

## Unit 84: Civil Engineering Construction

Unit code: L/600/0368

QCF Level: 3

Credit value: 10

Guided learning hours: 60

### Unit aim

The aim of this unit is to enable learners to gain knowledge of earthwork activities and an understanding of methods and techniques used in substructures and superstructures, including the hazards and risks involved in civil engineering construction activities.

### 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 Know the methods commonly used to perform earthwork activities and control groundwater	1.1 Identify the earthwork activities carried out when forming deep excavations and cuttings
	1.2 Describe methods of controlling groundwater
2 Understand the methods and techniques used in civil engineering substructures	2.1 Describe the forms of substructure commonly used for commercial and industrial civil engineering projects
	2.2 Explain how drainage is integrated into substructures
	2.2 Explain how public utilities are integrated into substructures
3 Understand the methods and techniques used in civil engineering superstructures	3.1 Describe the construction plant and equipment used to erect steel and concrete frames
	3.2 Explain the use of steel and concrete frames in superstructures
4 Understand health and safety issues associated with civil engineering construction activities	4.1 Describe health and safety management roles and responsibilities on civil engineering sites

	4.2 Explain the hazards and risks associated with substructure activities
	4.3 Explain the hazards and risks associated with superstructure activities

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## Unit content

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### **1 Know the methods commonly used to perform earthwork activities and control groundwater**

*Earthwork activities:* earthmoving equipment; deep excavation; groundwater exclusion

*Earthmoving equipment:* for basement and trench excavations

*Deep excavation:* temporary works; trench strutting; trench boxes; false work

*Groundwater exclusion:* de-watering; sump pumping; permanent exclusion methods

### **2 Understand the methods and techniques used in civil engineering substructures**

*Substructure construction:* plant and equipment; piling systems; foundations; drainage; utilities

*Plant and equipment:* excavators; piling rigs; grab buckets; bentonite plant

*Piling systems:* sheet steel; contiguous; secant; diaphragm cut-off walls

*Foundations:* isolated pads; pile caps; ground beams; rafts

*Drainage:* installation of deep sewers; pipework; cable trenching; reinforced concrete culverts (stream and river containment and diversion)

*Utilities:* infrastructure developments; deep sewer installation water discharge pipes; service tunnels; structured cable installation

### **3 Understand the methods and techniques used in civil engineering superstructures**

*Plant and equipment:* cranes, mobile and static; concrete pumps; all terrain hydraulic access equipment

*Steel frames:* universal columns; beams; pad and column connections; composite floor decks; concrete

*Frames:* columns; beams; floors; formwork

*Concrete production:* ready mix; placement; pumps; skips

### **4 Understand health and safety issues associated with civil engineering construction activities**

*Health and safety:* legislative framework; hazards and risks; Construction Design and Management (CDM)

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*Legislative framework:* acts and regulations; duties of employers; duties of employees  
*Construction hazards:* hazard identification; risk assessments; method statements

*Construction Design and Management (CDM):* duties of main contractor, sub-contractor, health and safety officer; compliance requirements; health and safety file requirements (welfare; site security; site access; training requirements; certification)

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