

**Level 3 - Principal Learning
Specification (2764-03)
Assessment 2013 onwards**



Construction and the Built Environment

This Principal Learning specification should be read in conjunction with:

- Specimen assessment materials and mark schemes for Principal Learning
- Teacher guidance materials for Principal Learning
- Examiners' Reports for Principal Learning

This specification will be published annually on our website **www.cityandguilds.com**

We will notify centres in writing of any changes to this specification. We will also publish changes on our website. The version of the specification on our website will always be the most up-to-date version, although it may be different from printed versions.

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1 Introduction

1.1 Why choose City & Guilds?

City & Guilds is a household name for vocational qualifications. City & Guilds offers over 500 awards across a range of industries. With over 8500 centres in over 100 countries, City & Guilds is recognised by employers worldwide. It works closely with employers and industry bodies to ensure that its qualifications provide the benchmark standard for workplace skills and knowledge.

Principal Learning is a blend of academic and vocational skills and that is why City & Guilds is the ideal choice for any school, college or consortium looking to offer them.

Why is City & Guilds so popular?

Specifications

These are designed to the highest standards, so that teachers, learners and learners' parents or guardians can be confident that a City & Guilds award provides an accurate measure of achievement. Assessment structures have been designed to achieve a balance between rigour, reliability and demands on learners and teachers.

Support

City & Guilds runs the most extensive programme of Principal Learning support meetings available in the UK; these are free of charge in the first years of a new specification and are offered at a very reasonable cost thereafter. These meetings explain the specification and suggest practical teaching strategies and approaches that really work.

Service

We are committed to providing an efficient and effective service and we are at the end of a phone when you need information, advice or guidance. We will try to resolve issues the first time you contact us and will work with you to find the solution.

Ethics

City & Guilds is a registered charity. We have no shareholders to pay. We exist solely for the good of education. Any surplus income is ploughed back into educational research and our service to you, our customers. We don't profit from education, you do.

If you are an existing customer, we thank you for your support. If you are thinking of adopting City & Guilds for Principal Learning, we look forward to welcoming you.

1.2 Why choose the Construction and the Built

Environment Principal Learning?

The Construction and the Built Environment Principal Learning provides a programme of applied and practical learning which introduces learners to the fabric of the world in which we live and its impact on individuals and communities. This Principal Learning gives learners the opportunity:

- to acquire knowledge of the construction and built environment industries
- to develop understanding of the extent and significance of the built environment and of the activities which shape, develop and influence it
- to develop skills relevant to the construction and built environment industries.

The Principal Learning will enable learners to progress into further and higher education and future employment.

1.3 How do I start using this specification?

You will need to register your centre with us. (See Section 5.2.) This will enable us to ensure that you receive all the material you need to help you to deliver units and to enter your learners for examinations. This is particularly important where examination material is issued before the entry deadline. You can let us know by completing the appropriate registration forms. We will send copies to your exams officer and they are also available on the City & Guilds website: www.cityandguilds.com

If your centre is new to City & Guilds, please contact your local City & Guilds Regional Office.

2 Specification at a glance

2.1 Level 3 Construction and the Built Environment Principal Learning at a glance

All seven units are compulsory

Unit 1 60 GLH

Design the built environment design factors
--

Externally assessed

Unit 2 90 GLH

Design the built environment stages in the design and planning process

Internally set and marked

Unit 3 90 GLH

Design the built environment physical and environmental influences

Internally set and marked

Unit 4 60 GLH

Create the built environment health, safety and environmental influences

Externally assessed

Unit 5 90 GLH

Create the built environment management processes
--

Internally set and marked

Unit 6 90 GLH

Value and use of the built environment adding value to the wider community

Internally set and marked

Unit 7 60 GLH

Value and use of the built environment protecting and maintaining
--

Externally assessed

3 Principal Learning

3.1 Personal, Learning and Thinking Skills

The Framework of Personal, Learning and Thinking Skills 11-19 comprises six groups of skills that, together with the Functional Skills of English, mathematics and ICT, are essential to success in learning, life and work. For each group there is a focus statement that identifies the main PLTS in that group. This is followed by a set of outcome statements that are indicative of behaviours and personal qualities associated with each group of skills.

Each group of skills is distinctive and coherent. The groups are also inter-connected. Learners are likely to encounter skills from several groups in any one learning experience.

Listed below are the PLTS that are integrated within the assessment criteria in each unit. A copy of the PLTS framework should be given to each learner. Following these descriptors is a table showing the PLTS in the seven units of the Level 3 Construction and the Built Environment Principal Learning.

Independent enquirers

Focus:

Young people process and evaluate information in their investigations, planning what to do and how to go about it. They take informed and well-reasoned decisions, recognising that others have different beliefs and attitudes.

Young people:

- IE1 identify questions to answer and problems to resolve
- IE2 plan and carry out research, appreciating the consequences of decisions
- IE3 explore issues, events or problems from different perspectives
- IE4 analyse and evaluate information, judging its relevance and value
- IE5 consider the influence of circumstances, beliefs and feelings on decisions and events
- IE6 support conclusions, using reasoned arguments and evidence

Creative thinkers

Focus:

Young people think creatively by generating and exploring ideas, making original connections. They try different ways to tackle a problem, working with others to find imaginative solutions and outcomes that are of value.

Young people:

- CT1 generate ideas and explore possibilities
- CT2 ask questions to extend their thinking
- CT3 connect own and others' ideas and experiences in inventive ways
- CT4 question own and others' assumptions
- CT5 try out alternatives or new solutions and follow ideas through
- CT6 adapt ideas as circumstances change

Reflective learners

Focus:

Young people evaluate their strengths and limitations, setting themselves realistic goals with criteria for success. They monitor their own performance and progress, inviting feedback from others and making changes to further their learning.

Young people:

- RL1 assess themselves and others, identifying opportunities and achievements
- RL2 set goals with success criteria for their development and work
- RL3 review progress, acting on the outcomes
- RL4 invite feedback and deal positively with praise, setbacks and criticism
- RL5 evaluate experiences and learning to inform future progress
- RL6 communicate their learning in relevant ways for different audiences

Team workers

Focus:

Young people work confidently with others, adapting to different contexts and taking responsibility for their own part. They listen to and take account of different views. They form trusting relationships, resolving issues to reach agreed outcomes.

Young people:

- TW1 co-operate with others to work towards common goals
- TW2 reach agreements, managing discussions to achieve results
- TW3 adapt behaviour to suit different roles and situations
- TW4 show fairness and consideration to others
- TW5 take responsibility, showing confidence in themselves and their contribution
- TW6 provide constructive support and feedback to others

Self-managers

Focus:

Young people organise themselves, showing personal responsibility, initiative, creativity and enterprise with a commitment to learning and self-improvement. They actively embrace change, responding positively to new priorities, coping with challenges and looking for opportunities.

Young people:

- SM1 seek out challenges or new responsibilities and show flexibility when priorities change
- SM2 work towards goals, showing initiative, commitment and perseverance
- SM3 organise time and resources, prioritising actions
- SM4 anticipate, take and manage risks
- SM5 deal with competing pressures, including personal and work-related demands
- SM6 respond positively to change, seeking advice and support when needed

Effective participators

Focus:

Young people actively engage with issues that affect them and those around them. They play a full part in the life of their school, college, workplace or wider community by taking responsible action to bring improvements for others as well as themselves.

Young people:

EP1 discuss issues of concern, seeking resolution where needed

EP2 present a persuasive case for action

EP3 propose practical ways forward, breaking these down into manageable steps

EP4 identify improvements that would benefit others as well as themselves

EP5 try to influence others, negotiating and balancing diverse views to reach workable solutions

EP6 act as an advocate for views and beliefs that may differ from their own

This table shows the coverage of PLTS in the seven units of the Level 3 Construction and the Built Environment Principal Learning.

Level 3 Construction and the Built Environment Principal Learning						
PLTS	IE	CT	RL	TW	SM	EP
Unit 1	*		*		*	*
Unit 2	*	*		*	*	
Unit 3	*	*				
Unit 4	*				*	
Unit 5	*		*			
Unit 6	*	*	*			*
Unit 7	*	*				*

3.2 Functional Skills signposting

The units may use and/or contribute towards the underpinning skills and knowledge of the Functional Skills in the following areas depending on the precise nature of the work done in the Principal Learning.

The Principal Learning	Functional Skills		
Unit 1 Design the built environment: the design factors	<ul style="list-style-type: none"> • Speaking and listening Level 2 • Reading Level 2 • Writing Level 2 	<ul style="list-style-type: none"> • Representing situations using Mathematics Level 2 • Analysing and processing using Mathematics Level 2 • Interpreting and presenting results Level 2 	<ul style="list-style-type: none"> • Use ICT systems Level 2 • Find and select information Level 2 • Develop, present and communicate information Level 2
Unit 2 Design the built environment: stages in the design and planning process	<ul style="list-style-type: none"> • Speaking and listening Level 2 • Reading Level 2 • Writing Level 2 	<ul style="list-style-type: none"> • Representing situations using Mathematics Level 2 • Analysing and processing using Mathematics Level 2 • Interpreting and presenting results Level 2 	<ul style="list-style-type: none"> • Use ICT systems Level 2 • Find and select information Level 2 • Develop, present and communicate information Level 2
Unit 3 Design the built environment: physical and environmental influences	<ul style="list-style-type: none"> • Speaking and listening Level 2 • Reading Level 2 • Writing Level 2 	<ul style="list-style-type: none"> • Representing situations using Mathematics Level 2 • Analysing and processing using Mathematics Level 2 • Interpreting and presenting results Level 2 	<ul style="list-style-type: none"> • Use ICT systems Level 2 • Find and select information Level 2 • Develop, present and communicate information Level 2
Unit 4 Create the built environment: health, safety and environmental influences	<ul style="list-style-type: none"> • Speaking and listening Level 2 • Reading Level 2 • Writing Level 2 	<ul style="list-style-type: none"> • Representing situations using Mathematics Level 2 • Analysing and processing using Mathematics Level 2 • Interpreting and presenting results Level 2 	<ul style="list-style-type: none"> • Use ICT systems Level 2 • Find and select information Level 2 • Develop, present and communicate information Level 2

<p>Unit 5 Create the built environment: management processes</p>	<ul style="list-style-type: none"> • Speaking and listening Level 2 • Reading Level 2 • Writing Level 2 	<ul style="list-style-type: none"> • Representing situations using Mathematics Level 2 • Analysing and processing using Mathematics Level 2 • Interpreting and presenting results Level 2 	<ul style="list-style-type: none"> • Use ICT systems Level 2 • Find and select information Level 2 • Develop, present and communicate information Level 2
<p>Unit 6 Value and use of the built environment: adding value to the wider community</p>	<ul style="list-style-type: none"> • Speaking and listening Level 2 • Reading Level 2 • Writing Level 2 	<ul style="list-style-type: none"> • Representing situations using Mathematics Level 2 • Analysing and processing using Mathematics Level 2 • Interpreting and presenting results Level 2 	<ul style="list-style-type: none"> • Use ICT systems Level 2 • Find and select information Level 2 • Develop, present and communicate information Level 2
<p>Unit 7 Value and use of the built environment: protecting and maintaining</p>	<ul style="list-style-type: none"> • Speaking and listening Level 2 • Reading Level 2 • Writing Level 2 	<ul style="list-style-type: none"> • Representing situations using Mathematics Level 2 • Analysing and processing using Mathematics Level 2 • Interpreting and presenting results Level 2 	<ul style="list-style-type: none"> • Use ICT systems Level 2 • Find and select information Level 2 • Develop, present and communicate information Level 2

3.3 The three themes of the Construction and the Built Environment Principal Learning

The Principal Learning of the Construction and the Built Environment Principal Learning is centred on three themes:

- 1 Design the built environment
- 2 Create the built environment
- 3 Value and use of the built environment.

This thematic approach provides an opportunity to make explicit the whole built environment cycle and reflects its nature and complexity. The programme of learning provides the thematic approach to the built environment and includes: how solutions to needs are designed; what processes are involved in creating buildings and structures; the value and uses of those buildings and structures and the impact they have on communities and individuals.

3.4 Level 3 Units

Level 3 Unit 1: Design the built environment: design factors

What is this unit about?

The purpose of this unit is for learners to explore the factors that affect the design process. Learners will consider the changes in style and attitude towards the built environment that have occurred over time, and the impact of political policies and priorities on design. The unit also covers the built environment's response to community needs and social integration, as well as the relationship between function, form and visual appearance.

This unit, alongside the others within the Level 3 Principal Learning in Construction and the Built Environment, has been designed to allow learners the opportunity to develop a range of Personal,

Learning and Thinking Skills (PLTS), and to demonstrate these on more than one occasion. This approach will allow them to build towards a full range of PLTS.

Learning outcomes

The learner will:

1. understand how historical, political, economic, social, infrastructural and aesthetic factors affect design
2. know how and why the built environment has changed over time
3. understand how the built environment adapts to meet changing political, economic, social, infrastructural and aesthetic requirements.

Assessment criteria

1. Factors that affect the design of the built environment

The learner can:

- 1.1 assess the various factors that affect the design of the built environment (IE5):
 - a. historical
 - b. political
 - c. economic
 - d. social
 - e. infrastructural, including transport
 - f. aesthetic
- 1.2 compile a schedule of important design factors to be considered for a new development (SM3)
- 1.3 perform a simple environmental assessment for a new development (SM4) (EP1).

2. The development of the built environment over time

The learner can:

- 2.1 analyse the ways in which the built environment has developed over time in terms of (IE4, 5):
 - a. changing styles
 - b. changing approaches
 - c. different political policies and priorities, including sustainability
 - d. different forms of private and public funding
 - e. the cyclical nature of economic growth and recession
- 2.2 produce and interpret documents which illustrate changing styles and approaches in the design of the built environment, in the form of (IE4) (RL6):
 - a. sketches
 - b. drawings
 - c. schedules
 - d. specifications.

3. The adaptation of the built environment to meet changing needs

The learner can:

- 3.1 evaluate how changing priorities, funding regimes and the state of the economy have affected development of the existing built environment (IE4, 5)
- 3.2 evaluate the response of the built environment over time in terms of (IE3, 4, 5):
 - a. community needs
 - b. social integration
 - c. the contribution to social engineering
 - d. the impact of infrastructural requirements including transport
 - e. the relationship between function, form and visual appearance for:
 - o various architectural styles
 - o landmark projects.

Where the assessment criteria show a direct link to an area of the PLTS framework, it is referenced here. Further information on PLTS is available in Section 3.1 of this specification and also within this unit in the section on Personal, Learning and Thinking Skills.

Guided learning hours

It is recommended that a minimum of 60 guided learning hours be spent on this unit.

Assessment

The assessment method for this unit will be external assessment. Learners will complete a two-hour written examination.

This unit focuses mainly on knowledge and understanding, and is therefore deemed to be an appropriate vehicle for the externally assessed component of Principal Learning at Level 3. The assessment is by means of a written test, with extended answers as opposed to the multiple choice format used at Level 1 and the short answer format used at Level 2. The purpose of the written test paper is to assess the learners' understanding of the learning outcomes, content and assessment criteria as indicated in the examination specification shown below.

There are opportunities for experiential learning during any formative assessment undertaken. Learners should make their own initial evaluations of the topics discussed and refine such evaluations by revisiting their suggestions after discussion with other learners and/or construction professionals. These evaluations can be improved each time the matter is discussed.

A suitable period of reflection should follow upon completion of the assessment for this unit. The learner should evaluate which questions they answered correctly, which they did not, why they sometimes chose the wrong answer and why the correct answer is correct. The learning and assessment can then be used, in part, by the learner to inform the learning in Level 3 Unit 5: Create the built environment: management processes.

Examination specification

Duration: 2 hours

Assessment Type: Written test

No of marks: 60

Assessment criteria topics	Subtopic	No of marks	Total marks	Weighting
1. Factors that affect the design of the built environment	Historical and political factors	6		
	Social and economic factors	6	18	30%
	Infrastructure and transport	6		
2. The development of the built environment over time	Styles and approaches	4		
	Political policies and priorities	4		
	Private and public funding	4	24	40%
	Cyclical nature of economics	4		
	Sketching and drawing	8		
3. The adaptation of the built environment to meet changing needs	Community needs	4		
	Social integration/engineering	4		
	Infrastructure and transport	4	18	30%
	Function, form and appearance	6		
	Total	60	60	100%

Guidance for teachers

When delivering this unit, teachers should use a broad range of techniques including lectures, discussions, seminar presentations, case studies, site visits, supervised practical sessions and realistic work environments.

Teachers should encourage learners to undertake research using the Internet and/or local library resources. The use of personal and/or industrial experience will also prove invaluable and will reduce the time required for delivery.

The unit deals with the historical, geographical, availability of resources, political, economic, social, aesthetic, technological and infrastructure-related elements that influence the design process.

The unit is important because it sets the scene for all the subsequent units in the Principal Learning at Level 3. This unit has close links with Level 3 Unit 2: Design the built environment: stages in the design and planning process, and Unit 3: Design the built environment: physical and environmental influences. Joint delivery of the three units may be considered.

There are legal issues implicit throughout the content of this unit, and ethical issues associated with Assessment Criteria 1.1 b-d, 2.1 c-d, 3.1 and 3.2 a-c. These should be signposted to the learner and the implications developed within the delivery of the unit.

Whatever teaching, learning and assessment strategies are employed, health, safety and welfare issues are paramount at all times. The unit content contains little that will generate hazards in the centre, but risk assessments will be required for visits to construction sites, manufacturers' premises, etc.

The most realistic work environment would be a design or planning office and any form of work placement, work experience or work shadowing in such an environment would prove invaluable. If this is not available then presentations by design or planning professionals would be very useful.

The 'Opportunities for applied learning' section below applies throughout and should be read in conjunction with the guidance here.

Opportunities for applied learning

This unit deals with the complex and changing factors that underpin design decisions, the on-going development of the built environment, and the impact of new developments on the existing built environment and those who use it. As such, it is more conceptual than the other units, and opportunities for applied learning must be taken wherever possible.

Working in small groups, learners should be allocated one well-established development, one development in the process of construction, and one development at the 'drawing-board' stage. They will need to visit these developments if they are at the construction stage, and the designers and planners of the development if they are at the pre-construction stage. Presentations from community groups, environmental pressure groups or local residents' groups that have objected to or opposed any one of the developments will provide a very different and interesting perspective on the development process, and their promotional materials should be included in the source material for the unit.

Learners should be required to analyse and evaluate the first in terms of Assessment criteria topics 2 and 3, and the second and third in terms of Assessment criterion 1a. They should prepare material such as posters or electronic slides to support their findings, and use this to support a short presentation to the whole class. This should be used to stimulate a debate about which factors are important in each case, and how they affect the final design solutions.

The historic, political, economic, social and community aspects of design can be difficult concepts for younger learners to grasp, especially if they have never studied these subjects in any depth. If they are to understand the practical design implications of these factors, they must be exposed to a wide variety of experienced design personnel and built environments.

Visits to construction sites, roadworks, architects' offices, design studios and local authority planning and highways or transport offices will help reinforce working practices and the various factors that influence designs. If such access proves difficult, centres should invite practising professionals into the centre to talk to the learners about what they do in their day-to-day working lives, how things have changed during their lives, what first attracted them into the positions they now hold and what they see as the positive aspects of the careers they chose.

Town or city archives will contain a great deal of information relating to the local built environment of the past, but local museums and higher education institutions can also be useful sources of interesting historical references to the built environment, and will generally be willing to provide guest lectures, presentations or tours to interested parties.

The main method of communication in construction design is sketching and drawing. Learners will need to be able to interpret and produce sketches and drawings to support both learning and assessment, but they are not required to demonstrate a professional level of competence in this unit. Scale models of buildings and structures will help set the learning in a realistic context, especially where the models are accompanied by design drawings that clearly show the relationship between ideas on paper and the finished model in 3D.

A range of pre-prepared drawings of all kinds should be made available for the learners to consider.

These could be either hard copies or in electronic form. Whichever kind is preferred, the learners will benefit from the use of design drawings linked to photographs of the design being realised as an actual construction project or to visits to construction projects, both during and after construction. The learners should be exposed to the widest possible range of buildings and structures, and encouraged to consider the reasons why individual buildings are designed the way they are and how the design of a building is linked to its intended purpose.

Learners should be encouraged to develop individual portfolios to support their studies. Portfolios could include anything relating to design that engages their attention, such as photographs taken by the learners or collected from other sources, images downloaded from the Internet, articles from newspapers and trade magazines, and notes made during any visits or conversations with experienced designers. This information could be used to support learners' presentations and any subsequent class discussions.

The opinions of those who use the built environment is important, and learners will benefit from the use of survey material to determine the opinions of the local community on the issues involved. The obvious people to survey are those whom they know, but the sample should be representative and learners should ideally not choose the same sample as other learners. Surveys that collect opinions from a wide range of ages and occupations will prove very useful when assessing aesthetic, community, economic and social impacts. Learners may need some assistance in the devising of these simple surveys to determine the opinions of their local community on the issues involved, and clear teacher guidance on how to interpret the results of such surveys. They should start by asking family and friends to complete a survey form.

The learners should use the survey returns and their own research to inform a short presentation to be made to the whole class. They must then contribute to a debate about what is important and what is not in each case. There are no right and wrong answers. The learners will increase their understanding by examining the environment, collecting the opinions of the local community (informed or otherwise), and discussing the results.

What activities might be involved in this unit?

- Producing sketches and drawings, taking photographs and maintaining a design portfolio.
- Visiting construction sites, roadworks and off-site prefabrication plants.
- Visiting architects' studios and local authority planning, highways and/or transport departments.
- Assessing the potential impact of a new development on the existing built environment.
- Performing simple environmental assessments for potential developments.
- Undertaking surveys and opinion polls to determine the public response to development.

Suggested prior learning

Level 2 Principal Learning in Construction and the Built Environment, or 5 GCSEs at Grade C or above.

Personal, Learning and Thinking Skills

The list below is indicative of the way this unit supports the development of PLTS, as opposed to the achievement of PLTS that are possible through the assessment. The unit supports the development of more PLTS than are covered through the assessment criteria alone.

Alternative approaches could be selected. The learner could develop PLTS by:

Independent enquirers

- planning and carrying out research into the factors that influence the design process
- exploring issues and problems from different perspectives in order to identify the main factors that will affect planning requirements and community impact

Creative thinkers

- debating with experienced construction personnel to determine their opinion of how past developments have impacted on the existing built environment

Reflective learners

- setting themselves targets and goals in the production of any sketches, drawings, schedules and specifications required
- monitoring and reviewing their progress towards targets and goals in the production of any sketches, drawings, schedules and specifications required

Team workers

- making effective contributions to group discussions when debating with designers and planners in small groups.

Suggested learning resources

Books

- Design and Construction -ed. Best, R & de Valence, G - Published by: Architectural Press, 2002 ISBN: 0-750-65149-0
- Building Construction Handbook - Chudley, R & Greeno, R - Published by: Butterworth-Heinemann, 2006 - ISBN: 0-750-66822-9
- Introduction to Building (Mitchells Building Series) - Greeno, R - Published by: Prentice Hall, 2006 - ISBN: 0-132-32571-3
- How Designers Think -Lawson, B -Published by: Architectural Press, 2005 - ISBN:0-750-66077-5
- Architectural Design Procedures - Thompson, A - Published by: Architectural Press, 1998- ISBN: 0-340-71941-9
- Managing the Building Design Process - Tunstall, G - Published by: Butterworth-Heinemann, 2000 -ISBN: 0-750-66791-5
- Green Building Handbook - Woodley, T & Kimmins, S Published by: Spon Press, 2000 - ISBN: 0-419-25380-7

Journals and magazines

Architects' Journal - AJ Building Design

Videos, CDs and DVDs

- The Construction of Houses The Video Project UWE
- Building History and Building Conservation The Video Project UWE
- A Sampler of Alternative Homes: Approaching Sustainable Architecture (DVD) Kelly Hart
- E-resources for construction www.rsc-wales.ac.uk

Websites

- Architecture Centre Network www.architecturecentre.net
- bConstructive www.bconstructive.co.uk
- Building Connections www.thecarbontrust.co.uk/energy
- The Carbon Trust www.thecarbontrust.co.uk/energy
- Chartered Institute of Architectural Technologists www.ciat.org.uk
- Chartered Institute of Building www.ciob.org.uk
- Commission for Architecture and the Built Environment www.cabe.org.uk/teachingresources
- Construction Industry Research and Information Association www.ciria.org.uk
- ConstructionSkills www.citb.org.uk
- Design Quality Indicator www.dqi.org.uk
- Royal Institute of British Architects (RIBA) www.architecture.com
- Royal Town Planning Institute www.rtpi.org.uk

Level 3

Unit 2: Design the built environment: stages in the design and planning process

What is this unit about?

The purpose of this unit is to introduce learners to the individual stages of the design and planning processes, and the principles involved in taking a design through the complete design cycle. Learners will study the specific skills required to design the urban environment. The unit explores the important factors that affect planning procedures and decisions, and the contribution made by the urban environment to the local community. Career opportunities in the design and planning of the urban environment are also covered.

This unit, alongside the others within the Level 3 Principal Learning in Construction and the Built Environment, has been designed to allow learners the opportunity to develop a range of Personal, Learning and Thinking Skills (PLTS), and to demonstrate these on more than one occasion. This approach will allow them to build towards a full range of PLTS.

Learning outcomes

The learner will:

1. understand the stages of the design process and be able to apply design principles and methods to the design of the urban environment
2. understand the stages of the planning process and how it monitors, controls and assists the work of designers
3. understand how urban development affects communities and the environment
4. know how to plan a career in design and planning up to professional membership.

Assessment criteria

1. The design process

The learner can:

- 1.1 identify, describe and analyse the various stages of the design process/cycle and use this knowledge and understanding to (IE2, 4) (SM2):
 - a. establish and verify client requirements
 - b. define relationships between the client and various members of the design team
 - c. identify relevant regulatory and planning requirements
 - d. explore the visual impact of a proposed design on the existing built environment
 - e. apply design principles and methods to develop preliminary design solutions
 - f. evaluate preliminary design solutions against constraints on design and development
 - g. develop increasingly refined alternative design solutions
 - h. identify the technical and physical processes needed to realise final design solutions
 - i. arrange for translation of final design solution to working drawings and specifications.

2. The planning process

The learner can:

- 2.1 identify, describe and analyse the various stages of the planning process, including the need to (IE2, 4):
 - a. evaluate the important factors that affect planning procedures and decisions:
 - o social
 - o political
 - o legal
 - o economic
 - o environmental
 - o technical
 - b. interpret planning requirements including structure plans and local plans iii decide whether to grant Outline Planning Permission (OPP)
 - c. develop strategies to help the design team achieve an acceptable design solution
 - d. give appropriate consideration to design solutions at each stage
 - e. decide whether to grant Full Planning Permission (FPP)
 - f. monitor the construction process to ensure compliance with Building Regulations.

3. Development of the urban environment

The learner can:

- 3.1 apply the design process to the development of the urban environment, including:
 - a. evaluating present and future uses of urban space (IE4)
 - b. designing and planning urban spaces as part of a team (IE1) (CT1, 5) (SM3) (TW1, 2, 5)
 - c. assessing the contribution made by the urban environment to:
 - o social inclusion
 - o economic growth
 - o environmental sustainability
 - o transport structures
 - o quality of life
 - d. manipulating space to produce alternative design solutions
 - e. making effective use of the various disciplines involved in urban design.

4. Career opportunities

The learner can:

- 4.1 compare and contrast career opportunities in the design of the built environment, in terms of (IE6):
 - a. the range and characteristics of career opportunities
 - b. the level of available career opportunities:
 - o craft
 - o technical
 - o supervisory
 - o professional and management
 - c. the nature of interactions between those who work in design
 - d. progression opportunities available in design
 - e. the qualifications needed to support career progression
 - f. the role of professional institutions in the design of the built environment.

Where the assessment criteria show a direct link to an area of the PLTS framework, it is referenced here. Further information on PLTS is available in Section 3.1 of this specification and also within this unit in the section on Personal, Learning and Thinking Skills.

Guided learning hours

It is recommended that a minimum of 90 guided learning hours be spent on this unit.

Assessment

This unit is assessed through a centre set and marked assignment. Internal assessments are subject to moderation by City & Guilds.

This method of assessment allows the centre to contextualise the evidence requirements to meet the requirements of time and place by encouraging learners to develop knowledge and understanding of the stages of the design and planning process, with particular attention to the urban built environment and the career opportunities available in the construction design sector, in their own local area, using up-to-date information.

Learners will complete an assignment, the purpose of which is to develop knowledge and understanding of the various stages of the design and planning process, and the way in which the two interact to convert client requirements into preliminary design solutions. Learners will develop increasingly refined design solutions into a final design solution that is granted Full Planning Permission. The assessment should also build upon the learning provided in **Level 3 Unit 1: Design the built environment: design factors**. Lastly, the assignment should require the learner to explore the career opportunities and progression routes available in the design of the built environment.

The evidence must be based on a local project at the design and planning stage, a building or other structure under construction, or a realistic teacher-devised scenario.

If all, or part of, the evidence produced by a learner relates to outcomes produced as a result of working in a group, it must be clear which evidence is to be credited to the individual learner.

The assignment will take approximately 15 of the 90 guided learning hours available for this unit. The learner should work under controlled conditions in accordance with the guidance in Section 4.4 of this specification, and witness testimony should be used to support the use of team work. Evidence should be kept for moderation purposes.

Evidence requirements

The learner must produce evidence of achievement of the assessment criteria. In the assignment, the learner will produce:

1. a report on the various stages of the design and planning process and the ways in which the two interact to convert client requirements into preliminary design solutions
2. design suggestions for use in an urban development in their local area, applying the design and planning cycle to the production of designs leading to a final design solution, developed as part of a team
3. an application for Full Planning Permission, produced as part of a team
4. a summary of the career opportunities available in design of the built environment, as they relate to urban development in the learner's local area.

In order to attain a high mark in this unit, learners must address all of the above. It may, however, be possible to achieve a pass mark without producing every one of the evidence requirements. A table showing how the Assessment criteria topics are weighted is included below, and learners should be shown this in order that they understand how the final mark is determined.

Assignment structure

A suggested assignment structure, which would allow learners to meet the evidence requirements, may include the following steps:

- Identify and describe the various stages of the design process in terms of how the design team are working, or have worked, with the clients to convert their original concept into a final design solution.
- Describe and analyse how the planning process works to ensure that design solutions are technically and legally correct, and to address important social, political, economic and environmental issues of concern to the wider community.
- Explain how the process is structured to help the design team progress towards planning permission.
- Evaluate the design and planning process in terms of urban development and the specific issues raised by development in the urban environment as part of a team.
- In a team, apply the design and planning cycle to produce design suggestions for use in a local urban development.
- Work in a team to improve upon the initial design until a final design solution is reached.
- Summarise career opportunities within the design area of the local construction and built environment sector, to assist potential young designers in navigating their way through the process, up to the role of the professional institutions and their individual membership requirements.

Learners should use a team approach when appropriate and incorporate helpful and insightful opinions and comments from other learners and experienced construction personnel.

The first and second tasks offer an excellent opportunity for experiential learning in terms of the knowledge and understanding of the stages of the design and planning processes; how they interact; and the application of skills to apply such knowledge and understanding to the urban environment and to plan a career in the design sector. The learner has the opportunity to plan and action their initial investigations; to review and monitor their findings with other learners, experienced construction professionals and careers officers; and to revisit their original findings in the light of the outcomes of such discussions.

A suitable period of reflection should follow upon completion of the assessment for this unit. The learner should evaluate what they have done, what went well, what went less well and how they would do things differently if they were to do the assessment again. The learning and assessment that comprise this unit can then be used by the learner to inform the content of Level 3 Unit 3: Design the built environment: physical and environmental influences.

Weighting of assessment criteria topics

Assessment criteria topic	Weighting	Marks
1 The design process	35%	21
2 The planning process	30%	18
3 Development of the urban environment	25%	15
4 Career opportunities	10%	6
Total	100%	60

Assessment grid

Please note that the descriptions in this marking grid relate to the top of each band. Further guidance on using marking grids is available in the Assessment section of this specification.

Assessment criteria topic	Band 1	Band 2	Band 3
	The learner has:		
1. The design process	<p>0-7 marks</p> <p>Demonstrated a basic understanding of the design process by identifying most of the stages of the design cycle, briefly describing how the design team work through the various stages to develop simple design solutions, and relating the process to the building or structure under consideration in a superficial but generally accurate fashion.</p>	<p>8-14 marks</p> <p>Demonstrated a good understanding of the design process by identifying all of the stages of the design cycle, clearly describing how the design team work through the various stages to develop effective design solutions, and relating the process to the building or structure under consideration in a clear and accurate fashion</p>	<p>15-21 marks</p> <p>Demonstrated an in-depth understanding of the design process by identifying every stage of the design cycle in full, thoroughly describing how the design team work through the various stages to develop creative and practical design solutions, and relating the process to the building or structure under consideration in a detailed fashion</p>

<p>2. The planning process</p>	<p>0-6 marks</p> <p>Demonstrated a basic understanding of the planning process by identifying most of the stages of the planning cycle, briefly describing how planning ensures compliance with legislation and community needs, and relating the planning process to the building or structure under consideration in a superficial but generally accurate fashion</p>	<p>7-12 marks</p> <p>Demonstrated a good understanding of the planning process by identifying all of the stages of the planning cycle, clearly describing how planning ensures compliance with legislation and community needs, and relating the planning process to the building or structure under consideration in a clear and accurate fashion</p>	<p>13-18 marks</p> <p>Demonstrated an in-depth understanding of the planning process by identifying every stage of the planning cycle in full, thoroughly describing how good planning ensures compliance with legislation and community needs, and relating the planning process to the building or structure under consideration in a detailed fashion</p>
<p>3. Development of the urban environment</p>	<p>0-5 marks</p> <p>Worked as a member of team to demonstrate a basic understanding of the development of the urban environment by making a minor contribution to the use of the design and planning cycle to progress a design solution to the full planning permission stage</p>	<p>6-10 marks</p> <p>Worked as a member of team to demonstrate a partial understanding of the development of the urban environment by making an effective contribution to the use of the design and planning cycle to progress a design solution to the full planning permission stage</p>	<p>11-15 marks</p> <p>Worked as a member of team to demonstrate an in-depth understanding of the development of the urban environment by making a major contribution to the use of the design and planning cycle to progress a design solution to the full planning permission stage</p>
<p>4. Career opportunities</p>	<p>0-2 marks</p> <p>Compared careers available in the design and planning of the built environment, and produced a basic summary of individual career progression opportunities, up to professional membership level</p>	<p>3-4 marks</p> <p>Compared careers available in the design and planning of the built environment, and produced a coherent summary of individual career progression opportunities, up to professional membership level</p>	<p>5-6 marks</p> <p>Effectively compared careers available in the design and planning of the built environment, and produced a precise and thoughtful summary of individual career progression opportunities, up to professional membership level</p>

Guidance for delivery

This unit has close links with Level 3 Unit 1: Design the built environment: design factors, and Unit 3: Design the built environment: physical and environmental influences. Joint delivery of the three units may be considered.

When delivering this unit, teachers should use a broad range of techniques including lectures, discussions, seminar presentations, case studies, site visits, visits to planning offices and design studios, supervised practical sessions and realistic work environments.

Teachers should encourage learners to undertake research using the internet and/or local library resources. The use of personal and/or industrial experience will also prove invaluable and will reduce the time required for delivery.

Whatever teaching, learning and assessment strategies are employed, health, safety and welfare issues are paramount at all times. The unit content contains little that will generate hazards in the centre, but risk assessments will be required for visits to construction sites, manufacturers' premises and the like.

There are specific legal issues implicit in Assessment criteria 1a iii and 2a i (legal) and ethical issues associated with all of Assessment criteria topics 1 and 2. These should be signposted to the learner and the implications of each developed within the delivery of the unit.

The most realistic work environment would be a design or planning office and any form of work placement, work experience or work shadowing in such an environment would prove invaluable. If this is not available then presentations by design or planning professionals would be very useful.

Opportunities for applied learning

The unit deals with the design cycle and the planning regime designed to support, control and monitor building design. It then applies the principles that underpin these disciplines specifically to urban design and the urban environment. Although the word 'designer' is generally taken to mean 'architect', it is important to remember the part played in construction design by civil engineers, structural engineers and building services engineers, to name but a few of those involved in building design.

Learners who are able to gain relevant work experience, or who are fortunate enough to find opportunities to work shadow construction technicians and professionals as they perform their design and planning functions, will learn in the best environment of all. It is, however, likely that applied learning experiences will arise out of links with projects that are at the design and planning stage, which the learners can follow through, or out of simulated scenarios prepared by the teacher. A wide range of visits to design studios and offices, local authority planning offices, builders' merchants and construction sites of all kinds is strongly recommended.

In either case, the involvement of construction professionals at some stage and the use of realistic documentation is highly recommended. The design cycle can be simulated by role-play, with one group of learners representing the client, another group representing the design team, and the teacher(s) representing the planning department. Minutes should be taken of meetings, with actions, times and responsibilities made clear.

Learners should create their own designs for use in the design cycle, although the teacher should steer them away from the fanciful. It may be that not every design solution receives 'planning permission' after going through every stage of the process, but it is the process of design and planning that is important here, together with the individual stages of each process and the iterative techniques used to arrive at the final design solution.

Career development is a straightforward topic but needs to be made interesting and relevant. It is important that learners develop an understanding of the careers available in construction design, and how they can access such careers, in order to supplement their developing understanding of what construction designers actually do in their day-to-day work.

There is a wealth of information available from the websites listed in the 'Suggested learning resources' section below. The local further education college and/or Connexions service should be happy to visit the centre and explain what careers are available, what the opportunities for progression are, what qualifications are required to support that progression, and what is available locally. Visits from building companies looking for staff are easy to arrange when the sector is busy and competing for workers. Contact with experienced designers will help learners understand how members of the design team interact with each other.

The main method of communication in construction design is sketching and drawing. Learners will need to be able to interpret and produce sketches and drawings to support both learning and assessment, and should be encouraged to use standard drawing conventions. However, they are not required to demonstrate a professional level of competence in this unit as its focus is on design, not construction drawing. A range of pre-prepared drawings and documents relevant to planning and design should be made available for the learners to consider. These could be either hard copies or in electronic form. Whichever kind is preferred, the learners will benefit from the use of construction drawings linked to photographs of the actual construction project, standard documentation as used by the local planning department, or visits to building sites, architects' offices and design studios, and the local planning office, both during and after construction.

What activities might be involved in this unit?

- Producing sketches and drawings, taking photographs and maintaining a portfolio.
- Visiting design and planning offices and construction sites.
- Interviewing experienced design and planning professionals.
- Preparing alternative design solutions for submission to a planning role-play exercise.
- Analysing design solutions to determine their compliance with legal and technical issues.
- Gathering useful careers information from a variety of experienced personnel.

Suggested prior learning

Level 2 Principal Learning in Construction and the Built Environment, or 5 GCSEs at Grade C or above.

Personal, Learning and Thinking Skills

The list below is indicative of the way this unit supports the development of PLTS, as opposed to the achievement of PLTS that are possible through the assessment. The unit supports the development of more PLTS than are covered through the assessment criteria alone.

Alternative approaches could be selected. The learner could develop PLTS by:

Independent enquirers

- determining and verifying their requirements by identifying questions to ask clients
- exploring a range of design solutions and design constraints with the client to further the development of the design solution
- analysing and evaluating technical information and legal and environmental concerns in the development of the design solution

Creative thinkers

- trying out alternative design solutions and adapting and improving those solutions as further evidence, information and constraints are applied to the process

Reflective learners

- reviewing progress with the design team and inviting feedback from the client and the planning authority

Team workers

- co-operating with other members of the design team and the planning authorities to achieve the common goal of planned development

Self-managers

- organising time and resources to take responsibility for completing assigned tasks by required deadlines

Effective participators

- discussing issues of mutual concern with other members of the design team and resolving those issues to the satisfaction of all concerned.

Suggested learning resources

Books

- Design and Construction - ed. Best, R & de Valence, G - Published by: Architectural Press, 2002 - ISBN: 0-750-65149-0
- Architect's Pocket Book - Baden-Powell, C - Published by: Architectural Press, 2001 - ISBN: 0-750-64764-7
- The Architect in Practice - Chappell, D & Willis, J A - Published by: Blackwell Publishing, 2005 - ISBN: 1-405-12467-9
- Building Construction Handbook - Chudley, R & Greeno, R - Published by: Butterworth-Heinemann, 2006 - ISBN: 0-750-66822-9
- How Designers Think - Lawson, B - Published by: Architectural Press, 2005 - ISBN: 0-750-66077-5
- Architectural Design Procedures - Thompson, A - Published by: Architectural Press, 1998 - ISBN: 0-340-71941-9
- Managing the Building Design Process - Tunstall, G - Published by: Butterworth-Heinemann, 2000 - ISBN: 0-750-66791-5
- Green Building Handbook - Woodley, T & Kimmins, S - Published by: Spon Press, 2000 - ISBN: 0-419-25380-7

Journals and magazines

- Architects' Journal - AJ
- Building Design

Videos, CDs and DVDs

- The Construction of Houses The Video Project UWE Building History
- Building History and Building Conservation The Video Project UWE
- A Sampler of Alternative Homes: Approaching Sustainable Architecture (DVD) The Video Project UWE
- E-resources for construction www.rsc-wales.ac.uk

Websites

- Architecture Centre Network www.architecturecentre.net
- bConstructive www.bconstructive.co.uk
- Building Connections www.thecarbontrust.co.uk/energy
- The Carbon Trust www.thecarbontrust.co.uk/energy
- Chartered Institute of Architectural Technologists www.ciat.org.uk
- Chartered Institute of Building www.ciob.org.uk
- Commission for Architecture and the Built Environment www.cabe.org.uk/teachingresources
- Construction Industry Research and Information Association www.ciria.org.uk
- ConstructionSkills www.citb.org.uk
- Design Quality Indicator www.dqi.org.uk
- Institution of Civil Engineers www.ice.org.uk
- Institution of Structural Engineers www.istructe.org.uk
- Royal Institute of British Architects (RIBA) www.architecture.com
- Royal Town Planning Institute www.rtpi.org.uk

Level 3

Unit 3: Design the built environment: physical and environmental influences

What is this unit about?

The purpose of this unit is for learners to explore the Health and Safety and environmental factors that affect design of the built environment. Learners will find out about the provision of primary services utilities to the design of buildings. The unit also covers the potential impact of climate change on the design of the built environment, and techniques used to reduce energy demands and polluting emissions to air, water and land.

This unit, alongside the others within the Level 3 Principal Learning in Construction and the Built Environment, has been designed to allow learners the opportunity to develop a range of Personal, Learning and Thinking Skills (PLTS), and to demonstrate these on more than one occasion. This approach will allow them to build towards a full range of PLTS.

Learning outcomes

The learner will:

1. understand the factors that influence good design practice in terms of health, safety and welfare; risk management; and the environment
2. know how primary services utilities are planned, distributed and installed to maximise environmental efficiency
3. understand issues associated with climate change, the potential impact on the community and the actions that must be taken to reduce this impact.

Assessment criteria

1. Health, safety and welfare; risk management; and environmental considerations

The learner can:

- 1.1 identify and describe factors influencing the built environment:
 - a. health, safety and welfare
 - b. environmental
- 1.2 analyse factors influencing the built environment in terms of (IE4,5):
 - a. regulatory requirements
 - b. risk assessments and environmental assessments
 - c. risk management as part of the design process
 - d. security of people using the built environment
 - e. design implications of the above
- 1.3 evaluate good design practice in health, safety and welfare and environmental terms (IE4,5,6).

2. Primary services utilities

The learner can:

- 2.1 evaluate the provision of primary services utilities to buildings in terms of (IE4, 6):
 - a. accommodation of services within the design process
 - b. main features and characteristics:
 - o provision
 - o location
 - o entry to building
 - o accessibility
 - o maintenance
 - o scaling down to provide effective supply
 - o environmental implications
 - o effective management of services
 - c. basic operating principles
 - d. materials used.

3. Climate change issues relating to the design of the built environment

The learner can:

- 3.1 assess projected climate change issues in terms of (IE3, 6) (CT1):
 - a. global warming
 - b. water extraction
 - c. emissions to air, land and water
 - d. waste disposal
 - e. impact on the design of the built environment of:
 - o changes in water table and drought
 - o the need to minimise energy demand
 - o the need to control emissions to air, land and water
 - o the need to maximise energy efficiency, including effective heat exhaust
 - o renewable energy issues:
 - o technical
 - o economic
 - o social
- 3.2 assess a range of sustainable construction techniques.

Where the assessment criteria show a direct link to an area of the PLTS framework, it is referenced here. Further information on PLTS is available in Section 3.1 of this specification and also within this unit in the section on Personal, Learning and Thinking Skills.

Guided learning hours

It is recommended that a minimum of 90 guided learning hours be spent on this unit.

Assessment

This unit is assessed through a centre set and marked assignment. Internal assessments are subject to moderation by City & Guilds.

Learners will complete an assignment, as shown in the evidence requirements noted below. The assignment should be based upon a local project at the design and planning stage, a building or other structure under construction, or a realistic teacher-devised scenario. The assessment should focus on the factors identified above but should also build upon the learning provided in Level 3 Unit 1: Design the built environment: design factors, and Level 3 Unit 2: Design the built environment: stages in the design and planning process.

The assignment will take approximately 18 of the 90 guided learning hours available for this unit. The learner should work under controlled conditions in accordance with the guidance in Section 4.4 of this specification and evidence should be kept for moderation purposes.

Evidence requirements

The learner must produce evidence of achievement of the assessment criteria. In the assignment, the learner will produce:

1. a report on:
 - a. the health, safety and welfare issues, and the environmental principles and practices, that influence good design in the built environment
 - b. the principles, practices and materials associated with the provision of primary services utilities to buildings
 - c. a broad range of the environmental and sustainable construction issues associated with climate change
2. a portfolio of photographs, images, articles and notes selected to support the assignment and any presentations they undertake.

In order to attain a high mark in this unit, learners must address all of the above. It may, however, be possible to achieve a pass mark without producing every one of the evidence requirements. A table showing how the Assessment criteria topics are weighted is included below, and learners should be shown this in order that they understand how the final mark is determined.

Assignment structure

A suggested assignment structure, which would allow learners to meet the evidence requirements, may include the following steps:

- Identify, describe and analyse the health, safety and welfare issues; risk management; and environmental considerations that influenced the design of a chosen building or structure.
- Evaluate, in terms of basic principles, materials used and environmental implications; how the primary services utilities were planned and installed; how and where the services enter buildings; and how access for maintenance was provided.
- Evaluate how the design was affected by issues relating to climate change such as global warming; emissions to land, air and water; over-extraction of water; waste disposal; and the specification of renewable energy sources.

Weighting of assessment criteria topics

Assessment criteria topic	Weighting	Marks
1. Health, safety and welfare; risk management; and environmental considerations	35%	21
2. Primary services utilities	30%	18
3. Climate change issues relating to the design of the built environment	25%	15
Total	100%	60

Assessment grid

Please note that the descriptions in this marking grid relate to the top of each band. Further guidance on using marking grids is available in the Assessment section of this specification.

Assessment criteria topic	Band 1	Band 2	Band 3
	The learner has:		
1. Health, safety and welfare; risk management; and environmental considerations	<p>0-7 marks</p> <p>Demonstrated a basic knowledge and understanding of the impact that health, safety and welfare and the environment have on good design by identifying and briefly describing a limited number of associated issues, principles and practices</p> <p>Related the issues to the design stage of a local development in a superficial but generally accurate fashion</p>	<p>8-14 marks</p> <p>Demonstrated a partial knowledge and understanding of the impact that health, safety and welfare and the environment have on good design by identifying and clearly describing a wide range of associated issues, principles and practices</p> <p>Related the issues to the design stage of a local development in a clear and accurate fashion</p>	<p>15-21 marks</p> <p>Demonstrated an in-depth knowledge and understanding of the impact that health, safety and welfare and the environment have on good design by identifying and precisely describing an extensive range of associated issues, principles and practices</p> <p>Related the issues to the design stage of a local development in a thorough and detailed fashion</p>
2. Primary services utilities	<p>0-6 marks</p> <p>Produced a basic evaluation of a limited range of issues relating to the installation of primary services utilities in terms of principles, materials or environmental implications</p> <p>Related this to the design and planning stage of a local development in a superficial but generally accurate fashion</p>	<p>7-12 marks</p> <p>Produced a competent evaluation of a wide range of issues relating to the installation of primary services utilities in terms of principles, materials and/or environmental implications</p> <p>Related this to the design and planning stage of a local development in a clear and accurate fashion.</p>	<p>13-18 marks</p> <p>Produced an in-depth evaluation of an extensive range of issues relating to the installation of the primary services utilities in terms of principles, materials and environmental implications</p> <p>Related this to the design and planning stage of a local development in a thorough and detailed fashion</p>

<p>3. Climate change issues relating to the design of the built environment</p>	<p>0-7 marks</p> <p>Produced a brief evaluation of a limited range of climate change issues</p> <p>Explained how climate change issues impact on the design and planning stage of a local development in a superficial but generally accurate fashion</p>	<p>8-14 marks</p> <p>Produced a competent evaluation of a wide range of climate change issues</p> <p>Explained how climate change issues impact on the design and planning stage of a local development in a clear and accurate fashion</p>	<p>15-21 marks</p> <p>Produced an in-depth evaluation of an extensive range of climate change issues</p> <p>Explained how climate change issues impact on the design and planning stage of a local development in a thorough and detailed fashion</p>
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Guidance for delivery

This unit has close links with Level 3 Unit 1: Design the built environment: design factors, and Level 3 Unit 2: Design the built environment: stages in the design and planning process. Joint delivery of the three units may be considered.

The unit deals with health, safety and welfare issues, and environmental and sustainable issues, as they apply to the design process. Learners must be encouraged to examine the evidence; to research the current legal, statutory and regulatory position on design; to understand the difference between risk assessment and risk management; and to consider what is meant by 'risk' in design terms. The unit also deals with the provision of primary services utilities and the importance of their inclusion in the design from the very start, together with many other issues relating to the effective management and environmental implications of such building services. When delivering this unit, teachers should use a broad range of techniques including lectures, discussions, seminar presentations, case studies, site visits (particularly to sustainable construction projects) and realistic work environments.

Teachers should encourage learners to undertake research using the Internet and/or local library resources. The use of personal and/or industrial experience will also prove invaluable and will reduce the time required for delivery.

Whatever teaching, learning and assessment strategies are employed, health, safety and welfare issues are paramount at all times. The unit content contains little that will generate hazards in the centre but risk assessments will be required for visits to construction sites, manufacturers' premises, etc., and Health and Safety as it applies to design is of course one of the key topics covered in this unit.

There are legal issues implicit throughout Assessment criteria 1ai, 1bi, 1bii, 3aiii and 3aiv, and ethical issues associated with Assessment criterion 2aii (accessibility) and all of topics 1 and 3. These should be signposted to the learner and the implications developed within the delivery of the unit.

The most realistic work environment would be a design or planning office and any form of work placement, work experience or work shadowing in such an environment would prove invaluable. If this is not available then presentations by design or planning professionals would be very useful, especially from 'green' architectural practices.

Opportunities for applied learning

This unit deals with 'influences' on the design process. Learners need to be guided to examples where those influences have been made apparent, either during the design and planning stage, or afterwards during construction, or in completed buildings and structures.

Learners who are able to gain relevant work experience, or who are fortunate enough to find opportunities to work shadow construction technicians and professionals as they perform their design and planning functions, will learn in the best environment of all. It is, however, likely that applied learning experiences will arise out of links with projects that are at the design and planning stage, which the learners can follow through, or out of simulated scenarios prepared by the teacher. A wide range of visits to design studios and offices, local authority planning offices, builders' merchants and construction sites of all kinds is strongly recommended.

Links with local designers are invaluable here, particularly if those designers are committed to an environmental and sustainable approach to design. All designers should be committed to health, safety and welfare. Learners need to be exposed to the design process at each stage in order to see how and where health, safety and welfare and sustainability issues are taken into account, and how the planning authorities ensure that everything is done in compliance with the relevant legislation. Learners will need access to all kinds of design drawings, models and relevant town planning documentation as well as risk assessments, method statements, environmental assessments and material specifications.

Learners will derive particular benefit from visits to sustainable construction sites, to wind farms, recycling centres, architectural salvage merchants, landfill sites, and permanent exhibitions that emphasise the benefits of a sustainable approach. Most new buildings will show some evidence of an increasingly sustainable approach to urgent environmental issues, if only in terms of improved energy efficiency or the specification of renewable materials.

Learners should have the opportunity to see for themselves how primary services are distributed and installed. If first-hand experience should prove difficult, use should be made of plumbing and electrical suppliers, manufacturers, the building services craft workshops of the local college, various electronic media, and talks from experienced services providers.

Learners should be encouraged to develop individual portfolios to support their studies. These could include photographs, images downloaded from the Internet, articles from newspapers and trade magazines, and notes made during visits and guest lectures by designers, planners and construction managers. Their portfolios could be used to support their presentations, any subsequent class discussions and their internal assignments.

The benefits of renewable energy should be made clear, but it is important that the learners have access to unbiased information. The learners must consider whether it is actually possible to meet our current energy needs using only renewable energy sources. They must also reflect on the implications if the answer is anything other than yes. Either we will have to learn to use less energy, however this is achieved, or we will be forced into reliance on nuclear power, which does not consume precious fossil fuels or emit carbon dioxide into the atmosphere, but which does raise very serious issues of maintenance, control and security.

A great deal of material is available on the subject of the environment, global warming, climate change, sustainability and renewable energy sources, and it is often difficult to know when and where to stop researching. One excellent project that addresses a lot of these issues is the Brompton EcoHouse. Useful information on this project can be found at:

- European Commission Directorate-General for Energy and Transport www.managenergy.net
- Green Building Press www.newbuilder.co.uk
- Green Building Magazine www.greenbuildingmagazine.co.uk
- Eden Frame www.edenframe.com
- Department for Business, Enterprise and Regulatory Reform – Sustainable Construction Brief 2004 www.dti.gov.uk/files/file13939.pdf

What activities might be involved in this unit?

- Producing design sketches and drawings, taking photographs, and maintaining a portfolio.
- Conducting risk assessments and simple environmental assessments.
- Evaluating the quality of a given design in risk management terms.
- Interpreting working diagrams relating to the distribution and installation of services utilities.
- Visiting plumbing and electrical suppliers and building services craft workshops.
- Visiting wind farms, waste recycling plants, landfill sites and architectural salvage sites.

Suggested prior learning

Level 2 Principal Learning in Construction and the Built Environment, or 5 GCSEs at Grade C or above.

Personal, Learning and Thinking Skills

The list below is indicative of the way this unit supports the development of PLTS, as opposed to the achievement of PLTS that are possible through the assessment. The unit supports the development of more PLTS than are covered through the assessment criteria alone.

Alternative approaches could be selected. The learner could develop PLTS by:

Independent enquirers

- carrying out research into how environmental issues impact upon the design process
- planning to incorporate good health, safety and welfare practice into the design process, interpreting risk assessments and producing method statements

Creative thinkers

- trying out alternative solutions to health, safety and welfare issues
- adapting design solutions to address emerging environmental concerns

Self-managers

- organising time and resources to see for themselves the distribution and installation of services utilities at first-hand.

Websites

Architecture Centre Network	www.architecturecentre.net
bConstructive	www.bconstructive.co.uk
Building Connections	www.buildingconnections.co.uk
The Carbon Trust	www.thecarbontrust.co.uk/energy
Chartered Institute of Architectural Technologists	www.ciat.org.uk
Chartered Institute of Building	www.ciob.org.uk
Chartered Institution Of Building Services Engineering	www.cibse.org
Commission for Architecture and the Built Environment	www.cabe.org.uk/teachingresources
Construction Industry Research and Information Association	www.ciria.org.uk
ConstructionSkills	www.citb.org.uk
Department for Business, Enterprise and Regulatory Reform – Sustainable Construction Brief 2004	www.dti.gov.uk/files/file13939.pdf
Design Quality Indicator	www.dqi.org.uk
Eden Frame	www.edenframe.com
European Commission Directorate-General for Energy and Transport	www.managenergy.net
Green Building Magazine	www.greenbuildingmagazine.co.uk
Green Building Press	www.greenbuildingpress.co.uk
Institution of Civil Engineers	www.ice.org.uk
Institution of Structural Engineers	www.istructe.org.uk
Royal Institute of British Architects (RIBA)	www.architecture.com
Royal Town Planning Institute	www.rtpi.org.uk

Level 3

Unit 4: Create the built environment: health, safety and environmental influences

What is this unit about?

The purpose of this unit is to develop learners' knowledge of how the natural environment can be protected and maintained during construction. The unit considers health, safety and environmental factors that affect the construction process, and technical and social issues associated with the construction process. Learners will also gain an understanding of renewable energy sources.

This unit, alongside the others within the Level 3 Principal Learning in Construction and the Built Environment, has been designed to allow learners the opportunity to develop a range of Personal, Learning and Thinking Skills (PLTS), and to demonstrate these on more than one occasion. This approach will allow them to build towards a full range of PLTS.

Learning outcomes

The learner will:

1. know the legislation relating to health, safety and welfare and project planning in the construction of the built environment
2. know about the application of Construction Design and Management (CDM) Regulations during construction
3. be able to analyse the causes and consequences of accidents during the construction process, and recognise trends relating to them
4. understand environmental issues relating to construction, and potential ways of overcoming them.

Assessment criteria

1. Legislation relating to health, safety and welfare, and project planning in the construction of the built environment

The learner can:

- 1.1 analyse the legislation used to control health, safety and welfare and project planning (IE4):
 - a. Health and Safety at Work Act 1974
 - b. Construction Design and Management (CDM) Regulations 2007
 - c. Construction Health, Safety and Welfare Regulations 1996
 - d. Management of Health and Safety at Work Regulations 1999
 - e. Work at Heights Regulations 2005
- 1.2 identify and describe the procedures used by construction companies and employers to ensure compliance with such legislation:
 - a. risk assessments
 - b. permits and method statements
 - c. safe systems of work
 - d. induction and training
 - e. good site management
 - f. Health and Safety signage
 - g. personal protective equipment (PPE)
 - h. checklists
 - i. safety inspections
- 1.3 prepare and interpret risk assessments
- 1.4 formulate method statements from risk assessments
- 1.5 select appropriate PPE for use in specific construction tasks (SM4).

2. The application of Construction Design and Management Regulations during construction

The learner can:

- 2.1 compare and contrast roles and responsibilities as defined under the CDM Regs.2007, relating to (IE4, 6):
 - a. client
 - b. designer
 - c. contractor
 - d. subcontractors
 - e. users
 - f. planning supervisor
 - g. Health and Safety officer.

3. Accidents in the construction of the built environment

The learner can:

- 3.1 analyse accidents in terms of (IE3, 4):
 - a. the common causes of fatalities and non-fatal injuries
 - b. comparisons of UK and European statistics
 - c. consequences and costs
 - d. human effects (on individuals, families and friends)
 - e. financial effects (direct or hidden, insured or not)
 - f. loss of reputation, delays to work, lost work
- 3.2 discern trends in the official data relating to fatalities and non-fatal injuries.

4. Environmental issues relating to construction

The learner can:

- 4.1 evaluate environmental issues inherent in the construction process (IE3, 6):
 - a. supply chain:
 - o availability of materials
 - o local procurement of materials
 - o access and delivery
 - o manual and mechanical methods of unloading
 - o storage and handling of materials
 - b. sustainability of resources:
 - o recycling and re-use of materials wherever possible
 - o conservation of natural resources by use of eco-friendly materials
 - o processing of raw materials
 - o embedded (embodied) energy issues
 - o amount of carbon dioxide emitted to air during processing
 - o extraction implications of local procurement
 - o disposal of materials at the end of their useful life (biodegradability)
 - o waste management issues
 - c. how modern methods of construction:
 - o generate fewer on-site environmental issues
 - o produce less noise and dust
 - o reduce project durations
- 4.2 analyse the use of a range of modern and sustainable methods of construction in terms of efficacy and relative cost (IE4).

Where the assessment criteria show a direct link to an area of the PLTS framework, it is referenced here. Further information on PLTS is available in Section 3.1 of this specification and also within this unit in the section on Personal, Learning and Thinking Skills.

Guided learning hours

It is recommended that a minimum of 60 guided learning hours be spent on this unit.

Assessment

The assessment method for this unit will be external assessment. Learners will complete a two-hour written examination.

This unit focuses mainly on knowledge and understanding, and is therefore deemed to be an appropriate vehicle for the externally assessed component of Principal Learning at Level 3. The assessment is by means of a written test, with extended answers as opposed to the multiple choice format used at Level 1 and the short answer format used at Level 2. The purpose of the written test paper is to assess the learners' understanding of the learning outcomes, content and assessment criteria as indicated in the examination specification shown below.

There are opportunities for experiential learning during any formative assessment undertaken in connection with discussions concerning: the analysis of accidents in construction and the built environment; the perception of trends in the accident data; and the evaluation of environmental and sustainability issues in construction, including the potential environmental benefits of modern methods of construction. Learners should make their own initial evaluations of these topics and refine such evaluations by revisiting their suggestions after discussion with other learners and/or construction professionals. These evaluations can be improved each time the matter is discussed.

A suitable period of reflection should follow upon completion of the assessment for this unit. The learner should evaluate which questions they answered correctly, which they did not, why they sometimes chose the wrong answer and why the correct answer is correct. The learning and assessment can then be used, in part, by the learner to inform the learning in Level 3 Unit 5: Create the built environment: management processes.

Examination specification

Duration: 2 hours

Assessment Type: Written test

No of marks: 60

Assessment criteria topics	Subtopic	No of marks	Total marks	%
1a Legislation	Health, safety and welfare	9	15	25
	Project planning	6		
1b Procedures to ensure compliance with legislation	Risk assessments, method statements, safe working	6	18	30
	Inductions, signage, PPE, site management practices	6		
	Checklists, inspections	6		
The application of CDM Regulations during construction	Roles	3	6	10
	Responsibilities	3		
Accidents in the construction of the built environment	Causes, statistical breakdown	6	9	15
	Consequences and costs	3		
Environmental issues relating to construction	Supply chain	3	12	20
	Sustainability of resources	6		
	Modern methods of construction, efficacy and costs	3		
	Totals	60	60	100

Guidance for delivery

This section should be read in conjunction with 'Opportunities for applied learning' below.

This unit has links with Level 3 Unit 5: Create the built environment: management processes. Joint delivery of the two units may be considered.

When delivering this unit, teachers should use a broad range of techniques including lectures, discussions, external presentations, role-play exercises, site visits and realistic work environments.

Teachers should encourage learners to undertake research using the Internet and/or local library resources. Learners should use this to supplement the experiences they gain in industry, on visits and from external sources.

Whatever teaching, learning and assessment strategies are employed, health, safety and welfare issues are paramount at all times. The unit content contains little that will generate hazards in the centre but risk assessments will be required for visits to construction sites, manufacturers' premises, waste disposal sites, recycling facilities, etc. These should be utilised in the teaching and learning strategies used for the unit.

There are very specific legal issues implicit in Assessment criteria topics 1 and 2, and ethical issues associated with Assessment criteria topics 3 and 4. These should be signposted to the learner and the implications of each developed within the delivery of the unit.

Any form of work placement, work experience or work shadowing would prove invaluable in this unit. The range of roles and responsibilities of those who work in this part of the industry is very wide and learners cannot be expected to experience everything. They should, however, be given as many chances as possible to see how Health and Safety, and environmental issues, are dealt with at different levels.

Opportunities for applied learning

Learners must be exposed to the documentation used in the industry and should have the opportunity to see how this documentation is used both off-site and on-site. They should be provided with copies of the relevant health, safety and welfare legislation, guides on how to comply with such legislation, and prepared risk assessments, method statements and permits to work. They should visit manufacturers' premises, builders' merchants and construction sites to see how things are made, what is available, and how materials and components are assembled to construct buildings and structures. These visits should be supported by interviews with experienced construction personnel and presentations from those involved in Health and Safety and environmental issues. The learners should pay special attention to how risk assessments, COSHH assessments and environmental assessments are used on-site; how these lead to control measures such as method statements; and how they inform good practice in construction site management. They should also reflect on how design is changing in light of increasing concerns regarding Health and Safety and environmental issues and the effect of modern methods of construction.

Learners would benefit from attendance at an on-site Health and Safety induction or a tool-box talk, and should be given the opportunity to inspect, wear and use a wide range of personal protective equipment. They should appraise such equipment in terms of why each is necessary, where each should be used and how each provides protection. They should be encouraged to consider the possible disincentives to wearing PPE and the excuses often given for not wearing the appropriate PPE, and they should produce coherent arguments to overcome such excuses and objections. Any opportunities to work shadow company Health and Safety officers as they make their inspections would be very useful. Where this proves difficult, learners should be provided with this information through other means such as videos, CDs, DVDs and, as noted above, by presentations from the very people who do the inspections.

A role-play exercise involving external input from experienced construction personnel will increase learners' awareness of their roles and responsibilities under the CDM Regulations 1994. Such a role-play exercise could involve the teacher as client and the experienced construction personnel as the planning supervisor and Health and Safety officer, with the learners taking on the various roles of designer, contractor, sub-contractors and users. Each should be given a 'prompt' sheet that helps them to act in character and explains what that character would be expecting from the process and what their typical behaviour might be.

Another useful on-site exercise, which could be simulated in contractors' offices off-site, is to track the materials and components used on-site back to the suppliers, from the suppliers back to the manufacturers, and then even further back to the source of the raw materials. This would help encourage discussions regarding the advantages of local procurement, the contradictions sometimes implied by embedded energy issues, and the benefits associated with 'life-cycle' ways

of thinking that consider the problems associated with the final disposal of construction materials and components, from the very beginning of the design process.

Visits to recycling centres, architectural salvage companies and waste management centres will all help raise the learners' awareness of waste disposal issues, re-use, recycling, recovery of materials, landfill taxes, incineration issues, etc. Learners must prepare for the visit and should have a range of questions ready to ask whoever is showing them around and/or making a presentation. The aim should be to return with a better understanding of how good waste disposal and recycling practices constitute sustainable construction in that they both help the environment and reduce the need for new materials to be manufactured and transported to site, which are of course two further impacts on the environment.

What activities might be involved in this unit?

- Visiting manufacturers' premises, builders' merchants and construction sites.
- Attending on-site Health and Safety inductions and/or tool-box talks.
- Preparing and interpreting risk assessments and method statements.
- Analysing trends using official accident statistics.
- Visiting wind farms, recycling centres and waste management centres.
- Tracking sustainable materials from their raw state to deterioration and replacement.

Suggested prior learning

Level 2 Principal Learning in Construction and the Built Environment, or 5 GCSEs at Grade C or above.

Personal, Learning and Thinking Skills

The list below is indicative of the way this unit supports the development of PLTS, as opposed to the achievement of PLTS that are possible through the assessment. The unit supports the development of more PLTS than are covered through the assessment criteria alone.

Alternative approaches could be selected. The learner could develop PLTS by:

Independent enquirers

- identifying questions to ask of experienced Health and Safety, environmental and construction personnel during presentations and visits to their sites and/or premises
- analysing health, safety and welfare legislation in order to determine the nature of the compliance demanded of construction companies

Creative thinkers

- questioning their own assumptions, and those of others, made regarding what is and what is not good practice in environmental and sustainability terms, specifically when considering embedded energy issues
- exploring how they would feel if someone close to them was killed or injured in a construction accident and what the direct and indirect consequences might be

Reflective learners

- inviting feedback on both their performance in the 'CDM role-play' and the quality of the decisions made during the exercise, and using this to inform their future progress

Team workers

- working as a team in pursuit of a common goal to track the materials and components used in a construction project back to their source

Self-managers

- preparing for visits to sites and presentations from external sources, in order to better inform their understanding of what they see and what they are told
- preparing, and agreeing with the teacher and with other learners, a range of suitable questions to ask experienced construction personnel

Effective participators

- acting as an advocate for views that may not be their own when following the 'prompt' sheets provided for the role-play exercise.

Suggested learning resources

Books

- Fundamentals of Building Construction: Materials and Methods - Allen, E & Iano, J Published by: John Wiley & Sons, 2003 - ISBN: 0-471-21903-7 (Please note: J Iano keeps a blog for readers of the book at <http://jiano.typepad.com/fbc/>)
- Building Construction Handbook - Chudley, R & Greeno, R Published by: Butterworth-Heinemann, 2006 - ISBN: 0-750-66822-9
- Reclaimed and Recycled Construction Materials - Coventry, S; Woolveridge, C; & Hillier, S Handbook - Published by: Construction Industry Research & Information Association (CIRIA), 1999 - ISBN: 0-860-17513-8
- Safe Start: Safety Handbook: GE 707 - Hands, D & - Published by: ConstructionSkills, 2005 - CITB-ConstructionSkills -ISBN: 1-857-51109-3
- Introduction to Health and Safety in Construction: - Hughes, P & Ferrett E The handbook for construction professionals and - students on NEBOSH and other construction courses - Published by: Butterworth-Heinemann, 2006 - ISBN: 0-750-68111-X
- Ecohouse 2: A Design Guide - Roaf, S Published by: Architectural Press, 2003 - ISBN: 0-750-65734-0
- Principles of Construction Safety - St. John Holt, A Published by: Blackwell Publishing, 2005 - ISBN: 1-405-13446-1
- Approved Documents: The Building Regulations 2000 - The Stationery Office - Published by: Stationery Office Books, 2006 - ISBN: 0-117-03635-8 - Approved documents can also be purchased individually as required.
- The New Autonomous House: Design and Planning for Sustainability - Vale, B & Vale, R - Published by: Thames & Hudson Ltd, 2002 - ISBN: 0-500-28287-0

Journals and magazines

- Building
- Construction News

Resource packs

'Be a safe learner. Aspects of Health and Safety'
Published by: Standards Unit, DfES -
Available from standards.unit@dfes.gsi.gov.uk and
www.successforall.gov.uk

DfES

'Health and Safety: Skills for Construction'
Published by: DfES
Available from dfes@prolog.uk.com

DfES

Videos, CDs and DVDs

- The Construction of Houses The Video Project UWE
- Building History and Building Conservation The Video Project UWE
- A Sampler of Alternative Homes: Approaching Sustainable Architecture (DVD) Kelly Hart
- Money for Nothing and Your Waste Tips for Free Environment Agency
- Building a Cleaner Future CIRIA / Environment Agency
- Designs that Hold Water Urban Design Allowance
- E-resources for construction www.rsc-wales.ac.uk

Websites

- Beddington Zero Energy Development www.peabody.org.uk/bedzed
- The Carbon Trust www.thecarbontrust.co.uk/energy
- Construction Industry Research and Information www.ciria.org.uk
- ConstructionSkills www.citb.org.uk
- Department for Business, Enterprise and Regulatory Reform – Sustainable Construction Brief 2004 www.dti.gov.uk/files/file13939.pdf
- Design Quality Indicator www.dqi.org.uk
- Eden Frame www.edenframe.com
- European Commission Directorate-General for Energy and Transport www.managenergy.net
- Forest Stewardship Council www.fsc-uk.org
- Green Building Magazine www.greenbuildingmagazine.co.uk
- Green Building Press www.greenbuildingpress.co.uk
- Health and Safety Executive hseinformationservices@natbrit.com
- Health and Safety Executive Books www.hsebooks.co.uk
- National House-Building Council www.nhbc.co.uk
- Wood for Good www.woodforgood.com
- ZEDfactory Ltd www.zedfactory.com

Level 3

Unit 5: Create the built environment: management processes

What is this unit about?

The purpose of this unit is for learners to explore the construction processes used to create substructures and superstructures. Learners will become familiar with project management tools and techniques, and quality assurance and project monitoring processes. The unit will also make learners aware of the career opportunities available in managing the construction of the built environment.

This unit, alongside the others within the Level 3 Principal Learning in Construction and the Built Environment, has been designed to allow learners the opportunity to develop a range of Personal, Learning and Thinking Skills (PLTS), and to demonstrate these on more than one occasion. This approach will allow them to build towards a full range of PLTS.

Learning outcomes

The learner will:

1. know about the various stages of construction projects and the technological skills required to deliver each stage of such projects
2. be able to compare traditional and modern methods of construction (MMC) in terms of cost and efficiency
3. be able to define personal and project management skills, and use them to manage construction projects
4. be able to plan a career in construction up to and including professional membership.

Assessment criteria

1. Stages of construction projects and construction technology

The learner can:

- 1.1 identify and describe the technological skills used to bring a construction project to a successful conclusion in terms of the following distinct stages of the process:
 - a. groundworks
 - b. substructure
 - c. superstructure:
 - o carcassing
 - o roofing
 - o cladding
 - o first fix
 - o plastering and dry lining
 - o second fix
 - o decoration
 - d. external works and landscaping
- 1.2 analyse the development of a construction project in terms of the important stages
- 1.3 interpret detailed construction drawings, specifications and schedules of work.

2. Traditional methods of construction versus modern methods of construction

The learner can:

- 2.1 appraise the skills used in construction projects in terms of (IE4, 6):
 - a. the key methods, techniques, operations and processes used
 - b. the differences between traditional and modern methods of construction
 - c. the advantages of modern methods of construction, such as:
 - o lower costs
 - o shorter project durations
 - o enhanced Health and Safety
 - o fewer environmental concerns
 - o improved fit with community and society needs.

3. Project management skills

The learner can:

- 3.1 assess project management roles in terms of (IE6) (RL1):
 - a. personal and practical skills required:
 - o forecasting and project planning
 - o organising, controlling and co-ordinating
 - o communication with other members of design and construction teams
 - o resource management (materials, labour and plant)
 - o management and co-ordination of sub-contractors and suppliers
 - o cost and budgetary control
 - o leadership and motivation

- b. roles and responsibilities:
 - o general foreman
 - o site manager
 - o site engineer
 - o quantity surveyor
 - o contracts manager
 - c. typical procedures:
 - o liaison with client and architect
 - o planning (Gantt charts, critical path analyses)
 - o weekly programming
 - o monitoring and costing materials, labour, plant and sub-contractors
 - o conducting site meetings
 - o supervision, monitoring and quality control
 - o control of work in progress, materials, plant and waste
 - o management of delivery schedules
 - o managing snagging processes both during and after each construction stage
- 3.2 produce a simple project plan, including:
- a. risk assessments
 - b. method statements
 - c. delivery schedules
 - d. Gantt charts
 - e. critical path analyses
 - f. costings.

4. Career opportunities in construction management

The learner can:

- 4.1 compare and contrast career opportunities in the construction of the built environment (IE4, 6):
- a. the range and characteristics of career opportunities
 - b. the level of available career opportunities:
 - o craft
 - o technical
 - o supervisory
 - o professional and management
 - c. the nature of interactions between those who work in construction management
 - d. progression opportunities available in construction management
 - e. the qualifications needed to support career progression
 - f. the role of professional institutions in construction of the built environment.

Where the assessment criteria show a direct link to an area of the PLTS framework, it is referenced here. Further information on PLTS is available in Section 3.1 of this specification and also within this unit in the section on Personal, Learning and Thinking Skills.

Guided learning hours

It is recommended that a minimum of 90 guided learning hours be spent on this unit

Assessment

This unit is assessed through a centre set and marked assignment. Internal assessments are subject to moderation by City & Guilds.

Learners will complete an assignment, which should be based upon the project management skills needed to bring a construction project to a successful conclusion supported, as and when appropriate, by knowledge of the stages of a typical construction process and the technology available. Learners will also explore the differences between traditional and modern methods of construction, and appraise the perceived advantages of the latter.

The assignment should be based upon a building or other structure under construction, possibly within the school or college grounds, or at least nearby; a constructed building or structure; or a realistic teacher-devised scenario. The assignment will also require the learner to explore career opportunities and progression routes available in the creation of the built environment.

The assignment will take approximately 18 of the 90 guided learning hours available for this unit. The learner should work under controlled conditions in accordance with the guidance in Section 4.4 of this specification, and evidence should be kept for moderation purposes.

Evidence requirements

The learner must produce evidence of achievement of the assessment criteria. In the assignment, the learner will produce:

1. a report on:
 - 1.1 the various stages of a construction project and the technological skills associated with each stage
 - 1.2 traditional and modern methods of construction in terms of methods and techniques, and comparative costs and efficiency
 - 1.3 project planning, including a project plan comprising risk assessments, method statements, delivery schedules, Gantt charts, critical path analyses and costings
 - 1.4 career progression within project management up to and including professional level.

In order to attain a high mark in this unit, learners must address all of the above. It may, however, be possible to achieve a pass mark without producing every one of the evidence requirements. A table showing how the Assessment criteria topics are weighted is included below, and learners should be shown this in order that they understand how the final mark is determined.

Assignment structure

A suggested assignment structure, which would allow learners to meet the evidence requirements, may include the following steps:

- Identify and describe the various stages of the construction project and the technological skills needed to complete the project successfully.
- Classify the methods, techniques, operations and processes used in the project as either traditional or modern methods of construction, and compare the two in terms of their advantages and disadvantages.
- Assess the project management skills used to manage the project in terms of the roles and responsibilities of those involved, the personal and practical skills required of project managers, and the procedures involved in project management.
- Demonstrate project management skills by interpreting, producing and/or modifying risk assessments, method statements, delivery schedules, Gantt charts, critical path analyses and costings relevant to the chosen construction project.
- Prepare a career development plan to support progression to professional membership within project management and to help potential construction managers navigate their way through the process.

Learners may use drawings, photographs and other images to support their work. It is also acceptable for them to use the opinions and judgements of construction professionals to support their work.

A suggested context for this assignment is a construction project involving a building or other structure under construction, possibly within the school or college grounds.

Weighting of assessment criteria topics

Assessment criteria topic	Weighting	Marks
1. Stages of construction projects and construction technology	25%	15
2. Traditional methods of construction versus modern methods of construction	25%	15
3. Project management skills	40%	24
4. Career opportunities in construction management	10%	6
Total	100%	60

Assessment grid

Please note that the descriptions in this marking grid relate to the top of each band. Further guidance on using marking grids is available in the Assessment section of this specification.

Assessment criteria topic	Band 1	Band 2	Band 3
	The learner has:		
1. Stages of construction projects and construction technology	<p>0-5 marks</p> <p>Demonstrated a basic knowledge and understanding of the technology used in construction projects by identifying and briefly describing some of the stages of a construction project, and a limited number of the technological skills required to complete the project</p> <p>Related these stages and skills to the construction of the local building or structure under consideration in a superficial but generally accurate fashion</p>	<p>6-10 marks</p> <p>Demonstrated a partial knowledge and understanding of the technology used in construction projects by identifying and clearly describing most of the stages of a construction project and a wide range of the technological skills required to complete the project</p> <p>Related these stages and skills to the construction of the local building or structure under consideration in a clear and accurate fashion</p>	<p>11-15 marks</p> <p>Demonstrated an in-depth knowledge and understanding of the technology used in construction projects by identifying and precisely describing all of the stages of a construction project, and an extensive range of the technological skills required to complete the project</p> <p>Related these stages and skills to the construction of the local building or structure under consideration in a thorough and detailed fashion</p>

<p>2. Traditional methods of construction versus modern methods of construction</p>	<p>0-5 marks</p> <p>Correctly classified a limited range of construction methods as traditional or modern</p> <p>Identified and briefly described some of the advantages of modern methods of construction</p> <p>Illustrated their answers with relevant images of an acceptable standard</p>	<p>6-10 marks</p> <p>Correctly classified a wide range of construction methods as traditional or modern</p> <p>Identified and clearly described most of the advantages of modern methods of construction</p> <p>Illustrated their answers with relevant images of a good standard</p>	<p>11-15 marks</p> <p>Correctly classified an extensive range of construction methods as traditional or modern</p> <p>Identified and precisely described all or nearly all of the advantages of modern methods of construction</p> <p>Illustrated their answers with relevant images of a high standard</p>
<p>3. Project management skills</p>	<p>0-8 marks</p> <p>Assessed a limited range of project management roles, responsibilities and procedures in terms of the personal and practical skills required</p> <p>Interpreted a limited range of project planning documentation</p>	<p>9-16 marks</p> <p>Assessed a wide range of project management roles, responsibilities and procedures in terms of the personal and practical skills required</p> <p>Produced and interpreted a wide range of project planning documentation</p>	<p>17-24 marks</p> <p>Assessed an extensive range of project management roles, responsibilities and procedures in terms of the personal and practical skills required</p> <p>Produced, interpreted and modified a comprehensive range of project planning documentation</p>
<p>4. Career opportunities in construction management</p>	<p>0-2 marks</p> <p>Produced a basic summary of a limited number of the careers available in project management</p> <p>Offered a superficial explanation of how project managers can develop and progress their careers up to professional membership level</p>	<p>3-4 marks</p> <p>Produced a clear and accurate summary of a wide range of the careers available in project management</p> <p>Offered a coherent and reasoned explanation of how project managers can develop and progress their careers up to professional membership level</p>	<p>5-6 marks</p> <p>Produced an in-depth summary of an extensive number of the careers available in project management</p> <p>Offered a precise and detailed explanation of how project managers can develop and progress their careers up to professional membership level</p>

Guidance for delivery

This section should be read in conjunction with 'Opportunities for applied learning' below.

This unit has links with Level 3 Unit 4: Create the built environment: health, safety and environmental influences. Joint delivery of the two units may be considered.

When delivering this unit, teachers should use a broad range of techniques including lectures, discussions, external presentations, role-play exercises, site visits and realistic work environments.

Teachers should encourage learners to undertake research using the Internet and/or local library resources. Learners should use this to supplement the experiences they gain in industry, on visits and from external sources.

Whatever teaching, learning and assessment strategies are employed, health, safety and welfare issues are paramount at all times. The unit content contains little that will generate hazards in the centre but risk assessments will be required for visits to construction sites, manufacturers' premises, etc. These should be utilised in the teaching and learning strategies used for the unit.

There are very specific legal issues implicit in Assessment criteria 3a ii-iii, 4ii and 4vi, and ethical issues associated with all of Assessment criteria topic 2 and with criterion 4iii. These should be signposted to the learner and the implications developed within the delivery of the unit.

Any form of work placement, work experience or work shadowing would prove invaluable in this unit. The range of roles and responsibilities of those who work in this part of the industry is very wide, and learners cannot be expected to experience everything. They should, however, be given as many chances as possible to see how construction projects are managed.

Learners should be aware of the following as they apply to management processes:

Groundworks

- Work such as excavation and drain laying that takes place early in the project and below ground.

Substructure

- Work carried out mostly underground, including the structure on which the building or structure stands
- Services, including drainage, that run to and from the building
- Modern methods of construction by piling and slab construction.

Superstructure

- The part of the building that is seen above ground
- Includes traditional on-site building methods, such as brick and concrete, together with modern pre-fabricated methods of timber or steel frame and cladding.

Carcassing

- Floor and roof structures, together with internal non-load bearing walls.

Roofing

- Methods and materials by which both flat and pitched are covered.
- Methods of weather-proofing at edges and joints.

Cladding

- The method by which walls and other features are made weather-proof and provide a range of decorative finishes to make the buildings both varied and aesthetically pleasing.

First fix

- The process whereby the pipes and wires of the building services, including plumbing, electricity, gas and telecommunication, are installed behind walls and under floors before the floors, walls and ceilings are completed.

Plastering and dry lining

- The method by which walls are completed with a smooth finish using either wet or dry processes.

Second fix

- The process whereby many trades complete their installation, from plumbers fitting taps and plugs, to carpenters fixing doors and skirting.

Decoration

- Painting and other decorative finishes to all internal and external surfaces to protect them from weather and damage, and to enhance their aesthetic value.

External works

- Provision of a garden and other external areas according to their type and location to enhance visual appearance.
- Important parts of landscape include tree protection, legally required open space, paths and fences around the property.

Schools and colleges will have to comply with Health and Safety legislation when visits to sites have been arranged. Site visits will motivate learners and help them to appreciate the importance and complexity of the construction industry. Teachers should arrange for the Health and Safety officer to come to the school or college beforehand to instruct the learners in what the project is intended to achieve and how Health and Safety is ensured on the site.

Use of real situations and experiences can be facilitated by working with local construction companies with offices close to the school/college, or with construction sites nearby. When using external visits and working with guest speakers, it is critical that both parties are clear about the aim and the level of understanding required. It is also important to ensure that the method of delivery is appropriate for the course and the learners.

Teachers could invite guest speakers who work in the industry and allow learners to interview them and find out what they enjoy about their work and how they trained for it. Representatives from local colleges and universities might be invited to explain the courses and qualifications in construction and the built environment offered at their institution. Teachers could also ask a developer or contractor to provide learners with copies of method statements and risk assessments, and then give the learners an operation and ask them to develop their own method statement. This could be done following a site visit.

Opportunities for applied learning

This unit has clear links with Level 3 Unit 4: Create the built environment: health, safety and environmental influences, and the 'Opportunities for applied learning' section from that unit should be read in conjunction with the advice below.

Learners must identify a small construction project on the school or college campus or in the local community, and develop a simple project management plan including all approximate costs. This will form the basis of their learning. They should hold simulated site team meetings as a role-play exercise and ask construction professionals to come into the school or college to help them plan it, take part in the meeting, observe the part played by the learners, evaluate the learners' contribution and provide feedback.

Learners are required to visit a range of construction sites to view work at different stages of construction. They should use this to inform their understanding of how the various stages of construction relate to each other, the order in which they must be carried out, the relative duration of each stage, the trades and plant needed at each stage, and the site management issues associated with each stage. They should also take the opportunity to interview the site manager, the general foreman and other key personnel, regarding their roles and responsibilities and the 'tools of their trades' in procedural and management terms.

Career development is a straightforward topic but needs to be made interesting and relevant. It is important that learners develop an understanding of the careers available in construction, and how they can access such careers, to supplement their developing understanding of what construction workers actually do in their day-to-day work. There is a wealth of information available from the websites listed in the 'Suggested learning resources' section below. The local further education college and/or Connexions service should be happy to visit the centre and explain what careers are available, what the opportunities for progression are, what qualifications are required to support that progression, and what is available locally. Visits from building companies looking for staff are easy to arrange when the sector is busy and competing for workers. Contact with experienced construction workers at all levels will help learners understand how members of the team interact with each other.

Learners could also:

- perform SWOT (strengths, weaknesses, opportunities and threats) analyses on a range of managerial tasks
- use, or watch demonstrations of, professional project management software
- contact developers to obtain previously used:
- construction drawings schedule of works planning charts method statements
- take photographs of technical and project management issues on a construction site
- obtain brochures from, and visit websites of, colleges and universities
- obtain brochures from, and visit websites of, professional institutions
- create charts that show career pathways
- work in small groups to simulate a tender for the award of a contract, including costs.

What activities might be involved in this unit?

- Visiting a range of different construction sites at different stages of construction.
- Interpreting drawings, specifications and schedules of work for an on-going project.
- Devising method statements for both programming and Health and Safety purposes.
- Producing simple Gantt charts, critical path analyses and delivery schedules.
- Planning simulated site meetings for role-play exercises and taking minutes of them.
- Gathering useful careers information from a variety of experienced personnel.

Suggested prior learning

- Level 2 Principal Learning in Construction and the Built Environment, or 5 GCSEs at Grade C or above.

Personal, Learning and Thinking Skills

The list below is indicative of the way this unit supports the development of PLTS, as opposed to the achievement of PLTS that are possible through the assessment. The unit supports the development of more PLTS than are covered through the assessment criteria alone.

Alternative approaches could be selected. The learner could develop PLTS by:

Independent enquirers

- exploring and evaluating the range of career opportunities available in the construction and built environment sector

Creative thinkers

- devising and compiling method statements for resource planning, project programming and Health and Safety purposes
- producing Gantt charts, critical path analyses and delivery schedules to support management of the selected construction project

Reflective learners

- reviewing the outcomes of site meetings in terms of what was discussed, what was achieved, and any action points that were agreed

Team workers

- working as a group to plan site team meetings with clients, other members of the management team, and on-site construction personnel

Self-managers

- organising their time and resources to reduce control quality by monitoring costs, material wastage, and quality of work done
- organising snagging procedures where necessary.

Suggested learning resources

Books

- Building Construction Handbook - Chudley, R & Greeno, - R Published by: Butterworth-Heinemann, 2006- ISBN: 0-750-66822-9
- Introduction to Health and Safety in Construction: The handbook for construction professionals and students on NEBOSH and other construction courses - Hughes, P & Ferrett, E - Published by: Butterworth-Heinemann, 2006 - ISBN: 0-750-68111-X
- Approved Documents: The Building Regulations 2000 - The Stationery Office - Published by: Stationery Office Books, 2006 - ISBN: 0-117-03635-8
Approved documents can also be purchased individually as required.

Resource packs

'Be a safe learner. Aspects of Health and Safety' DfES
- Published by: Standards Unit, DfES
Available from standards.unit@dfes.gsi.gov.uk
and **www.successforall.gov.uk**

'Health and Safety: Skills for Construction' - DfES
Published by: DfES
Available from dfes@prolog.uk.com

Journals and magazines

- Building
- Construction News
- Housebuilder

Videos, CDs and DVDs

- The Construction of Houses The Video Project UWE
- Building History and Building Conservation The Video Project UWE
- E-resources for construction www.rsc-wales.ac.uk

Websites

- Beddington Zero Energy Development www.peabody.org.uk/bedzed
- ConstructionSkills www.citb.org.uk
- Department for Business, Enterprise and Regulatory Reform – Sustainable Construction Brief 2004 www.dti.gov.uk/files/file13939.pdf
- Eden Frame www.edenframe.com
- European Commission Directorate-General for Energy and Transport www.managenergy.net
- Forest Stewardship Council www.fsc-uk.org
- Green Building Magazine www.greenbuildingmagazine.co.uk
- Green Building Press www.greenbuildingpress.co.uk
- Health and Safety Executive hseinformationservices@natbrit.com
- Health and Safety Executive Books www.hsebooks.co.uk
- National House-Building Council www.nhbc.co.uk
- Wood for Good www.woodforgood.com
- ZEDfactory Ltd www.zedfactory

Level 3

Unit 6: Value and use of the built environment: adding value to the wider community

What is this unit about?

The purpose of this unit is to introduce learners to the role of stakeholders and the community in the development of the built environment. The unit looks at social, economic and commercial contributions of the built environment to the community, and the importance of balancing the different needs of different stakeholders and communities. Learners will be made aware of the primary factors that affect the planning process and how they relate to design. Learning about the career opportunities available in community development will also be integral to the unit.

This unit, alongside the others within the Level 3 Principal Learning in Construction and the Built Environment, has been designed to allow learners the opportunity to develop a range of Personal, Learning and Thinking Skills (PLTS), and to demonstrate these on more than one occasion. This approach will allow them to build towards a full range of PLTS.

Learning outcomes

The learner will:

1. understand how individuals, organisations and communities can contribute to development decisions
2. understand how the built environment can be designed in a way that adds value to the wider community
3. understand how planned built environments contribute to the wellbeing of individuals, economic activity, the prosperity of areas, sustainability, and social cohesion
4. know about the planning process and the factors that influence it
5. know about job roles within community development and how the different roles interact, as well as the qualifications and experience they require.

Assessment criteria

1. Key stakeholders in the construction of the built environment

The learner can:

- 1.1 compare the different perspectives, interests and priorities of the key stakeholders involved in the development and use of the built environment and the local infrastructure (IE3) (CT3):
 - a. local authorities
 - b. local council representatives
 - c. parish council representatives
 - d. Highways Agency
 - e. transport company representatives
 - f. Environment Agency
 - g. Regional Development Agencies
 - h. Housing Associations/Trusts
 - i. building developers
- 1.2 evaluate the methods used by planning authorities to engage key stakeholders:
 - a. consultations aimed at the development of the built environment (IE1, 4) (EP1)
 - b. production of promotional and planning material (RL6).

2. Procedures designed to add value to the wider community

The learner can:

- 2.1 assess the effectiveness of procedures designed to add value to the wider community (IE6) (RL1):
 - a. involvement of all key stakeholders in consultation on local developments
 - b. agreement of a balanced approach to the needs and interests of the key stakeholders
 - c. methods by which the needs of the community can be surveyed, collated, agreed and used to influence development decisions.

3. The contribution made by the planned built environment

The learner can:

- 3.1 evaluate the contribution of a planned built environment to (IE3, 6):
 - a. the wider economy in terms of general economic and business drivers
 - b. local economic activity in terms of locally applying conditions
 - c. the general prosperity of the community
 - d. the wellbeing of individuals and communities
 - e. social cohesion within the community
 - f. the development of a sustainable community.

4. The planning process and the uses of planning information

The learner can:

- 4.1 analyse the planning process in terms of (IE4, 5):
 - a. the primary factors that influence the planning process:
 - o social
 - o political
 - o economic
 - b. how the above factors relate to other components of the design process
 - c. how planning information is provided for:
 - o the general public (private development)
 - o professional developers (development on behalf of commercial clients and/or organisations)
 - o local government officials (development on a community scale).

5. Career opportunities in the value and use of the built environment

The learner can:

- 5.1 compare and contrast career opportunities in the value and use of the built environment (IE4, 6):
 - a. range and characteristics of career opportunities
 - b. level of available career opportunities:
 - o craft
 - o technical
 - o supervisory
 - o professional and management
 - c. nature of interactions between those who work in the value and use of the built environment
 - d. progression opportunities available in the value and use of the built environment
 - e. qualifications needed to support career progression
 - f. role of professional institutions in the value and use of the built environment.

Where the assessment criteria show a direct link to an area of the PLTS framework, it is referenced here. Further information on PLTS is available in Section 3.1 of this specification and also within this unit in the section on Personal, Learning and Thinking Skills.

Guided learning hours

It is recommended that a minimum of 90 guided learning hours be spent on this unit.

Assessment

This unit is assessed through a centre set and marked assignment. Internal assessments are subject to moderation by City & Guilds.

This method of assessment allows the centre to contextualise the assignment, by encouraging learners to develop knowledge and understanding of sources of funding, the many stakeholders to the construction process, their differing priorities, and the promotional material and documentation needed to support the value and use of the built environment. The assignment should relate to the learners' local area and use up-to-date information.

The evidence must be based on a building or other structure under construction, a constructed building or structure, or a realistic teacher-devised scenario.

The assignment will take approximately 18 of the 90 guided learning hours available for this unit. The learner should work under controlled conditions in accordance with the guidance in Section 4.4 of this specification, and evidence should be kept for moderation purposes.

Evidence requirements

The learner must produce evidence of achievement of the assessment criteria. In the assignment, the

learner will produce:

1. a list of the key stakeholders with whom it would be important to consult and a description of the different perspectives and priorities of these stakeholders
2. examples of promotional and planning material designed to convince stakeholders of the contribution the development will make to the local built environment
3. a flow chart indicating the factors that will affect the planning process and how development will progress from initial planning to project completion
4. a career development plan to support progression in the value and use of the built environment.

In order to attain a high mark in this unit, learners must address all of the above. It may, however, be possible to achieve a pass mark without producing every one of the evidence requirements. A table showing how the Assessment criteria topics are weighted is included below, and learners should be shown this in order that they understand how the final mark is determined.

Assignment structure

A suggested assignment structure, which would allow learners to meet the evidence requirements, may include the following steps:

- Identify, compare and contrast the key stakeholders involved in the development process in terms of their different perspectives and priorities.
- Assess the formal and informal procedures used to identify community needs, to involve key stakeholders and to secure their support for a balanced approach in the interests of, and to the benefit of, all parties.
- Explain the ways in which a planned built environment can contribute to economic activity, individual wellbeing, general prosperity, social cohesion and the development of a sustainable community.
- Analyse the factors that affect the planning process, explain how it links with the design process and evaluate the ways in which planning information is used.
- Prepare a career development plan to support progression within development and help potential property developers, local authority officers, housing association officers and similar to navigate their way through the process.

Each of the above tasks offers an excellent opportunity for experiential learning. The learner has the opportunity to plan and action their initial investigations, to review and monitor their findings with other learners, experienced construction professionals and careers officers, and to revisit their original findings in the light of the outcomes of such discussions.

A suitable period of reflection should follow upon completion of the assessment for this unit. The learner should evaluate what they have done, what went well, what went less well and how they would do things differently if they were to do the assessment again. The learning and assessment that comprise this unit can then be used by the learner to inform further study of selected units from the Applied and Specialist Learning.

Weighting of assessment criteria topics

Assessment criteria topic	Weighting	Marks
1. Key stakeholders in the construction of the built environment	25%	15
2. Procedures designed to add value to the wider community	25%	15
3. The contribution made by the planned built environment	25%	15
4. The planning process and the uses of planning information	15%	9
5. Career opportunities in the value and use of the built environment	10%	6
Total	100%	60

Assessment grid

Please note that the descriptions in this marking grid relate to the top of each band. Further guidance on using marking grids is available in the Assessment section of this specification.

Assessment criteria topic	Band 1	Band 2	Band 3
	The learner has:		
1. Key stakeholders in the construction of the built environment	<p>0 – 5 marks</p> <p>Demonstrated a basic knowledge and understanding of the development process by identifying some of the key stakeholders, briefly describing some of their perspectives and priorities, and relating the process to the development under consideration in a superficial but generally accurate fashion.</p>	<p>6 – 10 marks</p> <p>Demonstrated a partial knowledge and understanding of the development process by identifying most of the key stakeholders, clearly describing most of their perspectives and priorities, and relating the process to the development under consideration in a clear and accurate fashion.</p>	<p>11 – 15 marks</p> <p>Demonstrated an in-depth knowledge and understanding of the development process by identifying all of the key stakeholders, clearly and precisely describing a comprehensive range of their perspectives and priorities, and relating the process to the development under consideration in a detailed fashion.</p>
2. Procedures designed to add value to the wider community	<p>0 – 5 marks</p> <p>Demonstrated a basic knowledge and understanding of the contribution development can make to the local built environment by identifying and briefly describing some of the procedures used to identify community needs.</p> <p>Produced simple promotional and planning material designed to secure the support of key stakeholders.</p>	<p>6 – 10 marks</p> <p>Demonstrated a partial knowledge and understanding of the contribution development can make to the local built environment by identifying and clearly describing most of the procedures used to identify community needs.</p> <p>Produced clear and useful promotional and planning material designed to secure the support of key stakeholders.</p>	<p>11 – 15 marks</p> <p>Demonstrated an in-depth knowledge and understanding of the contribution development can make to the local built environment by identifying and briefly describing all or nearly all of the procedures used to identify community needs.</p> <p>Produced attractive and detailed promotional and planning material designed to secure the support of key stakeholders.</p>

<p>3. The contribution made by a planned built environment</p>	<p>0 – 5 marks</p> <p>Briefly explained some of the ways in which a planned built environment benefits the individual and the wider community.</p>	<p>6 – 10 marks</p> <p>Clearly explained most of the ways in which a planned built environment benefits the individual and the wider community, and clearly differentiated between effects on individuals and the wider community.</p>	<p>11 – 15 marks</p> <p>Fully explained all of the ways in which a planned built environment benefits the individual and the wider community, and precisely differentiated between effects on individuals and the wider community.</p>
<p>4. The planning process and the uses of planning information</p>	<p>0 – 3 marks</p> <p>Produced a simple analysis of how planning information is used to inform the design and planning process, and constructed a basic flow chart showing the development progress through the process in limited detail.</p>	<p>4 – 6 marks</p> <p>Produced a reasoned analysis of how planning information is used to inform the design and planning process, and constructed a flow chart showing the development progress through the process in some detail.</p>	<p>7 – 9 marks</p> <p>Produced an in-depth analysis of how planning information is used to inform the design and planning process, and constructed a flow chart showing the progress of the development through the process in considerable detail.</p>
<p>5. Career opportunities in the value and use of the built environment</p>	<p>0 – 2 marks</p> <p>Compared careers available in the value and use of the built environment, and produced a basic plan to support individual career progression opportunities, up to professional membership.</p>	<p>3 – 4 marks</p> <p>Compared careers available in the value and use of the built environment, and produced a clear and coherent plan to support individual career progression opportunities, up to professional membership.</p>	<p>5 – 6 marks</p> <p>Compared careers available in the value and use of the built environment, and produced a precise and thoughtful plan to support individual career progression opportunities, up to professional membership.</p>

Guidance for delivery

Procedures for developing the built environment

Learners should be encouraged to expand their prior knowledge of the built environment by exploring the processes involved in developing the existing built environment. Much of the background information relating to this unit is in the public domain and can be accessed via:

- the Communities and Local Government website www.communities.gov.uk
- the Planning Portal website www.planningportal.gov.uk

The planning process

Learners should explore how planning information is provided for:

- the general public (private development)
- professional developers (development on behalf of commercial clients and/or organisations)
- local government officials (development on a community scale).

This research should help learners to ascertain an understanding of the basic planning procedures adopted for different developments. There is an opportunity for this learning to be enhanced through workplace experience in:

- Local Authority planning departments
- Housings Services and/or Association offices
- community management and regeneration services
- construction and/or building company development offices.

This will give learners an opportunity to experience at first-hand how economic and social factors are integrated into the planning process.

Community engagement

Learners should be introduced to government-led initiatives designed to engage stakeholders (people and/or organisations with a vested interest in what is being proposed) from the community and to encourage them to give their voice to bodies such as Local Strategic Partnerships (LSPs). These are quasi-governmental organisations, which have representation from government, the private sector and local authorities, and are charged with helping to deliver the government's vision of 'Strong and Prosperous Communities'.

Learners should be encouraged to assess the role of these bodies after detailed investigation of how they function and how effective they are. This could include primary research through contact with people who represent Local Authorities and Local Strategic Partnerships. This element of study should also include some investigation into the success of the consultation strategies adopted for both nationally and locally focused developments.

Details of current and past national consultations can be found via the Communities and Local Government website. Details of current and past local consultations can be found on Local Authority websites. Guidance details on the criteria that public consultations must meet are included in the Cabinet Office Code of Practice on Consultation. Primary research through representatives of Local Authorities could be useful in terms of discovering what, in their experience, are the most effective consultation methods.

A learner activity could be developed to look specifically at how consultations regarding transport link developments are conducted. The Highways Agency website will be a good place to start this process at www.highways.gov.uk

Contribution of the built environment

In studying the contribution of the built environment, learners should be encouraged to consider both the localised benefits that development of the built environment can bring to a particular area and also the macro- economic issues associated with the current economic climate of the building and construction industry.

Aspects which learners should consider include:

- the contribution of industrial and/or commercial buildings to economic activity and prosperity
- the contribution of industrial and/or commercial buildings to social cohesion
- ways in which buildings used as a place of work or leisure can integrate with the community, without adversely affecting social cohesion
- the positive and negative effects of development of the built environment on communities
- ways in which development of the built environment affects new investment and creates better services to a particular area
- the effects that a strong and healthy construction industry can have in terms of creating employment, creating business for associated sectors (property markets, service providers, utilities companies, etc.), and the impact this can have on the national economy.

Once these elements have been covered, learners could be asked to research the following high profile examples in order to help them apply some of the elements covered above to real life situations. This could take the form of a group activity. The developments mentioned are examples only and teachers should research what is available and accessible in their local area.

Completed developments:

- the Magna Centre in South Yorkshire (Steel Mill to Science Adventure Centre)
- the redeveloped Bull Ring area of central Birmingham
- the redevelopment of Stratford in East London for the 2012 Olympic Games.

Opportunities for applied learning

Learners can apply their learning by assessing how new developments in their local area have contributed to the community in terms of economic activity, prosperity and social cohesion. They could compile a simple questionnaire to use in a survey of their friends and family and people living in the local area. The teacher may need to help in the development of the questionnaire but the standard need not be that of a professional survey or an opinion poll. It is crucial that the learners realise the importance of involving the community that will use the proposed development, or at the least have to live with the consequences of the proposed development. Learners should attempt to analyse the responses to produce a reasonable summary of the views of the community and, in particular, should ask whether the benefits of the development are perceived to outweigh any adverse factors.

Learners can use a real or virtual development produced by the teacher to compile reports showing how the planning authorities engaged stakeholders and communities in consultations aimed at controlling that development.

Learners could formulate proposals for a given development in an area they know well, and then:

- identify possible funding sources for the project
- identify the key stakeholders with whom it would be important to consult
- produce promotional material outlining the merits of the development
- produce a flow chart showing the progress of the development process.

Visits to construction sites and local authority planning and highways and/or transport offices will help reinforce good practice and the various factors that influence the value and use of the built environment. If this proves difficult, centres should invite practising professionals into the centre to talk to the learners about what they do in their day-to-day working lives, how things have changed during their lives, what first attracted them into the positions they now hold and what they see as the positive aspects of the careers they chose.

Local newspapers and town or city archives will contain a great deal of information relating to past developments. This will be useful to show how the principle of community involvement in planning decisions is embedded in the planning process and when and where it has proven effective in influencing local planning decisions on the size, design and location of new developments. Much of this information should now be available electronically through the Internet.

Learners could contribute to a debate about the economic consequences of development of the built environment for individuals, organisations and communities. This will offer an opportunity for the involvement of local key stakeholders. They, or their representatives, should be involved in planning the event, contributing to the debate in an informed manner, observing the performance of others and evaluating learner performance.

Learners should be encouraged to develop individual portfolios to support their studies. These could include photographs, images downloaded from the Internet, articles from newspapers and trade magazines, and notes made during visits and guest lectures from those involved in the value and use of the built environment. These portfolios could be used to support learners' presentations, subsequent class discussions and internal assessments.

What activities might be involved in this unit?

- Visiting construction sites and local authority planning and highways and/or transport offices.
- Reporting on the methods used to engage key stakeholders in meaningful consultations.
- Formulating proposals for funding, consultation, promotional techniques and planning.
- Performing surveys and opinion polls on public concerns regarding new developments.
- Using local newspaper offices and town or city archives to research the past use of land.
- Gathering useful careers information from a variety of experienced personnel.

Suggested prior learning

Level 2 Principal Learning in Construction and the Built Environment, or 5 GCSEs at Grade C or above.

Personal, Learning and Thinking Skills

The list below is indicative of the way this unit supports the development of PLTS, as opposed to the achievement of PLTS that are possible through the assessment. The unit supports the development of more PLTS than are covered through the assessment criteria alone.

Alternative approaches could be selected. The learner could develop PLTS by:

Independent enquirers

- planning and carrying out research into the different planning processes required for different developments within the built environment
- exploring issues and problems regarding development of the built environment from the differing perspectives of the key stakeholders to the process
- analysing information gathered from research to form conclusions regarding the processes and procedures which control development of the built environment

Creative thinkers

- asking questions of those with experience of developing the built environment, to extend their knowledge and inform their thinking
- testing their own and others' assumptions by questioning whether development is always a good idea

Reflective learners

- inviting feedback on their development proposals and dealing positively with praise and criticism
- monitoring and reviewing their progress towards project or assignment targets and goals

Team workers

- working with others towards common project goals by sharing research and allocating specific job roles and tasks
- making effective contributions to debates and group discussions in the presence of industry representatives

Self-managers

- organising time and resources, prioritising actions to ensure work is completed on time
- dealing with competing pressures, including personal and work-related demands

Effective participators

- acting as an advocate for views and beliefs that may differ from their own if, for example, they are asked to support or oppose the creation of a 'super casino' in their local area, or something equally controversial.

Suggested learning resources

Books

- Handbook of Sustainable Building: An Environmental Preference Method for Choosing Materials in Construction and Renovation - Anink, D & Boonstra, C - Published by: James and James (Science Publishers), 1996 - ISBN: 1-873-93638-9
- Creative Neighbourhoods: The Role of the Arts in Building Sustainable Communities - Beedham, G & Stanton Wade - Published by: Aston Housing Consultancy, 2005 - ISBN: 0-955-01100-0
- Building Construction Handbook - Chudley, R & Greeno, R - Published by: Butterworth-Heinemann, 2006 - ISBN: 0-750-66822-9
- Introducing Planning (Continuum Studies in Geography Education) - Greed, C - Published by: Continuum International Publishing Group Ltd., 2004 - ISBN: 0-826-47752-6
- Approaching Urban Design: The Design Process - Roberts, M & Greed, C - Published by: Longman, 2001 ISBN: 0-582-30300-1
- Managing the Building Design Process - Tunstall, G - Published by: Butterworth-Heinemann, - 2000 ISBN: 0-750-66791-5

Resource packs

- Be a safe learner. Aspects of health and safety' Published by: Standards Unit, DfES - Available from **standards.unit@dfes.gsi.gov.uk** and **www.successforall.gov.uk** DfES
- 'Health and Safety: Skills for Construction' - Published by: DfES - Available from **dfes@prolog.uk.com** DfES

Journals and magazines

- Building
- Construction News
- Property Week
- Sold Out
- News on the Block
- Housebuilder

Videos, CDs and DVDs

- The Construction of Houses The Video Project UWE
- Building History and Building Conservation The Video Project UWE
- E-resources for construction ww.rsc-wales.ac.uk

Websites

- ConstructionSkills www.citb.org.uk
- Cabinet Office www.cabinetoffice.gov.uk
- Chartered Institute of Building www.ciob.org.uk
- Environment Agency www.environment-agency.gov.uk
- Health and Safety Executive www.hse.gov.uk
- Highways Agency www.highways.gov.uk
- Communities and Local Government www.communities.gov.uk

Level 3

Unit 7: Value and use of the built environment: protecting and maintaining

What is this unit about?

The purpose of this unit is to give learners an understanding of how the fabric of buildings and structures can be protected from damage caused by elements and people. Learners will explore how the built environment is maintained to extend its useful life and enhance sustainability, and how effective protection and maintenance impact upon social and community objectives. The unit also covers the role of asset management in the built environment, and the principles, practices and techniques of asset management. Learning about career opportunities available in protecting and maintaining the built environment will be integral to the unit.

This unit, alongside the others within the Level 3 Principal Learning in Construction and the Built Environment has been designed to allow learners the opportunity to develop a range of Personal, Learning and Thinking Skills (PLTS), and to demonstrate these on more than one occasion. This approach will allow them to build towards a full range of PLTS.

Learning outcomes

The learner will:

1. understand the importance and benefits of protecting and maintaining the built environment
2. know about the different ways of minimising energy demands and reducing emissions to water, air and land
3. know how to improve the sustainability of the built environment, and how to engage stakeholders and communities in protecting buildings and the environment
4. be able to evaluate private and public asset management in the built environment in terms of social, economic, environmental and other concerns
5. understand the available career opportunities in the protection and maintenance of the built environment.

Assessment criteria

1. The protection and maintenance of the built environment

The learner can:

- 1.1 describe the main benefits of protecting and maintaining the built environment:
 - a. social
 - b. economic
 - c. environmental
- 1.2 compare and contrast the principles and practices associated with the protection and maintenance of the built environment (IE4, 6):
 - a. regular inspections to identify common building defects
 - b. timely intervention
 - c. planned programmes of regular maintenance
 - d. emergency repair of damage done by elements and people
 - e. use of sustainable repair and maintenance techniques
 - f. use of sustainable materials
- 1.3 analyse the effect of local infrastructure and transport services on the built environment (IE4,5):
 - a. exhaust emissions
 - b. photochemical smog
 - c. traffic noise
 - d. congestion.

2. Strategies to minimise energy demands and reduce emissions

The learner can:

- 2.1 analyse and evaluate strategies to minimise energy demand from buildings and structures and reduce emissions to air, land and water (IE4, 6):
 - a. reduction of carbon dioxide (CO) emissions by use of:
 - o high efficiency condensing boilers for hot water and central heating
 - o combined heat and power systems
 - o solar panels/photovoltaic cells
 - o roof-mounted wind turbines
 - o ground source heat pumps
 - o natural ventilation - as opposed to mechanical
 - o effective building insulation techniques
 - b. 'green roofs' to reduce surface run-off from buildings during periods of heavy rainfall
 - c. 'grey' water systems that utilise rain water to flush toilets
 - d. energy-saving devices such as energy efficient appliances and low energy lighting.

3. Strategies to promote the sustainability of the built environment

The learner can:

- 3.1 analyse and evaluate strategies to minimise the effects of transport and improve the sustainability of the built environment (IE4, 6):
 - a. traffic-calming measures such as speed bumps and pedestrianized city and town centres

- b. bus lanes to encourage more people to use public transport
 - c. congestion charging in built-up city areas
 - d. re-introduction of tram systems in cities such as Manchester and Sheffield to encourage more people to use public transport
- 3.2 devise strategies to encourage stakeholders and communities to engage in initiatives to (CT1, 3) (EP3, 4):
- a. help protect the built environment
 - b. ensure that buildings and structures are protected from damage and kept secure.

4. Private and public asset management

The learner can:

- 4.1 evaluate both private and public asset management in the built environment (IE4, 6):
- a. general benefits
 - b. social and community utility:
 - o economic (both locally and nationally)
 - o extended lifespan of buildings and structures, hence extended utility
 - o enhanced safety, comfort and wellbeing of users in the community
 - o increased value and improved financial viability of buildings and structures
 - c. standard practices:
 - o investment and renewal
 - o purchase and disposal of properties
 - o operation and maintenance of properties
 - o risk management
 - o compliance with statutory and regulatory legislation
 - o addressing sustainability and environmental issues.

5. Career opportunities in the protection and maintenance of the built environment

The learner can:

- 5.1 compare and contrast career opportunities in protection and maintenance of the built environment (IE4, 6):
- a. the range and characteristics of career opportunities
 - b. the level of available career opportunities:
 - o craft
 - o technical
 - o supervisory
 - o professional and management
 - c. the nature of interactions between those who work in protection and maintenance
 - d. progression opportunities available in protection and maintenance
 - e. the qualifications needed to support career progression
 - f. the role of professional institutions in protection and maintenance.

Where the assessment criteria show a direct link to an area of the PLTS framework, it is referenced here. Further information on PLTS is available in Section 3.1 of this specification and also within this unit in the section on Personal, Learning and Thinking Skills.

Guided learning hours

It is recommended that a minimum of 60 guided learning hours be spent on this unit.

Assessment

The assessment method for this unit will be external assessment. Learners will complete a two-hour written examination.

This unit focuses mainly on knowledge and understanding, and is therefore deemed to be an appropriate vehicle for the externally assessed component of Principal Learning at Level 3. The assessment is by means of a written test, with 'extended' answers as opposed to the multiple choice format used at Level 1 and the 'short' answer format used at Level 2. The purpose of the written test paper is to assess the learners' understanding of the learning outcomes, content and assessment criteria as indicated in the examination specification shown below.

There are opportunities for experiential learning during any formative assessment undertaken. Learners should make their own initial evaluations of the topics discussed and refine such evaluations by revisiting their suggestions after discussion with other learners and/or construction professionals. These evaluations can be improved each time the matter is discussed.

A suitable period of reflection should follow upon completion of the assessment for this unit. The learner should evaluate which questions they answered correctly, which they did not, why they sometimes chose the wrong answer and why the correct answer is correct.

Examination specification

Duration: 2 hours

Assessment Type: Written test

No of marks: 60

Assessment criteria topics	Subtopic	No of marks	Total marks	%
1. The protection and maintenance of the built environment	Benefits	6		
	Principles	4		
	Practices	4	18	30
	Effects of infrastructure	2		
	Effects of transport system	2		
2. Strategies to minimise energy demands and reduce emissions	CO2 reduction	4		
	Green roofs and grey water	2		
	Energy-saving devices	2	12	20
	Renewable energy systems	4		

3. Strategies to promote the sustainability of the built environment	Transport and community issues	6	12	20
	School and/or college involvement	6		
4. Private and public asset management	General benefits	6	12	20
	Practices and cost-benefit issues	6		
5. Career opportunities in the protection and maintenance of the built environment	Range and characteristics	2	6	10
	Interactions and Professional Bodies	2		
	Progression and career planning	2		
Totals		60	60	100

Guidance for delivery

This guidance should be read alongside the 'Opportunities for applied learning' section below.

Protect and maintain the environment

This unit represents an opportunity for learners to explore the strategies employed to help reduce the emissions resulting from the use of the built environment, and also to ensure that maintenance and development of the built environment is completed in ways that can contribute to sustainability. Learners should be encouraged to consider the following factors:

- the energy efficiency of buildings – specifically relating to the requirements of Parts L1 (A and B) and L2 (A and B) of the Building Regulations
- other strategies to reduce CO2 emissions, including those that relate to the manufacture of building products and the benefits of 'lean' construction
- utilisation of renewable energy sources – solar, wind, ground source heat pumps, bio-fuels
- introduction of 'green' roofs in built-up areas to help reduce the amount of surface run-off from buildings in times of heavy rainfall
- buildings which are designed to use natural ventilation, rather than requiring mechanical air-conditioning systems
- utilisation of 'grey water' systems – grey water refers to water collected from rainfall, or water from baths, showers and basins which is collected separately and then used to feed toilet cisterns
- improvement of public transport systems – incentives for people to use public transport rather than use their own vehicles
- recycling and waste disposal strategies – reducing the amount of waste that goes to landfill; environmental objections to waste incinerators
- maintenance strategies adopted to improve and protect communities – traffic reduction schemes, Local Authority sponsored new home developments, relocation of residents from dilapidated estates to more sustainable community developments, use of new technologies in the development of new communities.

The following are some activities related to these points:

- Identifying measures that could be taken to ensure buildings comply with Part L of the Building Regulations – learners could assess how compliant school or college buildings are.
- Weighing up the practicalities of using renewable energy sources, balancing the environmental ‘pros’ against the practical ‘cons’. This element could become an activity in which learners are asked to complete a research project into the viability of providing all power and heat to their school or college buildings using renewable energy sources.
- Visits to Local Authority offices to discuss transport initiatives aimed at encouraging more people to use public transport and traffic reduction or calming schemes.

Protect the physical structure of the built environment

This aspect of the unit will require learners to think carefully about ways in which the built environment requires protection from physical harm. This could be the result of:

- adverse weather conditions (high winds, torrential rain, freezing conditions, and droughts, etc.)
- ‘wear and tear’ which affect buildings as a result of usual day-to-day activity
- deliberate vandalism or criminal activity
- perceived security threats (especially relevant to buildings located in city centre locations and public buildings such as railway stations and airports; this could include warning building users about suspect packages and being mindful of not leaving personal belongings unattended)
- mechanical and electrical failure
- fire
- historical considerations
- the need to utilise land on high risk sites such as landfill and areas susceptible to subsidence.

Learners could be asked to produce a ‘building user’ leaflet to residents of an inner city residential building, covering aspects such as:

- safe day-to-day building use (use of building facilities, building services systems – location of isolation valves or switches for water, gas and electricity supplies)
- reporting of common building defects
- rectification of basic building defects
- use of energy efficient appliances and light bulbs
- checking for correct operation of protective devices such as smoke alarms and fire extinguishers
- actions to take if a threat to building security is suspected.

Learners will be encouraged to research, through the Internet and interviews with building managers, the ways in which the built environment can be protected against these factors, and also to think about the ways in which effective protection of the built environment can help extend the lifespan of buildings.

Learners should also be encouraged to think about how protecting the built environment can contribute to wider social and community objectives. An example of this could be the provision of CCTV networks in a number of built-up areas. Learners could consider whether or not their presence helps to protect the built environment and reduce crime. This particular issue could be broadened out to cover the wider debate regarding the increasing number of CCTV cameras, and whether this is an infringement of people’s civil liberties. Learners could be asked to debate the issue.

Asset management

This element of the unit will require learners to research the principles and practices associated with the management of built assets to achieve economic and social benefits. This process will depend upon clear teacher explanation of the role of asset managers in helping to maximise the potential of the built environment.

What is asset management?

Asset management in connection with the built environment relates to the management of physical built assets and refers mainly to investment in assets, the operation and maintenance of assets, and the materials and resources used by assets. Asset management is a vital component in both public and private areas of industry, though one of the best examples to focus on is how asset management activities are implemented in local authorities.

An initial activity when asking learners to consider asset management in local authorities could be for learners to list the buildings they think the Local Authority would be responsible for managing. These lists could be checked for accuracy through interviews with asset managers who work on behalf of the Local Authority. Any interaction whatsoever with asset management professionals would be extremely useful in helping learners to understand an area which is conceptually quite hard to grasp.

Concepts of asset management

The Institute of Asset Management has some excellent articles giving examples of how different approaches to asset management can have a significant impact on the built environment. For example, is it better to run buildings into the ground, then knock them down and start again, or to maintain buildings and keep them in good working order for as long as possible? There are arguments for and against each of these approaches – learners could be asked to debate each of these approaches and come to conclusions about which would be the best approach if the building in question was their school or college. Would their opinion change if the building in question was a council office building? Learners should consider the economic, environmental, social and aesthetic factors associated with each approach.

Learners should be made aware of the fact that asset managers are often required to make difficult recommendations on sensitive issues, for example, when advising a local authority whether it is better to build five new schools by squeezing down the initial costs, or four new schools which are more sustainable. This example could again lead learners into a debate.

An example of the influence of asset management on the built environment could include the use of disused church buildings for new developments. This is a good example to use because it demonstrates how development of assets can affect the lifespan, financial viability and social utility of buildings. Another example could include the use of schools and other public buildings for activities other than those they are primarily there to provide (e.g. schools being used to host community events) and so maximising the usefulness of the building.

Opportunities for applied learning

Visits to repair, maintenance and refurbishment sites will help reinforce learners' understanding of good practice and the various factors that influence protection and maintenance of the built environment. If this proves difficult, centres should invite practising maintenance professionals such as building surveyors, general practice surveyors, and specialist builders and maintenance companies into the centre to talk to the learners about what they do in their day-to-day working lives, how things have changed during their lives, what first attracted them into the positions they now hold and what they see as the positive aspects of the careers they chose.

The learner will have ready access to the school or college where they are studying and this centre will serve as an excellent teaching and learning resource. Planned maintenance will be a feature of the care of the building(s) and experienced staff will be retained, or contracted, to fulfil the various functions required. Talks to the learners by, and work shadowing of, such staff will be very useful in underpinning the everyday realities of protection and maintenance. Such staff are likely to have professional skills in asset management and links with a local firm or firms specialising in this area will, as ever, prove invaluable.

Examples of maintenance sheets, job sheets, maintenance schedules, building inspections, surveys, etc., will be useful both as pro formas to complete and as typical exemplars of the documentation compiled or completed by experienced professionals. A library of such documentation can be built up over the years. Once again, the school or college records will prove invaluable, as will any bills, invoices, tenders, claims and so forth associated with the financial side of maintenance.

Learners should be encouraged to develop individual portfolios to support their studies. These could include photographs, images downloaded from the Internet, articles from newspapers and trade magazines, and notes made during visits and guest lectures from those involved in protection and maintenance of the built environment.

Also, learners could:

- produce proposals suggesting how their school or college could reduce emissions and minimise environmental impact
- demonstrate the operation of environmentally efficient energy generation systems such as solar panels and/or photovoltaic cells for hot water heating purposes, and ground source heat pumps to provide energy for heating purposes
- produce plans and proposals to show how traffic reduction measures can be implemented to help alleviate congestion and reduce the amount of traffic in an identified local area
- produce leaflets explaining what building users can do to help protect the physical structure of buildings by offering information, guidance and advice on:
 - safe day-to-day building use (use of building facilities, building services systems – location of isolation valves/switches for water, gas and electricity supplies)
 - reporting common building defects rectifying common building defects
 - using energy efficient appliances and lighting systems
 - checking correct operation of devices such as smoke alarms and fire extinguishers what actions to take if a threat to building security is suspected
- prepare charts and diagrams to explain the role of asset management
- debate the processes and principles of asset management with experienced workers
- undertake work experience or work shadowing with asset management professionals
- produce a simple cost-benefit analysis of asset management practices in social and financial terms
- produce a simple career plan showing progression within the area.

What activities might be involved in this unit?

- Visiting repair, maintenance and refurbishment sites.
- Producing leaflets to engage key stakeholders in the protection of the built environment.
- Proposing ways to enhance a school or college sustainable maintenance programme.
- Preparing 'building user' leaflets containing useful maintenance tips for householders.
- Producing simple cost-benefit analyses of common asset management practices.
- Gathering useful careers information from a variety of experienced personnel.

Suggested prior learning

Level 2 Principal Learning in Construction and the Built Environment, or 5 GCSEs at Grade C or above.

Personal, Learning and Thinking Skills

The list below is indicative of the way this unit supports the development of PLTS, as opposed to the achievement of PLTS that are possible through the assessment. The unit supports the development of more PLTS than are covered through the assessment criteria alone.

Alternative approaches could be selected. The learner could develop PLTS by:

Independent enquirers

- planning and carrying out research into renewable energy provision
- exploring issues and problems regarding the ways in which the physical fabric of the built environment can be protected
- analysing information gathered to form conclusions regarding the role of asset management within the built environment

Creative thinkers

- asking questions of those with industry experience extending their knowledge and informing their thinking
- questioning their own and others' assumptions regarding attitudes towards asset management within the built environment

Reflective learners

- inviting feedback on proposals on how to increase the energy efficiency of their school or college
- dealing positively with praise and criticism
- monitoring and reviewing their progress towards project or assignment targets and goals

Team workers

- making effective contributions to group discussions and/or debates with industry representatives and experienced maintenance workers and asset managers
- taking responsibility, showing confidence in themselves and their contribution

Self-managers

- organising time and resources and prioritising actions to ensure work is completed on time
- dealing with competing pressures, including personal and work-related demands

Effective participators

- identifying improvements that could be made to the energy efficiency of their school or college site, and also identifying any potential negative effects
- acting as an advocate for views and beliefs that may differ from their own.

Suggested learning resources

Books

- Building Construction Handbook - Chudley, R & Greeno, R - Published by: Butterworth-Heinemann, 2006 - ISBN: 0-750-66822-9
- Refurbishment and Upgrading of Buildings - Highfield, D - Published by: Spon Press, 2000
ISBN: 0-419-23160-9
- Building Maintenance (Building & Surveying) - Seeley, I H - Published by: Palgrave Macmillan, 1987 - ISBN: 0-333-45701-3
- Building Care - Wood, B - Published by: Blackwell Science Ltd, 2003 - ISBN: 0-632-06049-2
- Lee's Building Maintenance Management - Wordsworth, P - Published by: Blackwell Science Ltd, 2000 - ISBN: 0-632-05362-3

Journals and magazines

- Building
- Construction News
- Housebuilder

Resource packs

- 'Be a safe learner. Aspects of health and safety'- Published by: Standards Unit, DfES - Available from **standards.unit@dfes.gsi.gov.uk** and **www.successforall.gov.uk** DfES
- Health and Safety: Skills for Construction' Published by: DfES - Available from **dfes@prolog.uk.com** DfES

Videos, CDs and DVDs

- **The Construction of Houses** The Video Project UWE
- **Building History and Building Conservation** The Video Project UWE
- **E-resources for construction** www.rsc-wales.ac.uk

Websites

- Asset Skills **www.assetskills.org.uk**
- Cabinet Office **www.cabinetoffice.gov.uk**
- Chartered Institute of Building **www.ciob.org.uk**
- Communities and Local Government **www.communities.gov.uk**
- ConstructionSkills **www.citb.org.uk**
- Energy Saving Trust **www.energysavingtrust.org.uk**
- Environment Agency **www.environment-agency.gov.uk**
- Health and Safety Executive **www.hse.gov.uk**
- Highways Agency **www.highways.gov.uk**
- Institute of Asset Management **www.iam-uk.org**

4 Assessment

4.1 Aims

Principal Learning courses based on this specification should encourage learners to:

1. develop a broad understanding and knowledge of the construction and built environment industries
2. develop skills in the broad context of the construction and built environment industries
3. understand the fabric of the world in which we live and its impact on individuals and communities
4. apply:
 - 4.1 Functional Skills at Level 2 in Mathematics, English and ICT
 - 4.2 transferable Personal, Learning and Thinking Skills (PLTS) in independent enquiry, creative thinking, reflective learning, team working, self-managing and effective participation
 - 4.3 investigative and project management skills through a Principal Learning project
 - 4.4 skills gained through work experience
5. learn through experience of applying knowledge and skills to tasks or contexts including those that have the characteristics of real work e.g. the minimum 10 days' work experience, including:
 - 5.1 planning and reflecting on their experience
 - 5.2 drawing out and articulating lessons learnt
 - 5.3 applying their learning to new activities or situations.

4.2 National criteria

This Principal Learning Construction and the Built Environment specification complies with the following:

- Criteria for the specialised Principal Learning qualifications in construction and the built environment at levels 1, 2 and 3 (published QCA November 2006)
- Criteria for the accreditation of Principal Learning qualifications at levels 1, 2 and 3 (published QCA April 2007)

4.3 Prior learning

There are no prior learning requirements.

4.4 Internal assessment

Internally assessed units will comply with the Joint Council for Qualifications Instructions for conducting coursework/portfolios – please see JCQ website: <http://www.jcq.org.uk>

Task setting

Clear guidance, with exemplars of suitable internal assessment, is available to all consortia centres in order to ensure that suitable tasks are set. City & Guilds will give guidance on task setting and the moderator will review a selection of proposed tasks to check that they are suitable at the early advisory visits.

The teacher at a centre with overall responsibility for internal standardisation is also responsible for the standardisation of task setting.

Guidance is provided on the total amount of time that a task should take, on the amount of time that specific activities within a task should take and on the form of supervision expected.

Control criteria for tasks

The internally assessed assignments are to be taken under controlled conditions and the forms of evidence required in each unit will drive the controls needed. Where specific guidance is required, it will be found in the assessment section of the unit concerned. The following controls should be in place where appropriate for individual tasks.

Activity – A video or DVD recording of the activity, or a witness testimony describing the activity, will be necessary as evidence of ephemeral work.

Research of relevant sources of material – A bibliography or list of sources e.g. museums, businesses, organisations, websites will provide evidence of research. The teacher may also question learners on their research and submit signed notes from these questions as evidence.

Record of interviews with business, industry or third party representatives – Transcripts or audio recordings (if permitted by the individual concerned), or the learner's own record of the interview and evidence of permission or observation or witness statement by an observer may be used as evidence of interactions with learners.

Outcome or production – Where this is produced over time, it is possible that the teacher may not supervise the whole of the process, however, sufficient supervision must take place to ensure that the material for assessment is the unaided work of the learner. Photographs, recordings and witness testimony can also be utilised to confirm that the work belongs to an individual learner.

Practical assignment – These must be conducted under supervision and the outcome should be submitted for moderation if possible.

Portfolio of evidence – This must be submitted for moderation.

The above controls are summarised for reference in the following table.

Form of evidence	Method of Control								
	Video/DVD recording	Photographs	Witness statement	Bibliography or list of sources	Signed notes evidencing questions asked by teacher	Transcript or audio recording	Learner's own record	Supervision	Submission of artefact or product
Activity	1		2						
Research of relevant sources of material				1	2				
Record of interviews with business, industry or third party representatives			2 with learner's own record			1 with evidence of permission	2 with witness statement		
Outcome or Production	2	2	2			2		1*	1*
Practical assignment	2	2	2			2		1*	1* if possible
Portfolio of evidence									1*

Please note:

Control methods rated 1 are the most preferable type to be used. Those rated 2 may be used if employing the favoured method is not practical, or as a way of providing additional evidence of the learner having met the assessment criteria.

* Where the number 1 is followed by an asterisk, this indicates that any other control method may accompany but not substitute the use of this method.

Guidance by the teacher

The work assessed must be solely that of the learner. Any assistance given to an individual learner which is beyond that given to the group as a whole must be recorded.

Unfair practice

At the start of the course, the supervising teacher is responsible for informing learners of the City & Guilds Regulations concerning malpractice. Learners must not take part in any unfair practice in the preparation of work to be submitted for assessment, and must understand that to present material copied directly from books or other sources, without acknowledgement, will be regarded as deliberate deception. Centres must report suspected malpractice to City & Guilds.

Applying the assessment grid

When assessing learners' work, teachers/assessors should consider the level of attainment demonstrated in four broad areas within the demands and context of the specific unit being assessed:

- the depth and breadth of understanding
- the level of skills
- the level of synthesis, analysis and evaluation
- the level of independence and originality.

In the assessment grid for each unit, mark ranges are specified for each assessment criteria topic. When assessing a learner's work, teachers/assessors should use their professional judgement to identify for each assessment criteria topic, the mark band description within which that work falls and then the mark within that range that best describes the depth and quality of the work.

To achieve the higher mark bands, learners should show greater depth and breadth of understanding, higher level skills, higher levels of synthesis, analysis and evaluation and higher levels of independence and originality as required in the assessment criteria. Work that clearly meets all the requirements of the mark band description should be awarded the maximum mark identified.

Aspects of the work that might fall short of meeting, in full, the description but which do not, in the judgement of the teacher/assessor, sufficiently influence the overall level of achievement to merit the work being assigned to a lower mark band, will reduce the mark awarded within the identified range available. This can be expressed as identifying the 'best-fit' approach, where the areas of strength in the work submitted by the learner can be allowed to compensate for weaknesses in other areas

Assessors will use archived exemplars as they become available as a reference point. By comparing their own learners' work with archive work which has an assessment commentary attached, the assessor will be able to position the work either on a higher or lower point.

Assessment of group work

Group work is a useful way of obtaining information for some activities but it is important that individual learners meet the assessment criteria requirements. Teachers/assessors assessing the evidence will need to be convinced of its individual authenticity. Questioning can be used in order to clarify the validity, authenticity and sufficiency of evidence and, under these circumstances, the teacher/assessor may wish to include a dated witness statement detailing this evidence. It is expected that the use of such statements will be kept to a minimum, so that they constitute a very minor part of the submitted evidence.

Annotation of written/photographic evidence can also be used to detail an individual's contribution.

It is recognised that there can be instances where learners are required to carry out tasks as part of a group and that group-working skills are an integral part of the assessment requirements. In such cases this general guidance on group work will be superseded by the specific requirements and instructions of the individual unit(s).

Internal standardisation of marking

The centre is required to standardise the assessment across different teachers and teaching groups, within and across units, to ensure that all work at the centre has been judged against the same standards. If two or more teachers are involved in marking units, one teacher must be designated as responsible for internal standardisation.

Common pieces of work must be marked on a trial basis and differences between assessments discussed at a training session in which all teachers involved must participate.

The teacher responsible for standardising the marking must ensure that the training includes the use of reference and archive materials such as work from a previous year or examples provided by City & Guilds.

4.5 Supervision and authentication of internally assessed work

The Head of Centre is responsible to City & Guilds for ensuring that internally assessed work is conducted in accordance with City & Guilds instructions and JCQ instructions.

City & Guilds requires:

- learners to sign the record form to confirm that the work submitted is their own
- teachers/assessors to confirm on the record form that the work assessed is solely that of the learner concerned and was conducted under the conditions laid down by the specification
- the teacher/assessor responsible for internal standardisation also to sign the Centre

Declaration Sheet (CDS) to confirm that internal standardisation has taken place and that the work presented is that of the learners named. If only one teacher has undertaken the marking, that person must sign this form.

The completed record form must be attached to each learner's work and the Centre Declaration Sheet must be sent to the moderator. Failure to sign either or both the record form and the CDS may delay the processing of the learners' results.

The teacher should be sufficiently aware of the learner's standard and level of work to appreciate if the work submitted is beyond the ability of the learner.

In most centres teachers are familiar with learners' work through class and assignments. Where this is not the case, teachers should make sure that all internally assessed work is completed under direct supervision or controls listed in Section 4.4.

In all cases, some direct supervision is necessary to ensure that the work submitted can be confidently authenticated as the learner's own.

If it is believed that a learner has received additional assistance and this is acceptable within the guidelines for the internally assessed units, the teacher/assessor should award a mark which represents the learner's unaided achievement. The authentication statement should be signed and information given on the relevant form.

If the teacher/assessor is unable to sign the authentication statement for a particular learner, then the learner's work cannot be accepted for assessment.

4.6 Malpractice

Teachers should inform learners of the JCQ Regulations concerning malpractice. Learners must not:

- submit work which is not their own
- lend work to other learners
- allow other learners access to, or the use of, their own independently-sourced material (this does not mean that learners may not lend their books to another learner, but learners should be prevented from plagiarising other learners' research)
- include work copied directly from books, the Internet or other sources without acknowledgement or an attribution
- submit work typed or word processed by a third person without acknowledgement.

These actions constitute malpractice, for which a penalty (e.g. disqualification from the examination) will be applied.

If malpractice is suspected, the Examinations Officer should be consulted about the procedure to be followed.

Where suspected malpractice in internally assessed work is identified by a centre after the learner has signed the declaration of authentication, the Head of Centre must submit full details of the case to City & Guilds at the earliest opportunity. The form, JQM/M1, should be used. Copies of the form can be found on the JCQ website: <http://www.jcq.org.uk>

Malpractice in internally assessed work discovered prior to the learner signing the declaration of authentication need not be reported to City & Guilds, but should be dealt with in accordance with the centre's internal procedures. City & Guilds would expect centres to treat such cases very seriously. Details of any work which is not the learner's own must be recorded on the cover sheet or other appropriate place.

4.7 Moderation

City & Guilds will ensure that in consortia where learners from more than one centre are taught and assessed together, a single moderator for each Principal Learning qualification will be appointed subject to consideration of workload.

Moderation of internally assessed work will take place in two stages and the same moderator will be responsible for each.

Stage 1 – a visit from a moderator representing City & Guilds at a fairly early stage during the delivery of Principal Learning

The moderator will inspect some work and check such matters as:

- task setting against assessment criteria
- understanding of controlled conditions
- taking and marking of internal assessments
- arrangements for internal standardisation
- coverage of PLTS
- coverage of Applied Learning.

The moderator will give advice, feedback and guidance on each of the above. Stage 1 will be seen as a technical advisory visit and will cover the Principal Learning units.

Stage 2 – a check by the moderator on the taking and marking of samples of Principal Learning units

Internally assessed work will normally be reviewed at the centre but may be sent to the moderator. The samples to be moderated will be agreed with the centre for each identified unit in accordance with the moderation procedures. During the moderation visit, the moderator will normally assess samples of work with the teacher and discuss the standards in order to ensure that they are in line with the national standards for this qualification. If necessary, further samples may be requested and adjustments may be applied to the centre's marks. Mark adjustments will normally preserve the centre's order of merit, but if major discrepancies are discovered, City & Guilds reserves the right to alter the order of merit.

Centre marks for all units must be submitted to City & Guilds and to the moderator by the specified deadline. Claiming and moderation of internal assessment is only available in the summer term.

Further details will be given in moderation procedures documentation to be issued by City & Guilds.

4.8 Post-moderation procedures

On publication of the results for Principal Learning units, City & Guilds will provide centres with details of the final marks for the internally assessed units.

The learners' work will be returned to the centre after moderation has taken place. The centre will receive a report with, or soon after, despatch of published results giving feedback on the appropriateness of the task set, the accuracy of the assessments, and the reasons for any adjustment to the marks.

City & Guilds reserves the right to retain some learners' work for archive or standardising purposes.

4.9 Retaining evidence and re-using marks

The centre must retain the work of all learners for each internally assessed unit, with record forms attached, under secure conditions, from the time it is assessed, to allow for the possibility of an enquiry about results. The work may be returned to learners after the deadline for enquiries about results. If an enquiry about a result has been made, the work must remain under secure conditions in case it is required by City & Guilds.

4.10 External assessment

The external assessments will be timetabled twice a year, in January and June, and the dates will be published at the start of the academic year.

4.11 Factors affecting individual learners

Teachers should be able to accommodate the occasional absence of learners by ensuring that the opportunity is given for them to make up missed assessments.

If work is lost, City & Guilds should be notified immediately of the date of the loss, how it occurred, and who was responsible for the loss. Centres should use the JCQ form, JCQ/LCW, to inform City & Guilds Candidate Support of the circumstances.

Learners who move from one centre to another during the course may require individual attention. Possible courses of action depend on the stage at which the move takes place. If the move occurs early in the course, the new centre should take responsibility for assessment. If it occurs late in the course it may be possible to arrange for the moderator to assess the work through the 'Educated Elsewhere' procedure. Centres should contact City & Guilds at the earliest possible stage for advice about appropriate arrangements in individual cases.

5 Administration

5.1 Availability of Principal Learning units

All internally assessed Principal Learning units for this specification are available once a year only, commencing in June 2013. External assessments will be timetabled twice a year, in January and June, and the dates will be published at the start of the academic year.

5.2 Centre registration

Centres wishing to prepare learners for this specification should apply for approval to offer Principal Learning before teaching begins. Completed application forms should be submitted to your local City & Guilds Regional Office. Further details of the approval process are available on the website at: <http://www.cityandguilds.com>

5.3 Centre requirements

Resources

Centres must have access to sufficient equipment in the centre or in other centres within the consortium to ensure that learners have the opportunity to cover all the practical activities. Any requirement for specialised equipment is to be found in the description of the units themselves.

Health and safety

The importance of safe working practice and the demands of the Health and Safety at Work Act 1974 must be stressed to all learners. Learners have responsibilities for maintaining the safety of others as well as their own. Anyone behaving in an unsafe fashion must be stopped and a suitable warning given by the teacher responsible. It is essential that all learners acquire habits required to promote health and safety in the workplace and that their learning avoids potentially unpleasant or dangerous consequences.

Centre staff

Centre staff should be technically competent in all the areas for which they are delivering education and training and/or should also have relevant experience of providing the necessary practical training.

Continuing Professional Development (CPD)

Centres are expected to support their staff in ensuring that their knowledge and skills in the vocational area remain current and take account of any national or legislative developments.

5.4 Quality assurance

Internal quality assurance

Registered centres must have effective quality assurance systems to ensure optimum delivery and assessment of qualifications. Quality assurance includes initial centre registration by City & Guilds and the centre's and/or consortium's own internal procedures for monitoring quality. Centres are responsible for internal quality assurance and City & Guilds is responsible for external quality assurance.

National standards and rigorous quality assurance are maintained by the use of:

- City & Guilds external examinations
- City & Guilds externally set briefs or assignments
- internal quality assurance
- City & Guilds external moderation.

To meet the quality assurance criteria for this qualification, the centre must ensure that the following procedures are followed:

- the setting of appropriate tasks (see Section 4.4)
- the application of appropriate control of tasks (see Section 4.4)
- training in the use of the assessment grid (see Section 4.4)
- completion by the person responsible for internal standardisation of the Centre Declaration Sheet to confirm that internal standardisation has taken place (see Sections 4.4 and 4.5)
- the completion by learners and teachers/assessors of the record form for each learner's work (see Section 4.5).

External quality assurance

External quality assurance is provided by the two stage moderation system described in Section 4.7. External moderation of internally assessed work is carried out to ensure that assessment is valid and reliable, and that there is good assessment practice in centres and that national standards are maintained.

In order to carry out their quality assurance role, external moderators must have appropriate teaching and vocational knowledge and expertise. City & Guilds will appoint external moderators and will ensure that they attend regular training and development meetings designed to keep them up to date, to ensure standardisation of all assessments and to share good practice.

External moderators will:

- provide advice and support to staff in centres
- ensure the quality and consistency of assessments within and between centres and over time by the use of systematic sampling
- regularly visit centres to ensure that they continue to meet the centre registration requirements of City & Guilds
- provide feedback to centres and to City & Guilds.

In order to monitor compliance with JCQ requirements, particularly for administering external tests, JCQ inspectors will regularly visit centres.

City & Guilds requires the Head of Centre to:

1. facilitate any inspection of the Centre which is undertaken on behalf of City & Guilds
2. make secure arrangements to receive, check and keep examination material secure at all times, maintain the security of City & Guilds confidential material from receipt to the time when it is no longer confidential and keep scripts secure from the time they are collected from the candidates to their despatch to City & Guilds.

5.5 Irregularities

Centres must inform City & Guilds of any irregularity, including any candidate who arrives late for a test. For detailed instructions please refer to the current JCQ Instructions for Conducting Examinations which is available to view or to download from the JCQ's website:

<http://www.jcq.org.uk>

5.6 Awarding grades and reporting results

The Level 3 Construction and the Built Environment Principal Learning will be reported on a six-grade scale: A*, A, B, C, D and E. Learners who fail to reach the minimum standard for grade E will be recorded as U (Unclassified) and will not receive a qualification certificate.

5.7 Enquiries about results

The services available for enquiries about results include a clerical check, re-mark of external assessments and re-moderation of internally assessed work. Requests must be submitted within the specified period after the publication of results for individual assessments.

In cases where a post-results enquiry reveals inaccurate assessment, the result may be confirmed, raised or lowered.

For further details of enquiries about results services, please consult the current version of the JCQ Post-Results Services booklet.

5.8 Re-sits and shelf-life of unit results

Unit results remain available to count towards certification, whether or not they have already been used, as long as the specification is still valid.

Learners may re-sit a unit any number of times within the shelf-life of the specification. The best result for each unit will count towards the final qualification.

Learners will be graded on the basis of the work submitted for assessment.

5.9 Access arrangements and special consideration

We have taken note of the provisions of equalities legislation in developing and administering this specification.

We follow the guidelines in the Joint Council for Qualifications (JCQ) document: Regulations and Guidance Relating to Candidates who are Eligible for Adjustments in Examination GCSE, GCE, GNVQ, AEA, Entry Level, Basic Skills & Key Skills Access Arrangements and Special Consideration. This is published on the JCQ website:

http://www.jcq.org.uk/access_arrangements/

Access arrangements

We can make arrangements so that learners with disabilities, special educational needs and temporary injuries can access the assessment. These arrangements must be made before the examination.

For example, we can produce a Braille paper for a learner with visual impairment.

Special consideration

We can give special consideration to learners who have had a temporary illness, injury or indisposition at the time of the examination. Where we do this, it is given after the examination.

Applications for either access arrangements or special consideration should be submitted to City & Guilds by the Examinations Officer at the centre.

5.10 Language of examinations

We will provide units for this specification in English only.

5.11 Qualification titles

The qualification based on this specification is:

City & Guilds Level 3 Principal Learning in Construction and the Built Environment.

Other issues

European Dimension

City & Guilds has taken account of the 1988 Resolution of the Council of the European Community in preparing this specification and associated specimen units.

Environmental Education

City & Guilds has taken account of the 1988 Resolution of the Council of the European Community and the Report Environmental Responsibility: An Agenda for Further and Higher Education 1993 in preparing this specification and associated specimen units.

Avoidance of Bias

City & Guilds has taken great care in the preparation of this specification and specimen units to avoid bias of any kind.