

# Unit 21: Project Management in Construction

Unit code:	A/504/4386
QCF level:	6
Credit value:	15

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## Aim

The aim of this unit is to give learners an understanding of the techniques and practices required for effective project management in the construction sector. Learners will understand the role of the project manager and gain skills to undertake project management activities for construction projects.

## Unit abstract

Over the last decade, companies and organisations have taken a much more strategic interest in project management as they seek to address pressures to reduce costs and manage projects effectively. Knowledge and expertise in effective project management enable construction managers to combine subject expertise with management skills to contribute to profitability.

In this unit learners will gain an understanding of project management processes, examine the role, attributes, knowledge and skills of project managers and the effectiveness of project management techniques used within a construction organisation. Finally, learners will demonstrate their project management expertise by applying their understanding to carry out project management activities for construction projects.

## Learning outcomes

### On successful completion of this unit a learner will:

- 1 Understand project management techniques and practices in the construction sector
- 2 Understand the role of the project manager set in the context of a construction organisation and project
- 3 Be able to undertake project management activities for construction projects.

## Unit content

### 1 Understand project management techniques and practices in the construction sector

*Project management standards:* standards and professional recognition, e.g. British Standards Institution (BSI), Code of Practice for Project Management (Chartered Institute of Building), Project Management Body of Knowledge (PMBOK), Projects in Controlled Environments (PRINCE2), Association for Project Management (APM); professional bodies, e.g. CIOB, RICS, RIBA, CIAT, CIBSE, ICE

*Project lifecycle:* definition; initiation; planning; execution; monitoring and control; closure

*Project management processes:* obtain stakeholder commitment; define scope, goals and objectives; produce project execution plan; manage resources and encourage team working; manage communications; manage contractors and suppliers; maintain effective control processes; close and evaluate

*Project management models:* lifecycle models, e.g. Building Information Modelling (BIM), Waterfall, Virtual Prototyping (VP), spiral development

### 2 Understand the role of the project manager set in the context of a construction organisation and project

*Project manager roles:* strategic, e.g. strategic planning, value management, risk management, quality management, safety, health and environment; project control, e.g. project control cycle, developing a programme, monitoring, managing change, action planning, client/project interface, information management; technical, e.g. understanding of design management, resource allocation, budgeting; commercial, e.g. business case, financial management, procurement, legal issues, understanding of marketing and sales; organisation and people, e.g. selection of project team, roles and responsibilities, organisational structure, interpersonal skills (teamwork and leadership)

*Attributes of a project manager:* attitude, e.g. open minded, empathy, receptive, clarity of purpose, thorough, analytical, interrogative, pragmatic, realistic; skills, e.g. decision making, leadership, communication, negotiation, planning, strategic, presentation skills, technical skills, organisational, time management; knowledge, e.g. construction techniques, commercial, business, industry, contractual

*Project management techniques:* risk management; value management; change control; communication management; progress monitoring; quality management; Building Information Modelling (BIM)

### **3 Be able to undertake project management activities for construction projects**

*Project execution plan:* project drivers, e.g. financial, client need, timescales, business need, environmental; statement of client objectives; brief (strategic, functional); risk and value management; procurement route; programme (appointments, design and construction); roles and responsibilities (client organisation, project manager, design team, contractors); change control; quality management (quality planning, quality control, quality assurance); health and safety; reporting procedures; approval procedures; key performance indicators; information management procedures

*Implementation of the project execution plan:* monitoring (cost, time, quality, variation, risk) changes, e.g. due to client, time, legislation, finances, quality requirements

*Project outcomes:* Key Performance Indicators (KPIs); evaluation of effectiveness, e.g. in terms of cost, time, quality, client satisfaction, teamwork, project management leadership

## Learning outcomes and assessment criteria

<b>Learning outcomes</b> On successful completion of this unit a learner will:	<b>Assessment criteria for pass</b> The learner can:
LO1 Understand project management techniques and practices in the construction sector	1.1 Appraise current project management standards 1.2 Evaluate the features of the five project management processes used in a given project 1.3 Evaluate the appropriateness of a project management model for a specific construction project
LO2 Understand the role of the project manager set in the context of a construction organisation and project	2.1 Evaluate the role of the project manager in a construction organisation 2.2 Analyse the attributes, knowledge and skills required for a project manager in a specific construction project in an organisation 2.3 Critically assess the effectiveness of project management techniques for a construction organisation
LO3 Be able to undertake project management activities for construction projects	3.1 Devise a project execution plan for a specific construction project 3.2 Revise the implemented project execution plan to respond to a change in project deliverables 3.3 Critically assess project outcomes against project aims

## 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 1: Design Principles and Application for Construction and the Built Environment (D/601/1245) Unit 7: Construction and Maintenance of Buildings (F/601/1254) Unit 13: Environmental Impact of Construction (A/601/1270) Unit 21: Specification and Contract Documentation for Construction (H/601/1280) Unit 24: Design Procedures for Construction (A/601/1284)	Unit 19: Building Control Procedures and Legislation (K/601/1278) Unit 39: Transportation for Construction and the Built Environment (J/601/1322) Unit 57: Project Management for Building Services Engineering (T/601/1400) Unit 61: Project Design, Implementation and Evaluation (L/601/0995)	Unit 3: Managing in the Natural and Built Environment (T/504/4337) Unit 4: Construction Design (T/504/4340) Unit 5: Building Service Design (F/504/4342) Unit 6: Civil Engineering Design (D/504/4347) Unit 7: Construction Management (H/504/4351) 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 15: Design and Build Highways (D/504/4364) Unit 16: Plan and Design Transport System Solutions (R/504/4376)

Level 4	Level 5	Level 6
		Unit 19: Managing Resources for Project Work (Y/504/4380) Unit 20: Critical Evaluation Management (D/504/4381)

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

- COSCCOL4007 Identify, assess and evaluate project requirements
- COSCCOL4008 Develop and agree detailed project designs
- COSCCOL4010 Prepare procurement schedules and programmes of works
- COSCCOL4011 Implement strategic and integrated supply chain management and sourcing partnerships.
- COSCCOL4012 Obtain tenders and appoint successful contractors
- COSCCOL4013 Evaluate enquiries and submit tenders
- COSCCOL4014 Evaluate and confirm work methods and programme
- COSCCOL4016 Control contract work
- COSCCOL4017 Optimise and control contract progress and costs
- COSCCOL4018 Prepare and agree contract accounts and claims
- COSBED4006 Confirm project requirements and needs
- COSBED4007 Manage the brief, development programme and project risks and opportunities
- COSBED4008 Form and induct a project team
- COSBED4013 Manage project information
- COSBED4017 Prepare and agree forms of contract
- COSTTML4C02 Manage transportation project to completion
- COSTTML4005 Manage change in transportation requirements
- COSTTML4007 Develop plans for the implementation of transportation operations
- COSTTML4010 Manage transportation data collection and analysis
- COSTTML4012 Undertake transportation feasibility design and present options
- COSTTML4014 Manage the preparation of transportation specifications
- COSTTML4020 Manage procurement for transportation projects
- COSTTML4021 Manage the preparation of tenders for transportation projects
- COSTTML4024 Plan and estimate transportation project costs
- COSTTML4025 Manage transportation project valuations and claims.

## **Essential requirements**

It is important that learners have access to current information from the sector on the use and development of project management.

## **Delivery**

Learners would benefit from talks from visiting speakers such as current project managers working in a variety of industry sectors, including small- and large-scale construction projects. Learners would also benefit from an awareness session from a Building Information Modelling (BIM) practitioner. Whenever appropriate, project management case studies and learners' own project management experiences should feature strongly in the delivery of the unit.

It is essential that a culture of health and safety is embedded to ensure that learners understand the importance and relevance of health and safety issues.

## **Assessment**

Assessment could take the form of two assignments. For the first assignment, which could cover the first two learning outcomes, an evaluative report could be used to present an appraisal of the importance of the project manager and the roles and techniques used in project management. In the second assignment, a case study or project could be used as a vehicle for learners to draft a project plan, revising it due to the impact of changes and evaluating the effectiveness of the project on completion.

## Resources

### Books

- Cooke B and Williams P – *Construction Planning, Programming and Control*, 3rd Edition (Wiley-Blackwell, 2009) ISBN 978-1405183802
- Dainty A and Loosemore M – *Human Resource Management in Construction Projects: Strategic and Operational Approaches*, 2nd Edition (Routledge, 2012) ISBN 978-0415593076
- Fellows R, Langford D, Newcombe R and Urry S – *Construction Management in Practice*, 2nd Edition (Blackwell Science, 2001) ISBN 978-0632064021
- Fewings P – *Construction Project Management: An Integrated Approach* (Routledge, 2005) ISBN 978-0415359061
- Fryer B, Ellis R, Egbu C and Gorse C – *The Practice of Construction Management*, 4th Edition (Wiley-Blackwell, 2004) ISBN 978-1405111102
- Gould F and Joyce N – *Construction Project Management: International Edition*, 3rd Edition (Pearson, 2011) ISBN 978-0132766876
- Othman A – *Managing Human Resources in Construction: The Complete Guide for Building the Effective Architectural Team in Design Firms* (Lambert Academic Publishing, 2010) ISBN 978-3838390987
- Peterson S – *Pearson's Pocket Guide to Construction Management* (Prentice Hall, 2011) ISBN 978-0132156103
- Walker A – *Project Management in Construction* (5th Edition) (Wiley-Blackwell, 2007) ISBN 978-1405158244
- Winch G – *Managing Construction Projects: An Information Processing Approach* (Wiley-Blackwell, 2002) ISBN 978-0632058884

### Other publication

CIOB – *Code of Practice for Project Management for Construction and Development*, 4th Edition (Wiley-Blackwell, 2009) ISBN 978-1405194204

### Journals

- Building* (UBM Built Environment)
- Construction Manager* (CIOB, Atom Publishing)
- Construction Research and Innovation* (Chartered Institute of Building)
- Engineering, Construction and Architectural Management* (Emerald)
- International Journal of Construction Project Management* (Nova Science Publisher)
- International Journal of Project Management* (Elsevier)
- International Journal of Project Organisation and Management* (Inderscience Publishers)
- Journals in the Field of Construction Management* (Association of Researchers in Construction Management)



**Websites**

<a href="http://www.apm.org.uk/BOK.asp">www.apm.org.uk/BOK.asp</a>	Association for Project Management
<a href="http://shop.bsigroup.com/en/ProductDetail/?pid=00000000030170007">http://shop.bsigroup.com/en/ProductDetail/?pid=00000000030170007</a>	British Standards Institution
<a href="http://www.cabinetoffice.gov.uk/resource-library/best-practice-and-methodology-projects-programmes-and-portfolios">www.cabinetoffice.gov.uk/resource-library/best-practice-and-methodology-projects-programmes-and-portfolios</a>	Cabinet Office
<a href="http://www.ciob.org.uk/education">www.ciob.org.uk/education</a>	Chartered Institute of Building
<a href="http://www.constructingexcellence.org.uk">www.constructingexcellence.org.uk</a>	Constructing Excellence
<a href="http://webarchive.nationalarchives.gov.uk/20110822131357/http://www.ogc.gov.uk">http://webarchive.nationalarchives.gov.uk/20110822131357/http://www.ogc.gov.uk</a>	Office of Government Commerce archive
<a href="http://www.icknowledge.com/misc_techno/IntroToICTechRev4.pdf">www.icknowledge.com/misc_techno/IntroToICTechRev4.pdf</a>	This document provides a good introduction and overview on IC design and developments
<a href="http://www.prince2.com">www.prince2.com</a>	Prince project management tool