Unit 232: Set out secondary dimensional work control

# Delivery guide

Unit information

The aim of this unit is to provide learners with the relevant practical skills and understanding required for setting out secondary dimensional work control in a construction and civil engineering environment. It also covers interpreting information, adopting safe, healthy and environmentally responsible work practices, and selecting, preparing and using materials, components, tools and equipment.

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

* What is dimensional control?
* Why is setting out important within civil engineering?
* What equipment is needed when setting out dimensional work?
* What are the different methods used when setting out in civil engineering work?

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

* Kendrick, P. (2004) *Roadwork: Theory and Practice*, 5th edition. London: Routledge. ISBN 9-7807-506-6470-7
* Chudley, R. (2020) *Chudley and Greeno's Building Construction Handbook*, 12th edition. London: Routledge.

ISBN 9-7803-671-3543-0

* Pitman, P. (2017) *External Works, Roads and Drainage: A Practical Guide*, 1st edition. London: CRC Press. ISBN 9-7811-384-0887-6

Websites

* [Cadw (gov.wales)](https://cadw.gov.wales/) | Homepage
* [Constructing Excellence | Homepage](https://constructingexcellence.org.uk)
* [HSE | Homepage](https://www.hse.gov.uk)
* [Oxford University Press | Free Building & Construction resources](https://global.oup.com/education/secondary/subjects/vocational/building/free-resources/?region=international)
* [Construction Knowledge | Excavation](https://www.constructionknowledge.net/sitework/sitework_excavation.php)
* [NHBC | Substructure, Ground-floors, Drainage and Basements – Drainage below ground](https://nhbc-standards.co.uk/5-substructure-ground-floors-drainage-and-basements/5-3-drainage-below-ground/)
* [GOV.uk | Drainage and waste disposal: Approved Document H](https://www.gov.uk/government/publications/drainage-and-waste-disposal-approved-document-h)

| **Learning outcomes** | **Criteria** | **Delivery guidance** |
| --- | --- | --- |
| 1. Understand resource selection | * 1. Characteristics of the resources | * Learners to understand the range of resources used in the process of setting out dimensional control to drawings and specifications. * Learners to understand the characteristics and suitability of materials when selecting resources for setting out secondary dimensional work control for residential or larger civil engineering projects. * Learners to know the groundworks components and to be able to identify the defects that can affect the structural integrity and which need replacing and those that only affect the aesthetics. * Learners to know the uses and limitations of groundworks components and sustainable alternatives. * Materials could include spray paint, crayons, chalk and markers, flags and lines, levelling and reference nails, profile boards and edgings, nylon lines, straight edges. * Equipment could include tripods, staffs, theodolites, total stations, measuring tape, spirit levels, digital levels, squares, angle finders, straight edges and spirit levels. |
| * 1. Use of resources | * Learners to understand how the resources should be used and how any problems associated with them are reported. * Learners to know how to check straight edges, the accuracy of levels and the calibration requirements of total stations, ensuring architects’ and engineers’ drawings are also reviewed and current. * Learners to know the process for positional error checks and individual peg checks**.** * Learners to know and understand which materials are to be used in specific locations, the procedures and reporting protocols to follow to report any problems, possible defects or concerns with selected resources and how to rectify or report any defects. |
| * 1. Organisational procedures to select resources | * Learners to understand the working procedures used to select the most appropriate methods to set out secondary dimensional control in accordance with written instructions, drawings and verbal instructions to meet the contract size/needs. * Learners to know how to raise requisitions and how to order resources to complete a specific task using organisational procedures. |
| * 1. Hazards | * Learners to be able to identify the hazards associated with setting out secondary dimensional work control, the maintenance and replacement of components and to know how to follow the correct method of work when setting out, while working on small residential or large civil engineering projects. * Learners to know the importance of working to method statements and risk assessments, that may identify underground services, and how to check for these. * Learners to know the dangers of open excavations, moving plant and equipment and potential hand and eye injuries when knocking in pins or profiles etc. |
| 1. Understand working to a contract specification | * 1. Methods of work | * Learners to know and understand the application of safe and healthy work practices, procedures and skills relating to the method, process and area of work. * Learners to be able to plan their work efficiently from the given instructions and complete the work to the agreed specifications. * Learners to understand the importance of communication among team members during activities, as well as the needs of other occupations working alongside them. * Learners to understand the correct methods used to establish dimensions accurately and to be able to establish the setting out details from drawings, specifications and verbal instructions. |
| * 1. Tools and equipment | * Learners to know and understand the importance of maintaining tools and equipment and the operative care associated with setting out equipment, including tripods, staffs, theodolites, total stations, measuring tape, spirit levels, digital levels, squares, angle finders, straight edges and spirit levels. * Learners to understand procedures such as start-up and shut down checks, calibration and planned maintenance schedules on laser levels or total stations. * Learners to know how to maintain equipment to ensure its accuracy in future use and how equipment should be cleaned and maintained after use. * Learners to know methods of maintaining tools and equipment to check for accuracy and cleaning equipment after use. |
| 1. Comply with the given contract information to carry out the work safely and efficiently to the required specification | * 1. Use and maintain hand tools, measuring and marking equipment and ancillary equipment | * Learners to demonstrate that they can plan and set out secondary dimensional work control by following the information and guidance given to them. * Learners to know how to confirm the instructions given or what the desired outcomes will be. * Learners to plan efficiently for the work to be carried out within the agreed time for the work. |
| * 1. Demonstrate work skills to transfer, transpose, level, measure, mark, position, fix and secure | * Learners to be able to: * identify and extract suitable information from a range of sources to set out secondary dimensional work control * identify and use tools and equipment to set out secondary dimensional work control * maintain the equipment in good condition for future use * identify and use measuring tools and instruments to transfer, transpose, level, measure and position while setting out secondary dimensional work control * identify and use marking materials and components to mark, fix and secure the position while setting out secondary dimensional work control * set out secondary work control as per instructions or methods of work. * Instructions could be for: * setting lines – transferring points from a primary station to establish a secondary station on highways, roads, paths, kerb lines, block paving and paving slabs * inverting levels/falls for drainage, depths of excavations or foundations * marking out areas of boundaries or footprints, levels for finish floor in domestic dwellings. |