

Unit 7: Construction Management

Unit code:	H/504/4351
QCF level:	6
Credit value:	15

Aim

The aim of this unit is to develop the understanding and skills required for construction project management. The learner will gain a systematic understanding of key production processes and the resource demands of a complex construction project. The unit also introduces simulation and modelling techniques that support decision making for complex construction projects.

Unit abstract

Successful construction management is guided by a system of values that demonstrate responsibility to humanity and the environment. Effective project assessment and management in construction is regarded as the most efficient way of minimising environmental impact. Project management comprises all that is involved in achieving project objectives sustainably and safely against agreed performance criteria. Construction management provides the single point of integrative responsibility required to ensure successful delivery of a construction project.

In this unit learners will investigate cost versus benefit issues and begin to appraise elements of good construction management processes.

As the unit develops, learners will produce a cost effective and workable construction plan that has defined and established success criteria, including division of the whole project work into deliverable work packages. This plan will need to have been subjected to Building Information Modelling (BIM) systems to test and consider various project outcomes. On completion of the unit learners will appreciate the benefits of impact analysis on production methods and how to evaluate the environmental aspects of a project.

Learning outcomes

On successful completion of this unit a learner will:

- 1 Understand the application of project assessment techniques within the construction phase
- 2 Be able to create a project management plan to meet commercial, health and safety, stakeholder and environmental requirements
- 3 Be able to apply modelling techniques in managing complex construction projects.

Unit content

1 Understand the application of project assessment techniques within the construction phase

Social cost-benefit analysis: public sector, private sector; tools of social cost benefit analysis (direct costs, benefits, wider costs, wider benefits)

Project assessments: corporate social responsibility; sustainable development; sustainability legislation (local, national, international); reports, e.g. Latham Report, Rethinking Construction, Accelerating Change, Building a Better Quality of Life; 2012 Construction Commitments; risk types, e.g. physical, financial, monetary, planning; project appraisal (risk, uncertainty); risk control methods, risk perception, risk analysis, risk management; social impacts assessment; social implications of projects; environmental impact analysis, e.g. climate change, global warming; environmental management; sustainability; raw material supply; use of resources; manufacturing of products, energy consumption, CO₂ emissions, impact on air, soil, water, production waste; transport to site; quality of the building (air tightness); building-related sickness; human health preservation

Waste management: waste generation; deconstruction; production waste; impact of demolition waste; demolition on-site; recovery; disposal; transportation; evolution over time

2 Be able to create a project management plan to meet commercial, health and safety, stakeholder and environmental requirements

Project requirements: commercial, e.g. strategy (project success criteria, value management, quality management, environment), controls (work content, time scheduling, resource planning, financial management, change control); risk management; stakeholder management; sustainable development

Project management plan: project management systems, e.g. British Standard Institution, Association of Project Management, Cabinet Office; partitioning projects into independent work packages

Legislation and approved codes of practice: current legislation relevant to the home country; UK legislation to include the Health and Safety at Work etc Act (1974); UK regulations to include the Construction (Design and Management) Regulations (2007), the Management of Health and Safety at Work Regulations (1999); UK codes of practice and guidance notes

3 **Be able to apply modelling techniques in managing complex construction projects**

Building simulation techniques: techniques, textual data, graphical representation, 2-D drawings, 3-D drawing representations, static images, interactive animations, virtual reality; building performance; construction process; computer-based models (design, construction, operation, management decision-making process); technology transfer; innovations in visualisation

Building Information Modelling (BIM): concepts (virtual construction, problem solving, simulation of potential impacts); construction phase; post-construction phases; facility management; construction process efficiencies; pre-construction uncertainties; project safety; project challenges, e.g. tight budgets, limited number of people on project, accelerated schedules, limited or conflicting information; innovations in delivery capabilities; sub-contractors

Learning outcomes and assessment criteria

Learning outcomes On successful completion of this unit a learner will:	Assessment criteria for pass The learner can:
LO1 Understand the application of project assessment techniques within the construction phase	1.1 Evaluate social cost benefit analysis for public and private construction projects 1.2 Compare the cost effectiveness of project assessments currently used in the construction industry 1.3 Appraise the effectiveness of waste management procedures for a specific construction project
LO2 Be able to create a project management plan to meet commercial, health and safety, stakeholder and environmental requirements	2.1 Appraise a specific construction project in terms of project requirements 2.2 Produce a construction project management plan to meet success criteria for a specific construction project 2.3 Produce a Health and Safety plan for a specific construction project
LO3 Be able to apply modelling techniques in managing complex construction projects	3.1 Compare current building simulation techniques that can be applied to a specific construction project 3.2 Appraise the effectiveness of building information modelling techniques applied to a specific construction project

Guidance

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

The learning outcomes associated with this unit are closely linked with:

Level 4	Level 5	Level 6
Unit 13: Environmental Impact of Construction (A/601/1270) Unit 28: IT Applications for Construction (Y/601/1292)	Unit 4: Management Principles and Application for Construction and the Built Environment (T/601/1249) Unit 15: Production Management for Construction (L/601/1273) Unit 17: Project Management for Construction and the Built Environment (Y/601/1275) Unit 61: Project Design, Implementation and Evaluation (L/601/0995)	Unit 1: Major Project (Y/503/7221) Unit 2: Innovation in a Sustainable Construction Industry (H/504/4334) Unit 3: Managing in the Natural and Built Environment (T/504/4337) Unit 8: Construction Financial Management (K/504/4352) Unit 9: Construction Regulations for a Sustainable Society (M/504/4353) Unit 12: Planning for Sustainable Communities (F/504/4356) Unit 19: Managing Resources for Project Work (Y/504/4380) Unit 21: Project Management in Construction (A/504/4386)

This unit has been informed by the following National Occupational Standards:

- COSBED4C01 Develop design team programmes and working methods
- COSBED4O08 Form and induct a project team
- COSBED4O13 Manage project information
- COSBED4O18 Control projects
- COSBED4O19 Manage project completion and handover
- COSBED4C04 Develop and maintain professional relationships and practice
- COSBED4O06 Confirm project requirements and needs
- COSBED4O07 Manage the brief, development programme and project risks and opportunities
- COSCCOL4O11 Implement strategic and integrated supply chain management and sourcing partnerships
- COSCCOL4O14 Evaluate and confirm work methods and programme
- COSCCOL4C02 Manage the performance of teams and individuals
- COSCCOL4C03 Chair meetings and take decisions
- COSCCOL4O07 Identify, assess and evaluate project requirements
- COSCCOL4O09 Specify and control production documents.

Essential requirements

Learners will need access to appropriate, industry-standard modelling software.

Delivery

The learning outcomes are most likely to be achieved through introducing construction management plans from a theoretical perspective, enabling learners to explore and research the cost benefit equation for construction projects in general.

As learners develop their understanding of construction management they could be encouraged to produce sample construction plans which will create confidence as they learn how to apply these concepts to develop a coherent, logical and deliverable plan. In creating a plan, learners must utilise Building Information Modelling techniques to assess the potentiality of multiple outcomes of the project. In completing this, they should be able to appraise or evaluate the likely project outcomes along with the consequences of not delivering the project effectively and efficiently.

The learning outcomes can be delivered through introductory lectures which can then develop into individual tutorials or workshop sessions to monitor progress during the assessment process. Tutors should encourage learners to relate their investigations to the underpinning theories they have studied in other units, in particular the integration of sustainability.

Assessment

The preferred method of assessment for this unit is for learners to carry out two assignments or projects. The first assignment will enable learners to research and explain their understanding of managing construction projects and the need to appraise the complexity of sustainability assessments within the construction phase. The second assignment will enable learners to devise a sophisticated construction management plan by establishing success criteria and then developing these into a coherent plan that satisfies the commercial, health and safety, stakeholder and environmental requirements. In this assignment learners can integrate Building Information Modelling (BIM) systems by appraising these techniques and the value they can add to the project.

Resources

Books

Ashworth A and Hogg K – *Added Value in Design and Construction* (Longman, 2000) ISBN 978-0582369115

Chartered Institute Of Building – *Code of Practice for Project Management for Construction and Development* (Wiley-Blackwell, 2009) ISBN 978-1405194204

Gould F and Joyce N – *Construction Project Management: International Edition*, 3rd Edition (Pearson, 2011) ISBN 978-0132766876

Green S – *Making Sense of Construction Improvement* (Wiley-Blackwell, 2011) ISBN 978-1405130462

Griffith A and Stephenson P and Watson P – *Management Systems for Construction (Chartered Institute for Building)* (Longman, 2000) ISBN 978-0582319271

Harris F and McCaffer R and Edum-Fotwe F – *Modern Construction Management* 6th Edition (Wiley-Blackwell, 2006) ISBN 978-1405133258

Nunnally S – *Construction Methods and Management: International Edition*, 8th Edition (Pearson, 2010) ISBN 978-0132167451

Peterson S – *Pearson's Pocket Guide to Construction Management* (Prentice Hall, 2011) ISBN 978-0132156103

Journals

Building (UBM Built Environment)

Construction Manager (Chartered Institute of Building (CIOB), Atom Publishing)

Construction Research and Innovation (CIOB)

Engineering, Construction and Architectural Management (Emerald)

International Journal of Construction Project Management (Nova Science Publisher)

International Journal of Project Management (Elsevier)

Journals in the Field of Construction Management (Association of Researchers in Construction Management)

Websites

www.apm.org.uk/BOK.asp

Association for Project Management

<http://shop.bsigroup.com/en/ProductDetail/?pid=00000000030170007>

British Standards Institution project management guidelines

www.cabinetoffice.gov.uk/resource-library/best-practice-and-methodology-projects-programmes-and-portfolios

Cabinet Office: best practice and methodology resources

www.ciob.org.uk/education

Chartered Institute of Building