

# Unit 11: Economics and Finance in Construction and Civil Engineering

<b>Unit code:</b>	<b>L/600/0452</b>
<b>QCF Level 3:</b>	<b>BTEC Nationals</b>
<b>Credit value:</b>	<b>10</b>
<b>Guided learning hours:</b>	<b>60</b>

## ● Aim and purpose

This unit aims to enable learners to understand the economic principles that underpin construction activities and to use and apply cost planning and control techniques.

## ● Unit introduction

The economy of any country, in terms of both local and global markets, is a vital indicator of the wellbeing of the nation. High employment, business confidence and the efficient use of natural and human resources all contribute to the wealth of a country.

The construction economist has to make decisions concerning which projects to develop, where to develop, the suitability of the project, and when to commence the work. Finance and capital play a major role in every economy or business. Investment is often the key to the success of a construction business, and government policies and spending can have very real effects in terms of producing steady growth and minimising the impact of recessions.

Learners will develop an understanding of the basic economic issues that are encountered in the construction sector, the problems a developer can face, and the decisions that need to be made before work can start on a construction site. They will explore the use of cost control in a project, and investigate what constitutes a successful project outcome through the use of simple feasibility calculations.

Consideration will be given to the financial and economic impact of good design and site practice in terms of sustainability and the impact on life cycle costing on a project. Learners will recognise how projects with higher initial construction costs with improved sustainable specifications, may have a lower overall life cycle cost when maintenance and running costs are taken into account.

## ● Learning outcomes

**On completion of this unit a learner should:**

- 1 Understand the economic principles that underpin construction projects
- 2 Know the economic resources required to complete a typical construction project
- 3 Understand how to plan and control construction costs
- 4 Be able to produce a feasibility study for a small construction project.

# Unit content

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## 1 Understand the economic principles that underpin construction projects

*Economic principles:* supply; demand; markets

*Supply:* definition; factors affecting supply; supply curves; changes in supply

*Demand:* definition; factors affecting demand; demand curves; changes in demand; demand elasticity

*Markets:* determination of the market equilibrium; shortages, scarcity and their effect on price; price determination; changes in price; opportunity costs; consumer choice; price mechanism; the four Ws (where, what, why and when); the relationship between project price, costs (including overhead costs) and profit; the impact of government policy

## 2 Know the economic resources required to complete a typical construction project

*Economic resources:* land; capital and finance; labour; entrepreneurialism

*Land:* types; factors affecting price; factors affecting availability; location; brownfield; greenfield

*Capital and finance:* definition; specific capital; share capital; capital goods; EU finance; mortgages; venture capital; bank loans; directors' loan accounts; lottery funding; retained profits

*Labour:* demographics of the working population; factors affecting availability; mobility of labour; factors affecting labour efficiency; the quality of labour; skills; incentives

*Entrepreneurialism:* entrepreneur as risk taker; land developers; property developers; private investors; need for knowledge and foresight of the market

## 3 Understand how to plan and control construction costs

*Cost control:* history of cost control; need for cost control; main aims and objectives; budgeting; comparison of schemes; cost, price and value; building cost price indices

*Cost planning:* reasons for cost planning; cost value engineering; budgeting; scheme appraisal; profit; sources of finance; techniques eg elemental, comparative, approximate quantities, cash flow forecasts, the key components of a budget for a given project

*Cost control techniques:* standard techniques (eg cost value reconciliation, valuations, financial statements and reports, real time costings, s-curves, coding data, resource allocated bar charts, costing stages of construction); types of contract eg Joint Contracts Tribunal (JCT) standard forms, fixed or fluctuating price, design and build; effect of each on costs; how costs are divided between materials, labour and plant/equipment; calculation and monitoring of resources

*Budget:* preparation of preliminary estimates; land purchase price; cost of units; elements; measured; design costs; construction costs; potential profit/loss

## 4 Be able to produce a feasibility study for a small construction project

*Feasibility study:* factors relevant to a practical exercise on a given situation eg comparison of new scheme against historical project, floor areas, volumes, elements, price indices, factors affecting decision to proceed, interest rates, availability of finance, land availability, market, break-even point, cost of borrowing, planning restrictions, brownfield sites, redevelopment grants, EU grants, enterprise and action zones; the impact of sustainability on life cycle costs

## Assessment and grading criteria

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

Assessment and grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:	To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:
<b>P1</b> explain the economic principles that underpin construction projects [IE1, IE4]	<b>M1</b> analyse the economic problems associated with the construction industry and the cyclical nature of the industry	<b>D1</b> evaluate different sources of finance in terms of the cost of the finance and the conditions imposed by the finance provider
<b>P2</b> review the main markets within the construction industry [IE1, IE4]	<b>M2</b> analyse the sources of finance available for the funding of a typical construction project	
<b>P3</b> describe the four main economic resources that are needed for a construction project [IE1, IE4]		
<b>P4</b> explain the reasons for cost planning and the techniques that are available to control costs in construction [IE1, IE4]	<b>M3</b> compare the advantages and disadvantages of two different cost control techniques	<b>D2</b> evaluate the factors that affect feasibility in terms of the influence of the government on the economics of the construction industry.
<b>P5</b> prepare a cost budget for a construction project from historical cost data [IE1, IE2, IE3, IE4, SM4, SM5]	<b>M4</b> analyse the factors that will affect both the budget required for, and the final feasibility of, a typical project proposal.	
<b>P6</b> carry out a feasibility study for a small construction project. [IE1, IE2, IE3, IE4, SM4, SM5]		

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

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

# Essential guidance for tutors

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## Delivery

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

In learning outcome 1 learners will gain understanding of basic economic principles and apply them to the construction market. They should be able to consider the effects of changes to supply and/or demand within construction markets and become aware of the relationship between price, cost, overheads and profit.

The economic resources needed to complete a project, including land, capital, labour, finance and entrepreneurial skill are considered in learning outcome 2.

Learning outcome 3 covers the reasons why construction costs need to be controlled and the techniques used to do so. Learners should be given opportunities to practise cost planning and control techniques through well-planned formative exercises.

In learning outcome 4 feasibility studies should be investigated, enabling learners to apply their knowledge to report on the feasibility of proposed construction projects.

In order to engage learners, delivery should, as far as possible, be applied to practical situations within the construction industry. These practical situations may refer to ongoing current construction projects or be based on contextualised scenarios provided by the tutor.

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

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

## Outline learning plan

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

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

Topic and suggested assignments/activities and/assessment
Introduction: <ul style="list-style-type: none"><li>• unit structure and the programme</li><li>• what is economics?</li></ul>
Visiting speaker and/or visit to quantity surveying practice to contextualise
Supply and demand – definition of and factors affecting price equilibrium: <ul style="list-style-type: none"><li>• didactic input</li><li>• analysis of supply and demand curves</li><li>• independent research</li><li>• formative assessment</li></ul>
Markets and business types: <ul style="list-style-type: none"><li>• didactic input – price mechanisms</li><li>• independent research and local market analysis – factors that affect markets for construction work</li><li>• formative assessment</li></ul>
Economic resources – land, capital and labour: <ul style="list-style-type: none"><li>• didactic input</li><li>• independent research and analysis of resources required for typical projects</li><li>• formative assessment</li></ul>
Finance and the entrepreneur: <ul style="list-style-type: none"><li>• didactic input – types and availability of finance</li><li>• role play – the role of the entrepreneur</li><li>• recognition of opportunities – the skills of the entrepreneur</li><li>• formative assessment</li></ul>
<b>Assignment 1: Principles of Economics</b>
Cost planning and control: <ul style="list-style-type: none"><li>• didactic input – the need to plan costs</li><li>• formative exercises – using key techniques and methodologies</li><li>• experiential feedback</li></ul>
Feasibility studies: <ul style="list-style-type: none"><li>• didactic input – production of budgets and other factors affecting feasibility</li><li>• formative exercises – developing skills in producing feasibility studies</li><li>• experiential feedback</li></ul>

## Topic and suggested assignments/activities and/assessment

Analysis of historical cost data:

- project familiarisation
- calculation of floor areas etc
- application of appropriate cost information
- production of cost report

Project familiarisation:

- planning and project evaluation
- consideration of project costs

### **Assignment 2: Cost Planning, Cost Budgets and Feasibility**

Review of unit and assignment feedback

## Assessment

Evidence for this unit may be gathered from a variety of sources, including well-planned investigative assignments, case studies and answers to oral questioning.

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

Some criteria can be assessed directly by the tutor during practical activities. If this approach is used then suitable evidence would be observation records or witness statements. Guidance on the use of these is provided on the Edexcel website.

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

For P1, learners must explain the basic economic principles that underpin construction projects. These should include supply and demand and elasticity, scarcity and the price mechanism (including the relationship between cost – including overhead costs – price and profit), all applied to a simple construction project. Evidence could be in the form of a presentation, a report or through oral questioning based on a tutor-provided case study.

For P2, learners must review the main markets within the construction industry. Learners should use national statistics as a source of raw data. Industry trade associations can provide useful resources to identify construction markets. Examples of suitable approaches to evidence could be as for P1.

For P3, learners must describe the four main economic resources that are needed for a construction project. These should include land as the capital cost of purchase, labour as the human resource to build the project, capital as the finance required to invest in the project and the entrepreneur as the owner of the company providing the driving force to complete the project. Examples of suitable approaches to evidence could be as for P1.

For P4, learners must explain the reasons for cost planning and explain the techniques that are available to control costs in construction. Learners are expected to identify and describe profit, budgets, return on capital, cost value reconciliation and cost value engineering. Evidence could be in the form of a presentation or report supported by appropriate calculations.

For P5, learners must prepare a cost budget for a simple construction project from historical cost data. The source material should relate to an historical case study. Learners should produce elemental rates from the source material and adjust and reapply the figures in terms of the proposed scheme. They should also include the separation of costs into materials, labour and plant. Learners should have access to information from the main professional body, the Royal Institution of Chartered Surveyors (RICS). Examples of suitable approaches to evidence could be as for P4.

For P6, learners must carry out a feasibility study on a small construction project and could prepare a report for a client. Learners should use local land values and could effectively combine this with the evidence for P5 to provide an overall project view. Learners must also provide a recommendation. Evidence should be presented in a standard format, typical of that used in the industry.

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

For M1, learners must analyse the economic problems associated with the construction market and the cyclical nature of the industry. They could build on the evidence produced for P1 and apply basic economic principles to the construction industry marketplace. This is, to an extent, open ended, but it is anticipated that areas such as supply and demand as applied to housing and/or factory units, or the expansion and contraction of the industry, could be explored and analysed. Examples of suitable approaches to evidence could be as for P1.

For M2, learners must analyse the sources of finance available for the funding of a typical construction project. Learners should incorporate financial sources from the UK and European markets and reference some of the many government grant schemes available. Evidence could be as for P1.

For M3, learners must compare the advantages and disadvantages of two different cost control techniques. This should refer to given case studies or to realistic examples from industry. Evidence could be as for P4.

For M4, learners must examine the factors that will affect both the budget required for, and the final feasibility of, a typical project proposal. These factors should refer to local issues, such as the physical site, and to economic issues. Examples of suitable approaches to evidence could be as for P4.

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

For D1, learners must evaluate different sources of finance in terms of the cost of the finance and the conditions imposed by the finance provider. Learners are expected to make reference to at least one grant scheme. Examples of suitable approaches to evidence could be as for P4.

For D2, learners must evaluate the factors that affect feasibility in terms of the influence of the government on the economics of the construction industry. Learners should refer to terms such as base rates, planning decisions and grants. Examples of suitable approaches to evidence could be as for P4.

## Programme of suggested assignments

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

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, P3, M1, M2, D1	Principles of Economics	You are working as a construction cost consultant and have been asked by your client to explain the economic principles that underpin construction projects.	Technical report with text supported by graphs, tables, charts and calculations as appropriate.
P4, P5, P6, M3, M4, D2	Cost Planning, Cost Budgets and Feasibility	You are working as a construction cost consultant and a senior partner in your practice has asked you to produce a report on contemporary methodologies used in cost planning and control, the production of cost budgets and feasibility studies.	Technical report. Cost budget. Feasibility study.

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

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

Level 1	Level 2	Level 3
		Measuring, Estimating and Tendering Processes in Construction and the Built Environment
		Design Procedures in Construction

The unit also links with similar units at Higher National and degree level. The unit can also be used as additional specialist learning for the Level 3 Diploma.

This unit links to the Edexcel Level 3 NVQ in Technical Design (Construction Environment), the Edexcel Level 3 NVQ in Construction, Plant and Equipment Supervision, the Edexcel Level 4 NVQ in Site Inspection and the Edexcel Level 4 NVQ in Construction, Plant and Equipment Management.

This unit also links to the following level 3 NOS:

- BE Design
- BE Development and Control
- Construction Contracting Operations
- Construction Plant and Equipment Supervision
- Surveying Property and Maintenance
- Surveying
- Transportation.

## Essential resources

Access to live data will give learners a real time framework of construction costs and enrich the learning experience. A 'live' contract will provide up-to-date information and access to web-based resources will help with economic statistics.

## Employer engagement and vocational contexts

The involvement of industry is essential to establishing a real world context for the delivery of the course content. Most medium to large construction companies are actively seeking links with centres and colleges, especially with a view to recruiting trainees and future graduates. Centres should actively seek links with such companies, and establish what help they will be able to provide. Links or assistance could include:

- visiting speakers to promote recruitment onto the BTEC programme
- possible sponsorship of the centre's construction programme
- provision of exemplar documentation or resources
- provision of cost data or information
- loan of or assistance with specialist equipment or ICT access
- assistance with the development of links with other sources of help, including material suppliers, architects, clerk of works consultancies, trade associations, consultants, etc
- sponsorship of individual learners and direct recruitment onto modern apprenticeships and training schemes
- the provision of focused site or office visits and/or sector-related work experience
- access to visiting speakers who will put learning into an industrial context. Specific content level and expected outcomes will need to be discussed in advance
- commentaries on the production of budgets and feasibility studies.

Whilst site and office visits will aid learners' general awareness and perceptions of site and office-based construction activities, it is essential that all visits have a focus. Preparation and follow-up activities should be prepared and discussed with the company well in advance of the visit. It will probably be necessary to have copies of drawings or other documentation in advance of the visit. Suitable activities could include:

- an investigation into project costs
- an investigation into the methodologies used for cost monitoring and control
- an analysis of the management information systems used within the organisation
- an investigation into the roles and responsibilities of quantity surveyors and management accountants
- investigation of potential risks associated with site operations and how these impact on budgets and feasibility studies
- an investigation into the communication systems used within the organisation.

It may be that within one site visit different groups will investigate different elements of cost and financial control and gather research and information for other BTEC units.

It is essential that centre and LA guidelines and procedures are strictly adhered to for all visits, and that tutors visit the site in advance to carry out risk assessments and agree specific health and safety requirements with the company's health and safety officer. Learners should be supervised and accompanied at all times during a site visit.

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

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

## Indicative reading for learners

### Textbooks

Gruneberg S – *Construction Economics: An Introduction* (Palgrave Macmillan, 1997) ISBN 0333655419

Ive G and Gruneberg S – *Economics of the Modern Construction Firm* (Palgrave Macmillan, 2000)  
ISBN 0333919955

Ive G and Gruneberg S – *Economics of the Modern Construction Sector* (Palgrave Macmillan, 2000)  
ISBN 0333626621

Seeley I – *Building Economics* (Palgrave Macmillan, 1997) ISBN 0333638352

### Journals

*The Architects' Journal* – Emap

*The Builder* – Hanley Wood

*Construction News* – Emap

*Economist* – The Economist

### Websites

[www.economist.com](http://www.economist.com)

The Economist

[www.mottmac.com/skillsandservices/constructioneconomics/](http://www.mottmac.com/skillsandservices/constructioneconomics/)

Construction Economics

## Delivery of personal, learning and thinking skills (PLTS)

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

Skill	When learners are ...
<b>Independent enquirers</b>	<p>identifying questions to answer and problems to resolve, planning and carrying out research, appreciating the consequence of decisions, exploring issues, events and problems from different perspectives and analysing and evaluating information, judging its relevance and value, as they:</p> <ul style="list-style-type: none"> <li>• research construction costs</li> <li>• analyse economic problems associated with the construction industry</li> <li>• investigate sources of finance available for construction projects</li> </ul>
<b>Self-managers</b>	<p>anticipating, taking and managing risks and dealing with competing pressures, as they:</p> <ul style="list-style-type: none"> <li>• manage their own time during assignment activities</li> <li>• evaluate different forms of finance</li> <li>• conduct a feasibility study.</li> </ul>

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

Skill	When learners are ...
<b>Independent enquirers</b>	<p>supporting conclusions using reasoned arguments and evidence, as they:</p> <ul style="list-style-type: none"> <li>• analyse economic problems associated with the construction industry</li> <li>• evaluate different sources of finance</li> <li>• evaluate factors that affect the feasibility of a construction project</li> </ul>
<b>Creative thinkers</b>	<p>trying out alternatives or new solutions and following ideas through, as they:</p> <ul style="list-style-type: none"> <li>• compare the advantages and disadvantages of different cost control techniques</li> </ul>
<b>Reflective learners</b>	<p>assessing themselves and others, identifying opportunities and achievements, setting goals with success criteria for their development and work, reviewing progress and acting on the outcomes, inviting feedback and dealing positively with praise, setbacks and criticism and evaluating experiences and learning to inform future progress, as they:</p> <ul style="list-style-type: none"> <li>• participate in formative and Assessment for Learning (AfL) activities</li> <li>• become involved in peer and self-assessment</li> <li>• respond to tutor feedback from formative assessment</li> </ul>
<b>Team workers</b>	<p>collaborating with others to work towards common goals, reaching agreements and managing discussions to achieve results, as they:</p> <ul style="list-style-type: none"> <li>• participate in role-play activities</li> </ul>
<b>Self-managers</b>	<p>seeking out challenges or new responsibilities and showing flexibility when priorities change, and working towards goals, showing initiative, commitment and perseverance, as they:</p> <ul style="list-style-type: none"> <li>• participate in role-play activities</li> <li>• conduct a cost budget and feasibility study</li> </ul>

Skill	When learners are ...
<b>Effective participators</b>	discussing issues of concern, seeking resolutions where needed, presenting a persuasive case for action and identifying improvements that would benefit others as well as themselves, as they: <ul data-bbox="504 331 1018 461" style="list-style-type: none"><li>• take an active role during class discussions</li><li>• participate in role-play activities</li><li>• become involved in peer assessment.</li></ul>

## ● Functional Skills – Level 2

Skill	When learners are ...
<b>ICT – Use ICT systems</b>	
Select, interact with and use ICT systems independently for a complex task to meet a variety of needs	producing technical reports which include digital images and work imported from other software packages
Manage information storage to enable efficient retrieval	organising their folders and file storage
<b>ICT – Find and select information</b>	
Select and use a variety of sources of information independently for a complex task	using internet and historic cost information to complete assessment tasks
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	using internet and historic cost information to complete assessment tasks
<b>ICT – Develop, present and communicate information</b>	
Enter, develop and format information independently to suit its meaning and purpose including: <ul style="list-style-type: none"> <li>• text and tables</li> <li>• images</li> <li>• numbers</li> <li>• records</li> </ul>	producing technical reports which include digital images and work imported from other software packages producing construction cost budgets and feasibility studies
Bring together information to suit content and purpose	compiling feasibility studies
Present information in ways that are fit for purpose and audience	developing presentations and producing planning documentation
<b>Mathematics</b>	
Identify the situation or problem and the mathematical methods needed to tackle it	comparing the advantages and disadvantages of two different cost control techniques
Select and apply a range of skills to find solutions	preparing a cost budget for a simple construction project from historical cost data
Use appropriate checking procedures and evaluate their effectiveness at each stage	checking cost budgets before submission
Draw conclusions and provide mathematical justifications	evaluating different sources of finance in terms of the cost of the finance and the conditions imposed by the finance provider
<b>English</b>	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	presenting their work and participating in question and answer sessions
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	producing technical reports