550 3066

Email: info@ultraline.co.uk

www.ultraline.co.uk

Ultranel Building Technologies

Stand 84

Tel: 01200 414714

Email: hello@ultranel.co.uk

www.ultranel.co.uk

Velfac



Piazza & Renovation House

Tel: 01480 759510

Email: velfac@dovista.com

www.velfac.co.uk

VELFAC wood/aluminium windows and doors bring together Scandinavian design, exceptional performance, and long-lasting durability. Whether creating a contemporary architectural statement or complementing a more traditional home, the VELFAC range offers energy-efficient solutions with slim sightlines, abundant natural light, and low-maintenance aluminium exteriors. Built to last for decades, VELFAC products enhance comfort, character, and kerb appeal in equal measure.



Velox (Eco Massive House) Walls/Structures Zone

Tel: 01483 511255

Email: info@velox-systems.co.uk

www.icfsystems.co.uk

Velux Stand 62 & Roof Zone

Tel: 01592 778225

Email: technical@velux.co.uk

www.velux.co.uk

Warmcel (PYC Insulation) Stand 62a & Retrofit Zone

Tel: 01938 500797

Email: info@pycgroup.co.uk

www.warmcel.co.uk

Webbs Builders Merchant Stand 57

Tel: 01793 783 879

Email: sales@webbsbm.co.uk

www.webbsbm.co.uk

WERU UK Stand 108, 120 & Finishes Zone

Tel: 03332 070776

Email: info@weru.co.uk

www.weru.co.uk

Westminster Stone Outdoor Living Zone & Veranda Wall Display

Tel: 01978 710 000

Email: ask@westminsterstone.com

www.westminsterstone.com

Which?

Stand 55

Tel: 029 2267 0000

Email: support@which.co.uk

www.which.co.uk

Worcester Bosch

Stand 50 & Professional Services Hub

Tel: 0330 123 9559

Email: service.mailbox@uk.bosch.com

www.worcester-bosch.co.uk

Worcester Renewables Professional Services Hub

Tel: 01386 871490

Email: info@worcesterrenewables.com

www.worcesterrenewables.com

Wyvern Surveyors Professional Services Hub

Tel: 01249 911818

Email: enquiries@wyvernsurveyors.co.uk

www.wyvernsurveyors.co.uk

Zehnder Group Uk Piazza

Tel: 01276 605800

Email: enquiries@zehnder.co.uk

www.zehnder.co.uk

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Aim High Accounts	Professional Services Hub
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Aldas	Professional Services Hub
Build Test Solutions	Professional Services Hub & retrofit Zone

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Austin Design Works	Professional Services Hub
Bob Nicholls MCIAT Chartered Architectural Technologist	Professional Services Hub
Chartered Institute of Architectural Technologists - CIAT	184 & Professional Services Hub
Eco Design Consultants	Professional Services Hub & Retrofit Zone
Fleming Homes Timber Frame	Piazza & Professional Services Hub

Green Space Architects	Professional Services Hub
Lynxcraft	Professional Services Hub
Mark Doodes Planning	Professional Services Hub & Retrofit Zone
Royal Institute of British Architects (RIBA)	Professional Services Hub

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(AECB) Association for Environment Conscious Building	Professional Services Hub
Chartered Institute of Architectural Technologists - CIAT	184 & Professional Services Hub
Federation of Master Builders	Professional Services Hub
INCA	Professional Services Hub
MPA Masonry	Professional Services Hub & Walls/Structures Zone
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Royal Institute of British Architects (RIBA)	Professional Services Hub
Structural Timber Association	Professional Services Hub
The Alliance for Sustainable Building Products	Professional Services Hub
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A large grid of graph paper for taking notes. The grid consists of 20 columns and 30 rows of small squares, created by thin grey lines. The grid covers the majority of the page area.

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