

## Unit 14: Surveying in Construction and Civil Engineering

Unit code: J/600/0224

QCF Level: 3

Credit value: 10

Guided learning hours: 60

### Unit aim

The aim of this unit is to enable learners to develop skills in linear and levelling surveys, measuring angles and setting out of small buildings. Learners will become familiar with basic surveying techniques, be able to carry out simple surveying tasks and present the data, and understand the roles of surveying and setting-out in the construction process.

### Learning outcomes and assessment criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning outcomes	Assessment criteria
1 Be able to perform linear surveys to produce drawings	1.1 Identify linear surveying terminology
	1.2 Carry out linear surveys, using appropriate equipment, to produce accurate drawings
2 Be able to perform levelling surveys to produce drawings	2.1 Identify levelling surveying terminology
	2.2 Carry out levelling surveys, using appropriate equipment, to produce accurate drawings
3 Be able to measure angles and produce results from calculations	3.1 Identify angular terminology
	3.2 Carry out angular measurements, using appropriate equipment, and calculations

4 Be able to perform the setting-out of small buildings	4.1 Identify setting-out terminology
	4.2 Set out and check corner pegs for a small building using appropriate equipment and techniques

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THIS IS AN ACCREDITED SPECIFICATION AND CAN BE USED FOR TEACHING AND ASSESSMENT

## Unit content

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### 1 Be able to perform linear surveys to produce drawings

*Terminology:* framework; whole to part; well conditioned; taping; horizontal and slope distances; chainage; running measurements; perpendicular offsets; tie lines; check lines

*Equipment:* tapes; bands; rules; handheld lasers; ancillary equipment

*Calculations:* basic arithmetical operations

*Drawings:* internal or external survey plotted to scale

### 2 Be able to perform levelling surveys to produce drawings

*Terminology:* back sight; intermediate sight; fore sight; reduced level; datum; Ordnance Survey Bench Mark; Temporary Bench Mark; height of collimation; rise and fall; fly levelling

*Equipment:* automatic levels; tilting levels; water levels; rotating lasers; barcode instruments

*Calculations:* basic arithmetical operations, simple trigonometry

*Drawings:* spot heights on plans; section

### 3 Be able to measure angles and produce results from calculations

*Terminology:* whole circle bearings; azimuth; horizontal angle; zenith angle; angles of inclination

*Equipment:* optical square; theodolites

*Calculations:* addition and subtraction of angles; sine, cosine, tangent; Pythagoras; sine rule; cosine rule

### 4 Be able to perform the setting-out of small buildings

*Terminology:* plan measurement; check measurement; baseline; profile

*Equipment:* theodolites; site square; tapes; ancillary equipment

*Techniques:* set out pegs and profiles to control construction of a small house; constraints on positioning; application of arithmetic and simple trigonometry