Unit 8: Technology of Complex Buildings

Unit code: J/601/1255
QCF level: 5
Credit value: 15

Aim
This unit provides learners with an understanding of the materials, methods and buildability features of complex structures, and the sustainability, alteration, remediation and safe demolition of complex structures.

Unit abstract
This unit focuses on the erection of complex multi-storey buildings and the use of modern systems to provide flexible internal space planning and design. These themes are developed to include how the useful life of buildings can be extended by alteration and repair techniques. The principles of buildability in terms of health and safety, efficiency, economy and quality of construction projects are analysed. The importance of developing a sustainable construction strategy is emphasised and learners will explore the methods and procedures involved in the safe demolition of buildings.

Learning outcomes
On successful completion of this unit a learner will:
1. Understand the materials and construction methods used for multi-storey buildings
2. Know the systems used to provide flexibility for internal layouts
3. Understand the features of buildability
4. Understand sustainable construction strategies
5. Understand the alteration, remediation and safe demolition of complex structures.
Unit content

1  **Understand the materials and construction methods used for multi-storey buildings**

   *Construction methods:* structural frame; external envelope; structural floors; roofing; compatibility of materials and construction forms

2  **Know the systems used to provide flexibility for internal layouts**

   *Internal layout systems:* demountable partitioning systems; infinite access floors; temporary room division; suspended ceilings; underfloor and vertical service ducting

3  **Understand the features of buildability**

   *Features of buildability:* dimensional coordination and standardisation; considerations of access; services coordination; specification of materials; components and assemblies; simplicity of construction; effective communications; The Construction (Design and Management) Regulations 2007 (CDM)

4  **Understand sustainable construction strategies**

   *Sustainable construction strategies:* environmental concerns; deforestation and manageable forestry; energy efficiency and insulation; alternative energy sources; embedded energy costs

5  **Understand the alteration, remediation and safe demolition of complex structures**

   *Alteration and remediation:* project feasibility; underpinning; temporary support; modern conversion; adaptation and refurbishment techniques

   *Demolition methods and procedures:* legal constraints eg building control constraints; health and safety considerations, CDM requirements
## Learning outcomes and assessment criteria

<table>
<thead>
<tr>
<th>Learning outcomes</th>
<th>Assessment criteria for pass</th>
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<tbody>
<tr>
<td>Learning outcomes</td>
<td>On successful completion of</td>
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<tr>
<td>this unit a learner will:</td>
<td>The learner can:</td>
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<tr>
<td>LO1</td>
<td>1.1 discuss the types of structural design used for multi-storey buildings</td>
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<tr>
<td>Understand the materials and construction methods used for multi-storey buildings</td>
<td>1.2 analyse the construction techniques used for multi-storey buildings</td>
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<td>1.3 justify the materials specification for given multi-storey designs</td>
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<tr>
<td>LO2</td>
<td>2.1 describe the systems used to provide flexibility of spatial planning</td>
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<tr>
<td>Know the systems used to provide flexibility for internal layouts</td>
<td>2.2 describe how the choice of internal system layout can impact on building services</td>
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<tr>
<td>LO3</td>
<td>3.1 analyse buildability in terms of health and safety, efficiency, economy and quality of construction projects</td>
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<tr>
<td>Understand the features of buildability</td>
<td></td>
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<tr>
<td>LO4</td>
<td>4.1 discuss the key features of sustainable construction strategies</td>
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<tr>
<td>Understand sustainable construction strategies</td>
<td>4.2 explain how sustainable construction strategies benefit both modern and traditional methods of construction</td>
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<td></td>
<td>4.3 evaluate construction methods and spatial planning used for multi-storey buildings in relation to sustainable construction strategies</td>
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<tr>
<td>LO5</td>
<td>5.1 analyse alteration and repair techniques used to meet the needs of future occupiers of buildings</td>
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<tr>
<td>Understand the alteration, remediation and safe demolition of complex structures</td>
<td>5.2 evaluate the methods used to demolish structures referring to associated documentation and compliance with legal constraints</td>
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Guidance

Links

This unit links with other Edexcel BTEC HN Construction and the Built Environment units, for example:

- Unit 6: Health, Safety and Welfare for Construction and the Built Environment
- Unit 7: Construction and Maintenance of Buildings
- Unit 12: Conversion and Adaptation of Buildings
- Unit 13: Environmental Impact of Construction
- Unit 20: Construction Methods and Design Solutions
- Unit 22: Structural Behaviour and Detailing
- Unit 23: Advanced Measurement for Construction
- Unit 25: Design Technology for Construction
- Unit 26: Properties and Performance of Construction Materials.

The content of this unit has been designed and mapped against the current CIC National Occupational Standards and the current NVQs at levels 4 and 5. Completion of the learning outcomes will contribute knowledge, understanding and skills towards the evidence requirements of the NVQs.

- See Annexe B for summary of mapping information to NVQs.

This unit has also been mapped to illustrate the links to the NQF units.

- See Annexe D for summary of mapping information to NQF units.

Essential requirements

Construction methods and practices must comply with health, safety and welfare legislation. CDM Safety Plans are important in linking design and build aspects together in order to avoid risk.

Employer engagement and vocational contexts

Tutors should organise site visits, for example practical audits of centre buildings to determine their environmental credentials. To ensure site visits are successful tutors should outline the aims and objectives of the visits, conduct preparatory briefings and encourage learners to work in teams and present their findings to the other groups. Tutors should organise presentations by visiting speakers, for example designers outlining methods used to design out potential building defects and/or building surveyors explaining the methods of eradicating common defects. Tutors should use real-life case studies, for example investigations into modern internal layout systems, structural frame types for multi-storey buildings and/or methods used for demolishing complex buildings.