

BTEC

**Edexcel Level 3 BTEC Nationals in
Construction**

**Edexcel Level 3 BTEC Nationals in
Civil Engineering**

**Edexcel Level 3 BTEC Nationals in
Building Services Engineering**

May 2007

Specification

**Edexcel Level 3 BTEC Nationals in
Construction, Civil Engineering and
Building Services Engineering**



Qualifications and
Curriculum Authority



Llywodraeth Cynulliad Cymru
Welsh Assembly Government



Rewarding Learning

Edexcel, a Pearson company, is the UK's largest awarding body offering academic and vocational qualifications and testing to more than 25,000 schools, colleges, employers and other places of learning here and in over 100 countries worldwide. Our qualifications include GCSE, AS and A Level, GNVQ, NVQ and the BTEC suite of vocational qualifications from entry level to BTEC Higher National Diplomas and Foundation Degrees.

We deliver 9.4 million exam scripts each year, with over 3.8 million marked onscreen in 2006. As part of Pearson, Edexcel has been able to invest in cutting-edge technology that has revolutionised the examinations system, this includes the ability to provide detailed performance data to teachers.

References to third party material made in this specification are made in good faith. Edexcel does not endorse, approve or accept responsibility for the content of materials, which may be subject to change, or any opinions expressed therein. (Material may include textbooks, journals, magazines and other publications and websites.)

Authorised by Roger Beard
Prepared by Terry Hart

Publications Code BN018456

All the material in this publication is copyright
© Edexcel Limited 2007

Contents

The units for the Nationals in Construction, Civil Engineering and Building Services Engineering are on the CD ROM on the inside back cover page.

Ten principles for delivering an Edexcel Level 3 BTEC National qualification	1
What are BTEC Nationals?	3
BTEC National Award	3
BTEC National Certificate	3
BTEC National Diploma	4
National Occupational Standards (NOS)	4
Key features of the BTEC Nationals in Construction, Civil Engineering and Building Services Engineering	5
Rationale of the BTEC Nationals in Construction, Civil Engineering and Building Services Engineering	5
Structure of the qualification	8
Edexcel Level 3 BTEC National Award in Construction	8
Edexcel Level 3 BTEC National Certificate in Construction	9
Edexcel Level 3 BTEC National Diploma in Construction	10
Edexcel Level 3 BTEC National Certificate in Civil Engineering	12
Edexcel Level 3 BTEC National Diploma in Civil Engineering	13
Edexcel Level 3 BTEC National Certificate in Building Services Engineering	14
Edexcel Level 3 BTEC National Diploma in Building Services Engineering	15
Unit format	17
Assessment and grading	19
Grading domains	19
Quality assurance	20
Approval	20
Risk assessment	20
Internal verification	21

External verification	21
Calculation of the qualification grade	21
Awarding a qualification grade	21
Unit points	22
Grade boundaries and UCAS points (as of 1st January 2007)	22
Programme design and delivery	23
Mode of delivery	23
Resources	23
Delivery approach	24
Accreditation of Prior Learning (APL)	24
Meeting local needs	24
Limitations on variations from standard specifications	25
Access and recruitment	25
Restrictions on learner entry	26
Access arrangements and special considerations	26
The Edexcel BTEC Qualification Framework for the Construction and Built Environment sector	27
Further information	31
Useful publications	31
How to obtain National Occupational Standards	31
Professional development and training	32
Annexe A	33
QCA codes	33
Annexe B	35
Grading domains: Level 3 BTEC generic grading domains	35
Annexe C	39
Key skills	39
Key skills mapping – summary of opportunities suggested in each unit	40
Annexe D	45
National Occupational Standards/mapping with NVQs	45

Annexe E	47
BTEC National in Construction old (end date 31/08/07)/BTEC National in Construction new (start date 01/09/2007) – unit mapping	47
BTEC National in Civil Engineering old (end date 31/08/2007)/BTEC National in Civil Engineering new (start date 01/09/2007) – unit mapping ⁴⁸	
BTEC National in Building Services Engineering old (end date 31/08/2007)/BTEC National in Building Services Engineering new (start date 01/09/2007) – unit mapping	49
BTEC Nationals in Construction, Civil Engineering and Building Services Engineering old (end date 31/08/2007)/BTEC Nationals in Construction, Civil Engineering and Building Services Engineering new (start date 01/09/2007) – unit mapping in depth (core units)	50
Annexe F	53
Wider curriculum mapping	53
Annexe G	57
Provision and Use of Work Equipment Regulations 1998 (PUWER)	57

Ten principles for delivering an Edexcel Level 3 BTEC National qualification

This specification contains the rules and regulations, along with the units and associated guidance, to enable centres to design and deliver a programme of learning for the Edexcel Level 3 BTEC Nationals in Construction, Civil Engineering and Building Services Engineering. The qualification structures set out the permitted combination of units learners need to complete the qualification. Each unit sets out the learning outcomes and grading criteria along with content, advice and guidance regarding appropriate delivery and assessment strategies. The following generic principles need to be adhered to so that a BTEC qualification is delivered to the appropriate standard.

- 1 The specification:** The specification gives the information needed for the successful delivery and achievement of the units and the qualification as a whole. The specification is of importance to the learner and the tutor alike. Individual units can be delivered and studied in isolation but the learner and the deliverer should have access to the full information provided to support the programme of learning.
- 2 The website:** Centres need to make regular use of the Edexcel website (www.edexcel.org.uk) to ensure that they have the most up-to-date information. In particular, the requirements for the external verification of the qualification receive regular updates, and appropriate information for centres is posted on the website. It is the responsibility of the centre to ensure that they are familiar with the latest BTEC NQF Level 2/3 (including Short Courses at Levels 1-3) Handbook and that they implement any related policy documentation which may have been posted on the website.
- 3 Policy:** This specification gives details of our assessment and quality assurance procedures. It includes advice about our policy regarding access to our qualifications, the design of programmes of study and delivery modes. Centres must ensure that they follow the procedures and conform to the policies outlined.
- 4 Recruitment:** Centres are required to recruit learners with integrity. A fundamental aspect of this integrity is that centres take appropriate steps to assess each applicant's potential and make a professional judgement about the applicant's ability to be able to successfully complete the programme of study and achieve the qualification. Centres should ensure that applicants have appropriate information and advice about the qualifications and that the qualification will meet their needs.

- 5 Assessment:** Centres are required to use this specification to design and deliver a programme of learning that will enable learners to achieve the grading criteria stipulated in the unit grading grids. The programme of learning should consist of assignments which provide the opportunity for coverage of all grading criteria as set out in the grading grid for each unit. Assignments must be reliable and fit for purpose, giving learners every opportunity to generate evidence which satisfies the grading criteria. Centres should use a variety of assessment methods, including case studies, assignments and work-based assessments, along with projects, performance observation and time-constrained assessments where appropriate.
- 6 Assignments:** Centres are encouraged to apply the grading criteria in a practical way. They should provide, wherever possible, a realistic scenario for learners to work with, and make maximum use of practical activities and work experience. The creation of assignments that are fit for purpose is vital to the learner's achievement.
- 7 National Qualifications Framework (NQF):** These qualifications have been accredited to the NQF and are eligible for public funding as determined by the DfES under Sections 96 and 97 of the Learning and Skills Act 2000. Details of the qualification units can be seen on the QCA OpenQuals database (www.openquals.org.uk).
- 8 Qualification Accreditation Numbers (QANs):** The qualification titles feature in the funding lists published annually by the DfES and on the regularly updated website www.dfes.gov.uk/. The NQF QANs should be used by centres when they seek public funding for their learners. The QANs are listed in *Annexe A*.
- 9 Accreditation:** This specification is accredited by the Qualifications and Curriculum Authority (QCA). This specification may be updated during its period of accreditation and centres should refer to our website for the latest issue.
- 10 Approval:** Centres that have not previously offered BTEC qualifications must apply for, and be granted, centre approval before they can apply for approval to offer the programme. When a centre applies for approval to offer a BTEC qualification they will be required to enter into an 'approvals agreement'. The approvals agreement is a formal commitment by the head or principal of a centre to meet all the requirements of the specification and any linked codes or regulations.

What are BTEC Nationals?

BTEC Nationals are qualifications that are designed to provide specialist work-related qualifications in a range of sectors. They give learners the knowledge, understanding and skills that they need to prepare them for employment. The qualifications also provide career development opportunities for those already in work. Consequently they can provide a course of study for full-time or part-time learners in schools, colleges and training centres.

The family of BTEC Nationals includes Awards, Certificates and Diplomas which offer opportunities for nested provision and flexibility of delivery.

BTEC Nationals are designed to relate to the National Occupational Standards for the sector, where these are appropriate, and are supported by the relevant Standards Setting Body (SSB) or Sector Skills Council (SSC). Some BTEC Nationals form the Technical Certificate component of Apprenticeships and all attract UCAS points that equate to similar-sized general qualifications.

On successful completion of a BTEC National qualification, learners can progress into or within employment and/or continue their study in the same vocational area.

BTEC National Award

The 360 guided learning hours (GLH) (usually 6 units) BTEC National Award offers a specialist qualification that focuses on particular aspects of employment within the appropriate vocational sector. The BTEC National Award is a qualification which can extend a learner's programme of study and provide vocational emphasis for learners following an Applied GCE or GCE route or a combination of both in their main programme of study. The BTEC National Award is especially suitable for more mature learners, who wish to follow a shorter programme of study directly related to their work experience or to an area of employment that they wish to move into.

BTEC National Certificate

The 720 GLH (usually 12 units) BTEC National Certificate provides a specialist work-related programme of study that covers the key knowledge and practical skills required in the appropriate vocational sector. The BTEC National Certificate offers flexibility and a choice of emphasis through the specialist units. It is broadly equivalent to two GCEs.

The qualification offers an engaging programme for those who are clear about the area of employment that they wish to enter. These learners may wish to extend their programme through the study of a related GCE, a complementary NVQ or another qualification. These learning programmes can be developed to allow learners to study complementary qualifications without duplication of content.

For adult learners the BTEC National Certificate can extend their experience of work. It is a suitable qualification for those wishing to change career or move into a particular area of employment following a career break.

BTEC National Diploma

The 1080 GLH (usually 18 units) BTEC National Diploma extends the specialist work-related focus available from the BTEC Certificate. There is potential for the qualification to prepare learners for employment in the appropriate vocational sector and is suitable for those who have decided that they wish to enter a particular area of work.

Some adult learners may wish to complete this qualification in order to enter a specialist area of employment or progress into higher education. Other learners may want to extend the specialism that they followed on the BTEC National Certificate programme.

Progression from the BTEC National Diploma could be into employment where learners might take professional body examinations or complete NVQs. Alternatively, learners could continue to degree or other higher-education programmes in the same vocational sector or in a related sector.

National Occupational Standards (NOS)

BTEC Nationals are designed to relate to the National Occupational Standards (NOS) in the appropriate vocational sector. NOS form the basis of National Vocational Qualifications (NVQs). BTEC Nationals do not purport to deliver occupational competence in the sector, which should be demonstrated in a work context. However, the qualifications provide much of the underpinning knowledge for the NOS, as well as developing practical skills in preparation for work and possible achievement of NVQs in due course.

Relevant aspects of the NOS are addressed in the learning outcomes and content of the units, and these links are identified where appropriate.

The Edexcel Level 3 BTEC Nationals in Construction, Civil Engineering and Building Services Engineering relate to the following NOS:

- Level 3 NVQ in Construction Contracting Operations
- Level 3 NVQ in Construction Plant and Equipment Supervision
- Level 3 NVQ in Construction Site Supervision
- Level 3 NVQ in Technical Design (Built Environment)
- CIC National Occupational Standards.

A breakdown of the coverage for the core units is provided at *Annexe D*.

Key features of the BTEC Nationals in Construction, Civil Engineering and Building Services Engineering

The BTEC Nationals in Construction, Civil Engineering and Building Services Engineering are work-related qualifications reflecting the knowledge and understanding required in these sectors and are designed to focus on:

- providing opportunities for learners and employees to achieve a nationally recognised Level 3 vocationally-specific construction, civil engineering or building services qualification
- providing opportunities for learners who are already in, or about to enter into, employment to work towards the achievement of an apprenticeship in their sector, or to progress to further education vocational qualifications such as the Edexcel Level 5 BTEC Nationals in Construction, Civil Engineering or Building Services Engineering
- providing education, training and the application of knowledge in technical areas that are directly relevant to the changing needs of construction employees, employers and professions
- providing learners with enhanced knowledge and understanding of the key issues of sustainability and health, safety and welfare in the construction and built environment industries
- providing opportunities for learners to enhance a range of skills and techniques, personal qualities and attitudes essential for successful performance in working life and career development
- providing knowledge and skills that are relevant to the QCA key skills units (separately certificated).

Rationale of the BTEC Nationals in Construction, Civil Engineering and Building Services Engineering

The construction industry continues to experience manpower shortages throughout the skills range, and entrants to the industry need to be given every encouragement to develop and enhance their knowledge, skills and potential. The BTEC Nationals provide appropriate work-related and motivating programmes of study.

Options include progression on to a further qualification in construction and the built environment, for example a BTEC Higher National qualification in Construction, Civil Engineering or Building Services Engineering, or entry into industry with the possibility of undertaking additional training, possibly leading to the completion of an NVQ and/or an apprenticeship.

The BTEC Nationals are supported by Sector Skills Councils (SSC) within the construction and built environment sector, and link to the Occupational Standards for the sector where these are appropriate.

BTEC National Award in Construction

The six-unit BTEC National Award in Construction provides a specialist work-related programme of study for sixteen to nineteen year olds that covers some of the key knowledge and practical skills required in the sector. It also offers a choice of specialist units which may be directed towards a career route the learner wishes to follow. This qualification can extend a programme of study and provide a vocational emphasis for learners following a GCE route. The BTEC National Award in Construction offers an engaging programme for learners who, at entry stage, are uncertain about committing to a full twelve unit or eighteen unit programme but wish to learn about the construction industry and the opportunities available. Equally, this qualification offers a focussed qualification for learners, particularly more mature learners, who wish to follow a shorter programme of study that is directly related to their work experience or to an aspect of employment that they may wish to move into in the future. Mature learners wishing to enter the BTEC Higher Nationals in Construction, Civil Engineering or Building Services Engineering may also study this qualification as the basis of the balancing studies required to 'bridge' the gap between their current level of knowledge and skills and the entry requirements for the BTEC Higher Nationals. Mature learners may also benefit from additional specialist units to meet their individual progression needs.

BTEC National Certificates in Construction, Civil Engineering and Building Services Engineering

The twelve unit BTEC National Certificates in Construction, Civil Engineering and Building Services Engineering provide specialist work-related programmes of study that cover the key knowledge and practical skills required in the sectors, and also offer different emphasis through the choice of specialist units. They are broadly equivalent to two GCEs.

The qualifications offer engineering programmes for 16-19 year old learners who are clear about the area of employment that they wish to enter, although, at the stage of entry, they may not be sure of the exact discipline that they wish to follow. Such learners may wish to extend their programme through the study of a related GCE or other qualification. Alternatively, their access to suitable work situations may allow learners to achieve an NVQ qualification in the vocational sector or individual NVQ units.

For adult learners the BTEC National Certificates in Construction, Civil Engineering and Building Services Engineering offer specialist work-related qualifications to confirm and extend their work experience if they are entering or have been employed in the relevant sector. They also provide suitable qualifications for those wishing to change career, or to move into a particular area of employment following a career break.

Learners undertaking an apprenticeship qualification may be able to use a BTEC National Certificate qualification as the Technical Certificate, or other component, of this. This may require specific BTEC Nationals units to be undertaken to meet the requirements of the apprenticeship for the chosen discipline. Details may be obtained from the relevant Sector Skills Council (SSC).

BTEC National Diplomas in Construction, Civil Engineering and Building Services Engineering

The eighteen unit BTEC National Diplomas in Construction, Civil Engineering and Building Services Engineering extend and deepen the specialist focus available in the twelve unit certificate. The qualifications prepare learners for employment in the relevant sectors, and will be suitable for sixteen to nineteen year olds who have already decided that they wish to enter a relevant area of work, although at the stage of entry they may not be sure of the exact discipline that they wish to follow. Some adult learners may wish to make the commitment required by these qualifications in order to enter a specialist area of employment, or to progress into higher education. Other learners may wish to extend the specialism that they have followed in a BTEC National Certificate programme. Progression from these qualifications may well be into employment, where learners may progress to Professional body exams. Alternatively, learners may progress to a degree or to other higher education studies in the sector or a related one.

Structure of the qualification

Edexcel Level 3 BTEC National Award in Construction

The Edexcel Level 3 BTEC National Award in Construction consists of four core units plus specialist units that provide for a combined total of 360 guided learning hours (GLH) for the completed qualification.

The units for the Nationals in Construction, Civil Engineering and Building Services Engineering are on the CD ROM on the inside back cover page.

Edexcel Level 3 BTEC National Award in Construction			
Unit	Core units	GLH	Level
1	Health, Safety and Welfare in Construction and the Built Environment	60	3
2	Construction and the Environment	60	3
4	Science and Materials in Construction and the Built Environment	60	3
5	Construction Technology and Design in Construction and Civil Engineering	60	3
Unit	Specialist units		
3	Mathematics in Construction and the Built Environment	60	3
7	Planning, Organisation and Control of Resources in Construction and the Built Environment	60	3
8	Graphical Detailing in Construction and the Built Environment	60	3
9	Measuring, Estimating and Tendering Processes in Construction and the Built Environment	60	3
10	Surveying in Construction and Civil Engineering	60	3

Edexcel Level 3 BTEC National Certificate in Construction

The Edexcel Level 3 BTEC National Certificate in Construction consists of six core units plus specialist units that provide for a combined total of 720 guided learning hours (GLH) for the completed qualification.

The units for the Nationals in Construction, Civil Engineering and Building Services Engineering are on the CD ROM on the inside back cover page.

Edexcel Level 3 BTEC National Certificate in Construction			
Unit	Core units	GLH	Level
1	Health, Safety and Welfare in Construction and the Built Environment	60	3
2	Construction and the Environment	60	3
3	Mathematics in Construction and the Built Environment	60	3
4	Science and Materials in Construction and the Built Environment	60	3
5	Construction Technology and Design in Construction and Civil Engineering	60	3
6	Building Technology in Construction	60	3
Unit	Specialist units		
7	Planning, Organisation and Control of Resources in Construction and the Built Environment	60	3
8	Graphical Detailing in Construction and the Built Environment	60	3
9	Measuring, Estimating and Tendering Processes in Construction and the Built Environment	60	3
10	Surveying in Construction and Civil Engineering	60	3
13	Environmental Science in Construction	60	3
15	Building Surveying in Construction	60	3
17	Building Regulations and Control in Construction	60	3
18	ICT and CAD in Construction and the Built Environment	60	3
20	Property Valuation in Construction	60	3
21	Employer-Related Project in Construction and the Built Environment	60	3
24	Planning Procedures in Construction	60	3
25	Property Law in Construction	60	3
26	Land Information in Construction	60	3
27	Surveying Technology in Construction and Civil Engineering	60	3
28	Topographic Surveying in Construction and Civil Engineering	60	3

Edexcel Level 3 BTEC National Diploma in Construction

The Edexcel Level 3 BTEC National Diploma in Construction consists of six core units plus specialist units that provide for a combined total of 1080 guided learning hours (GLH) for the completed qualification.

The units for the Nationals in Construction, Civil Engineering and Building Services Engineering are on the CD ROM on the inside back cover page.

Edexcel Level 3 BTEC National Diploma in Construction			
Unit	Core units	GLH	Level
1	Health, Safety and Welfare in Construction and the Built Environment	60	3
2	Construction and the Environment	60	3
3	Mathematics in Construction and the Built Environment	60	3
4	Science and Materials in Construction and the Built Environment	60	3
5	Construction Technology and Design in Construction and Civil Engineering	60	3
6	Building Technology in Construction	60	3
Unit	Specialist units		
7	Planning, Organisation and Control of Resources in Construction and the Built Environment	60	3
8	Graphical Detailing in Construction and the Built Environment	60	3
9	Measuring, Estimating and Tendering Processes in Construction and the Built Environment	60	3
10	Surveying in Construction and Civil Engineering	60	3
11	Economics and Finance in Construction and Civil Engineering	60	3
12	Setting out Processes in Construction and Civil Engineering	60	3
13	Environmental Science in Construction	60	3
14	Structural Mechanics in Construction and Civil Engineering	60	3
15	Building Surveying in Construction	60	3
16	Mechanical and Electrical Services in Construction	60	3
17	Building Regulations and Control in Construction	60	3
18	ICT and CAD in Construction and the Built Environment	60	3
19	Further Mathematics in Construction and the Built Environment	60	3

Edexcel Level 3 BTEC National Diploma in Construction			
Unit	Specialist units (<i>continued</i>)	GLH	Level
20	Property Valuation in Construction	60	3
21	Employer-Related Project in Construction and the Built Environment	60	3
22	Design Procedures in Construction	60	3
23	Spatial Data Techniques in Construction and Civil Engineering	60	3
24	Planning Procedures in Construction	60	3
25	Property Law in Construction	60	3
26	Land Information in Construction	60	3
27	Surveying Technology in Construction and Civil Engineering	60	3
28	Topographic Surveying in Construction and Civil Engineering	60	3

Edexcel Level 3 BTEC National Certificate in Civil Engineering

The Edexcel Level 3 BTEC National Certificate in Civil Engineering consists of six core units plus specialist units that provide for a combined total of 720 guided learning hours (GLH) for the completed qualification.

The units for the Nationals in Construction, Civil Engineering and Building Services Engineering are on the CD ROM on the inside back cover page.

Edexcel Level 3 BTEC National Certificate in Civil Engineering			
Unit	Core units	GLH	Level
1	Health, Safety and Welfare in Construction and the Built Environment	60	3
2	Construction and the Environment	60	3
3	Mathematics in Construction and the Built Environment	60	3
4	Science and Materials in Construction and the Built Environment	60	3
5	Construction Technology and Design in Construction and Civil Engineering	60	3
29	Construction in Civil Engineering	60	3
Unit	Specialist units		
8	Graphical Detailing in Construction and the Built Environment	60	3
10	Surveying in Construction and Civil Engineering	60	3
12	Setting out Processes in Construction and Civil Engineering	60	3
14	Structural Mechanics in Construction and Civil Engineering	60	3
18	ICT and CAD in Construction and the Built Environment	60	3
19	Further Mathematics in Construction and the Built Environment	60	3
21	Employer-Related Project in Construction and the Built Environment	60	3
30	Public Health Engineering in Civil Engineering	60	3
31	Highway Construction and Maintenance in Civil Engineering	60	3

Edexcel Level 3 BTEC National Diploma in Civil Engineering

The Edexcel Level 3 BTEC National Diploma in Construction consists of six core units plus specialist units that provide for a combined total of 1080 guided learning hours (GLH) for the completed qualification.

The units for the Nationals in Construction, Civil Engineering and Building Services Engineering are on the CD ROM on the inside back cover page.

Edexcel Level 3 BTEC National Diploma in Civil Engineering			
Unit	Core units	GLH	Level
1	Health, Safety and Welfare in Construction and the Built Environment	60	3
2	Construction and the Environment	60	3
3	Mathematics in Construction and the Built Environment	60	3
4	Science and Materials in Construction and the Built Environment	60	3
5	Construction Technology and Design in Construction and Civil Engineering	60	3
29	Construction in Civil Engineering	60	3
Unit	Specialist units		
7	Planning, Organisation and Control of Resources in Construction and the Built Environment	60	3
8	Graphical Detailing in Construction and the Built Environment	60	3
9	Measuring, Estimating and Tendering Processes in Construction and the Built Environment	60	3
10	Surveying in Construction and Civil Engineering	60	3
11	Economics and Finance in Construction and Civil Engineering	60	3
12	Setting out Processes in Construction and Civil Engineering	60	3
14	Structural Mechanics in Construction and Civil Engineering	60	3
18	ICT and CAD in Construction and the Built Environment	60	3
19	Further Mathematics in Construction and the Built Environment	60	3
21	Employer-Related Project in Construction and the Built Environment	60	3
23	Spatial Data Techniques in Construction and Civil Engineering	60	3
27	Surveying Technology in Construction and Civil Engineering	60	3
28	Topographic Surveying in Construction and Civil Engineering	60	3
30	Public Health Engineering in Civil Engineering	60	3
31	Highway Construction and Maintenance in Civil Engineering	60	3

Edexcel Level 3 BTEC National Certificate in Building Services Engineering

The Edexcel Level 3 BTEC National Certificate in Building Services Engineering consists of six core units **plus** specialist units that provide for a combined total of 720 guided learning hours (GLH) for the completed qualification.

The units for the Nationals in Construction, Civil Engineering and Building Services Engineering are on the CD ROM on the inside back cover page.

Edexcel Level 3 BTEC National Certificate in Building Services Engineering			
Unit	Core units	GLH	Level
1	Health, Safety and Welfare in Construction and the Built Environment	60	3
2	Construction and the Environment	60	3
3	Mathematics in Construction and the Built Environment	60	3
4	Science and Materials in Construction and the Built Environment	60	3
32	Building Services Control Systems	60	3
33	Building Services Science	60	3
Unit	Specialist units		
5	Construction Technology and Design in Construction and Civil Engineering	60	3
8	Graphical Detailing in Construction and the Built Environment	60	3
19	Further Mathematics in Construction and the Built Environment	60	3
21	Employer-Related Project in Construction and the Built Environment	60	3
34	Heating in Building Services Engineering	60	3
35	Ventilation and Air Conditioning in Building Services Engineering	60	3
36	Fluids Static and Dynamic in Building Services Engineering	60	3
37	Refrigeration Technology in Building Services Engineering	60	3
38	Plumbing Technology in Building Services Engineering	60	3
39	Electrical Principles in Building Services Engineering	60	3
40	Electrical Installation Standards and Components in Building Services Engineering	60	3
41	Electrical Installation Design in Building Services Engineering	60	3
42	Commissioning Electrical Installations in Building Services Engineering	60	3

Edexcel Level 3 BTEC National Diploma in Building Services Engineering

The Edexcel Level 3 BTEC National Diploma in Building Services Engineering consists of six core units plus specialist units that provide for a combined total of 1080 guided learning hours (GLH) for the completed qualification.

The units for the Nationals in Construction, Civil Engineering and Building Services Engineering are on the CD ROM on the inside back cover page.

Edexcel Level 3 BTEC National Diploma in Building Services Engineering			
Unit	Core units	GLH	Level
1	Health, Safety and Welfare in Construction and the Built Environment	60	3
2	Construction and the Environment	60	3
3	Mathematics in Construction and the Built Environment	60	3
4	Science and Materials in Construction and the Built Environment	60	3
32	Building Services Control Systems	60	3
33	Building Services Science	60	3
Unit	Specialist units		
7	Planning, Organisation and Control of Resources in Construction and the Built Environment	60	3
8	Graphical Detailing in Construction and the Built Environment	60	3
9	Measuring, Estimating and Tendering Processes in Construction and the Built Environment	60	3
18	ICT and CAD in Construction and the Built Environment	60	3
19	Further Mathematics in Construction and the Built Environment	60	3
21	Employer-Related Project in Construction and the Built Environment	60	3
34	Heating in Building Services Engineering	60	3
35	Ventilation and Air Conditioning in Building Services Engineering	60	3
36	Fluids Static and Dynamic in Building Services Engineering	60	3
37	Refrigeration Technology in Building Services Engineering	60	3
38	Plumbing Technology in Building Services Engineering	60	3
39	Electrical Principles in Building Services Engineering	60	3

Edexcel Level 3 BTEC National Diploma in Building Services Engineering			
Unit	Specialist units (<i>continued</i>)	GLH	Level
40	Electrical Installation Standards and Components in Building Services Engineering	60	3
41	Electrical Installation Design in Building Services Engineering	60	3
42	Commissioning Electrical Installations in Building Services Engineering	60	3

Unit format

All units in Edexcel Level 3 BTEC National qualifications have a standard format. The unit format is designed to give guidance on the requirements of the qualification for learners, tutors, assessors and those responsible for monitoring national standards.

Each unit has the following sections.

Unit title

The unit title is accredited by QCA and this form of words will appear on the learner's Notification of Performance (NOP).

NQF level

This is the level of the unit within the National Qualifications Framework (NQF). The level of the unit has been informed by the NICATs level descriptors and, where appropriate, the NOS and/or other sector/professional benchmarks.

Guided learning hours (GLH)

In BTEC National qualifications each unit consists of 30, 60, 90 or 120 GLH. Guided learning hours are 'a notional measure of the substance of a unit'. GLH include an estimate of time that might be allocated to direct teaching, instruction and assessment, together with other structured learning time such as directed assignments or supported individual study. It excludes learner-initiated private study. Centres are advised to consider this definition when planning the programme of study associated with this qualification.

Unit abstract

The unit abstract gives the reader an appreciation of the value of the unit in the vocational setting of the qualification as well as highlighting the focus of the unit. It gives the reader a snapshot of the aims of the unit and the key knowledge, skills and understanding developed while studying the unit. The unit abstract also highlights any links to the appropriate vocational sector by describing how the unit relates to that sector.

Learning outcomes

Learning outcomes state exactly what a learner should 'know, understand or be able to do' as a result of completing the unit.

Unit content

The unit content gives centres the substance to devise and plan the programme of learning needed for the learning outcomes to be successfully achieved. Evidence to meet the grading criteria will include relevant areas of the unit content as described in the assessment section of the unit. Where appropriate, this is informed by the underpinning knowledge and understanding requirements of the related National Occupational Standards (NOS).

The unit content sets out each learning outcome with prescribed key phrases or concepts listed in italics followed by the range of related topics. Detailed lists provide an indicative range to support the specific topic item. Not all of the unit content is expected to be assessed in every unit.

Grading grid

Each grading grid contains statements of the assessment criteria used to determine the evidence that each learner must produce in order to receive a pass, merit or distinction grade. It is important to note that the merit and distinction grading criteria refer to a qualitative improvement in the learner's evidence, and not a quantitative one.

Essential guidance for tutors

This section is designed to give tutors additional guidance and amplification in order to provide understanding and a consistent level of delivery and assessment. It is divided into the following sections:

- *Delivery* – explains the content's relationship with the learning outcomes and offers guidance about possible approaches to delivery. This section is based on the more usual delivery modes but is not intended to rule out alternative approaches.
- *Assessment* – gives amplification about the nature and type of evidence that learners need to produce in order to pass the unit or achieve the higher grades. This section should be read in conjunction with the grading criteria.
- *Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications* – sets out links with other units within the qualification. These links can be used to ensure that learners make connections between units, resulting in a coherent programme of learning. The links show opportunities for integration of learning, delivery and assessment.
- *Essential resources* – identifies any specialist resources needed to allow learners to generate the evidence required for each unit. The centre will be asked to ensure that any requirements are in place when it seeks approval from Edexcel to offer the qualification.
- *Indicative reading for learners* – provides a short list of learner resource material that benchmarks the level of study.

Key skills

This section identifies any opportunities in the unit for learners to generate evidence to meet the requirements of key skills units. Assessors should take care to become familiar with the key skills specifications and evidence requirements and not to rely solely on this section when presenting key skills evidence for moderation. Centres should refer to the QCA website (www.qca.org.uk) for the latest version of the key skills standards.

Assessment and grading

The purpose of assessment is to ensure that effective learning has taken place.

Assignments constructed by centres should be reliable and fit for purpose, and should build on the application of the grading criteria. Centres should use a variety of assessment methods, including case studies, assignments and work-based assessments, along with projects, performance observation and time-constrained assessments. Centres are encouraged to emphasise the practical application of the grading criteria, providing a realistic scenario for learners to adopt, and making maximum use of practical activities and work experience. The creation of assignments that are fit for purpose is vital to learners' achievement and their importance cannot be over-emphasised.

All of the criteria listed in the grading grid for each unit must be covered by one assignment, or by a series of assignments. It is advisable that criteria are clearly indicated on each assignment to provide a clear focus for learners and to assist with internal verification and standardisation processes. This will also help to ensure that feedback is specific to the criteria. Tasks and activities should enable learners to produce evidence that relates directly to the specified criteria.

When reading the grading grids and designing assignments, centres should note that for learners to achieve a merit/distinction grade they will be required to provide evidence that is qualitative, not quantitative, in its nature. Centres are encouraged to look across the units' grading grids to identify common topics.

Grading domains

The grading criteria are developed in relation to grading domains which provide for the assessment of the learning outcomes of the unit. There are four BTEC National grading domains which underpin the grading criteria:

- application of knowledge and understanding
- development of practical and technical skills
- personal development for occupational roles
- application of generic and key skills.

The qualitative nature of the merit and distinction grading criteria is based on indicative characteristics of the evidence to fulfil the higher grades. Please refer to *Annexe B*.

A grading scale of pass, merit and distinction is applied to all units.

In Edexcel BTEC Nationals all units are internally assessed.

All assessment for BTEC Nationals is criterion referenced, based on the achievement of specified learning outcomes. Each unit has specified criteria which are to be used for grading. A summative unit grade can be awarded at pass, merit or distinction:

- to achieve a 'pass' a learner must have satisfied **all** the pass criteria
- to achieve a 'merit' a learner must additionally have satisfied **all** the merit criteria

- to achieve a ‘distinction’ a learner must additionally have satisfied **all** the distinction criteria.

Learners who complete the unit but who do not meet all the pass criteria are graded ‘unclassified’.

Quality assurance

Edexcel’s qualification specifications set out the standard to be achieved by each learner in order to be awarded the qualification. This is covered in the statement of learning outcomes and grading criteria in each unit. Further guidance on delivery and assessment is given in the *Essential guidance for tutors* section in each unit. This section is designed to provide additional guidance and amplification related to the unit to support tutors, deliverers and assessors and to provide for a coherence of understanding and a consistency of delivery and assessment.

Edexcel operates an independent, external quality assurance process which is designed to ensure that these standards are maintained by all internal verifiers and external verifiers. It achieves this through the following activities.

Approval

Centres that have not previously offered BTEC qualifications will first need to apply for, and be granted, centre approval before they can apply for approval to offer the programme.

Centres wishing to offer a vocational area for the first time will need to apply for approval to offer the programme.

When a centre applies for approval to offer a BTEC qualification they will be required to enter into an approvals agreement.

The approvals agreement is a formal commitment by the head or principal of a centre to meet all the requirements of the specification and any linked codes or regulations. Sanctions and tariffs may be applied if centres do not comply with the agreement. Ultimately, this could result in the suspension of certification or withdrawal of approval.

Centres will be allowed ‘accelerated approval’ for a new programme where the centre already has approval for a programme that is being replaced by the new programme.

Risk assessment

Edexcel has an approval process which creates a quality profile of each qualification programme in each centre and for the centre as a whole. This profile helps to determine how the programme will be externally verified and will also be used to initiate other quality control measures by Edexcel.

Internal verification

Centres are required to have processes in place that review each assessor's decisions. This ensures that they are correctly interpreting and applying the standards set out in the specifications. The system used to do this is a matter for individual centres and Edexcel fully supports the use of the centre's own quality assurance systems where they ensure robust internal standardisation.

Centres should refer to the BTEC NQF Level 2/3 (including Short Courses at Levels 1-3) Handbook (updated annually). This information can also be found on our website www.edexcel.org.uk then click on 'Services for Centres' and then 'FE Colleges & Schools'.

External verification

Edexcel will sample assessors' decisions using sector-specialist external verifiers. For BTEC Nationals this process will follow the National Standards Sampling (NSS) protocol.

Learners' work **must** be internally assessed. Additionally, at least 50 per cent of submitted work **must** be internally verified.

Centres should refer to the BTEC NQF Level 2/3 (including Short Courses at Levels 1-3) Handbook (updated annually). This updated information can also be found on our website, go to www.edexcel.org.uk then click on 'Services for Centres' and then 'FE Colleges & Schools'.

Calculation of the qualification grade

Awarding a qualification grade

The qualification grade will be calculated through the aggregation of points achieved through the successful achievement of individual units. The number of points available will be dependent on the unit grade achieved and the size of the unit as determined by the stipulated guided learning hours.

For the calculation of a qualification grade for a BTEC National a learner must:

- complete all designated units
- achieve a minimum points score of
 - 36 points for a National Award
 - 72 points for a National Certificate
 - 108 points for a National Diploma
- achieve a pass (or above) grade for units with a combined total of
 - 300 guided learning hours for a National Award
 - 600 guided learning hours for a National Certificate
 - 900 guided learning hours for a National Diploma.

Unit points

Size of unit (GLH)	Pass grade	Merit grade	Distinction grade
10	1	2	3
30	3	6	9
60	6	12	18
90	9	18	27
120	12	24	36

Grade boundaries and UCAS points (as of 1st January 2007)

Grade boundaries BTEC National Award	Overall grade BTEC National Award		UCAS points
36-59	Pass	P	40
60-83	Merit	M	80
84-108	Distinction	D	120

Grade boundaries BTEC National Certificate	Overall grade BTEC National Certificate		UCAS points
72-95	PP		80
96-119	MP		120
120-143	MM		160
144-167	DM		200
168-216	DD		240

Grade boundaries BTEC National Diploma	Overall grade BTEC National Diploma		UCAS points
108-131	PPP		120
132-155	MPP		160
156-179	MMP		200
180-203	MMM		240
204-227	DMM		280
228-251	DDM		320
252-324	DDD		360

Programme design and delivery

BTEC National qualifications consist of core units (which are mandatory) and specialist units. Specialist units are designed to provide a specific focus to the qualification. Required combinations of specialist units are set out clearly in relation to each qualification in the defined qualification structures in this document.

In BTEC Nationals each unit is 30, 60, 90 or 120 guided learning hours (GLH). The GLH includes an estimate of time that might be allocated to direct teaching, instruction and assessment, together with other structured learning time such as directed assignments or supported individual study. It excludes learner-initiated private study. Centres are advised to consider this definition when planning the programme of study associated with this specification.

Mode of delivery

Edexcel does not define the mode of study for BTEC Nationals. Centres are free to offer the qualifications using any mode of delivery that meets their learner's needs. This may be through traditional classroom teaching, open learning, distance learning or a combination of the three. Whichever mode of delivery used, centres must ensure that learners have appropriate access to the resources identified in the specification and to the subject specialists delivering the units. This is particularly important for learners studying for the qualification through open or distance learning.

Learners studying for the qualification on a part-time basis bring with them a wealth of experience that should be utilised to maximum effect by tutors and assessors. Assessment evidence drawn from learners' work environments should be encouraged. Those planning the programme should aim to enhance the vocational nature of the qualification by:

- liaising with employers to ensure a course relevant to learners' specific needs
- accessing and using non-confidential data and documents from learners' workplaces
- including sponsoring employers in the delivery of the programme and, where appropriate, in the assessment
- linking with company-based/workplace training programmes
- making full use of the variety of experience of work and life that learners bring to the programme.

Resources

BTEC Nationals are designed to prepare learners for employment in specific occupational sectors. Physical resources need to support the delivery of the programme and the proper assessment of the learning outcomes, and should therefore normally be of industry standard. Staff delivering programmes and conducting the assessments should be fully familiar with current practice and standards in the sector concerned. Centres will need to meet any specialist resource requirements when they seek approval from Edexcel.

Where specific resources are required these have been indicated in individual units under the *Essential resources* section.

Delivery approach

It is important that centres develop an approach to teaching and learning that supports the specialist vocational nature of BTEC National qualifications. Specifications give a balance of practical skill development and knowledge requirements, some of which can be theoretical in nature. Tutors and assessors need to ensure that appropriate links are made between theory and practical application and that the knowledge base is applied to the sector. This requires the development of relevant and up-to-date teaching materials that allow learners to apply their learning to actual events and activity within the sector. Maximum use should be made of the learner's experience. Where the a BTEC National qualification is being delivered as a Technical Certificate forming part of an Apprenticeship scheme, particular care needs to be taken to build strong links between the learning and assessment for the BTEC National qualification and that of the NVQ and key skill components of the apprenticeship.

Accreditation of Prior Learning (APL)

Edexcel encourages centres to recognise learners' previous achievements and experiences through APL. Learners may have evidence that has been generated during previous study or in their previous or current employment or whilst undertaking voluntary work that relates to one or more of the units in the qualification. Assessors should map this evidence against the grading criteria in the specification and make this evidence available to the external verifier. As with all evidence, assessors should be satisfied about the authenticity and currency of the material when considering whether or not the learning outcomes of the unit have been met.

Full guidance on Edexcel's policy on APL is provided on our website, go to www.edexcel.org.uk then click on 'About Us' and then 'Policies for Centres'.

Meeting local needs

Centres should note that the qualifications set out in these specifications have been developed in consultation with centres and employers, particularly the Sector Skills Councils or the Standards Setting Bodies for the relevant sector. The units are designed to meet the skill needs of the sector and the specialist units allow coverage of the full range of employment. Centres should make maximum use of the choice available to them within the specialist units in these specifications to meet the needs of their learners, and the local skills and training needs identified by organisations such as the Regional Development Agency and the local Learning and Skills Council.

In certain circumstances, units in this specification might not allow centres to meet a local need. In this situation, centres can seek approval from Edexcel to make use of units from other standard NQF BTEC National specifications. Centres will need to justify the need for importing units from other specifications and Edexcel will ensure that the vocational focus of the qualification has not been diluted. Units that have externally set assignments cannot be imported into other qualifications.

There may be exceptional circumstances where even this flexibility does not meet a particular local need. In this case, centres can seek permission from Edexcel to develop a unit with us to meet this need. There are very few cases where this will be allowed. Centres will need strong evidence of the local need and the reasons why our standard units are inappropriate. Edexcel will need to submit these units for accreditation by QCA.

Limitations on variations from standard specifications

The flexibility to import standard units from other BTEC Nationals and/or develop unique units is limited to a total of:

- $\frac{2}{9}$ (for example four 60 GLH units) in a BTEC National Diploma qualification
- $\frac{1}{6}$ (for example two 60 GLH units) in a BTEC National Certificate qualification
- $\frac{1}{6}$ (for example one 60 GLH unit) in a BTEC National Award qualification.

The use of these units cannot be at the expense of the core units in any qualification.

Access and recruitment

Edexcel's policy regarding access to its qualifications is that:

- they should be available to everyone who is capable of reaching the required standards
- they should be free from any barriers that restrict access and progression
- there should be equal opportunities for all wishing to access the qualifications.

Centres are required to recruit learners to BTEC qualifications with integrity. This will include ensuring that applicants have appropriate information and advice about the qualifications and that the qualification will meet their needs. Centres should take appropriate steps to assess each applicant's potential and make a professional judgement about their ability to successfully complete the programme of study and achieve the qualification. This assessment will need to take account of the support available to the learner within the centre during their programme of study and any specific support that might be necessary to allow the learner to access the assessment for the qualification. Centres should also show regard for Edexcel's policy on learners with particular requirements.

Centres will need to review the profile of qualifications and/or experience held by applicants, considering whether this profile shows an ability to progress to a Level 3 qualification. For learners who have recently been in education, the profile is likely to include one of the following:

- a BTEC First qualification in Construction or a related vocational area
- an Intermediate GNVQ in an appropriate vocational area
- a GCSE equivalent to four passes at grade C

- other related Level 2 qualifications
- related work experience.

More mature learners may present a more varied profile of achievement that is likely to include experience of paid and/or unpaid employment.

Restrictions on learner entry

Most BTEC National qualifications are accredited on the NQF for learners aged 16 years and over. Learners aged 15 and under cannot be registered for a BTEC National qualification.

In particular sectors the restrictions on learner entry might also relate to any physical or legal barriers, for example people working in health, care or education are likely to be subject to police checks.

Edexcel Level 3 BTEC Nationals are listed on the DfES funding lists Section 96 and Section 97.

Access arrangements and special considerations

Edexcel's policy on access arrangements and special considerations for BTEC and Edexcel NVQ qualifications aims to enhance access to the qualifications for learners with disabilities and other difficulties (as defined by the 1995 Disability Discrimination Act and the amendments to the Act) without compromising the assessment of skills, knowledge, understanding or competence.

Further details are given in the policy 'Access Arrangements and Special Considerations for BTEC and Edexcel NVQ Qualifications', which is on the Edexcel website (www.edexcel.org.uk). This policy replaces the previous Edexcel policy (Assessment of Vocationally Related Qualification: Regulations and Guidance Relating to Learners with Special Requirements, 2002) concerning learners with particular requirements.

The Edexcel BTEC Qualification Framework for the Construction and Built Environment sector

Progression opportunities within the framework are available vertically, diagonally and horizontally.

NQF Level	General Qualifications	BTEC Full VRQ Courses	NVQ/Occupational
5		HNC/D in Construction HNC/D in Building Services Engineering HNC/D in Civil Engineering	NVQ in Construction Management NVQ in Construction Project Management

NQF Level	General Qualifications	BTEC Full VRQ Courses	NVQ/Occupational
4			NVQ in Construction Contracting Operations – General NVQ in Construction Contracting Operations – Buying NVQ in Construction Contracting Operations – Estimating NVQ in Construction Contracting Operations – Planning NVQ in Construction Contracting Operations – Surveying NVQ in Construction Plant and Equipment Management NVQ in Construction Site Management – Conservation NVQ in Construction Site Management – Consulting Engineering NVQ in Construction Site Management – Contracting NVQ in Planning Supervision – CDM NVQ in Site Inspection

NQF Level	General Qualifications	BTEC Full VRQ Courses	NVQ/Occupational
3		NA/C/D in Construction NC/D in Building Services NC/D in Civil Engineering	NVQ in Construction Contracting Operations – General NVQ in Construction Contracting Operations – Buying NVQ in Construction Contracting Operations – Estimating NVQ in Construction Contracting Operations – Planning NVQ in Construction Contracting Operations – Surveying NVQ in Construction Contracting Operations – Site Technical Support NVQ in Construction Plant and Equipment Supervision NVQ in Construction Site Supervision – Building and Civil Engineering NVQ in Construction Site Supervision – Highway Maintenance NVQ in Technical Design – Built Environment

NQF Level	General Qualifications	BTEC Full VRQ Courses	NVQ/Occupational
2	GCSE in Construction and the Built Environment (Single Award) (Pilot) Pilot in Construction and the Built Environment (Double Award) (Pilot)	First Certificate and Diploma in Construction	
1		Introductory Certificate and Diploma in Construction	
Entry		Entry Level Certificate in Skills for Working Life – Practical skills	

Further information

For further information please call Customer Services on 0870 240 9800 (calls may be recorded for training purposes) or visit our website at www.edexcel.org.uk.

Useful publications

Further copies of this document and related publications can be obtained from:

Edexcel Publications

Adamsway

Mansfield

Nottinghamshire NG18 4FN

Telephone: 01623 467 467

Fax: 01623 450 481

Email: publications@linneydirect.com

Related information and publications include:

- *Accreditation of Prior Learning* available on our website: www.edexcel.org.uk
- *Guidance for Centres Offering Edexcel/BTEC NQF Accredited Programmes* – (Edexcel, distributed to centres annually)
- key skills publications – specifications, tutor support materials and question papers
- *The Statutory Regulation of External Qualifications in England, Wales and Northern Ireland* – (QCA, 2004)
- the current Edexcel publications catalogue and update catalogue.

Edexcel publications concerning the Quality Assurance System and the internal and external verification of vocationally related programmes can be found on the Edexcel website and in the Edexcel publications catalogue.

NB: Most of our publications are priced. There is also a charge for postage and packing. Please check the cost when you order.

How to obtain National Occupational Standards

Further information on the CIC National Occupational Standards may be obtained from:

Construction Industry Council (CIC)

26 Store Street

London WC1E 7BT

Telephone: 020 7399 7400

Standards helpline: 087 0606 4648

Facsimile: 020 7399 7425

Email: info@cic.org.uk

Professional development and training

Edexcel supports UK and international customers with training related to BTEC qualifications. This support is available through a choice of training options offered in our published training directory or through customised training at your centre.

The support we offer focuses on a range of issues including:

- planning for the delivery of a new programme
- planning for assessment and grading
- developing effective assignments
- building your team and teamwork skills
- developing student-centred learning and teaching approaches
- building key skills into your programme
- building in effective and efficient quality assurance systems.

The national programme of training we offer can be viewed on the Edexcel website (www.edexcel.org.uk). You can request customised training through the website or by contacting one of our advisers in the Professional Development and Training team via Customer Services on telephone 0870 240 9800 (calls may be recorded for training purposes) to discuss your training needs.

The training we provide:

- is active – ideas are developed and applied
- is designed to be supportive and thought provoking
- builds on best practice.

Annexe A

QCA codes

The QCA National Qualifications Framework (NQF) code is known as a Qualification Accreditation Number (QAN). This is the code that features in the DfES Funding Schedules, Section 96 and 97 and is to be used for all qualification funding purposes. Each unit within a qualification will also have a QCA NQF unit code.

The QCA qualification and unit codes will appear on the learner's final certification documentation.

The QANs for the qualifications in this publication are:

Edexcel Level 3 BTEC National Award in Construction	500/1830/9
Edexcel Level 3 BTEC National Certificate in Construction	500/1831/0
Edexcel Level 3 BTEC National Diploma in Construction	500/1833/4
Edexcel Level 3 BTEC National Certificate in Civil Engineering	500/1835/8
Edexcel Level 3 BTEC National Diploma in Civil Engineering	500/1836/X
Edexcel Level 3 BTEC National Certificate in Building Services Engineering	500/1832/2
Edexcel Level 3 BTEC National Diploma in Building Services Engineering	500/1834/6

These qualification titles will appear on the learners' certificates. Learners need to be made aware of this when they are recruited by the centre and registered with Edexcel. Providing this happens, centres are able to describe the programme of study leading to the award of the qualification in different ways to suit the medium and the target audience.

Annexe B

Grading domains: Level 3 BTEC generic grading domains

Grading domain 1	Indicative characteristics – Merit	Indicative characteristics – Distinction
<p>Application of knowledge and understanding (Learning outcome stem <i>understand or know</i>)</p>	<ul style="list-style-type: none"> • Shows depth of knowledge and development of understanding in familiar and unfamiliar situations (eg explain why, makes judgements based on analysis). • Applies and/or selects concepts showing comprehension of often complex theories. • Applies knowledge in often familiar and unfamiliar contexts. • Applies knowledge to non-routine contexts (eg assessor selection). • Makes reasoned analytical judgements. • Shows relationships between p criteria. 	<ul style="list-style-type: none"> • Synthesises knowledge and understanding across p/m criteria. • Evaluates complex concepts/ideas/actions and makes reasoned and confident judgements. • Uses analysis, research and evaluation to make recommendations and influence proposals. • Analyses implications of application of knowledge/understanding. • Accesses and evaluates knowledge and understanding to advance complex activities/contexts. • Shows relationships with p/m criteria. • Responds positively to evaluation.

Grading domain 2	Indicative characteristics – Merit	Indicative characteristics – Distinction
<p>Development of practical and technical skills (Learning outcome stem <i>be able to</i>)</p>	<ul style="list-style-type: none"> • Deploys appropriate advanced techniques/processes/skills. • Applies technical skill to advance non-routine activities. • Advances practical activities within resource constraints. • Produces varied solutions (including non-routine). • Modifies techniques/processes to situations. • Shows relationship between p criteria. 	<ul style="list-style-type: none"> • Demonstrates creativity/originality/own ideas. • Applies skill(s) to achieve higher order outcome. • Selects and uses successfully from a range of advanced techniques/processes/skills. • Reflects on skill acquisition and application. • Justifies application of skills/methods. • Makes judgements about risks and limitations of techniques/processes. • Innovates or generates new techniques/processes for new situations. • Shows relationship with p and m criteria.

Grading domain 3	Indicative characteristics – Merit	Indicative characteristics – Distinction
<p>Personal development for occupational roles (Any learning outcome stem)</p>	<ul style="list-style-type: none"> • Takes responsibility in planning and undertaking activities. • Reviews own development needs. • Finds and uses relevant information sources. • Acts within a given work-related context showing understanding of responsibilities. • Identifies responsibilities of employers to the community and the environment. • Applies qualities related to the vocational sector. • Internalises skills/attributes (creating confidence). 	<ul style="list-style-type: none"> • Manages self to achieve outcomes successfully. • Plans for own learning and development through the activities. • Analyses and manipulates information to draw conclusions. • Applies initiative appropriately. • Assesses how different work-related contexts or constraints would change performance. • Reacts positively to changing work-related contexts • Operates ethically in work-related environments. • Takes decisions related to work contexts. • Applies divergent and lateral thinking in work-related contexts. • Understands interdependence.

Grading domain 4	Indicative characteristics – Merit	Indicative characteristics – Distinction
<p>Application of generic skills (Any learning outcome stem)</p>	<ul style="list-style-type: none"> • Communicates effectively using appropriate behavioural and language registers. • Communicates with clarity and influence. • Makes judgements in contexts with explanations. • Explains how to contribute within a team. • Demonstrates positive contribution to team(s). • Makes adjustments to meet the needs/expectations of others (negotiation skills). • Selects and justifies solutions for specified problems. 	<ul style="list-style-type: none"> • Presents self and communicates information to meet the needs of a variety of audience. • Identifies strategies for communication. • Shows innovative approaches to dealing with individuals and groups. • Takes decisions in contexts with justifications. • Produces outputs subject to time/resource constraints. • Reflects on own contribution to working within a team. • Generates new or alternative solutions to specified problems. • Explores entrepreneurial attributes.

Annexe C

Key skills

All BTEC National qualifications include mapping and/or signposting of key skills. These are transferable skills, which play an essential role in developing personal effectiveness for adult and working life and in the application of specific vocational skills.

In each unit the opportunities for the generation of evidence for key skills are signposted. These are indicative links only. Tutors will need to become familiar with key skills specifications and their evidence requirements and they are advised not to rely on the signposting in the units when presenting key skills evidence for moderation. Centres should refer to the QCA website (www.qca.org.uk) for the latest key skills standards.

Key skills provide a foundation for continual learning. They enable and empower individuals who inevitably face a series of choices in work, education and training throughout their lives. Current and future initiatives such as learndirect, lifelong learning and widening participation all require a more flexible population in the workplace and key skills play a role in setting the framework.

Learners need the chance to show current and future employers that they can:

- communicate effectively, in a variety of situations, using a wide range of techniques
- work well with others – individuals or teams – so that work can be properly planned and targets met
- manage their own development, so that they are always ready to take on the challenges of change and diversification
- use number, not just within routine tasks and functions but to help them be more effective and efficient in all they do
- use ICT in a range of applications to support all aspects of their role
- solve problems in a variety of circumstances.

Key skills mapping – summary of opportunities suggested in each unit

Key skills	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8	Unit 9	Unit 10
N3.1	✓		✓	✓			✓		✓	✓
N3.2	✓		✓	✓	✓		✓		✓	✓
N3.3	✓		✓	✓			✓		✓	✓
C3.1a				✓				✓	✓	
C3.1b				✓				✓	✓	
C3.2		✓		✓	✓		✓	✓	✓	
C3.3		✓		✓			✓	✓	✓	
ICT3.1	✓		✓	✓	✓	✓	✓	✓	✓	
ICT3.2	✓		✓	✓	✓	✓	✓	✓	✓	
ICT3.3	✓		✓	✓	✓	✓	✓	✓	✓	
LP3.1	✓					✓			✓	
LP3.2	✓					✓			✓	
LP3.3						✓			✓	
PS3.1	✓				✓	✓				
PS3.2	✓				✓	✓				
PS3.3	✓				✓	✓				
WO3.1										✓
WO3.2										✓
WO3.3										✓

Key skills	Unit 11	Unit 12	Unit 13	Unit 14	Unit 15	Unit 16	Unit 17	Unit 18	Unit 19	Unit 20
N3.1	✓	✓	✓	✓	✓				✓	✓
N3.2	✓	✓	✓	✓	✓				✓	✓
N3.3	✓	✓	✓	✓	✓				✓	✓
C3.1a	✓	✓	✓	✓	✓	✓		✓		
C3.1b	✓	✓	✓	✓	✓	✓	✓	✓		
C3.2	✓	✓	✓	✓	✓	✓	✓	✓		
C3.3	✓	✓	✓	✓	✓	✓	✓	✓		
ICT3.1	✓	✓	✓	✓	✓	✓	✓	✓		✓
ICT3.2	✓	✓	✓	✓	✓	✓	✓	✓		✓
ICT3.3	✓	✓	✓	✓	✓	✓	✓	✓		✓
LP3.1	✓	✓	✓	✓	✓					
LP3.2	✓	✓	✓	✓	✓					
LP3.3	✓	✓	✓	✓	✓					
PS3.1	✓	✓	✓	✓	✓		✓	✓	✓	
PS3.2	✓	✓	✓	✓	✓		✓	✓	✓	
PS3.3	✓	✓	✓	✓	✓		✓	✓	✓	
WO3.1	✓	✓	✓	✓	✓					
WO3.2	✓	✓	✓	✓	✓					
WO3.3	✓	✓	✓	✓	✓					

Key skills	Unit 21	Unit 22	Unit 23	Unit 24	Unit 25	Unit 26	Unit 27	Unit 28	Unit 29	Unit 30
N3.1			✓	✓						
N3.2			✓	✓		✓	✓	✓		
N3.3			✓					✓		
C3.1a	✓	✓		✓	✓					
C3.1b	✓	✓								
C3.2	✓	✓		✓	✓	✓		✓	✓	✓
C3.3	✓	✓		✓		✓		✓	✓	✓
ICT3.1	✓	✓	✓	✓	✓	✓		✓		
ICT3.2	✓	✓	✓	✓		✓		✓		
ICT3.3	✓	✓	✓	✓		✓	✓	✓	✓	✓
LP3.1	✓	✓								
LP3.2	✓	✓								
LP3.3	✓	✓								
PS3.1	✓	✓		✓	✓					
PS3.2	✓	✓		✓						
PS3.3	✓	✓								
WO3.1	✓							✓		
WO3.2	✓							✓		
WO3.3	✓							✓		

Key skills	Unit 31	Unit 32	Unit 33	Unit 34	Unit 35	Unit 36	Unit 37	Unit 38	Unit 39	Unit 40	Unit 41	Unit 42
N3.1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
N3.2			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
N3.3			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
C3.1a			✓			✓	✓	✓	✓	✓	✓	✓
C3.1b			✓			✓	✓	✓	✓	✓	✓	✓
C3.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
C3.3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ICT3.1								✓	✓	✓	✓	✓
ICT3.2								✓	✓	✓	✓	✓
ICT3.3	✓							✓	✓	✓	✓	✓
LP3.1								✓	✓	✓	✓	✓
LP3.2								✓	✓	✓	✓	✓
LP3.3								✓	✓	✓	✓	✓
PS3.1		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
PS3.2		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
PS3.3		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
WO3.1								✓	✓	✓	✓	✓
WO3.2								✓	✓	✓	✓	✓
WO3.3								✓	✓	✓	✓	✓

Annexe D

National Occupational Standards/mapping with NVQs

The following grid maps the knowledge covered in the BTEC Nationals in Construction, Civil Engineering and Building Services Engineering against the underpinning knowledge of the Level 3 NVQ in Construction Contracting Operations, Level 3 NVQ in Construction Plant and Equipment Supervision, Level 3 NVQ in Construction Site Supervision and Level 3 NVQ in Technical Design (Built Environment).

Units 2, 3, 4, 11, 12, 13, 14, 16, 18, 19 and 20 do not appear in the table below because they have no significant map to any of the NVQs shown. The knowledge and understanding that comprise these units supports other units in the qualification that do map against the NVQs. Units 22-42 relate to other disciplines within Construction and the Built Environment.

The NVQ titles offered by Edexcel are subject to change from time to time, and an up-to-date mapping to currently offered NVQs, together with a summary mapping to the CIC Occupational Standards, may be found on the Edexcel website.

KEY

- ✓ indicates that the Edexcel Level 3 covers all of the underpinning knowledge of the NVQ unit
- # indicates partial coverage of the NVQ unit
- a blank space indicates no coverage of the underpinning knowledge

Units	1	5	6	7	8	9	10	15	17	21
Level 3 NVQ in Construction Contracting Operations	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Level 3 NVQ in Construction Plant and Equipment Supervision	✓			✓						#
Level 3 NVQ in Construction Site Supervision	✓			✓	✓				#	#
Level 3 NVQ in Technical Design (Built Environment)		✓			✓	✓	#	#	#	#

Annexe E

BTEC National in Construction old (end date 31/08/07)/BTEC National in Construction new (start date 01/09/2007) – unit mapping

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Old units															
New units															
Unit 1	F														
Unit 2		X													
Unit 3			X												
Unit 4				F											
Unit 5					F										
Unit 6												X			
Unit 7						F									
Unit 8							F								
Unit 9								F							
Unit 10									F						
Unit 11										X					
Unit 12											F				
Unit 13													F		
Unit 14														X	
Unit 15															X

KEY

- P – Partial mapping (Some topics from the old unit appear in the new unit)
- F – Full mapping (Topics in old unit match new unit exactly or almost exactly)
- X – Full mapping + New (All the topics from the old unit appear in the new unit, but new unit also contains new topic(s))

BTEC National in Civil Engineering old (end date 31/08/2007)/BTEC National in Civil Engineering new (start date 01/09/2007) – unit mapping

	1	2	3	4	5	6	7	9	11	12	13	14	15	17	19
Old units															
New units															
Unit 1	F														
Unit 2		X													
Unit 3			X												
Unit 4				F											
Unit 5					F										
Unit 7						F									
Unit 8							F								
Unit 10								F							
Unit 12									F						
Unit 14										X					
Unit 18											X				
Unit 19													X		
Unit 29												X			
Unit 30														X	
Unit 31															X

KEY

P – Partial mapping (Some topics from the old unit appear in the new unit)

F – Full mapping (Topics in old unit match new unit exactly or almost exactly)

X – Full mapping + New (All the topics from the old unit appear in the new unit, but new unit also contains new topic(s))

BTEC National in Building Services Engineering old (end date 31/08/2007)/BTEC National in Building Services Engineering new (start date 01/09/2007) – unit mapping

	1	2	3	4	5	7	10	11	12	13	14	17	18	19	22
Old units															
New units															
Unit 1	F														
Unit 2		X													
Unit 3			X												
Unit 4				F											
Unit 5					F										
Unit 8						F									
Unit 18							X								
Unit 19								X							
Unit 32														X	
Unit 33												X			
Unit 34									F						
Unit 35										F					
Unit 36															X
Unit 38											X				
Unit 39													X		

KEY

P – Partial mapping (Some topics from the old unit appear in the new unit)

F – Full mapping (Topics in old unit match new unit exactly or almost exactly)

X – Full mapping + New (All the topics from the old unit appear in the new unit, but new unit also contains new topic(s))

BTEC Nationals in Construction, Civil Engineering and Building Services Engineering old (end date 31/08/2007)/BTEC Nationals in Construction, Civil Engineering and Building Services Engineering new (start date 01/09/2007) – unit mapping in depth (core units)

New units		Old units		New topics
Number	Name	Number	Name	
Unit 1	Health, Safety and Welfare in Construction and the Built Environment	1	Health, Safety and Welfare	None, but content updated
Unit 2	Construction and the Environment	2	Construction and the Environment	Environmental assessment moved into LO3, greater emphasis on sustainable construction techniques in LO4
Unit 3	Mathematics in Construction and the Built Environment	5	Analytical Methods	Statistics from LO2 to LO4, graphs from LO3 to LO4, trigonometry from LO2 to LO3, otherwise much the same
Unit 4	Science and Materials in Construction and the Built Environment	4	Construction Science and Materials	None, but content updated

New units		Old units		New topics
Number	Name	Number	Name	
Unit 5	Construction Technology and Design in Construction and the Built Environment	3	Construction Technology and Design	LO2 was planning now design brief, LO3 was written and graphical communication now construction technology, LO4 was traditional and modern forms of construction, now sketching and drawing
Unit 6	Building Technology in Construction and the Built Environment	12	Building Technology	LO4 more about environmental issues and legal constraints instead of transport network and primary services
Unit 29	Civil Engineering Construction	14	Civil Engineering Construction	LO3 now about selection of techniques, processes, materials and plant. Job roles and responsibilities gone from LO4
Unit 32	Building Services Controls	17	Building Services Controls	LOs reduced to four: LO1 purposes, LO2 principles, LO3 operational features and characteristics, LO4 control strategies
Unit 33	Building Services Science	19	Building Services Science	LOs reduced to 4: LO1 energy and heat transfer, LO2 fossil fuel energy sources, LO3 thermal properties of solids, liquids and gases, LO4 psychrometry

Annexe F

Wider curriculum mapping

Study of the Edexcel Level 3 BTEC Nationals in Construction, Civil Engineering and Building Services Engineering gives learners opportunities to develop an understanding of spiritual, moral, ethical, social and cultural issues as well as an awareness of environmental issues, European developments, health and safety considerations and equal opportunities issues.

The Edexcel Level 3 BTEC Nationals in Construction, Civil Engineering and Building Services Engineering makes a positive contribution to wider curricular areas as appropriate.

Spiritual, moral, ethical, social and cultural issues

The specification contributes to an understanding of:

- moral and ethical issues – Units 1, 2, 3, 6 and 9
- social and cultural issues – Units 3 and 6.

Environmental issues

Learners are led to appreciate the importance of environmental issues through the experience of the construction and built environment sector, in Units 1, 2, 3, 4, 6, 7 and 9.

European developments

Much of the content of the Edexcel Level 3 BTEC Nationals in Construction, Civil Engineering and Building Services Engineering applies throughout Europe, even though the delivery is in a UK context. The European dimensions of construction are partially addressed in Units 2 and 8.

Health and safety considerations

The Edexcel Level 3 BTEC Nationals in Construction, Civil Engineering and Building Services Engineering practically based and health and safety issues are encountered throughout the units. Learners will develop awareness of the safety of others as well as themselves in all practical activities. Learners will also explore health and safety issues across the construction sector, particularly in Units 1, 2, 4, 5, 6, 7, 8, 9, and 10.

Equal opportunities issues

Equal opportunities issues are implicit throughout the Edexcel Level 3 BTEC Nationals in Construction, Civil Engineering and Building Services Engineering.

Wider curriculum mapping

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8	Unit 9	Unit 10	Unit 11
Spiritual issues	✓	✓					✓				
Moral and ethical issues	✓	✓	✓			✓			✓		✓
Social and cultural issues			✓			✓					
Environmental issues	✓	✓	✓	✓		✓	✓		✓		
European developments		✓							✓		✓
Health and safety considerations	✓	✓		✓	✓	✓	✓	✓	✓	✓	
Equal opportunities issues	✓	✓									

	Unit 12	Unit 13	Unit 14	Unit 15	Unit 16	Unit 17	Unit 18	Unit 19	Unit 20	Unit 21	Unit 22
Spiritual issues						✓			✓	✓	
Moral and ethical issues						✓		✓	✓	✓	✓
Social and cultural issues								✓	✓	✓	
Environmental issues	✓	✓	✓	✓	✓	✓		✓		✓	✓
European developments		✓			✓	✓	✓		✓	✓	✓
Health and safety considerations	✓	✓	✓	✓	✓	✓			✓	✓	✓
Equal opportunities issues										✓	

	Unit 23	Unit 24	Unit 25	Unit 26	Unit 27	Unit 28	Unit 29	Unit 30	Unit 31	Unit 32
Spiritual issues		✓	✓					✓		
Moral and ethical issues		✓	✓	✓				✓		
Social and cultural issues		✓	✓			✓		✓	✓	
Environmental issues	✓	✓		✓	✓	✓	✓	✓	✓	✓
European developments	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Health and safety considerations	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Equal opportunities issues										

	Unit 33	Unit 34	Unit 35	Unit 36	Unit 37	Unit 38	Unit 39	Unit 40	Unit 41	Unit 42
Spiritual issues										
Moral and ethical issues										✓
Social and cultural issues		✓	✓							✓
Environmental issues	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
European developments		✓	✓		✓	✓		✓	✓	✓
Health and safety considerations	✓	✓	✓		✓	✓		✓	✓	✓
Equal opportunities issues										

Annexe G

Provision and Use of Work Equipment Regulations 1998 (PUWER)

The HSC publication 'Safe use of work equipment, Approved Code of Practice and Guidance' is aimed at employers and employees across all industries and gives new guidance on the Provision and Use of Work Equipment Regulations 1998.

It addresses many issues including 'training for young people' and centres must comply with the following guidance when developing delivery and assessment strategies that involve the use of hand-held power tools. For the purposes of this unit the centre must assume the responsibilities incumbent upon the 'employer' with learners being deemed equivalent to 'employees' and/or 'workers'.

- 38 You have a duty under health and safety law to ensure, as far as is reasonably practicable, the health, safety and welfare of your employees. When carrying out an assessment of the risk to their health and safety, you should identify groups of workers that might be particularly at risk such as **young or disabled** people. The outcome of your risk assessment will be helpful in meeting your duty to provide information, instruction, training and supervision necessary to ensure the health and safety of your employees. You will want to take account of factors such as their competence, experience, maturity etc.
- 77 If you are an employer you have a duty to ensure that items of work equipment provided for your employees and the self-employed working for you comply with PUWER 1998.
- 189 Training and proper supervision of young people is particularly important because of their relative immaturity and unfamiliarity with the working environment. Induction training is of particular importance. There are no general age restrictions in legislation relating to the use of work equipment although there is some ACOP material in the relevant publications dealing with lifting, power presses and wood working; all employees should be competent to use work equipment with due regard to health and safety regardless of their age.

The Management Regulations contain specific requirements relating to the employment of young people under the age of 18. These require employers to assess risks to young people before they start work, taking into account their inexperience, lack of awareness of potential risks and their immaturity. Employers must provide information to parents of school-age children (for example when they are on work experience) about the risks and the control measures introduced and take account of the risk assessment in determining whether the young person should undertake certain work activities.

Note: This summary is intended to draw centres attention to the PUWER requirements but centres should satisfy themselves as to their compliance and to the full requirements of these regulations and of all other legislation relevant to the health, safety and welfare of learners.

Further copies of this publication are available from
Edexcel Publications, Adamsway, Mansfield, Notts, NG18 4FN

Telephone 01623 467467
Fax 01623 450481
Email: publications@linneydirect.com

Publications Code BN018456 May 2007

For more information on Edexcel and BTEC qualifications please contact
Customer Services on 0870 240 9800
or <http://enquiries.edexcel.org.uk>
or visit our website: www.edexcel.org.uk

BTEC is a registered trademark of Edexcel Limited

Edexcel Limited. Registered in England and Wales No. 4496750
Registered Office: One90 High Holborn, London WC1V 7BH

