Unit 44: Conversion and Adaptation of Buildings

Unit code: H/600/0327

QCF Level 3: BTEC Nationals

Credit value: 10

Guided learning hours: 60

Aim and purpose

The aim of this unit is to enable learners to gain an understanding of the reasons for, and to know the processes involved in the conversion and adaptation of buildings, and to develop skills in the design and evaluation of the conversion and adaptation of buildings.

Unit introduction

All buildings have a lifespan at the end of which they are demolished, or their purpose and use redefined. This results in buildings being converted or adapted to serve the new use, which is defined by the client and end users of the building. Conversion and adaptation is an important part of the overall construction process. Technological changes, client requirements and socio-economic factors are some of the reasons for changes.

This unit will give learners an understanding of why we convert and adapt buildings, and why a structured approach to providing feasible solutions must be followed. Learners will evaluate the potential of an existing building to fulfil a newly defined function. They will also be able to produce details of conversion and adaptation in accordance with the legislative requirements required by planning authorities and set out in the Building Regulations.

This unit builds on prior knowledge of construction technology, gained through the units *Construction Technology and Design in Construction and Civil Engineering* and *Building Technology in Construction*. It also builds on the skills gained from the units *Building Surveying in Construction* and *Graphical Detailing in Construction and the Built Environment*.

It is recommended that this unit is delivered at a later stage in any programme, when learners have completed the units mentioned above.

Learning outcomes

On completion of this unit a learner should:

1 Understand the reasons for redefining the use of a building

2 Know the processes involved in the conversion and adaptation of buildings

3 Be able to evaluate conversion and adaptation of an existing building

4 Be able to design for the conversion and adaptation of an existing building.

Unit content

1 Understand the reasons for redefining the use of a building

Redefining use: extension, conversion and adaptation

Factors: social factors; technological factors; client requirements; end user requirements; environmental and sustainability factors

2 Know the processes involved in the conversion and adaptation of buildings

Processes: stages of process, legislative requirements

Stages of process: client brief; survey of building; feasibility studies; working drawings; services drawings

Legislative requirements: health and safety including CDM (2007); Building Regulations; planning authority requirements

3 Be able to evaluate conversion and adaptation of an existing building

Assess building: measured surveys; condition surveys; possible alternative uses

Feasibility: financial and technical feasibility; local authority inquiries; cost and budget; needs of client; environmental issues; conclusions

4 Be able to design for the conversion and adaptation of an existing building

Working drawings: plans; elevations; sections; component details; structural details

Service drawings: provision of lighting, heating and ventilation; water supply and drainage including connection to existing services

Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	**To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:**	**To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:**
P1 explain the factors that influence the conversion and adaptation of buildings [IE2, IE4, IE6]	**M1** produce a flow chart of the processes involved in a typical conversion and adaptation project	**D1** evaluate the conversion and adaptation of an existing low-rise building in terms of sustainability principles
P2 describe the processes involved in the conversion and adaptation of buildings [IE2, IE4, IE6]	**M2** produce documentation to support planning and Building Regulations approval	
P3 outline the legislative requirements of conversion and adaptation projects [IE2, IE4, IE6]		
P4 assess a building for conversion and adaptation [IE2, IE4, IE6, CT1, CT5, CT6]	**M3** compare possible alternative uses for a given building in terms of feasibility and cost.	**D2** evaluate a conversion and adaptation proposal in terms of the structural capacity of the existing building.
P5 prepare a feasibility report for the conversion or adaptation of a building [IE2, IE4, IE6, CT1, CT5, CT6, SM2, SM3]		
P6 produce working drawings for the proposed conversion and adaptation [IE2, IE4, IE6, CT1, CT5, CT6, SM2, SM3]		

Assessment and grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	**To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:**	**To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:**
P7 produce drawings for internal and external services for the proposed conversion and adaptation. [IE2, IE4, IE6, CT1, CT5, CT6, SM2, SM3]		

PLTS: This summary references where applicable, in the square brackets, the elements of the personal, learning and thinking skills which are embedded in the assessment of this unit. By achieving the criteria, learners will have demonstrated effective application of the referenced elements of the skills.

Key	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

Essential guidance for tutors

Delivery

Tutors delivering this unit have opportunities to use a wide range of techniques. Lectures, discussions, seminar presentations, site visits, supervised practicals, videos/DVDs, research using the internet and/or library resources and use of personal and/or industrial experience are all suitable. Delivery should stimulate, motivate, educate and enthuse learners. Visiting expert speakers could add to the relevance of the subject.

As this unit builds on prior knowledge of construction technology, gained through the units *Construction Technology and Design in Construction and Civil Engineering* and *Building Technology in Construction*, as well as skills gained through units *Building Surveying in Construction* and *Graphical Detailing in Construction and the Built Environment*, it is recommended that it is at a later stage in any programme, when learners have completed these units.

Delivery and assessment can be linked with other units such as *Structural Mechanics in Construction and Civil Engineering*. Learning outcomes 1 and 2 are sequential.

Learning outcome 1 is intended to develop an understanding of the reasons for redefining the use of a building. Learners should develop a thorough understanding of the factors that influence the conversion and adaptation of an existing building.

Learning outcome 2 is designed to help learners understand the processes involved in the conversion and adaptation of buildings. Learners should have access to examples and/or case studies in order to understand how these processes interlink with each other. An understanding of the relevant legislative requirements is paramount and learners should have a clear view of the limitations of conversion and adaptation work.

Learning outcomes 3 and 4 are essentially practical. These give learners opportunities to carry out a realistic conversion project and produce high quality results. Learning outcome 3 deals with evaluating the possibility of converting and adapting an existing building. This is where learners begin to put theory into practice. The majority of work should be carried out in a practical context and the role of the tutor is to facilitate rather than lead. The emphasis should be on relating survey work to developing feasible proposals, keeping in view the legislative requirements.

Learning outcome 4 deals with the production of working and services drawings. It is the final part of the process where learners will apply their technical and graphical skills to produce a set of drawings.

Wherever possible, delivery of the unit should be supported by visits to construction sites. Learners should view ongoing conversion projects with access to briefs, feasibility studies and sets of drawings.

Group activities are permissible, but tutors will need to ensure that individual learners have equal experiential and assessment opportunities.

Health, safety and welfare issues are paramount and should be reinforced through close supervision of all workshops and activity areas, and risk assessments must be undertaken before practical activities are taken. Centres are advised to read the *Delivery approach* section in the specification, and *Annexe H: Provision and Use of Work Equipment Regulations 1998 (PUWER).*

Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan demonstrates one way in planning the delivery and assessment of this unit.

Topic and suggested assignments/activities and/assessment
Introduction to the unit
Whole-class, tutor-led discussion: life cycle of buildings
Class discussion: why should we convert or adapt a building?
Whole-class presentation: factors influencing conversion and adaptation, social factors with examples
Class discussion: factors influencing conversion and adaptation, changes in technology
Tutor delivery: factors influencing conversion and adaptation, client requirements, processes involved, client brief
Assignment 1: Conversion and Adaptation
Class discussion: processes involved, survey of a building – necessary observations and recording of data, measured and condition surveys
Tutor delivery: processes involved, elements of a feasibility study, importance of clarity, relating it to the client brief, evaluating alternative uses and research into such projects
Individual learner work: production of a set of drawings
Tutor input: legislative requirements: planning, building regulations, health and safety, especially CDM (2007)
Assignment 2: Feasibility
Learner activity: site visit to a conversion project with access to documentation such as client brief, feasibility and drawings
Tutor delivery: client brief for a conversion project
Group exercise: practical fieldwork carrying out a measured and condition survey
Learner exercise: recording field data/observations
Tutor delivery: preparing feasibility reports
Learner exercise: possible alternative uses and their evaluation
Group exercise: presentation of ideas
Learner exercise: producing working drawings: plans, sections, elevations, structural and component details
Learner exercise: producing services drawings: provision of lighting, heating and ventilation, water supply and drainage including connection to existing services
Assignment 3: Conversion and Adaptation Project
Review of unit delivery and assessment

Assessment

Evidence for this unit can be gathered from a variety of sources, including well-planned investigative assignments, case studies or reports of practical assignments.

Many suitable forms of assessment can be used and tutors are encouraged to consider and adopt these where appropriate. Some example assessment approaches are suggested below. However, these are not intended to be prescriptive or restrictive and are provided as an illustration of the alternative forms of assessment evidence that would be acceptable.

It is recommended that evidence for achieving the learning outcomes is generated through well-planned course work, assignments and projects. Assessment may be formative and summative and both may feature as part of the process. Although assessments must focus on the individual achievement of each learner, group work and role-play activities may contribute. Integrative assignments and project work will help to link this unit with other related units. Evidence should demonstrate the ability to draw detailed architectural style drawings both manually and by using CAD and other current, modern ICT facilities.

Where available, evidence from the workplace can also be incorporated to enhance the learning outcomes provided that this evidence is appropriate and authenticated as the learner's own work. The volume of evidence required for each assessment should take into account the overall number of assessments within this unit and the design of the overall teaching programme.

The structure of the unit suggests that the grading criteria could be addressed fully by using three assignments. The first of these would cover P1, P2, P3, M1, M2 and D1, the second would cover P4, P5, M3 and D2 and the third P6 and P7.

To achieve a pass grade learners must meet the seven pass criteria listed in the grading criteria grid.

For P1, learners must explain the factors influencing the conversion and adaptation of buildings. They should take a holistic view including social factors, technological changes and client requirements. Evidence should be in the form of an appropriately presented report.

For P2, learners must describe the processes involved in the conversion and adaptation of buildings. Each process should be described in adequate detail demonstrating clearly the linkage between and among these processes. Evidence could be in the same form as for P1.

For P3, learners must outline the legislative requirements of conversion and adaptation projects. These should include local planning authority and Building Regulations approval and health and safety requirements, especially those outlined under CDM (2007). Evidence could be in the same form as for P1.

For P4, learners must assess a building for conversion and adaptation by carrying out a survey of the building. Learners should work to a given client brief. They should carry out a measured and condition survey of the building to be converted and adapted. Evidence should be in the form of a survey report supported by well-annotated sketches, illustration and/or pictures.

For P5, learners must perform a feasibility report for converting or adapting a building. They should make clear references to the client brief and the findings of the survey work undertaken in P4. Evidence should be in the form of a report supported by well-annotated sketches.

For P6, learners must produce working drawings for the proposed conversion and adaptation. These should include plans, sections, elevations, component details and structural details. Evidence could be in the form of a set of drawings following standard conventions, correct drawing standards, layouts and presentation techniques.

For P7, learners must produce drawings for internal and external services for the proposed conversion and adaptation. The requirements are as for P6.

To achieve a merit grade learners must meet all of the pass grade criteria and the three merit grade criteria.

For M1, learners must produce a well-annotated flow chart of the processes involved in a typical conversion and adaptation project. The flowchart should clearly demonstrate an understanding of the interrelationship of the processes. This can be set as an extension to P2.

For M2, learners must produce documentation for planning and Building Regulations approval. This can be set as an extension to P2 and/or P3. Evidence could be in the form of a set of documents demonstrating the learner's presentational skills and understanding of the legislative requirements.

For M3, learners must compare possible alternative uses of a given building in terms of feasibility and cost. This should build on the evidence provided for P4 and P5. The alternative uses must be sensible and feasible and relate to the potential needs of the client and the intended end users. Costs should be relative and need not be precise.

To achieve a distinction grade learners must meet all of the pass and merit grade criteria and the two distinction grade criteria.

For D1, learners must evaluate the sustainability potential of an existing low-rise building which is being converted and adapted. They should explore the possibility of incorporating sustainable materials and services so improving on the sustainability of the existing building. Evidence should be in the form of a report supported by relevant data and illustrations.

For D2, learners must evaluate the structural capacity of an existing building for the proposed conversion and adaptation. They should be able to calculate loads resulting from the proposed design of the conversion and be able to evaluate whether the existing structure is adequate enough or whether structural alterations will be needed. Evidence could be in the form of a report supported by appropriate details.

Programme of suggested assignments

The following table shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Edexcel assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, P3, M1, M2, D1	Conversion and Adaptation	You are working as a trainee junior technician in a design consultancy. You have been asked to produce a report on conversion and adaptation of low-rise buildings.	A report containing written responses on the factors influencing conversion and adaptation of buildings as well as the processes involved in such projects.
P4, P5, M3, D2	Feasibility	You are working as a trainee junior technician in a design consultancy. You have been asked to assess a building and produce a feasibility report for the conversion and adaptation of that building.	A portfolio containing survey data and a feasibility report.
P6, P7	Conversion and Adaptation Project	You are working as a trainee junior technician in a design consultancy. You have been asked to produce a set of drawings to support the conversion and adaptation of a building.	A portfolio containing a set of working drawings, both for the construction and the services.

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

This unit forms part of the BTEC Construction and the Built Environment sector suite. This unit has particular links with the following unit titles in the Construction and the Built Environment suite:

Level 1	Level 2	Level 3
		Construction Technology and Design in Construction and Civil Engineering
		Building Technology in Construction
		Building Surveying in Construction
		Graphical Detailing in Construction and the Built Environment

Achievement of the learning outcomes of this unit will contribute towards the skills, knowledge and understanding of several units of the Edexcel Level 3 NVQ in Built Environment Design, particularly:

- Unit C01: Produce and recommend detailed design solutions
- Unit O05: Carry out and present condition surveys
- Unit O12: Monitor projects.

Essential resources

Learners should have access to a wide range of library resources, including textbooks and journals, government and industry wide publications, BRE Digests, professional journals, the internet and other research materials, and other associated documents.

Where possible, supervised visits to building sites will be valuable in contextualising the unit and demonstrating real examples of conversion projects.

Employer engagement and vocational contexts

The use of vocational contexts is essential in the delivery and assessment of this unit. Much of the work can be set in the context of case studies of local employers. Visits to sites/shows/exhibitions will enhance this particular part of the unit very well.

Support to enable centres to initiate and establish links to industry, and to networks arranging visits to industry and from property practitioners is given below:

- Learning and Skills Network – www.vocationallearning.org.uk
- National Education and Business Partnership Network – www.nebpn.org
- The Royal Institution of Chartered Surveyors – www.rics.org
- Work Experience/Workplace learning frameworks – Centre for Education and Industry (CEI University of Warwick) – www.warwick.ac.uk/wie/cei/

Indicative reading for learners

Textbooks

Ching F D K – *Architectural Graphics* (John Wiley & Sons Inc, 2002) ISBN 0471209066

Chudley R – *Building Construction Handbook, 7th Edition* (Butterworth-Heinemann, 2008) ISBN 0750686227

Dickinson P and Thornton N – *Cracking and Building Movement* (RICS, 2004) ISBN 184219156X

Douglas J – *Building Adaptation* (Butterworth-Heinemann, 2006) ISBN 0750666676

Glover P – *Building Surveys, 6th edition* (Butterworth-Heinemann, 2006) ISBN 0750681284

Riley M and Howard C – *Construction Technology 1 House Construction, 2nd Revised Edition* (Palgrave, 2008) ISBN 0230203620

Williams A R – *Spon's Practical Guide to Alterations and Extensions* (E & FN Spon, 2008) ISBN 0415434262

Journals

Architects Journal – Emap

The Builder – Hanley Wood

BRE Digests and publications – BRE

Construction News – Emap

Websites

www.architecture.com	Royal Institute of British Architects
www.ciat.org.uk	Chartered Institute of Architectural Technologists
www.greenspec.co.uk	Directory of sustainable construction products
www.thenbs.com	National Building Services
www.planningportal.gov.uk	Planning and building regulations resource
www.rics.org	Royal Institution of Chartered Surveyors

Delivery of personal, learning and thinking skills (PLTS)

The following table identifies the PLTS opportunities that have been included within the assessment criteria of this unit:

Skill	When learners are ...
Independent enquirers	producing feasibility reports, identifying questions and problems to resolve carrying out research to discuss the sustainability potential of an existing building evaluating the structural capacity of an existing building
Self-managers	organising time and resources and prioritising actions when producing working drawings for the proposed conversion
Creative thinkers	producing a flow chart of the processes involved in a typical conversion project.

Although PLTS are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Skill	When learners are ...
Creative thinkers	trying out alternative or new design solutions
Independent enquirers	exploring issues from different perspectives.

Functional Skills – Level 2

Skill	When learners are ...
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	discussing the sustainability potential of an existing building
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	outlining legislative requirements
ICT – Develop, present and communicate information	
Enter, develop and format information independently to suit its meaning and purpose including: • text and tables • images • numbers • records	preparing reports and presenting results of their evaluation and design
Present information in ways that are fit for purpose and audience	presenting evidence of measured and condition surveys
Mathematics	
Understand routine and non-routine problems in a wide range of familiar and unfamiliar contexts and situations	producing working drawings
English	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	discussing the sustainability potential of an existing building
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	producing feasibility reports evaluating alternative uses