Unit 301: Understanding construction practice in Wales

# Delivery guide

Unit information

The purpose of this unit is for learners to explore and understand the wide and changing scope of the construction sector in Wales from pre-1919 practices to future development. It will provide an overview and set the scene for working in the construction sector in Wales. It is recommended this unit is delivered prior to the Working in the Construction Sector in Wales unit.

Learners may be introduced to this unit by asking themselves questions such as:

* Why should I join a union?
* What do the different coloured CSCS cards mean?
* How is the Well-being of Future Generations (Wales) Act 2015 relevant to construction?
* What does circular economy mean?
* What is BREEAM?

Learning outcomes

1. Know the trade bodies and organisations within the construction sector
2. Understand connected practice in the construction industry
3. Know the changes in construction pressures and materials over time
4. Know the changes in construction methods over time
5. Understand the relationship between trades and the environment

Suggested resources

Textbooks

* Burdfield, M., Jones, S., Redfern, S., Fearn, C. (2020) *The City & Guilds Textbook: Site Carpentry & Architectural Joinery for the Level 3 Apprenticeship (6571), Level 3 Advanced Technical Diploma (7906) & Level 3 Diploma.* London: Hodder Education.

ISBN 978-1-5104-5815-4

* Gashe, M., Byrne, K. (2020) *The City & Guilds Textbook: Plastering for Levels 1 and 2.* London: Hodder Education.

ISBN 978-1-3983-0647-9

* Chudley, R. (2020) *Chudley and Greeno’s Building Construction Handbook.* 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

* [Considerate Constructors Scheme | Site Registration](https://www.ccscheme.org.uk/site-registration/site-registration-257/" \l ":~:text=Started%20in%201997%2C%20the%20Considerate%20Constructors%20Scheme%20was,monitoring%20of%20sites%20in%20the%20UK%20and%20Ireland.)
* [Heritage Help | Society for the Protection of Ancient Buildings (SPAB)](http://heritagehelp.org.uk/organisations/spab)
* [ConstructionCert | Book Your CSCS Test (CITB)](https://www.constructioncert.co.uk/book?msclkid=e2faabf2109318066e09cb7db1dd6710)
* [Unitetheunion | Unite Construction, Allied Trades and Technicians](https://www.unitetheunion.org/what-we-do/unite-in-your-sector/unite-construction-allied-trades-and-technicians/)
* [Passivhaustrust | What is Passivhaus?](https://www.passivhaustrust.org.uk/what_is_passivhaus.php)
* [British Gypsum | ThistlePro PureFinish](https://www.british-gypsum.com/products/thistlepro-purefinish?tab0=0)
* [The British Gypsum White Book](https://www.british-gypsum.com/literature/white-book)
* [External Rendering | Modern render system vs traditional render system](https://www.externalrendering.net/modern-render-system-vs-traditional-render-system/)
* [YouTube | Knauf Drywall MP75 Projection Plaster Race](https://www.youtube.com/watch?v=gpGIVPHkZmg)
* [PFT Wales | Plastering Machines](https://www.pftplasteringmachines.com/)
* [CECA Wales | Homepage](https://www.ceca.co.uk/wales/)

Legislation

* [LEGISLATION.GOV.UK | Environment (Wales) Act 2016](https://www.legislation.gov.uk/anaw/2016/3/contents/enacted)
* [GOV.UK | Construction near protected areas and wildlife](https://www.gov.uk/guidance/construction-near-protected-areas-and-wildlife)
* [HSE | Homepage](https://www.hse.gov.uk/)
* [Future Generations Commissioner for Wales | Well-being of Future Generations (Wales) Act 2015](https://www.futuregenerations.wales/about-us/future-generations-act/)

| **Learning outcomes** | **Criteria** | **Delivery guidance** |
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| 1. Know the trade bodies and organisations within the construction sector | * 1. The trade bodies and organisations within the construction sector | * Learners to understand the role that the HSE (Health and Safety Executive) have in the construction industry. * Learners to have an awareness of the full range of trade organisations within the construction sector, including the trade organisation umbrella Build UK, the larger mainstream federations such as the Federation of Master Builders (FMB), the Considerate Constructors Scheme and the National Federation of Builders (NFB). * Learners to research niche organisations covering every specialist aspect of the construction industry within their chosen trade area such as: * National Fire Protection Association (NFPA) * National Federation of Roofing Contractors (NFRC) * Natural Stone Industry Training Group (NSITG) * Association of Concrete Industrial Flooring Contractors (ACIFC) * Institution of Civil Engineers (ICE) * Civil Engineering Contractors Association (CECA) Wales and * Society for the Protection of Ancient Buildings (SPAB). * Learners to be aware of Construction Skills Certification Scheme (CSCS) card scheme in construction. * Learners to be able to recognise the specific trade federations which support their trade and a range of additional associations which support more specialist elements of their trade. * Learners to know about professional registrations available for their chosen trade area. |
| * 1. The role of trade bodies and organisations within the construction sector | * Learners to undertake theory training on the training bodies listed in 1.1 to have a better understanding of the roles and services these organisations offer. * Learners to research and discuss the pros and cons of being engaged with union representation such as Unite Construction, Allied Trades and Technicians (UNITE). * Learners to understand the role that trade organisations have within the construction sector. This should include the strengthening, uniting and advocacy role of Build UK, the assurances that company membership of FMB or NFB offers customers, as well as the business support and quality control that they offer to members and a ‘voice’, training and technical support that niche associations offer specialist contractors. |
| * 1. The competence card schemes within the construction sector and the types of cards available | * Learners to know the card schemes for construction trades including the mandatory CSCS card scheme which gives details about the type of cards available and learners should apply for. * Learners to have an understanding as they progress in construction when it is beneficial to engage with organisational bodies mentioned in 1.1. * Learners to know the role of card issuers, and registration requirements and the need for industry-recognised qualifications. * Learners to know the role of competent person schemes and the opportunity to become members of bodies such as FMB or NFB. |
| * 1. Professional registration as a construction professional | * Learners to be introduced to professional bodies and to understand the benefits of engaging with these such as: * higher earning potential * improved career prospects and employability * enhanced status leading to higher self-esteem * international recognition of competence and commitment * evidence of expertise * greater influence within own organisation and industry and * recognition as a counter-signatory. |
| * 1. CITB and its role within the construction sector | * Learners to research and map out career prospects and qualifications relevant to training. * Learners to have knowledge of qualifications relevant to their training and Continuing Professional Development (CPD) within the Construction Industry Training Board (CITB). * Learners to understand how to access funding to facilitate gaining relevant training qualifications through CITB. * Learners to know the role of the CITB in its support and funding for training and ongoing CPD. * Learners to understand the requirements for company registration and network of training groups and CITB advisors across the country. |
| 1. Understand connected practice in the construction industry | * 1. Interdependencies between trade | * Learners to engage in a project scenario of a construction task of their choice and link this to how to communicate with all other trades within the process regarding timings of first and second fix and how to work together collaboratively to complete a successful project. * Learners to understand the types of problems that can arise and how to mitigate them. * Learners to understand how individual trades interact across different scenarios and how these interactions and roles have changed over time. * Learners to appreciate the relationships between their chosen trade and other trades in different contexts from new build to repairing traditional structures. |
| 1. Know the changes in construction pressures and materials over time | * 1. Pre-1919 construction | * Learners to understand how pre-1919 construction resources were sourced locally and, due to transport constraints and supply chain of materials, local materials were more commonly used which dominated the type and look of buildings in certain areas e.g., local quarries would produce different looking types of aggregate from region to region. * Learners to understand the barriers/problems associated with using materials not local to work sites in this period. * Learners to have an understanding of binders and mortars used pre-1919 such as the different types of lime used such as quick lime and hot lime and how it was produced and slaked. * Learners to know the basic qualities and uses of mortars, aggregates, binders, internal and external functional and decorative finishes, stone, slate, timber, and earth. * Learners to know the permeable nature of lime and earth mortars. |
| * 1. Post-1919 to modern construction | * Learners to have a knowledge of how transport systems were developed from pre-1919 to post-1919 which helped to revolutionise the construction industry and make more varied construction materials available from around the country. * Learners to have an awareness of the sources of building materials, comparing materials found locally and those imported to a region. * Learners to understand cost implications both good and bad when more materials became available for purchase to construct buildings. * Learners to know that, for traditional buildings, the choice of materials often reflected the status of the building. * Learners to know that more prestigious buildings such as churches and government buildings would generally use more expensive materials to complete external and internal architectural finishes which would mean more expensive build costs. * Learners to know basic qualities of concrete slabs, brick and block, steel, glass, plastics, composite materials, standardisation of materials and damp-proof membranes. * Learners to know the role that materials such as cement, glass and steel have played in the industry and the effect that material innovations have had on the scale and speed of construction. * Learners to know that more modern buildings post-1919 would incorporate Damp Proof Membrane (DPM), Damp Proof Course (DPC), steel and glass into building projects and the affect this had on the types and speed of construction. |
| * 1. Twenty-first century construction | * Learners to understand what is meant by sustainable construction for modern twenty-first century building projects, including the increasing pressures of climate change and the carbon footprint of the construction industry. * Learners to understand the importance of energy efficiency and embodied energy in meeting the zero-carbon target. * Learners to understand the importance of the Well-being of Future Generations (Wales) Act 2015 for the construction industry. * Learners to know the quality and uses of building materials used for twenty-first century building projects particular to achieving a zero-carbon footprint including lime (limecrete, lime renders and mortars and plasters), natural building materials and engineered materials (timbers, acetylated wood, (re)engineered bricks and blocks, crushed concrete and glass aggregate, aerated bricks and blocks). * Learners to recognise the need for sustainability of traditional and vernacular buildings, sustainable building materials, embodied energy, material selection and quality, energy efficiency, waste management and recycled materials. * Learners to understand that sustainability includes the reuse of buildings, rather than their demolition and the construction of new ones, as well as the thermal performance of traditional buildings. * Learners to appreciate off-site manufacturing, modular buildings, prefabricated construction components and digital construction technologies. * Learners to be aware of traditional methods of building surveying and design, as well as modern construction applications including digital design software, smart enabled tools, technologies and apps, drones, robotics, Building Information Modelling (BIM), Computer Aided Design (CAD), 3D modelling, and simulation. * Learners to understand the difference and benefits of using modern software for use of 2D and 3D design tools compared to traditional methods and to be able to identify smart-enabled tools. * Learners to have some knowledge of limitations to planning and design in construction when using 2D and 3D software technologies and to be able to recognise where and how technologies, apps, drones, and robotics can be used in construction and the built environment. * Learners to have a basic knowledge of the concepts of 3D printing including its uses, benefits and limitations in relation to planning, designing, modelling and constructing. |
| 1. Know the changes in construction methods over time | * 1. Pre-1919 construction methods | * Learners to work in group sessions and collaborate to identify the changes in construction materials, tools and techniques over time. * Learners to know the typical methods, applications and techniques used to apply plaster and render materials pre-1919 to internal and external substrates including materials, tools and techniques relevant to their chosen trade. * Learners to have an understanding and to be able to list the types of tools used to apply plaster and render materials pre-1919 to internal and external substrates. * Learners to know the methods of applying internal and external functional surface finishes including internal and external ornate plaster work (render and plaster) using lath, hydraulic lime and hand tools such as lath hammer, water level and mild steel trowel. * Learners to research ‘The Worshipful Company of Plaisterers’ to gain a knowledge of the plastering industry pre-1919. * Learners to research and list the types of materials used to plaster and render and to produce and fix ornamental fibrous components pre-1919. * Learners to know the methods of construction for: * traditional ground floors (suspended timber) * timber lintels, bressummers * trussed partitions * traditionally cut roofs and King and Queen post roof trusses. * Learners to know traditional structural jointing techniques such as tusk tenons used in the above constructions. * Learners to know that locally sourced timber and ironmongery were predominantly used, and only handheld tools were available. * Learners will understand the development of construction practice within their chosen trade, for example brick cavity methods of construction and later variations of cavity wall design. |
| * 1. Post-1919 and modern construction techniques | * Learners to know the methods, applications and techniques used to apply plaster and render materials post-1919 to internal and external substrates including use of plasterboard and cement products. * Learners to understand and be able to list the types of tools used to apply plaster and render materials post-1919 to internal and external substrates including stainless steel trowels, flex trowels, speedskims, laser levels and projection plaster/render machines. * Learners to research and list the types of materials used to plaster and render and to produce and fix ornamental fibrous components post-1919 including mechanical fixing, screws/nails, direct bond, standard and performance plasterboards, Glass Reinforced Gypsum (GRG), various dry lining systems and modern render systems. * Learners to understand the development of construction practice within their chosen trade such as: * brick cavity methods of construction and later variations of cavity wall design * prefabricated floor, wall, roof and joinery components. * Learners to know methods of applying internal and external functional and surface finishes (render, plaster, and plasterboards) including the introduction of fixing dry lining with galvanised nails (circa 1950s), mechanical methods and by direct bond (circa 1980s) (standard and performance plasterboard). * Learners will understand the development of construction practice within their chosen trade, for example: * brick cavity methods of construction and later variations of cavity-wall design * prefabricated floor, wall, roof, and joinery components. * Learners to know when imported timber and regularised timber (CLS - Canadian Lumber Standard) became more commercially available and of the introduction of solvent-based preservatives and timber-based sheet materials. * Learners to know the requirement for the economical use of timber and quality standards through the introduction of the Timber Research and Development Association (TRADA) type roof trusses and structural joist size and tables. * Learners will know of the introduction of portable power tools and proprietary building ironmongery and fixing systems. |
| * 1. Twenty-first century construction techniques and technologies for chosen trade | * Learners to research modern-day application techniques of internal and external plaster/render materials including the materials, tools and techniques relevant to their chosen trade such as machine projection applications for airless systems, modern render systems and gypsum systems. * Learners to know how to access information on new developments in their trade such as through progression institutions, industry bodies and trade associations, articles, trade press, formal CPS, manufacturers’ information, etc. * Learners to have an understanding of modular building design and construction methods. * Learners to know what is meant by the following terms and what they mean in relation to construction and their trade: * circular economy * sustainable design and retrofit * insulation * moisture management * ventilation. * Learners to know modern methods of applying internal functional and surface finishes (performance plasterboard, specialist metal interior systems, fire proofing and acoustic control) using relevant modern resources (hand/mechanical taping and jointing, aerated and fast-setting chemical jointing adhesives including primers and sealers). * Learners to research beads and trims extensively used for modern internal and external finishes. * Learners to research and list performance plasterboards and render carrier boards used in twenty-first century applications. * Learners to have a knowledge of tools and resources used in twenty-first century plastering and rendering applications e.g., collated screwdrivers, telescopic board props, projection plastering/render machines, mechanical sponge floats, etc. * Learners to know emerging methods of construction for twenty-first century buildings, including the materials, tools, and techniques relevant to their chosen trade. * Learners to know the new/emerging technologies in their trade. Learners to know how to access information on new developments in their trade – such as through professional institutions, industry bodies and trade associations, articles, trade press, formal CPD, manufacturers’ information, etc. * Learners to be aware of modern construction, surveying and design applications including BIM, CAD, 3D modelling, simulation and drones, as well as traditional methods of building survey and design as relevant to their chosen trade. Refer to City & Guilds Construction (Level 3) Timber Frame Erection Qualification Handbook 31. * Learners to know what is meant by the following terms and what they mean in relation to their trade: * circular economy * sustainable design and retrofit * insulation * moisture management * ventilation. * Learners will know the impact of the development of modular construction and prefabricated flatpack. * Learners to know composite materials and modified timbers and their impact on performance, aesthetics, and design. Learners will know the increased range and use of cordless power tools. |
| 1. Understand the relationship between trades and the environment | * 1. Industry regulation and sustainability | * Learners to research government policy on sustainability e.g., Environment (Wales) Act 2016, Environmental Protection Act, PAS 2030 and PAS 2035, The Hazardous Waste Regulations, Pollution Prevention and Control Act, Control of Pollution Act. * Learners to know the value of thermal imaging in energy-efficient construction practice. * Learners to research Building Research Establishment Assessment Method (BREEAM) and how it fits into twenty-first century construction practice. * Learners to have knowledge of Passive House types of construction techniques to achieve government initiative and policy on zero-carbon footprint. * Learners to know the essentials of responsible retrofit of the full range of building stock including traditional and modern. * Learners to know the Conservation of Habitats and Species Regulations 2010 and the penalties for breaking the law. * Learners to know what should be done when there is a discovery of protected species during the construction process e.g., bat roosts and newt colonies. * Learners to know how the design of construction projects can help with energy efficiency and the link to include smart homes and smart technologies, such as sensors and controls. |
| * 1. Ecological considerations and principles | * Learners to have a basic appreciation of endangered habitats and a knowledge of current legislation and ecological considerations when undergoing any work which may affect primary protected species and habitats e.g., nesting birds, rare plant species. * Learners to understand implications for future development that are considered to flood plains and the effect this could have on the buildings and surrounding areas. * Learners to have a basic appreciation of endangered habitats, biodiversity offsetting and primary protected species. |
| * 1. Sustainable approaches | * Learners to be able to identify the sustainable considerations used in construction and the built environment and to be able to recognise the scope of their use to maintain a healthy building. * Learners will also be able to identify the ways in which buildings can offset their carbon footprint. |
| * 1. Waste disposal in construction | * Learners to know how the use of different materials can reduce environmental impact in their trade area, and the principles of the ‘3 Rs’ of waste management (reduce, reuse and recycle). * Learners to know the importance of accurately ordering materials in order to reduce site waste and save money on over-ordering and waste-disposal costs. * Learners to know how to store materials in an appropriate manner and how to control inventory and sort waste on site. * Learners to be aware of good practice guidance including WRAP for industry waste management and to be able to link this to on-site construction waste-disposal initiatives. * Learners to understand the nature of recyclable and biodegradable materials and the impact that it has on landfill and cost to the environment and the type of materials that are commonly recycled on site. * Learners to know how scrap materials can hold value (including copper), understand that it is a finite resource and to know the public register of scrap-metal dealers in Wales. * Learners to know how to dispose of hazardous waste including cement-bonded and fibrous asbestos waste collection. * Learners to know how to use of licensed waste carriers, brokers and dealers. * Learners to know the consequences to self, others, and the environment of not following best practice and the statutory requirements in relation to waste disposal. * Learners to know the key features of COSHH Regulations including the Environmental Protection Act, The Hazardous Waste Regulations, Pollution Prevention and Control Act, Control of Pollution Act, The Waste Electrical and Electronic Equipment Regulations. |