

Unit 1: Construction Design Project (Pearson-set)

Level:	4
Credits:	15
Ofqual Code:	F/618/8080

Introduction

The success of any project relies on the development of a good design and the technical information to allow the project to be built. The aim of this unit is to help students to appreciate and be aware of the design process and the information required to communicate the design itself, specify and quantify materials, provide instructions for the assembly and erection, and facilitate precise costing and project management.

Topics included in this unit are: project phases; construction drawing; detailing; Computer Aided Design (CAD); Building Information Modelling (BIM); schedules; specifications; bills of quantities; information collaboration.

On successful completion of the unit, students will be able to analyse scenarios, make decisions and produce drawings and specifications to achieve appropriate, creative and innovative home design proposals.

Learning Outcomes

By the end of this unit, students will be able to:

- LO1 Discuss the stages of a design process and the types of information required to communicate, share and manage the project process
- LO2 Explain the different types of construction information developed through the course of a project
- LO3 Produce design propositions that address project requirements defined through feasibility stages
- LO4 Present a construction information package, highlighting the coordination of information between different project stakeholders to ensure accuracy.

Essential Content

LO1 Discuss the stages of a design process and the types of information required to communicate, share and manage the project process

Design criteria

Project type (e.g., residential, commercial, industrial, infrastructure)

Client type (e.g., private, institutional, public)

Environment/sustainability

Statutory requirements (e.g., planning permissions, health and safety, building regulations)

Project process

Feasibility

Design

Construction information

Site operations (e.g., variations/architect's instructions, on-site design)

Handover

Post-occupancy

Cost/fee information

Initial budget

Professional fees (e.g., architect/design fees, engineers' fees, project manager fees)

Construction costs (e.g., material costs, plant costs, labour costs)

Design process

Concept design

Design development

Detail design

Construction information

Construction information

Drawings (e.g., sketches, construction drawings, CAD)

Models (e.g., physical models, digital models, BIM data)

Specifications

Schedules

Information sharing

CAD formats

BIM data

Digital collaboration systems

LO2 Explain the different types of construction information developed through the course of a project

Construction drawings

Site drawings

General arrangement (GA) drawings

Consultant Information (e.g., structural, mechanical, environmental)

Details

Specifications

Preliminaries ('prelims')

Specification types (e.g., outline specification, performance specification)

Specification sections

Schedules

Door schedules

Window schedules

Fixtures/fittings schedules

Schedule of Works

Information coordination

Manual information coordination

Digital information coordination (e.g., BIM, single-model data)

Clash detection

Manual clash detection

Digital clash detection

Health and safety information

Pre-construction health and safety plan

Health and safety method statements

Risk assessments

Construction phase plans

Health and safety file

Material safety information (e.g., control of substances hazardous to health [COSHH], material handling guidelines)

LO3 Produce design propositions that address project requirements defined through feasibility stages

Feasibility

Client need

Site conditions (e.g., geotechnical, contamination, environmental impact)

Project type

Budget

Legal/statutory requirements

Design propositions

Initial/concept propositions

Design development

Design evaluation

Environmental evaluation

Design iteration

Construction information

Drawings

Specifications

Schedules

Health and safety information

LO4 Present a construction information package, highlighting the coordination of information between different project stakeholders to ensure accuracy

Project roles/stakeholders

Client

User/occupier

Architects

Engineers (e.g., structural, mechanical)

Contractors (e.g., main contractor, sub-contractors)

Project managers

Contract managers

Cost consultants/quantity surveyors

Suppliers

Manufacturers

Project relationships

Contractual relationships

Professional collaboration (e.g., information sharing, information management)

Learning Outcomes and Assessment Criteria

Pass	Merit	Distinction
<p>LO1 Discuss the stages of a design process and the types of information required to communicate, share and manage the project process</p>		<p>D1 Critically evaluate the relationship between design and project stages, highlighting the processes and procedures to ensure information coordination throughout.</p>
<p>P1 Describe the stages and activities of a construction design process.</p> <p>P2 Explain the types of information required throughout the different stages of a project process.</p>	<p>M1 Assess the relationship between design and project stages and the information sharing requirements in each.</p>	
<p>LO2 Explain the different types of construction information developed through the course of a project</p>		
<p>P3 Examine a brief to ascertain the requirements of a building project</p> <p>P4 Outline the relationships between drawings, schedules and specifications.</p>	<p>M2 Analyse the importance of clash detection and information coordination.</p>	

Pass	Merit	Distinction
<p>LO3 Produce design propositions that address project requirements defined through feasibility stages</p>		<p>D2 Evaluate a package of construction information, in relation to their coordination and accuracy.</p>
<p>P5 Create construction drawings and details using industry-standard tools and techniques.</p> <p>P6 Produce specifications, schedules and an outline construction health and safety phase plan for a given project.</p>	<p>M3 Prepare specification prelims and schedule of works, in coordination with construction drawings and details.</p>	
<p>LO4 Present a construction information package, highlighting the coordination of information between different project stakeholders to ensure accuracy</p>		
<p>P7 Present construction information to an audience of specialists and non-specialists.</p> <p>P8 Explain the coordination and information sharing between different roles and stakeholders in a construction project.</p>	<p>M4 Analyse the ways in which different forms of contractual relationships between stakeholders influence flow of information in a construction project.</p>	

Recommended Resources

Print resources

BELBIN, R. (2010), *Team Roles at Work*, Routledge

BUSSEY, P. (2019), *CDM 2015: A Practical Guide for Architects and Designers*, Routledge

CHING, F. (2011), *Building Construction Illustrated*, John Wiley & Sons

CHUDLEY, R., GREENO, R., KOVAC, K. (2020), *Chudley and Greeno's Building Construction Handbook*, Butterworth-Heinemann

CONSTRUCTION SPECIFICATIONS INSTITUTE (2011), *The CSI Construction Specifications Practice Guide*, John Wiley & Sons

HUTH, M. (2018), *Understanding Construction Drawings*, Cengage Learning

KALIN, M., WEYGANT, R., ROSEN, H., REGENER, J. (2010), *Construction Specifications Writing: Principles and Procedures*, John Wiley & Sons

LAWSON, B. (2006), *How Designers Think: The Design Process Demystified*, Routledge

MAKSTUTIS, G. (2018), *Design Process in Architecture*, Laurence King Publishing

MEIER, H., WYATT, D. (2008), *Construction Specifications*, Delmar Pub

Web resources

<https://www.architecture.com>

RIBA Plan of Work 2020
(Professional Body)

<https://www.designingbuildings.co.uk>

Project plans for building design and construction
(Wiki)

<https://www.cbuide.com>

Chartered Association of Building Engineers
(Professional Body)

<https://www.designingbuildings.co.uk>

Designing Buildings Wiki
(General Reference)

<https://www.thenbs.com>

The NBS Knowledge
(General Reference)

Links

This unit links to the following related units:

- Unit 2: Construction Technology
- Unit 4: The Construction Environment
- Unit 5: Legal and Statutory Requirements in Construction
- Unit 6: Digital Applications for Construction Information
- Unit 12: Tender & Procurement
- Unit 13: Building Information Modelling
- Unit 23: Construction Economics & Sustainability
- Unit 24: Principles of Off-site Construction
- Unit 26: Digital Applications for Building Information Modelling
- Unit 27: Law & Legal Frameworks in Quantity Surveying
- Unit 28: Group Project (Pearson-set)
- Unit 29: Contracts & Management
- Unit 30: Project Management
- Unit 32: Advanced Construction Drawing & Detailing
- Unit 39: Personal Professional Development
- Unit 47: Advanced Building Information Modelling
- Unit 52: Advanced Housing Design & Specification
- Unit 53: Advanced Off-site Construction
- Unit 54: Advanced Quantity Surveying Practice.