Unit 219: Erect timber walls and floors

# Delivery guide

Unit information

This unit is about erecting timber walls and floors. Learners may be introduced to this unit by asking themselves questions such as:

* What is the difference between a load bearing partition and a normal stud partition?
* What does air tightness mean?
* What materials do we use in timber framed construction?
* What is a U-value?
* How do I plan a sequence of operations to erect timber walls and floors?

Learning outcomes

1. Understand resource selection
2. Understand working to a contract specification
3. Comply with the given contract information to carry out the work safely and efficiently to the required specification

Suggested resources

Textbooks

* Peter Brett, P. (2010) *Carpentry and Joinery: Book One Job Knowledge, 3rd edition*. Cheltenham: Nelson Thornes. ISBN 978-1-4085-0650-9
* Peter Brett, P. (2010) *Carpentry and Joinery: Book Two: Practical Activities, 3rd edition (Complete Reference Guide)*. Cheltenham: Nelson Thornes. ISBN 978-1-4085-0648-6
* Chudley, R. and Greeno, R. (2020) *Chudley and Greeno’s Building Construction Handbook, 12th edition*. Oxford: Routledge.   
  ISBN 978-0-3671-3543-0
* Jones, S., Redfern, S., Fearn, C. (2019) *The City & Guilds Textbook: Site Carpentry and Architectural Joinery for the Level 2 Apprenticeship (6571), Level 2 Technical Certificate (7906) & Level 2 Diploma (6706)*. London: Hodder Education. ISBN 978-1-5104-5813-0

Websites

* [Homepage | Cadw (gov.wales)](https://cadw.gov.wales/)
* [Home Building & Renovating | Timber Frame: The Fast, Flexible & Energy Efficient Build System](https://www.homebuilding.co.uk/advice/timber-frame-guide)
* [Vision Development | About Timber Frame](https://www.timber-frame-suppliers.co.uk/about-timber-frame/)
* [TRADA | Timber Research and Development Association](https://www.trada.co.uk/)
* [GOV.UK | Building regulations approval](https://www.gov.uk/building-regulations-approval)
* [HSE | RIDDOR Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013](https://www.hse.gov.uk/riddor/)
* [HSE | First aid at work - your questions answered](https://www.hse.gov.uk/pubns/indg214.pdf)
* [netregs | A simple guide to site waste management plans](https://www.netregs.org.uk/media/1718/a-simple-guide-to-site-waste-management-plans.pdfnetregs)

| **Learning outcomes** | **Criteria** | **Delivery guidance** |
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| 1. Understand resource selection | * 1. Characteristics of the resources | * Learners to understand and compare the difference between structural and non-structural components, load and non-loadbearing components and timber types and to show examples. * Learners to be able to highlight the purpose of and difference between materials (including solid timber, boards, membranes). * Learners to be familiar with components (including C stud, I beam, web joists) and assemblies (including closed panel, structured insulated panel (SIP), open panel, Larsen trusses). * Learners to show examples of the characteristics and limitations of different materials, including timber and timber based materials, types of sheet materials (ply, Oriented Strand Board (OSB)), sheathing board, wall, spandrel and floor panels, timber and metal columns and beams, damp-proof courses (DPC), damp-proof membranes (DPM), breather membranes, building paper, fire stops, cavity barriers, moisture and vapour barriers (permeable and non-permeable), preservatives, adhesives (including PVA and D4 expanding/PU), sealants, fittings, fixings (including nails, screws, masonry nails, ballistic nails, bolts, hammer fixings, brackets), acoustic and thermal insulation and associated ancillary items. * Learners to know and state the different types of defects, including conversion and seasoning defects, and their effect on structural timbers. * Learners to understand how sustainability can be applied to timber framed construction and the benefits of using sustainable materials. * Learners to know the advantages of using locally sourced materials, enhanced material properties (energy-saving), lower carbon footprint (to include embodied carbon), and how they relate to protecting the natural environment, controlling waste management, energy loss prevention and thermal transmittance (U-Value). * Learners to understand the importance of design for manufacture, including passive design, off-site construction and modern methods of timber construction; the concept of fabric first principles and building performance in terms of thermal performance (including airtightness, U-Values and cold bridging), as well as modelling versus as-built. * Learners to know the importance of quality control, quality assurance, certification and warranties in reducing the performance gap; the role of different materials, components and assemblies; fire safety in construction on-site and off-site; the importance of moisture control and minimising waste. |
| * 1. Use of resources | * Learners to know the purpose of the range of resources in 1.1, their function, their use and methods of fixing them in different circumstances. * Learners to know the procedures for reporting problems related to resources, e.g. hierarchy charts, company structure, architect’s role, terms of contract, changes to specification, variation orders and architect instruction. |
| * 1. Organisational procedures to select resources | * Learners to know the process for selecting materials using technical information sources and to understand the importance of working to drawings, specifications, schedules, digital information and 3D modelling and the interaction between documentation. * Learners to understand the benefits of planning the sequence of materials and labour requirements, the use of Bills of Quantities (BOQ), programmes of work, stock systems, stock control lead times, schedules, Gantt charts and bar charts. Learners could complete a range of on-site documentation that relates to a timber framed structure. |
| * 1. Hazards | * Learners to understand the hazards that are present in timber framed construction, including prevention methods, and to know the purpose of and how to follow risk assessments and method statements to carry out the work in a safe manner. * Learners to know and state the major types of hazards and risks associated with timber frame erection, including trips, falls from height, exposure to hazardous substances and those related to plant and vehicles, lifting, mechanical and manual handling. * Learners to know how hazards can be created by changing circumstances during the construction process, including construction site developments and ongoing work, plant and vehicles and periods of extreme weather. |
| 1. Understand working to a contract specification | * 1. Methods of work | * Learners to understand the importance of using the appropriate skills (mark, measure, set out) in framed construction methods. * Learners to understand the process of erection, including sole plates, damp-proof courses (DPC), damp-proof membranes (DPM), wall and floor panels (structural and non-structural, including SIPs), loose joist and decking structural columns and beams, cavity barriers, breather membranes and vapour control layers, floating floors insulation for both on-site (stick-build, balloon) and off-site manufacture (prefabricated) of closed and open panels. * Learners to understand the differences between stick-build, balloon and prefabricated construction methods.   Sole plates   * Learners to know how to select and fix sole plates, including section size and type of material, DPC, alternative fixings (including ballistic/masonry nails, screws, hammer fixings and brackets) to the correct size and position. * Learners to know how to lay to line, fix to line, level and amend any deviations in position in accordance with the work requirements and tolerances. * Learners to understand the types and limits of overhang and under-sail on slab, second sole plate, non-compressive packing and lapping requirements.   Timber frame walls and floors (structural and non-structural)   * Learners to know how to select, use and fix a range of timber wall panels, including external and internal panels, stick-build and prefabricated panels of closed and open panels. * Learners to know the sequence of operations in timber frame erection, e.g. starting position, temporary bracing, levelling, plumbing, fixing specification, head binders and lapping requirements.   Floor joists and coverings   * Learners to know a range of floor joists, including loose timber, metal web, I beam, laminated veneered beams and glulam beams. * Learners to find out about a range of manufactured board joist coverings and floating floor to include: OSB, moisture and vapour barriers (permeable and non-permeable), Tongue and Groove (T&G), chipboard, plywood. * Learners to understand the appropriate methods of fixing joist coverings in accordance with the given specification, including use of appropriate fasteners, tapes and sealants.   On-site erection of open and closed frame panels   * Learners to understand the correct location and orientation of panels: temporary bracing, levelling, connection of panels, erection/nailing, use of header binders, fixing and fasteners, use of waist bands, installation of breather membranes and tear and repair process, following numbering codes, drawings and schedules.   Off-site manufacture of wall panels and cassette floors   * Learners to know the processes involved in manufacturing closed and open wall panels, floor cassette systems using jigs, following plans and drawings, including: * solid timber, Larsen truss, I beam, metal web * internal and external sheathing boards * insulation (including mineral wool, foam-based products, air-injected cellulose, air injected wood fibre, flexible wood fibre and rigid wood fibre) * breather papers and membranes * access for services.   Incorporated structural columns and beams   * Learners to know how to position and fix a range of structural columns and beams, including steel, concrete, timber glulam beams and engineered timber for transmission of loads. * Learners to know the appropriate methods of fixing services within a timber frame construction, including gas, water and waste pipes, electric cables, telecommunications. |
| * 1. Tools and equipment | * Learners to know how to safely sharpen, maintain and store hand and power tools, and how to check, maintain and store equipment required to install walls and floors and how to record any faults found. * Tools and equipment to include saws, hammers, chisels, screwdrivers, electric drills, cordless drills, drill bits, powered nailer, battery powered tools, try square. * Measuring, levelling and recording equipment to include tape measure, laser level, spirit level, plumb bob, string line, water levels, dumpy level, theodolite and total stations. |
| 1. Comply with the given contract information to carry out the work safely and efficiently to the required specification | * 1. Demonstrate work skills to measure, mark out, fit, align, position and secure | * Learners to be able to: * select and fix a range of joists, including loose timber, metal web, I beam * select and fix a range of manufactured board joist coverings and floating floors, including OSB sheathing board, moisture and vapour barriers (permeable and non-permeable), T&G, chipboard, plywood, and form openings to services under floors * select and fix sole plates, including section size and type of material, DPC, laying to line, level and amend any deviations in position * select, use and fix a range of timber wall panels, including spandrel, external and internal panels, on-site stick-build, pre-manufactured panels including Structural Insulated Panels (SIPs), closed and open panels * select and use the appropriate methods of fixing services within partition walls * select, safely handle, stack and store resources using correct manual handling techniques. |
| * 1. Use and maintain hand and power tools and ancillary equipment to erect and/or install the following to given working instructions: * sole plates * timber frame walls and floors (structural and non-structural) * incorporated structural columns and beams | * Learners to be able to select, safely set up, use and maintain the different types of hand tools, power tools and associated equipment to erect and/or install resources to given working instructions. |