



Pearson BTEC Level 4

Higher National Certificate in

Construction and Built Environment

Unit 1: Construction Design Project (Pearson-set)

Level 4 – 15 Credit

Unit Code – F/618/8080

Assessment Type: Internal

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www.edulibrary.co.uk

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Please read this handbook in conjunction with departmental and unit pages on Microsoft Office Teams (including the Programme Handbook)

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1 INTRODUCTION

1.1 Purpose of the Unit Handbook

This unit handbook aims to provide learners with guidance and support with the construction design project unit of the qualification.

1.2 Introduction to the Unit

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.

1.3 Unit 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

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)

2 TEACHING AND LEARNING METHODS

Delivery will be through lectures, group workshops and tutorials. It is expected that learners undertake problem solving, further reading and research to support the guidance provided during taught sessions. Reading materials will be provided via the virtual learning environment (VLE) to support teaching but learners are encouraged to familiarise themselves with college library and online databases. Prior to each assessment, there will be series of formative feedback tutorial sessions/revision. These sessions will provide the opportunity for learners to receive constructive feedback on work/tasks prior to assessment.

3. LECTURE PROGRAMME

Week	Date	Lecture Duration (Hours)	Learning Aim	Session Aim
1	WC 02/09/2024	1.75	LO 1	- Unit introduction. - Tutor presentation of report formats, and standards. - Student to start their project plan. - Issue Assignment 1 (Assignment 1 breakdown)
2	WC 09/09/2024	1.75	LO1	- Student.-led discussion – Artificial Intelligence and emerging technologies - Student to complete Chapter One of the report: introduction, aim and objectives, significance of the project, and outline of the report.
3	WC 16/09/2024	1.75	LO1	- Student-led: stages of the design process - Chapter 2: Each student describes the stages and activities of a construction design process.
4	WC 23/09/2024	1.75	LO1	- Chapter 2: Each student to explain the types of information required throughout the different stages of a project process.
5	WC 30/09/2024	1.75	LO1	- Chapter 2: Each student to outline the relationships between drawings, schedules and specifications. - Each student to complete their logbook for the month of September.
6	WC 07/10/2024	1.75	LO2	- Student-led discussion – ‘What is a brief?’ - Each student develops a brief for the project proposals to ascertain the requirements of a building project: Chapter Three.

7	WC 14/10/2024	1.75	LO1	- Tutor/student-led: BIM - Chapter 2: Each student to assess the relationship between design and project stages and the information sharing requirements in each. - Chapter 2: Each student to analyse the importance of clash detection and information coordination
8	WC 21/10/2024	1.75	LO 2	- Student to critically evaluate the relationship between design and project stages, highlighting the processes and procedures to ensure information coordination throughout. - Students may meet with tutor, individually or in groups, to discuss their projects and receive advice in support of developing final outcomes, and report. - Each student to complete their logbook for the month of October.
	WC 28/10/2024			- STUDY REVIEW WEEK
9	WC 04/11/2024	1.75	LO1&2	- Students may meet with tutor, individually or in groups, to discuss their projects and receive advice in support of developing final outcomes, and report.
10	WC 11/11/2024	1.75	LO1&2	- Students may meet with tutor, individually or in groups, to discuss their projects and receive advice in support of developing final outcomes, and report.
11	WC 18/11/2024	1.75	LO1&2	- Submit Assignment 1: Report & Project Plan
12	WC 25/11/2024	1.75	L03	- Presentations on the use of Revit software to produce construction drawings. - Each student to complete their logbook for the month of November.

13	WC 02/12/2024	1.75	L03	- Students to navigate the user interface of the Revit software. use important navigation tools such as Zoom, Pan, View, Snap, produce title block sheet. - Assignment 1 feedback
14	WC 09/12/2024	1.75	L03	- Students to use Revit software to produce the ground floor, add new levels, create ground floor slabs (1).
15	WC 16/12/2024	1.75	L03	- Students to use Revit software to produce the ground floor, add new levels, create ground floor slabs (2). - Each student to complete their logbook for the month of December.
HOLIDAY	WC 23/12/2024			
HOLIDAY	WC 30/12/2024			
16	WC 06/01/2025	1.75	L03	- Students to use Revit software to produce upper floors, add new levels, create upper floor slabs (1). - Assignment 1 feedback
17	WC 13/01/2025	1.75	L03	- Students to use Revit software to produce upper floors, add new levels, create upper floor slabs (2).
18	WC 20/01/2025	1.75	L03	- Students to use Revit software to create railings on the floors of the building, and create walls on the floors.
19	WC 27/01/2025	1.75	L03	- Students to use Revit software to create the ceiling and roof, create the site, produce a rendered view. - Each student to complete their logbook for the month of January.
20	WC 03/02/2025	1.75	L03	- Students to use Revit software to produce schedules of building elements, save and export drawings as pdf files.
21	WC 10/02/2025	1.75	L03	- Topic: Defining specification (1) - Sample activities:

				- Teacher/student-led discussion – ‘What is a specification?’ - Each student to develop/extract specification for their project proposals from the Revit software (1).
22	WC 17/02/2025	1.75	LO3	- Each student to develop/extract specification for their project proposals from the Revit software (2). - Develop a construction health and safety phase plan for the project. - Each student to complete their logbook for the month of February.
	WC 24/02/2025			- STUDY REVIEW WEEK
23	WC 03/03/2025	1.75	LO3	- Submit Assignment 2: design propositions & logbook
24	WC 10/03/2025	1.75	LO4	- Student led- BIM - Each student to explain coordination and information sharing between different roles and stakeholders in a construction project.
25	WC 17/03/2025	1.75	LO4	- Students to analyse the ways in which different forms of contractual relationships between stakeholders influence flow of information in a construction project. - Students to evaluate a package of construction information, in relation to their coordination and accuracy - Students may meet with tutor, individually or in groups, to discuss their projects and receive advice in support of developing final outcomes, and report. - Assignment 2 feedback
26	WC 24/03/2025	1.75	LO4	- Topic: Reflective account. - Sample activities:

				- Working individually, students review a range of reports to identify: - o Criteria for evaluation - o Evaluation technique - o Project success/failure - Start the performance Review document.
27	WC 31/03/2025	1.75	LO4	- Topic: Project surgery - Sample activities: - Students may meet with tutor, individually or in groups, to discuss their projects and receive advice in support of developing final outcomes, and presentation. - Complete the performance Review document
28	WC 07/04/2025	1.75	LO4	- Topic: Presenting reports - Sample activities: - Discussion of effective presentation techniques. - Support/Progress Session for presentation Students may meet with tutor, individually or in groups, to discuss their projects and receive advice in support of developing final outcomes, and presentation.
	WC 14/04/2025	HOLIDAY		
	WC 21/04/2025	HOLIDAY		
29	WC 28/04/2025	1.75	LO4	- Submit Assignment 3 – PPT Presentation & Performance Review document.
30	WC 05/05/2025	1.75	LO4	- Give feedback Assignment 3
31	WC 12/05/2025	1.75	LO4	- Give feedback Assignment 3

32	WC 19/05/2025	1.75	LO4	- Resubmissions – Assignments - End of Unit
	WC 26/05/2025			



4. ASSESSMENT SCHEDULE

4.1 Detailed Description of Assessment Scheme

Submission requirements to Complete the Project Successful Completion:

1. **A Project Plan**- This should include aim and objectives, project outcome, project timeframes, project information, and project stages.
2. **A Log Book** - This offers a means to evidence the project development process and ongoing reflection. It should provide evidence that you have thought about the direction of your project, what challenges you have encountered and the steps taken to address.
3. **A 2,500 – 3000 word Academic/Professional Report** - This should be written in a concise, formal style using single spacing and font size 12. You are required to make use of headings, paragraphs and subsections as appropriate, and all work must be supported with research and referenced using the Harvard referencing system. Also, provide a bibliography using the Harvard referencing system.
4. **A 10 to 15 minute Presentation in an appropriate format** – Outlining your project outcomes.
5. **A Performance Review**-completed at the end of the project, allowing you to record the reflection and evaluation of your own learning through the project and to consider your individual performance. The above can be in the format of written reports, presentations, videos, blogs or any other form of communication.

NB: There will be ample opportunities for assessment resubmissions. Resubmission dates will be communicated in due course.

4.2 Learning Outcomes and Assessment Criteria

Pass	Merit	Distinction
LO1: Discuss the stages of a design process and the types of information required to communicate, share and manage the project process		
P1 Describe the stages and activities of a construction design process.	M1 Assess the relationship between design and project stages and the information sharing requirements in each	D1 Critically evaluate the relationship between design and project stages, highlighting the processes and procedures to ensure information coordination throughout.
P2 Explain the types of information required throughout the different stages of a project process.		
LO2 Explain the different types of construction information developed through the course of a project		

P3 Examine a brief to ascertain the requirements of a building project	M2 Analyse the importance of clash detection and information coordination.	
P4 Outline the relationships between drawings, schedules and specifications.		

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

4.3 Marking Standards

The controlled assessments will be marked in accordance with the Pearson standards. It will also meet requirements set by the Regulated Qualifications Framework (RQF). Learners are expected to make reasonable attempts towards problem solving. A coherent, well-balanced and organised approach to tasks with clear notations and evidence will be rewarded.

5. LEARNING RESOURCES

The library offers services and resources needed for this unit. The following resources have been provided to assist your studies in this Unit:

- Access to specialist databases.
- Class notes and lecture slides.
- Library electronic services.
- Links to online journal articles.
- Open-access computers and printers.
- Reprographic services.
- Staff expertise and advice.
- Librarian and team of learning support staff.

If you have any queries about how to access any of these learning resources, please ask the Unit Leader.

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://bit.ly/2WnuyCD> RIBA Plan of Work 2020 (Professional Body)
<https://bit.ly/3ld8PaW> Project plans for building design and construction (Wiki)
<https://bit.ly/3rKsWPc> Chartered Association of Building Engineers (Professional Body)
<https://bit.ly/2V1JwOr> Designing Buildings Wiki (General Reference)

www.thenbs.com The NBS Knowledge (General Reference)

Type of Resource	Resource Titles	Links
Website	Artificial intelligence (AI)	https://www.techtarget.com/searchenterpriseai/definition/AI-Artificial-Intelligence
Website	AI and construction	https://www.designingbuildings.co.uk/wiki/AI_and_construction
Website	Embracing AI	https://future.rics.org/case-studies/algorithms-and-aits-just-the-beginning
Website	Artificial intelligence: Development, risks, and regulation	https://lordslibrary.parliament.uk/artificial-intelligence-development-risks-and-regulation/
Website	The risks of Artificial Intelligence	https://jarnoduursma.com/blog/the-risks-of-artificial-intelligence/
Website	5 AI powered ideas for supercharging productivity	https://iuk.ktnuk.org/perspectives/revolutionising-construction-5-ai-powered-ideas-for-supercharging-productivity/
Website	What does the rise of AI mean for Architectural Technologists	https://architecturaltechnology.com/resource/what-does-the-rise-of-ai-mean-for-architectural-technologists.html
Website Article + Report	How are Architects using AI right now and what are they using it for?	https://www.architecture.com/knowledge-and-resources/knowledge-landing-page/artificial-intelligence-in-architecture https://www.architecture.com/knowledge-and-resources/resources-landing-page/riba-ai-report-2024
Website Video	Top 5 Construction Tech Trends of 2024	https://www.theb1m.com/video/construction-tech-trends-2024
Website News Article	The role of artificial intelligence in the Construction Industry	https://www.pbctoday.co.uk/news/digital-construction-news/construction-technology-news/artificial-intelligence-in-the-construction-industry/134175/

Website Whitepaper	How AI Can Transform the Built Environment from the Ground Up	https://www.bsigroup.com/siteassets/pdf/en/insights-and-media/insights/white-papers/bsi-ai-essays-rahul-s-hah.pdf
Website Resources	Generative Artificial Intelligence	https://www.qaa.ac.uk/membership/membership-areas-of-work/generative-artificial-intelligence
Website Industry Playbook	CIOB Artificial Intelligence (AI) Playbook 2024	https://www.ciob.org/industry/research/AI-Playbook