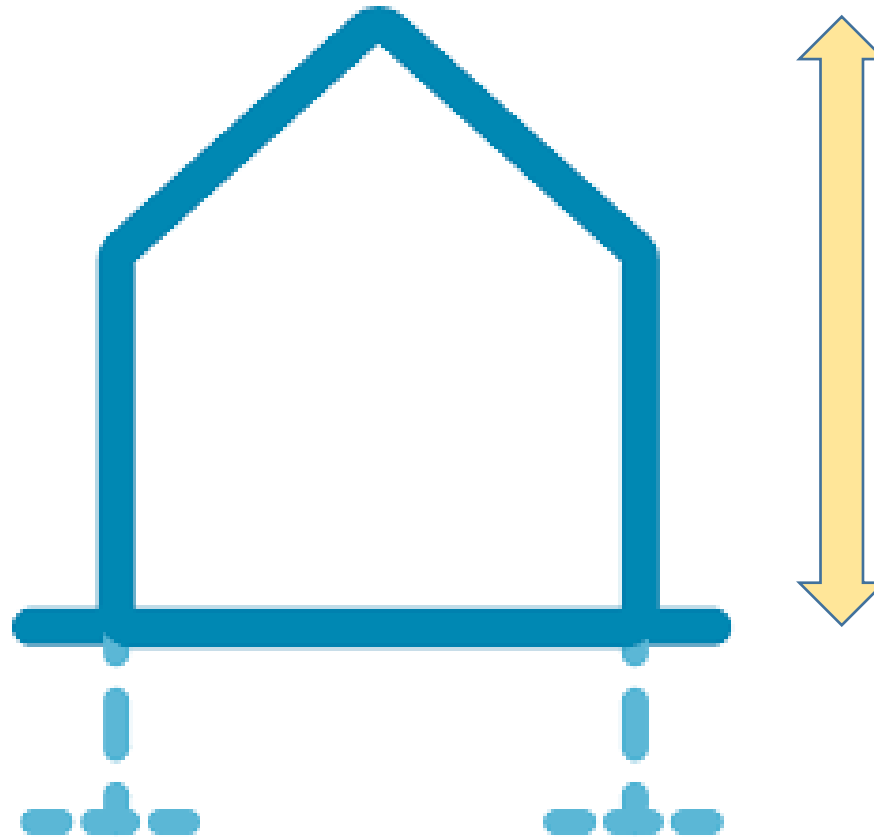
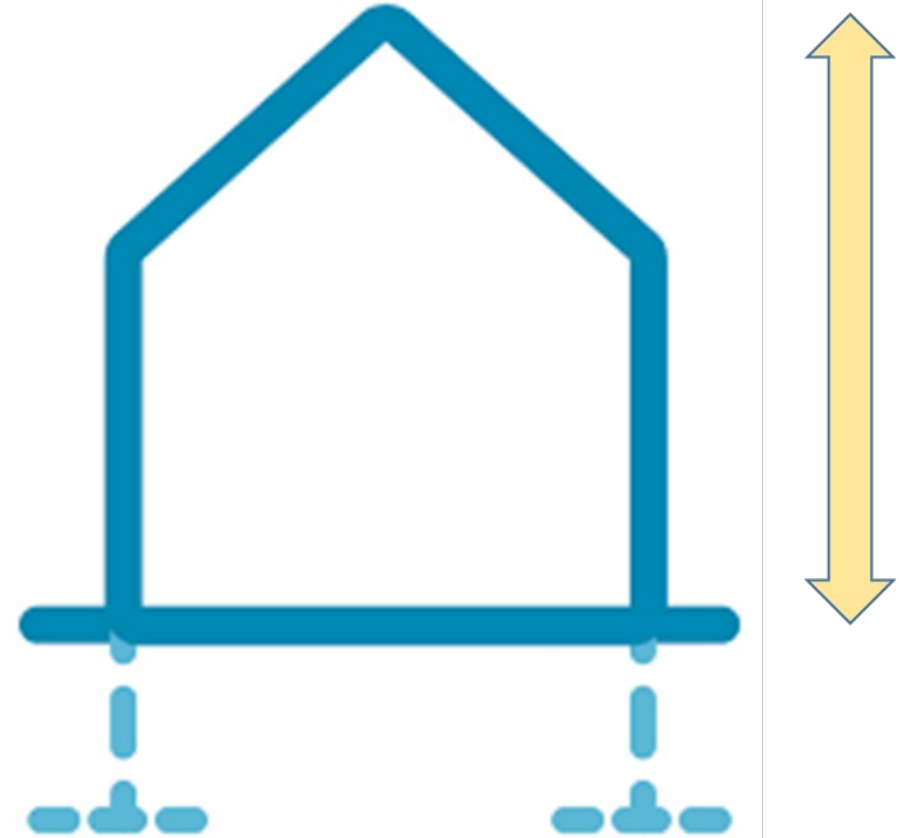


Superstructure : Fundamentals of Construction Technology



Construction Lab
Assessment
Terminology
Digital
Construction Lab



VISIT TO CONSTRUCTION LAB

Samples of timber frame construction

Assessment 2

Submission
deadline:

1st May 2025

Module Learning Outcomes (from module syllabus)

- interpret and produce annotated sketches that illustrate a broad range of common constructional forms, demonstrating understanding of their potential defect and repair needs.

Assessment 2

Submission
deadline:

1st May 2025

New Build Dwelling: Technical report with drawings (weighting 100%)

Scenario:

You have been approached by Miss A Client who has received planning consent for her single, two storey detached domestic building. It is to be constructed on a level but reclaimed site, which prior to advanced ground works had been used as agricultural land. There is a retaining wall structure to the south of the site and the Ground Investigation report suggests a suitable raft foundation be constructed for the property.

The client is considering a number of construction solutions and has asked you to prepare a technical case study that addresses some of the construction details required for each method.

The client is considering three different types of construction: Timber Twin frame, SIPs and Brick and Block and would like you to compare these methods in your submission.

The planning requirements stipulate that the outer skin is to consist of stack bonded facing brick work and blockwork with a smooth render finish.

Other requirements:

Additional insulation board is contained within an internally battened service zone to improve the thermal performance. There shall be an insulated ground floor with underfloor heating in the screed with upper floors of traditional solid timber with tongue and groove softwood flooring.

Windows and external doors are to be powder coated aluminium with triple-glazed units.

Roof structure is to be raised tie trussed rafters with a metal profile sheeting finish installed on OSB sheathing boards.

Assessment 2

Submission
deadline:

1st May 2025

The following tasks are allocated a percentage to emphasise the suggested time you should spend on each individual task. Marks will be allocated against the set Marking Criteria indicated

1. The client has been approached by a company offering offsite solutions on construction projects, but they are confused by the terminology used by the company.

Clearly define the term Offsite Construction giving examples of the four main categories and how these could be incorporated in the house. (5%)

2. Produce neatly drawn, proportionate and suitably annotated sections and sketches that illustrate the materials and methods for the detailing of the following building elements and construction inter-faces. Ensure that detailing shows how the design will meet the current Building Regulations for a domestic new-build giving particular attention to thermal performance of the building fabric.

i) Compare the Ground floor Construction, detailing and junctions with external walls for each method (30%)

ii) Compare a detailed section and plan detail showing a window opening in the external wall for each method (30%)

iii) Compare eaves detailing and roof structure– indicating appropriate weathering, fixing and laps for each method (30%)

iv) Recommend a construction method for the client, explain your reasoning. (5%)

Assessment 2

Guidance specific to this assessment:

Engagement with Literature Skills

You should reference your research on Offsite Construction, clearly using the university approved Harvard method.

Knowledge and Understanding Skills

Demonstrate your understanding of each construction method

Cognitive and Intellectual Skills

Comparison of construction method

Practical Skills

Practical aspects of each construction method

Transferable Skills for Life and Professional Practice

Your recommendations and communicating judgement

Submission
deadline:

1st May 2025

STUDENT FEEDBACK FORM

This section details the extent to which the assessment criteria are demonstrated by you, which in turn determines your mark. The marks available for each category of skill are shown. Lecturers will use the space provided to comment on the achievement of the task(s), including those areas in which you have performed well and areas that would benefit from development/improvement.

Generic Assessment Criteria	Mark available	Mark awarded
1. Engagement with Literature Skills		
	5	
2. Knowledge and Understanding Skills		
	30	
3. Cognitive and Intellectual Skills		
	30	
4. Practical Application Skills		
	30	
5. Transferable Skills for Life and Professional Practice		
	5	

Assessment 2

Submission
deadline:

1st May 2025



FRONT VIEW



FRONT VIEW

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Clearly define the term Offsite Construction giving examples of the four main categories and how these could be incorporated in the house. (5%)

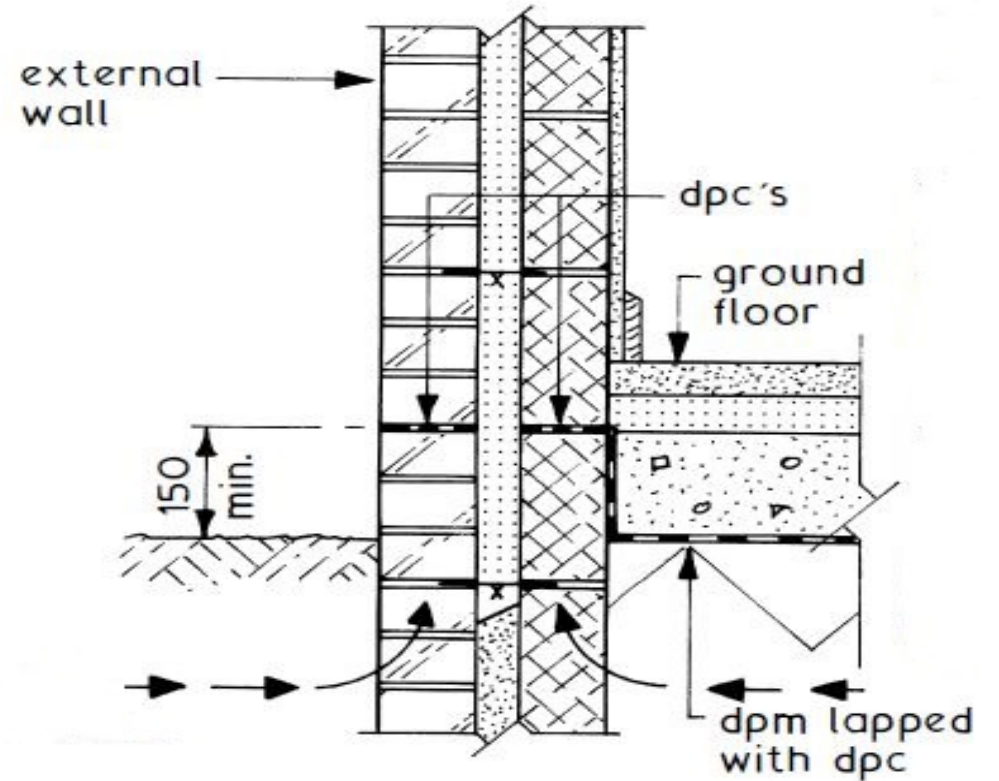
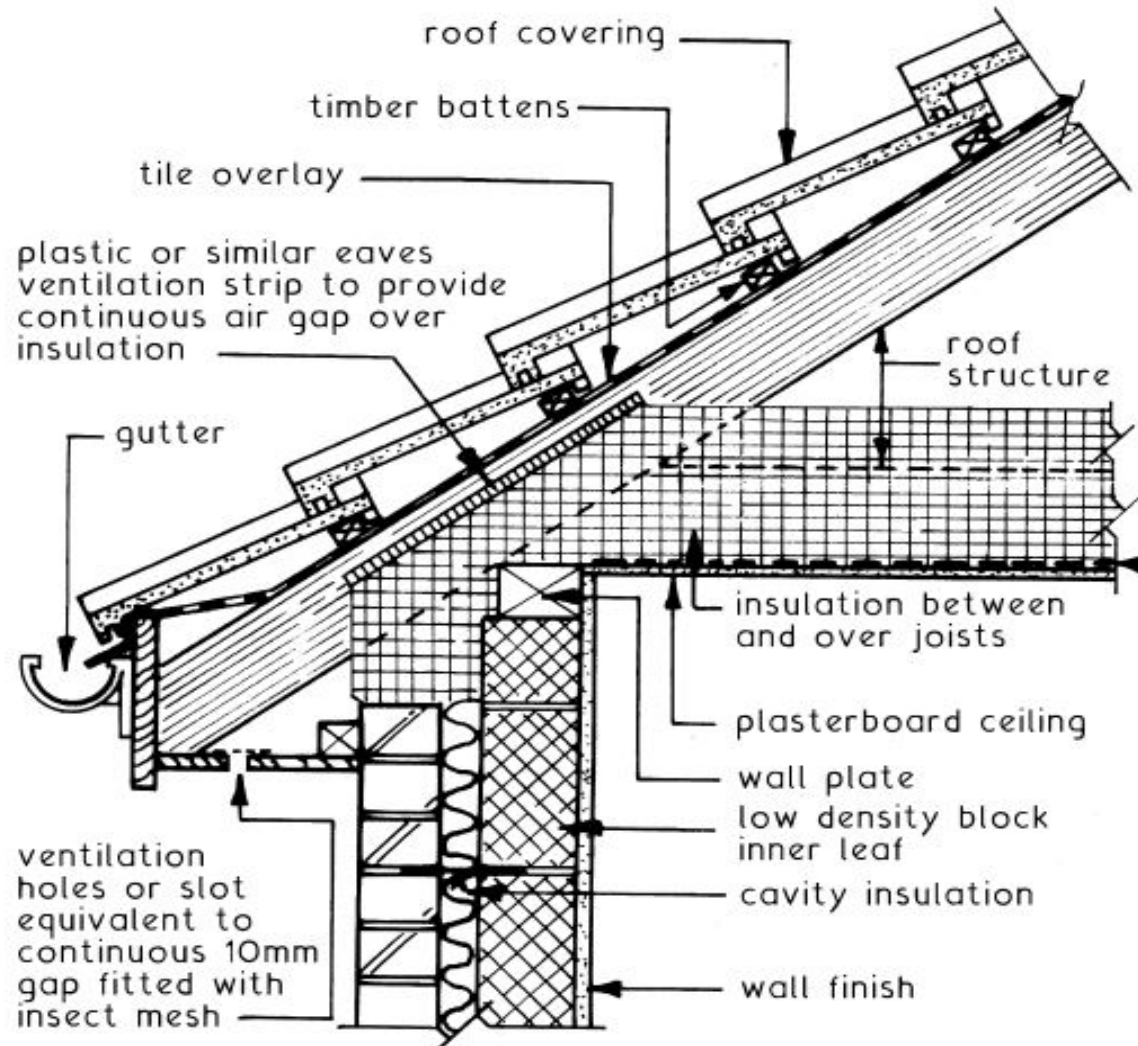
What is Offsite Construction. 4 Categories and Examples (dedicated lecture on Offsite)

Your sketches not images

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Your sketches not images



This hand-drawn cross-section diagram illustrates the construction of a building's exterior wall, roof, and foundation. The diagram is divided into several horizontal sections, each with specific labels and dimensions.

Roof Assembly (Top):

- Labels:** SHINGLES, ROOF UNDERLAYMENT, ICE+WATER SHIELD, ROOF SHEATHING, INSULATION Baffle, RAFTER BEARING, CEILING JOIST, INSULATION R=3.8, TOP PLATE, GYPSUM BOARD (CEILING).
- Dimensions:** 12'-0" (total roof height), 8" (rafter depth), 12" (ceiling joist depth).

Second Floor and Wall Section:

- Labels:** DRAIN GUTTER, FASCIA, SOFFIT, VENT, SECOND FLOOR, FURRING, GYPSUM BOARD (WALL).
- Dimensions:** 12'-0" (total second floor height), 2'-0" (wall section height).

Window Section:

- Labels:** CONG. LINTEL, CASING, HEAD, WINDOW, STOOL.
- Dimensions:** 1'-0" (window height), 4'-0" (total window section height).

First Floor and Foundation Section:

- Labels:** ROWLOCK SILL, FLASHING, BRICK VENEER, AIR CAVITY, RIGID INSULATION R=10, BITUMINOUS COATING, FIRST FLOOR, CONG. BLOCK W/ REIN, METAL TIE STRAP, SUBFLOOR, FLOOR JOIST, FIRE CUT, HANGER, INSULATION R=10, WEIR HOLES, GRADE, HORIZONTAL JOIST REIN., DAMP PROOFING, PARGING, CRAWLSPACE, CONC. WASH, PORUS FILL, CONC. FOOTING W/ REIN., DRAIN TILE, UNDISTURBED SOIL, GROUTED CONC. REIN., CONC. SLAB W.W.F., PORUS FILL, VAPOR BARRIER, DOWEL.
- Dimensions:** 3'-0" (first floor height), 1'-0" (crawl space height), 2'-0" (total foundation height), 3" (dowel length).

SCHEDULE OF TIMBER SIZES

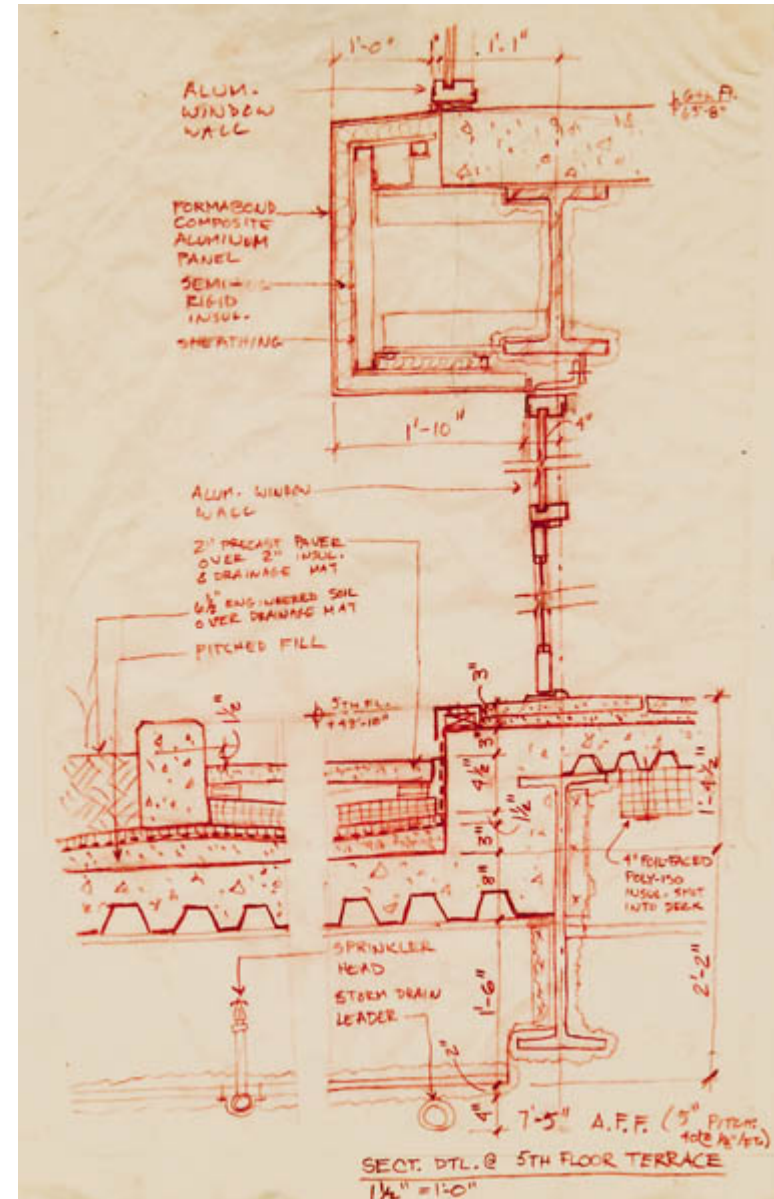
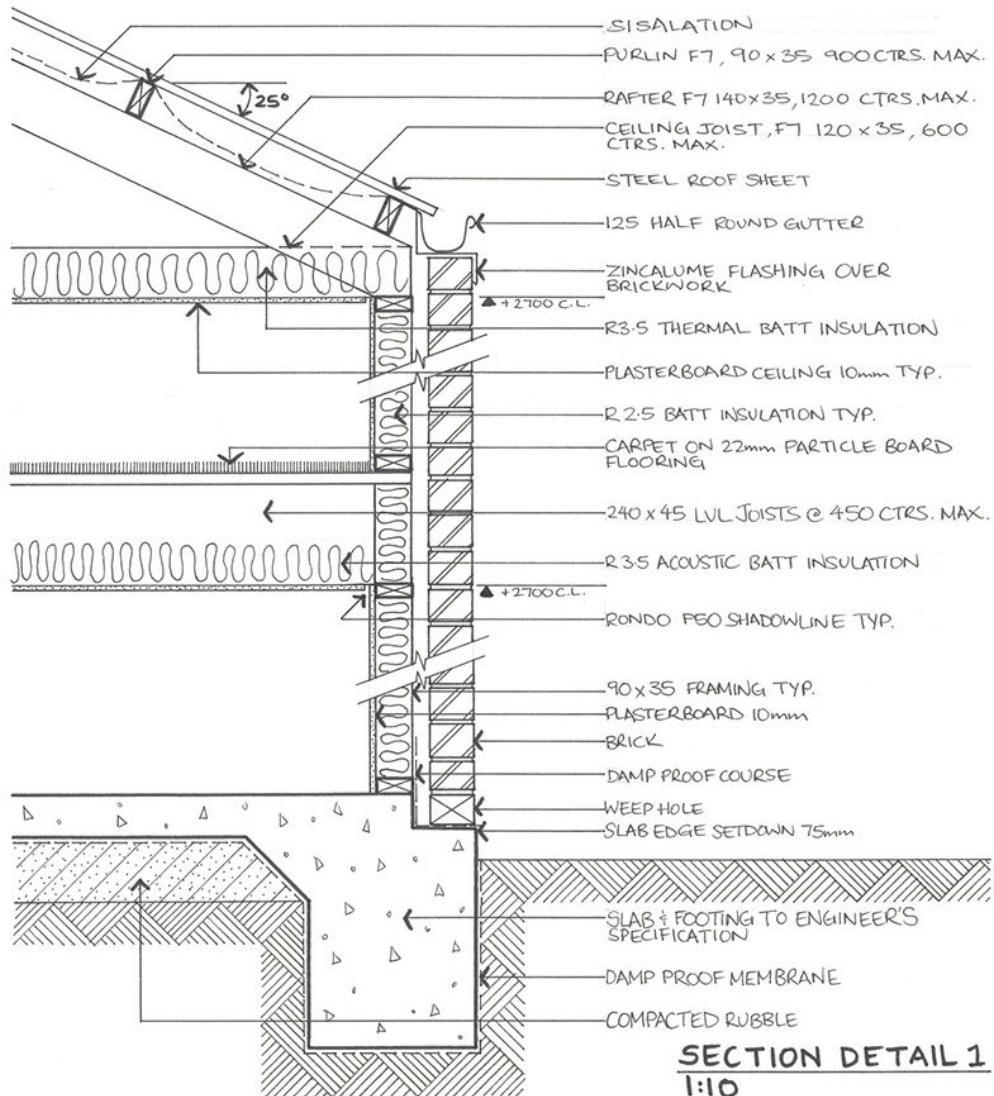
1. RAFTERS 100 X 50 @ 400 C/C
2. PURLIN 175 X 100
3. PRINCIPAL RAFTER 150 X 100
4. KING POST EX. 150 X 100
5. STRUT 100 X 100
6. TIE BEAM 275 X 100
POLE PLATE 225 X 75
7. JOISTS 100 X 50 @ 400 C/C
8. 100 X 75 X 225 CLEAT
9. 175 X 40 RIDGE
10. 175 X 40 RIDGE

Diagram Details:

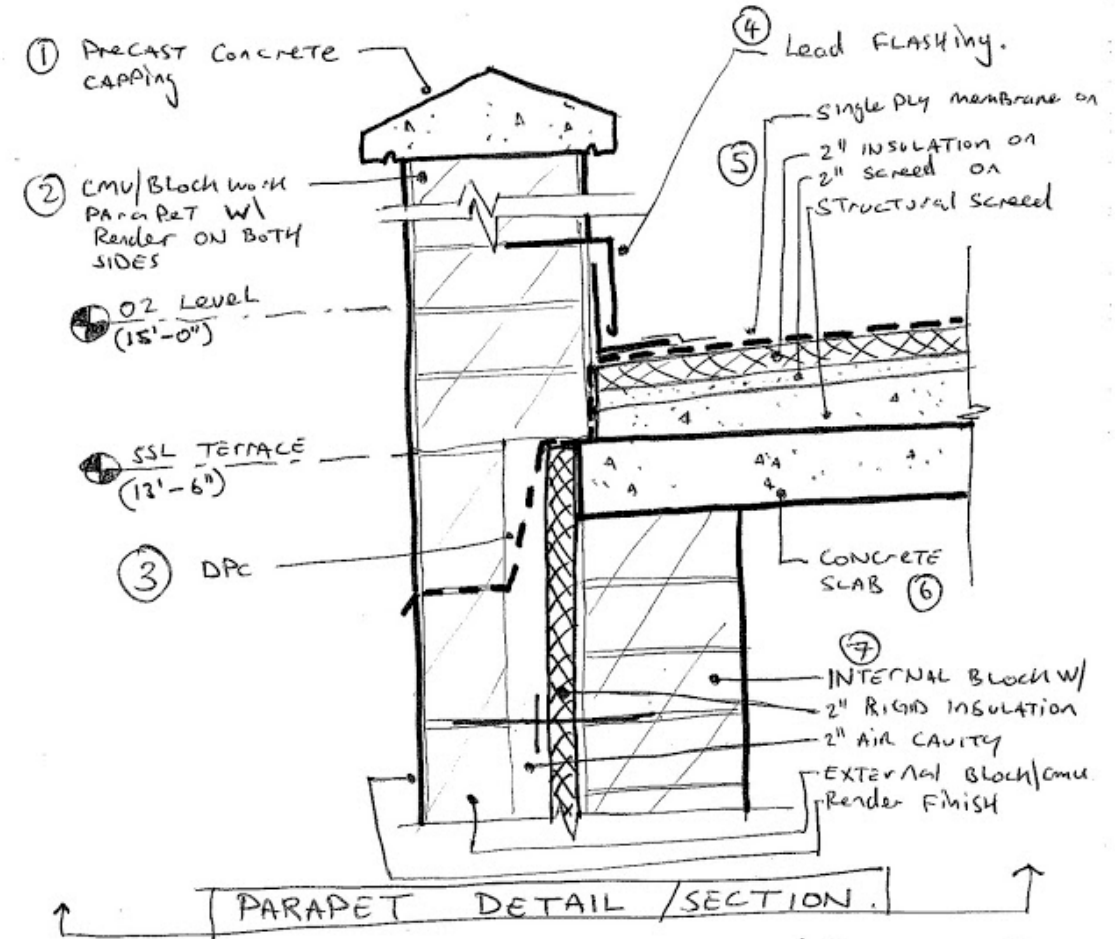
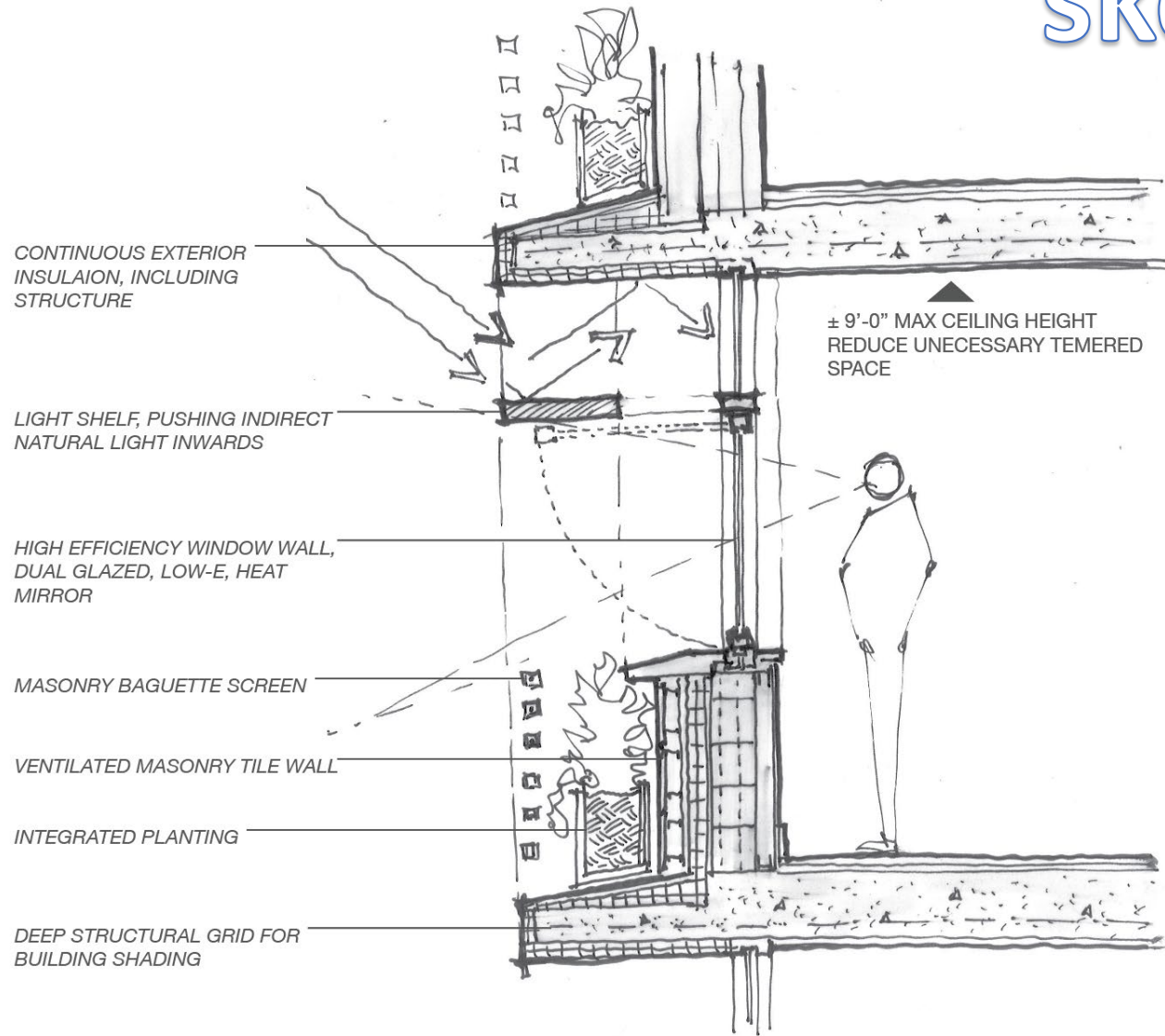
- Roof Structure:** Shows a cross-section of a gabled roof. The rafters (1) are supported by a principal rafter (3) and a king post (4). A strut (5) is used to support the king post. The roof is covered with 25 mm T & G boarding.
- Connections:**
 - King post (4) is connected to the principal rafter (3) using a 50 mm 3-way m strap.
 - King post (4) is connected to the tie beam (6) using a 19 mm bolt.
 - Tie beam (6) is connected to the wall using a 19 mm bolt.
 - Principal rafter (3) is connected to the wall using a 19 mm bolt.
 - Strut (5) is connected to the principal rafter (3) using a 19 mm bolt.
 - Strut (5) is connected to the tie beam (6) using a 19 mm bolt.
 - King post (4) is connected to the tie beam (6) using a 19 mm bolt.
 - King post (4) is connected to the wall using a 19 mm bolt.
- Dimensions:**
 - Three dimensions are indicated to determine the roof pitch.
 - A 100 mm dimension is shown for the width of the king post (4).
- Other Components:**
 - 225 x 150 x 45c padstone is shown under the tie beam (6).
 - L & P ceiling is shown under the tie beam (6).

Measuring roof construction.

sketches not images



sketches not images



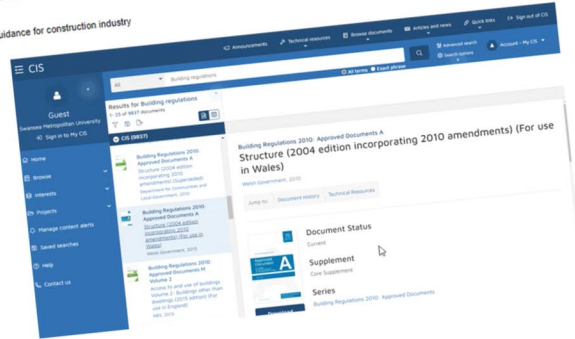
The Building Regulations

Access your individual products

The Construction Information Service - CIS

The most comprehensive source of technical standards legislation and technical guidance for construction industry professionals

view product



https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/544444/building-regulations-2010-approved-documents-a-structure-2004-edition-incorporating-2010-amendments-for-use-in-wales.pdf

Ensure that detailing shows how the design will meet the current Building Regulations for a domestic new-build:

Thermal Insulation & U-Values



The Building Regulations 2010

Approved Document

Volume 1 - Dwellings

Conservation of fuel and power

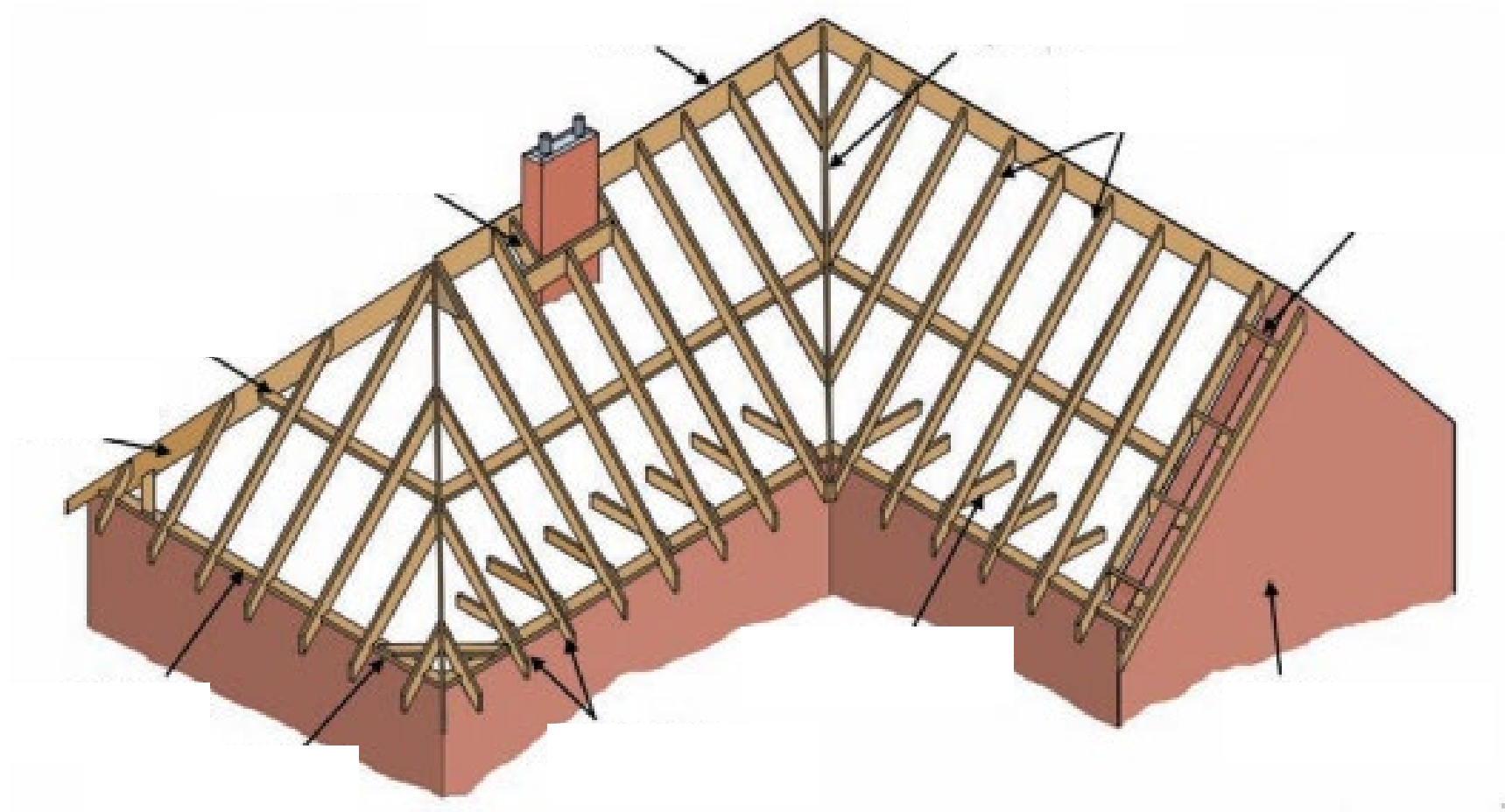
2022 edition - For use in Wales*

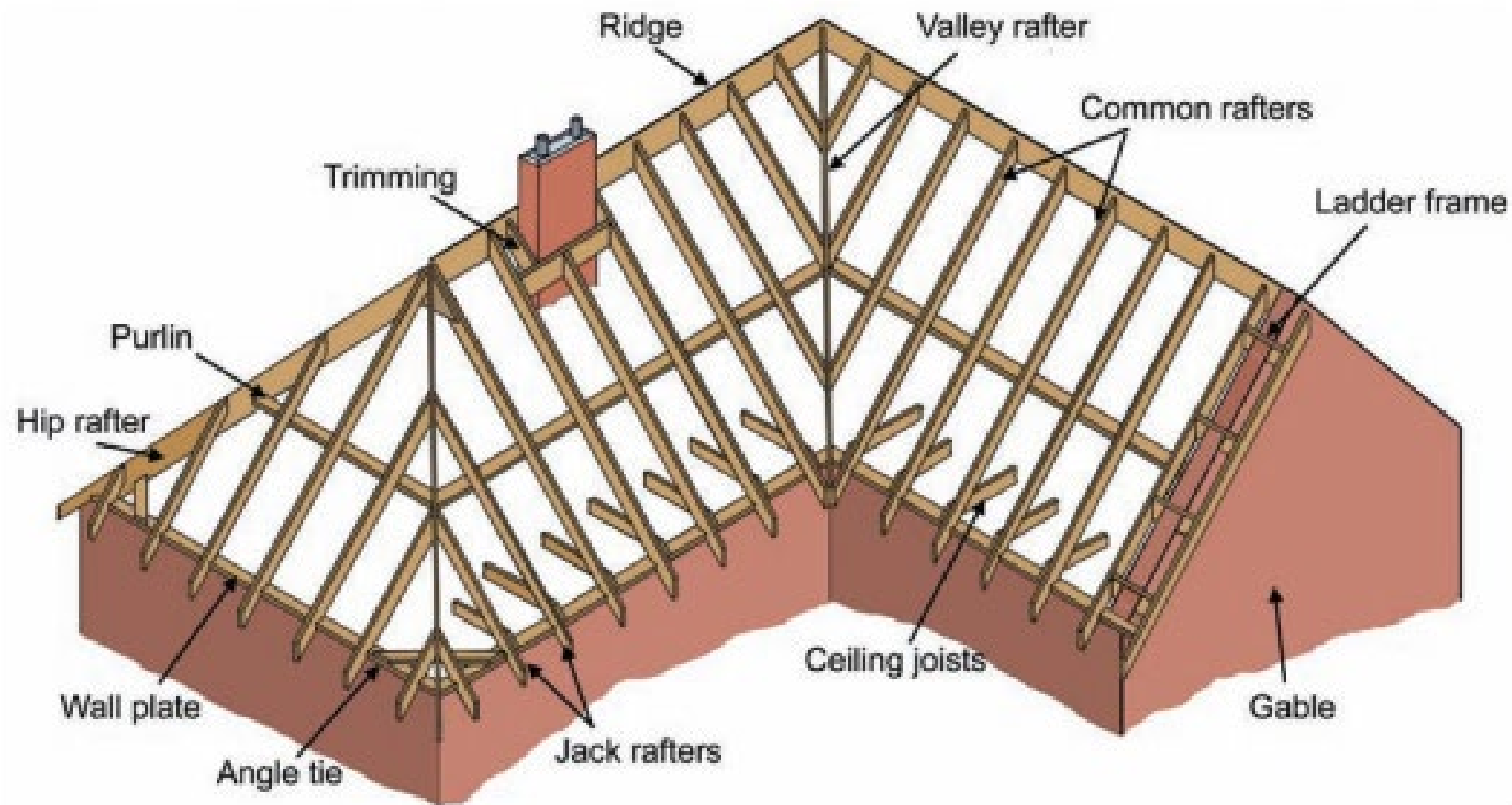
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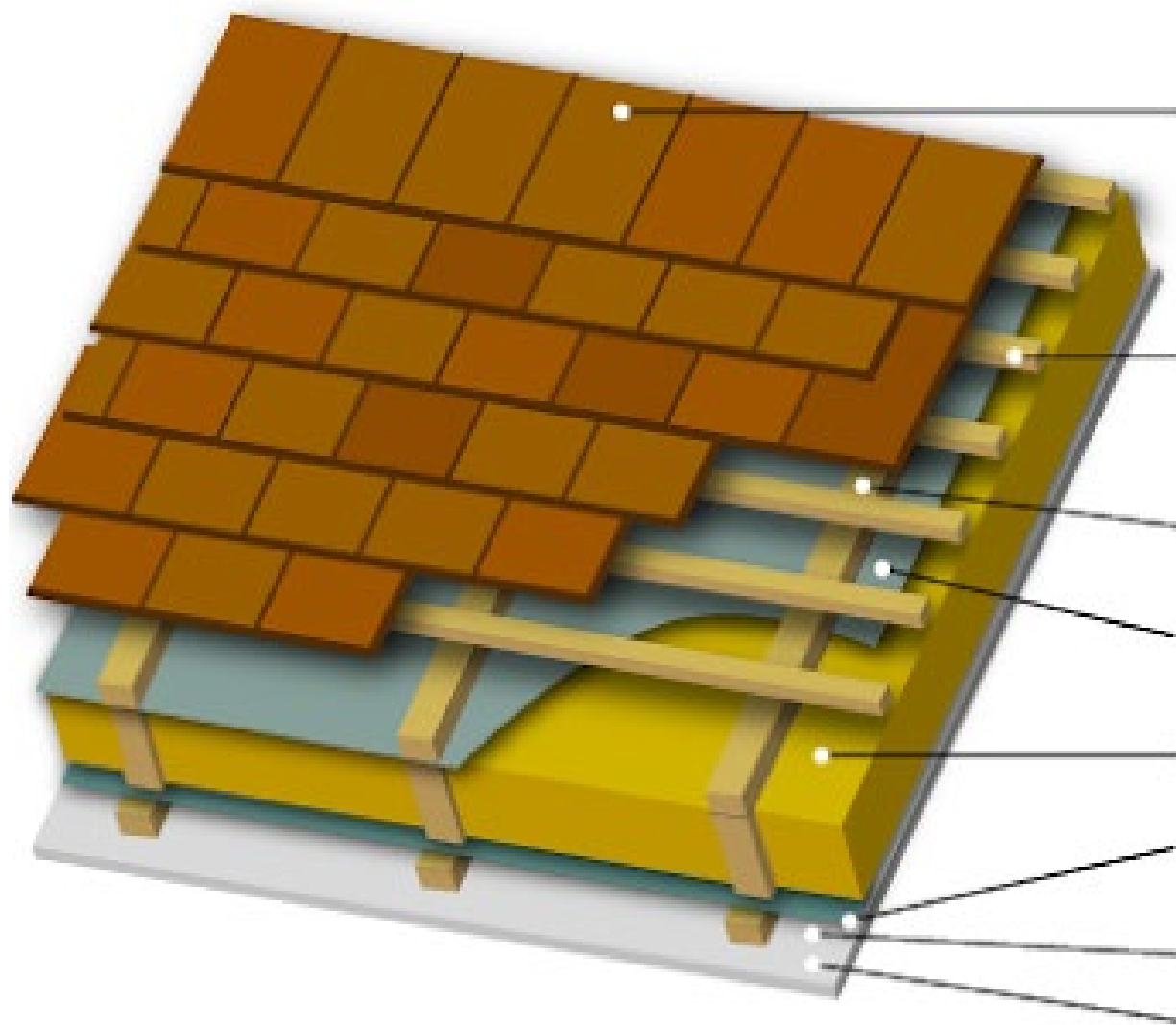
Compare and contrast

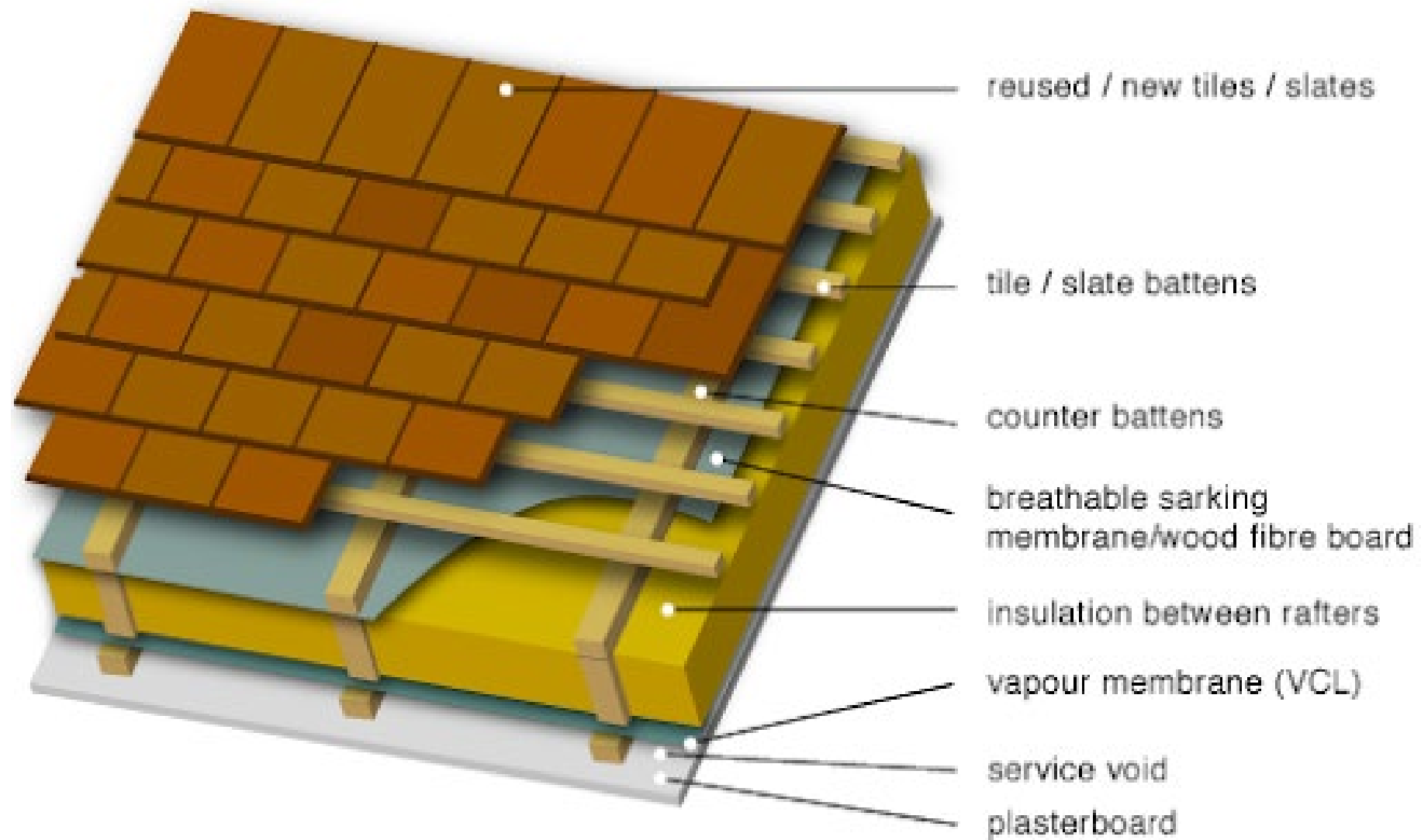
Text and Drawings

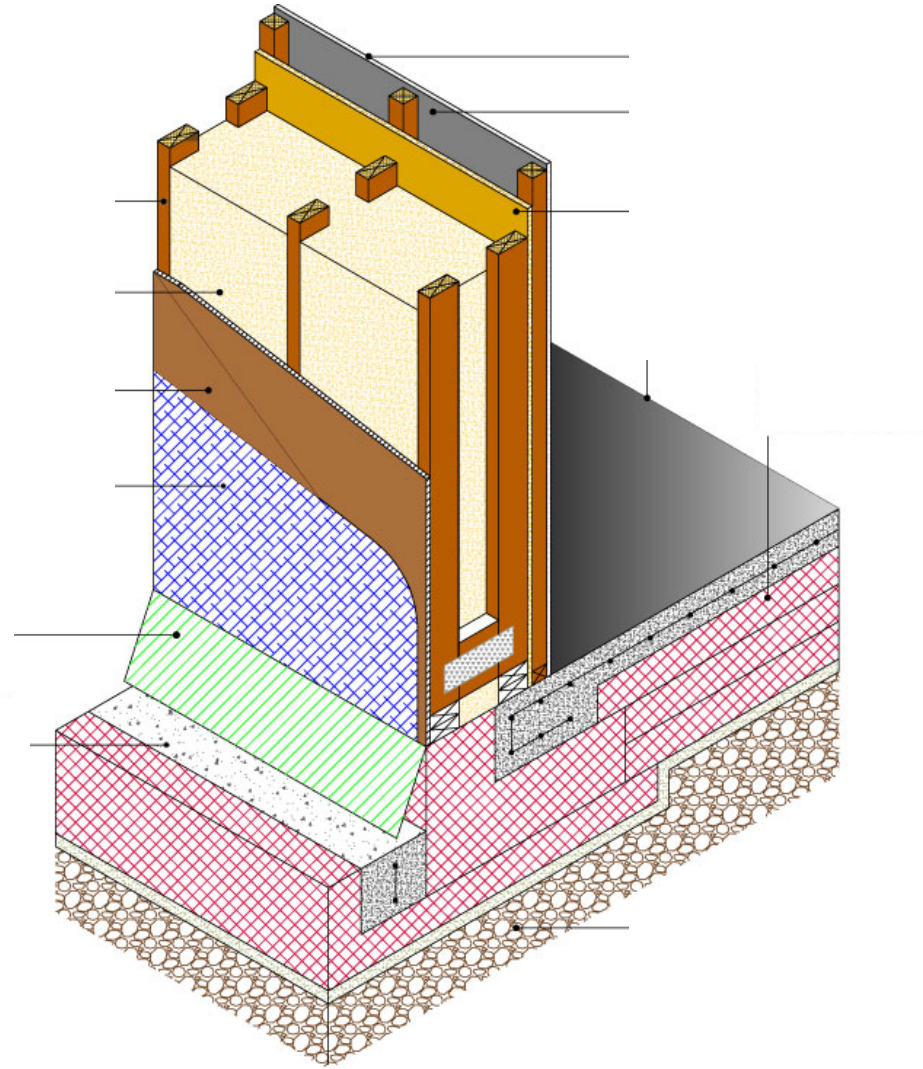
TERMINOLOGY

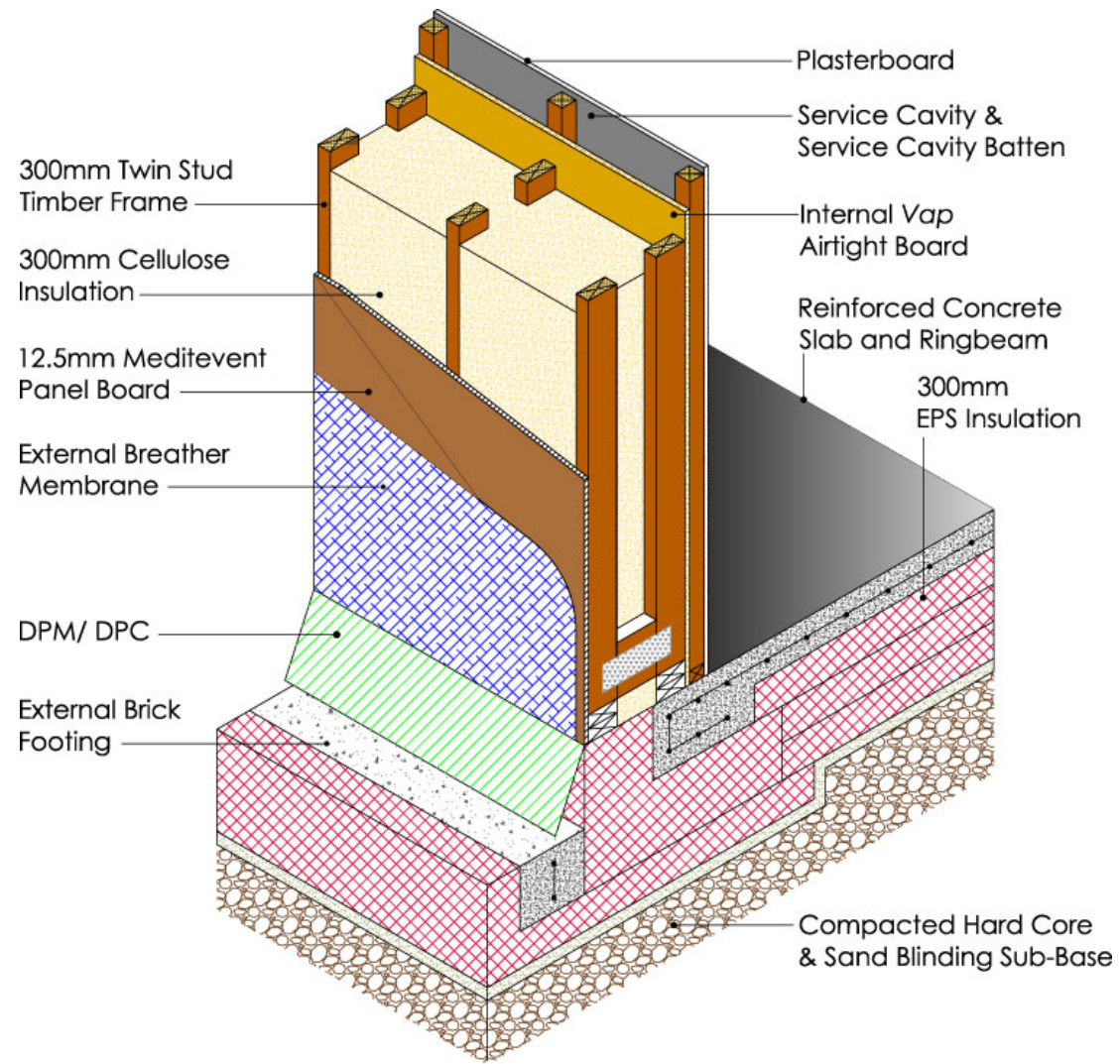


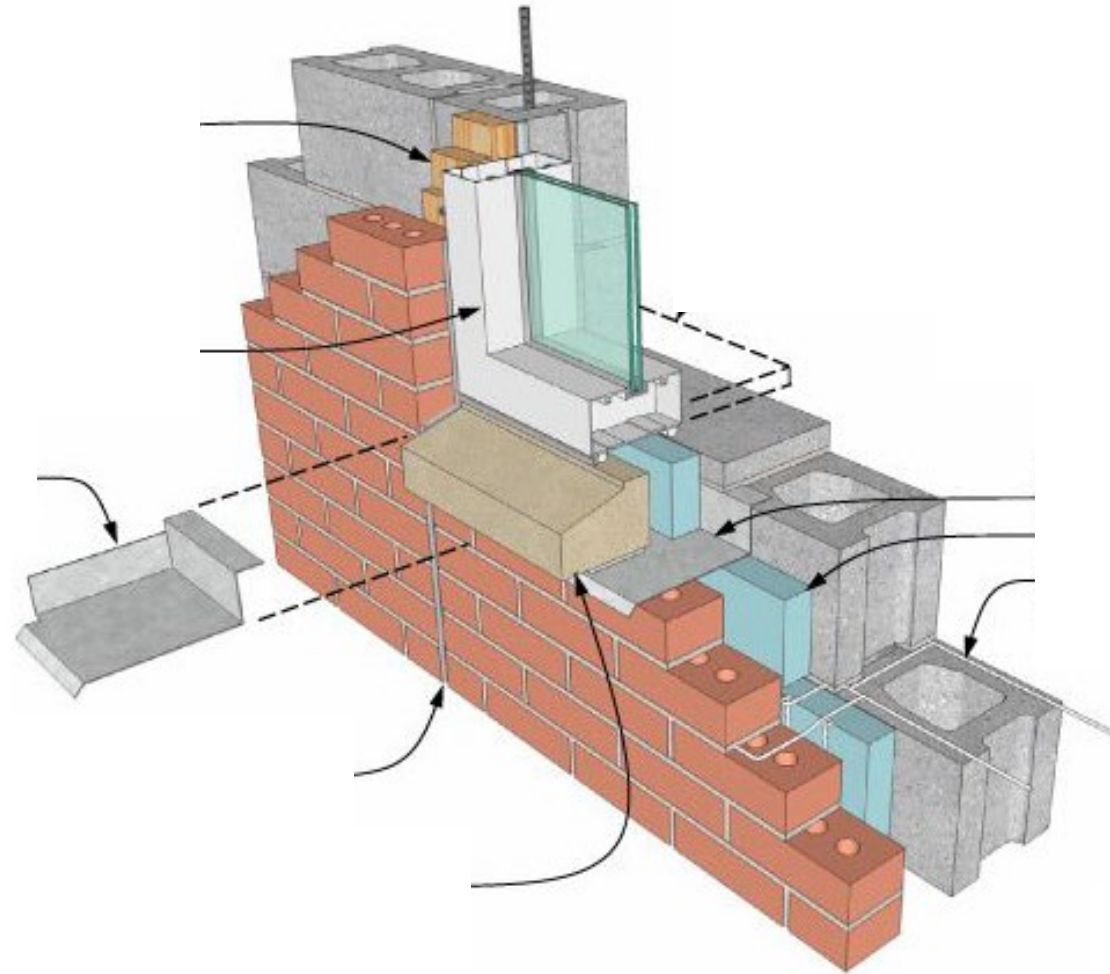


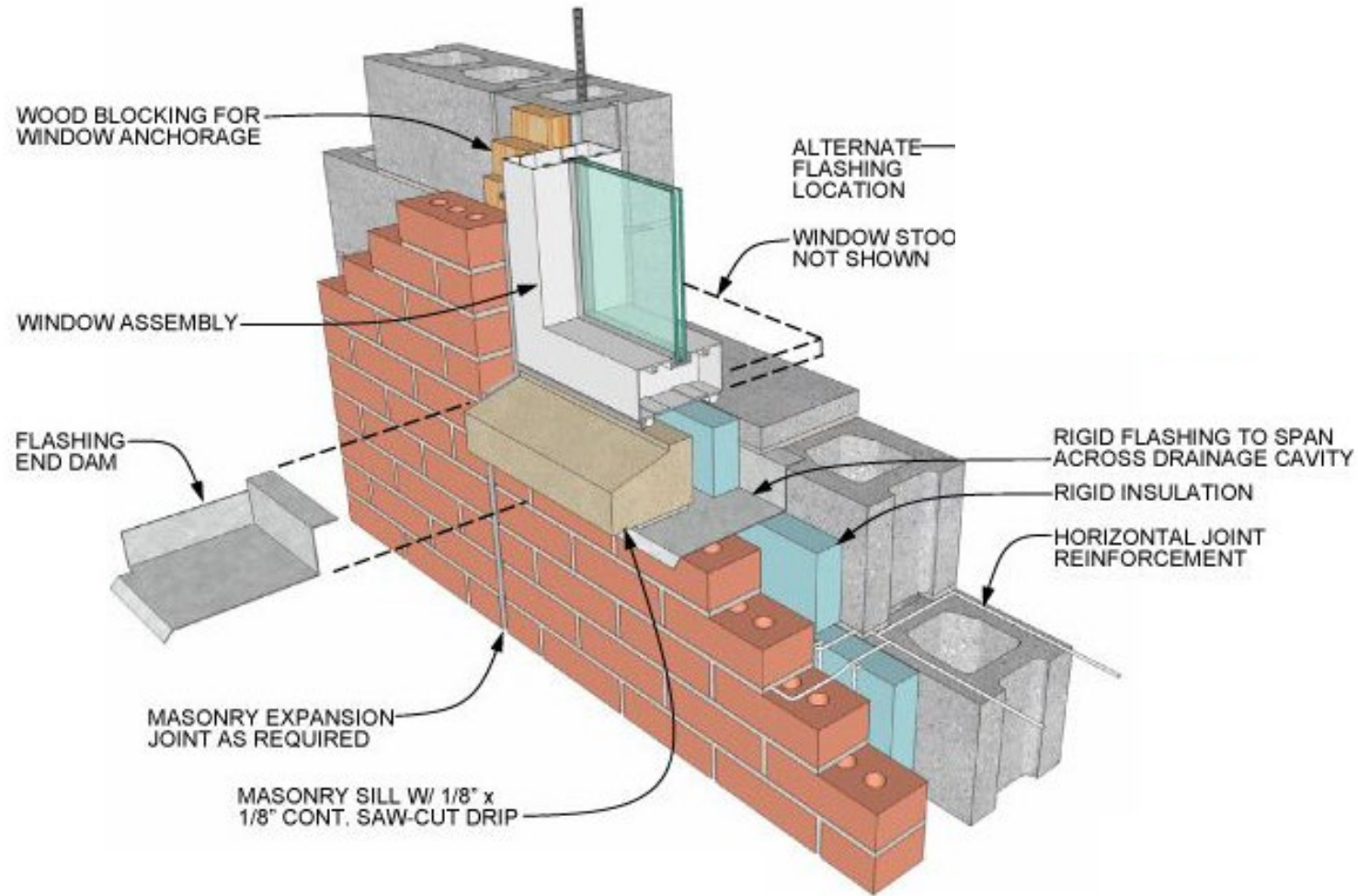












EXERCISE

Draw a cross section for a typical brick and block external cavity wall

Draw another cross section for a typical 140mm timber frame construction with the brick finish.

How do these compare?

FUNCTIONAL REQUIREMENTS OF EXTERNAL WALLS

- Weather protection
- Fire resistance
- Thermal resistance
- Strength and stability
- Durability
- Buildability
- Noise insulation

DIGITAL MODELLING / DETAILING

