
LOW ENERGY HOMES: HOW TO GET THE DESIGN RIGHT!
- WITH JENNY CHANDELA
Allan Corfield
ARCHITECTS

Designing your low energy home –

1. The Case for a “Green” Home
2. The Fabric First Approach
3. The Design Process
4. Summary

The Case for a “Green” Home

The Current Problem -

1. We have a massive shortage of housing in the UK and the current housing stock is sub-standard in design and energy performance

2. The major house builders who control the delivery of new homes are focused on volume rather than quality (EPC less than C)

3. Heating and powering homes accounts for over 20% of all greenhouse gas emissions in the UK

4. The construction industry accounts for over 10% of all greenhouse gas emissions in the UK


“Put simply a green or low energy home - from design, technologies and construction method - uses less energy, from any source, than a traditional or average new house.”

These are examples of low energy homes-


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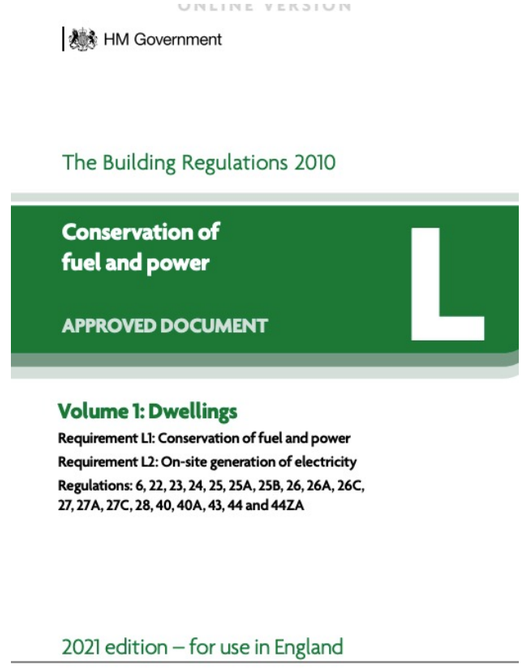
The Future Homes Standard

1. The new Future Homes Standard is aimed to ensure that all new homes built from 2025 will produce 75-80% less carbon emissions than homes delivered under 2013 regulations.

2. New homes built from 2022 produce 31% less carbon emissions compared to 2013 regulations. Amended Building Regulations came into effect June 2022.

From 2025 no new homes should be connected to the gas grid, they should instead be heated through low carbon sources, have ultra-high levels of energy efficiency alongside appropriate ventilations.
(Committee on climate change)


ONLINE VERSION

HM Government

The Building Regulations 2010

Conservation of fuel and power

APPROVED DOCUMENT

L

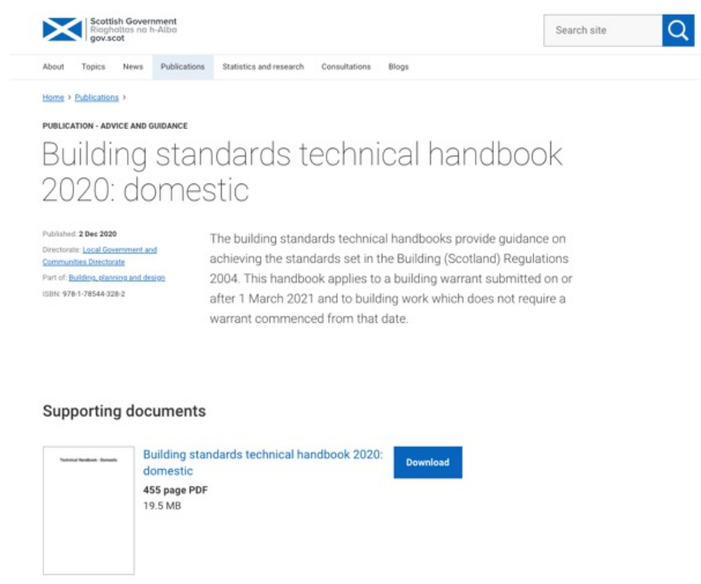
Volume 1: Dwellings

Requirement L1: Conservation of fuel and power

Requirement L2: On-site generation of electricity

Regulations: 6, 22, 23, 24, 25, 25A, 25B, 26, 26A, 26C, 27, 27A, 27C, 28, 40, 40A, 43, 44 and 44ZA

2021 edition – for use in England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PUBLICATION - ADVICE AND GUIDANCE

Building standards technical handbook 2020: domestic

Published: 2 Dec 2020
Directorate: Local Government and Communities Directorate
Part of: Building, planning and design
ISBN: 978-1-78544-328-2

The building standards technical handbooks provide guidance on achieving the standards set in the Building (Scotland) Regulations 2004. This handbook applies to a building warrant submitted on or after 1 March 2021 and to building work which does not require a warrant commenced from that date.

Supporting documents

Building standards technical handbook 2020: domestic

Download

455 page PDF
19.5 MB

The Future Homes Standard -

1. It is better for the environment, by reduced carbon emissions during construction

2. It is better for the environment, during operation due to the reduced energy demand

3. Typically 40-80% betterment in building standards than current housing stock

4. Reduced running costs over the life of the house

5. Potential for zero or positive energy bills

6. A more comfortable, healthy built environment

”Is a back to basics approach where you concentrate on the fabric of the building before throwing eco bling, in order to make it work.”

The Fabric First Approach

Fabric First, the key elements -

1. Solar Gain
2. Construction Type
3. Air Tightness
4. Limit Cold Bridging
5. Ventilation Strategy
6. Heating Systems

The Design Process

Initial design & planning stages -

1. Initial design ideas should be a response to the site and your brief (function before form)

2. Orientate habitable rooms due South to maximise solar gain, with utility/plant/service zones to the North

3. If going for Passive then large windows to South none on the North, also compact simple form

4. Larger more complex forms will cost more and have more junctions which will impact thermal bridging factor

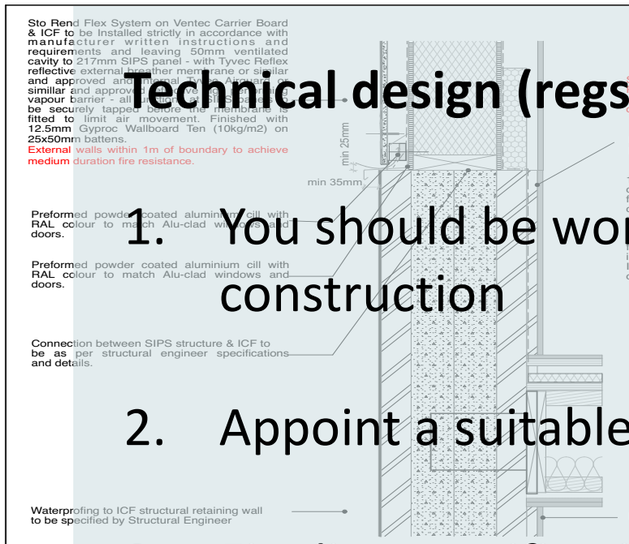
5. Design with a construction method in mind

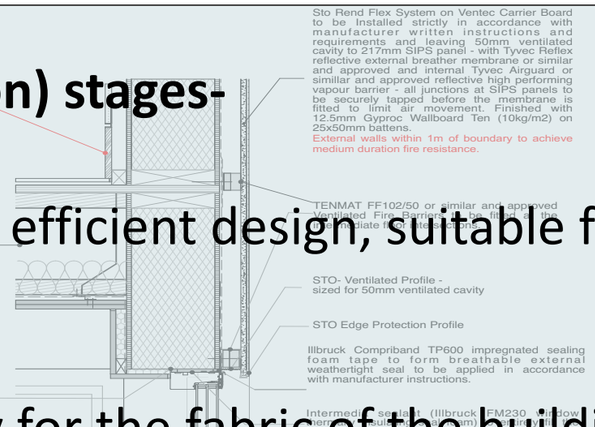
6. Limit overheating at design stage, ideally outwith building envelope

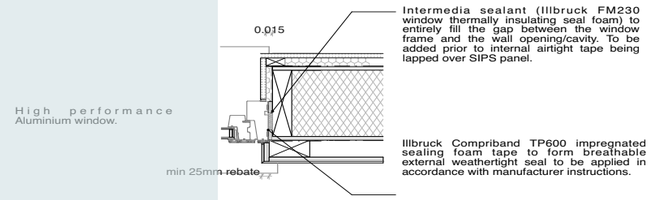
7. Once design is frozen complete initial PHPP and SAP calculations

Technical design (regs & production) stages-

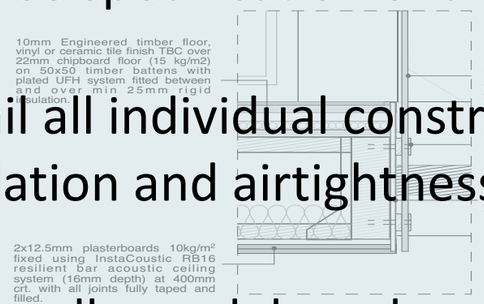
1. You should be working with an efficient design, suitable for construction
2. Appoint a suitable kit company for the fabric of the building
3. Finalise specification of all major products and materials
4. Detail all individual construction connections, clearly showing insulation and airtightness (openings & penetrations)
5. Thermally model any bespoke details
6. Review and update PHPP and SAP calculations
7. Appoint specialist design items – MVHR, renewable heating etc
8. Make sure design & specification is both buildable & economic



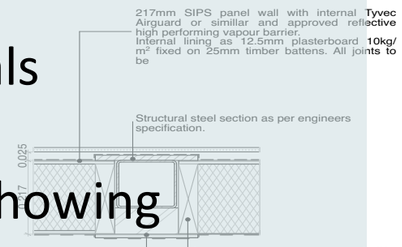




1:10 DETAIL 23 WINDOW JAMB GENERAL



1:10 DETAIL 11



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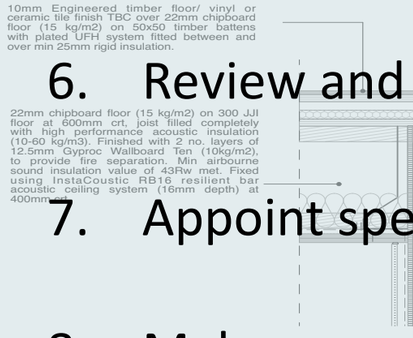

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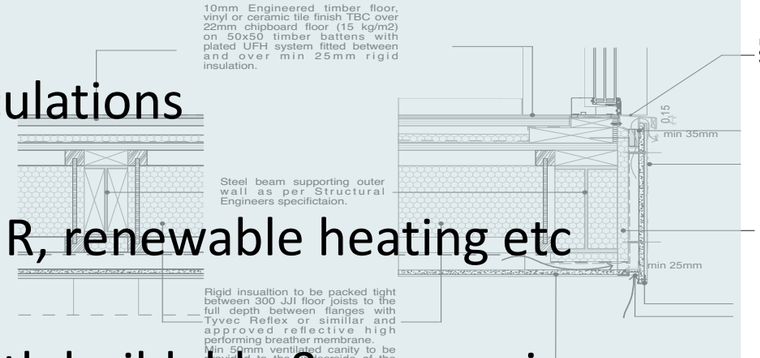

1:10 DETAIL 06 1:10 DETAIL 05

REVISION	INITIAL	DATE	SUFFIX
Amendments per building control report dated 11.05.17	SPH	16.05.17	B
Amendments per building control report dated 26.01.17	SPH	15.03.17	A

Allan Corfield Architects
The Self Build Experts

CLIENT
KENNETH MCLEAN

PROJECT
BELMONT DRIVE
EDINBURGH

TITLE
Details Walls/General
STAGE 3 DETAIL DESIGN DEVELOPMENT

SCALE @ A2	DATE	DRAWN	CHECKED
1:10	06/12/16		

No. 187 - BW 13
REV. B

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w - www.aca

On site -

1. Before you start make sure you discharge any planning or regs conditions. Also put in place any warranty or insurance policies.

2. What procedures do you have agreed for managing quality on site.

3. Every trade that comes on site needs to know about airtightness.

4. If you are using inexperienced trades then consider Toolbox talks, at key stages –
    1. Kit sign off
    2. Window fitting
    3. Airtightness layer (VCL)
    4. Pre airtest

5. **Tape everything!**

6. Any onsite changes to be run past the design team.

IN SUMMARY

1. The biggest impact on your low-energy home is during the initial design stages

2. Research all options, principles and construction methods for low energy homes

3. Decide how energy efficient you want your home to be; Zero / Passive or Fabric First

4. Detail out the poor traditional construction details, ie limit areas of cold bridging

5. Strive for Passive House standard Airtightness results

6. **Remember none of this matters if your designers/ builders don't follow these principles!**

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Are you considering Self Build?

This seminar – hosted by Allan Corfield Architects and delivered by top industry leaders – prepares you for your Self Build journey.

The day includes expert advice on key topics ranging from finding land and funding your project to future proofing your design and cost control. There are opportunities for individual consultations and networking throughout the day.

Key Topics:

- Finding and assessing land
- Funding and protecting your project
- Your project team and the design process
- Project Management and cost control
- Future home standards and construction systems
- Renewable heating design
- MVHR design
- Virtual Reality demonstration

For dates offered, more information, speakers bios and to book your place,

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Location: Build It Theatre, NSBRC, Swindon

Cost: FREE