Unit 310: Place and compact concrete

# Delivery guide

Unit information

This unit is about interpreting information, adopting safe, healthy and environmentally responsible work practices, selecting and using materials, components, tools, equipment and placing and compacting concrete.

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

* What components are used to make concrete?
* How should concrete be mixed and transported?
* What types of equipment can be used to lay and finish concrete?

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

* Jones, M. (2019) *The City & Guilds Textbook: Bricklaying for the Level 2 Technical Certificate & Level 3 Advanced Technical Diploma (7905), Level 2 & 3 Diploma (6705) and Level 2 Apprenticeship (9077)*. London: Hodder Education.

ISBN 978-1-5104-5814-7

* Hanses, K. (2015) *Basics Concrete Construction*. Switzerland: Birkhäuser.

ISBN 978-3-0356-0362-0

Websites

* [Britannica | Concrete building material](https://www.britannica.com/technology/concrete-building-material)
* [Concrete Network | Homepage](https://www.concretenetwork.com/)
* [For Construction Pros | 7 Methods for Testing Concrete Strength](https://www.forconstructionpros.com/concrete/article/21072546/7)
* [Hanson UK | Ready-mixed concrete](https://www.hanson.co.uk/en/ready-mixed-concrete)

| **Learning outcomes** | **Criteria** | **Delivery guidance** |
| --- | --- | --- |
| 1. Understand resource selection | * 1. Characteristics of the resources | * Learners to understand the various material types of resources used to produce concrete, including: * coarse aggregate * fine aggregate * cement * additives * potable water. * Learners to be shown the types of aggregate used and types of fine aggregate. * Learners to understand gauging techniques, water content and water cement ratios. |
| * 1. Use of resources | * Learners to understand the range of applications where concrete is used in construction such as: * the type of concrete and typical gauge used for foundations * the type of concrete used for reinforcement and the typical gauge used for floors * the type of concrete, typical gauge and finishes for pavements. * Learners to understand problems and defects that may arise and how these should be reported, regarding: * correct storage of resources, including how to keep resources dry and clean * identifying defects in materials, including how to keep them clean and dry. |
| * 1. Organisational procedures to select resources | * Learners to understand the correct methods of selecting suitable resources for concrete from: * drawings * specifications * schedules * ordering systems. * Learners to understand how to identify the method of producing concrete for the specific task – whether it should be mixed by hand mixer or ready mixed. |
| * 1. Hazards | * Learners to understand how to identify hazards associated with the resources when carrying out the work, including: * manual handling, when moving and handling * skin irritation and dermatitis – learners to be made aware of the skin protection and treatment available to prevent this. |
| 1. Understand working to a contract specification | * 1. Methods of work | * Learners to understand the methods of work used to: * gauge (by volume and by weight) – learners to understand how to consider the amounts to be produced and provide examples of where ready-mixed concrete is the better option * mix (by hand and mechanical) * transport, using buckets, barrows, dumpers and skips * compact and finish concrete in line with drawings, specifications and manufacturers’ information. * Learners to understand methods of compaction and placing, including various finishes to the concrete: * tamped float * power float * trowelled. * Learners to understand methods of work including: * mixing by hand * mechanical means * ready mixed * batching * pumping. |
| * 1. Tools and equipment | * Learners to understand the range of tools and equipment used on site to produce concrete in various volumes according to the scale of the work, including mixing by hand and by mechanical means and ready-mixed concrete delivered to site. * Learners to be given examples where site mixing would be suitable and examples where pre-mixed concrete would most likely be used. * Learners to understand the tools and equipment used to transport concrete and to be given examples of where each is used, including: * wheelbarrows * buckets * dumpers * conveyors * pumps * chutes * hoppers * cranes. * Learners to be able to identify suitable equipment for the given task. * Learners to understand the tools and equipment used to compact, consolidate and finish concrete including: * tamps * trowels * floats * edging tools * vibrating tamps * vibrating pokers * straight edges * power floats * conveyors. * Learners to understand the types of finish that can be produced by using the range of equipment available. * Learners to understand the hazards associated with the use of concrete and the protection measures that should be used when working with concrete. * Learners to be able to maintain tools and equipment associated with laying concrete. |
| 1. Comply with the given contract information to carry out the work safely and efficiently to the required specification | * 1. Demonstration of work skills to measure, mark out, inspect, receive, handle, transport, place, spread, level, vibrate, compact, test and protect | * Learners to be able to set out the work area by measurement to mark out positions for concrete and prepare the area to receive concrete. * Learners to be able to handle, transport and move concrete into the required positions in the appropriate time. * Learners to be able to spread concrete and level it to the required levels and to be able to compact the concrete to ensure that it is properly consolidated, using vibrating pokers, vibrating plates and tamps. * Learners to be able to demonstrate skills in finishing concrete to the required specification. * Learners to discuss types of finish that can be produced by using a range of equipment. * Learners to be able to carry out tests on concrete to establish its strength by destructive testing. * Learners to be able to carry out slump tests, to know how to prepare and take cubes and to understand curing and monitoring by destructive testing. * Learners to understand the process of producing a slump test and how to produce cubes, curing and testing processes. * Learners to be able to identify the need to protect concrete during laying and curing from the effects of the weather, including: * excess sunlight * frost * snow * rain. * Learners to know how to use suitable materials to cover and protect the work by using hessian, polythene sheets and tarpaulins. * Learners should be aware of what to do when the weather is hot and what to do when the weather is cold to provide protection for concrete whilst it is setting. |
| * 1. Use and maintain hand tools, portable power tools, plant or machinery and ancillary equipment to place, lay and compact concrete to given working instructions using at least three of the following placement methods: * chute * elephant’s trunk * skip * pump * monorail * manual | * Learners to be able to use hand and power tools to place concrete in the specified position to work instructions. * Learners to be able to transport concrete to the required position using: * pumps * conveyors * skips * hoppers * monorails * dumpers * barrows * buckets * manual. * Learners to be able to maintain hand and power tools when laying concrete. |