

# CONSTRUCTION AND THE BUILT ENVIRONMENT

## Specification

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**LEVEL****4****HNC**

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**5****HND**

Issue 8  
February 2015



## **Edexcel, BTEC and LCCI qualifications**

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This specification is Issue 8. Key changes are sidelined. We will inform centres of any changes to this issue. The latest issue can be found on our website: [qualifications.pearson.com](http://qualifications.pearson.com)

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**Pearson BTEC Level 4 HNC Diploma in Construction and the Built Environment (QCF)**

**Pearson BTEC Level 5 HND Diploma in Construction and the Built Environment (QCF)**

**Pearson BTEC Level 4 HNC Diploma in Construction and the Built Environment (Building Services Engineering) (QCF)**

**Pearson BTEC Level 5 HND Diploma in Construction and the Built Environment (Building Services Engineering) (QCF)**

**Pearson BTEC Level 4 HNC Diploma in Construction and the Built Environment (Civil Engineering) (QCF)**

**Pearson BTEC Level 5 HND Diploma in Construction and the Built Environment (Civil Engineering) (QCF)**

The Qualifications and Credit Framework (QCF) was introduced to replace the National Qualifications Framework (NQF). It recognises achievement through the award of credit for units and qualifications, working at all levels between Entry level and level 8.

To accommodate the framework we took the opportunity to revise the academic level and size of the BTEC HNCs (Higher National Certificates). These are now at level 4 and are a minimum of 120 credits in size. They have been nested within the structures of the BTEC HNDs (Higher National Diplomas).

BTEC HNDs are level 5 qualifications. They are a minimum of 240 credits in size.

The qualifications remain as Intermediate level qualifications on the Framework for Higher Education Qualifications (FHEQ). Progression to BTEC Higher Nationals continues to be from level 3 qualifications. Progression from BTEC Higher Nationals will normally be to qualifications at level 6. Learners' progression routes do not necessarily involve qualifications at every level.

As a nested qualification the HNC is an embedded component of the HND. However, it can be taken as a stand-alone qualification.

If a learner enrolls for an HNC they would be eligible to gain a grade for the HNC. If they then move onto an HND, the learner is graded on their HND performance. The grade for the HND will include units from the previously achieved HNC.

If a learner opts to take an HND from the start, then on successful completion of the HND they will receive one grade for the HND achievement only.

If a learner opts to take an HND from the start but later chooses to revert to an HNC programme, then on successful completion of the HNC they will receive a grade for the HNC achievement only.

Existing NQF Higher National units achievement can count towards the QCF BTEC Higher Nationals. (See *Annexe D* for NQF to QCF unit mapping.)

# BTEC Higher Nationals within the QCF, NQF and FHEQ

QCF/NQF/ FHEQ level	Progression opportunities and examples of qualifications within each level
8	PhD/DPhil Professional doctorates (credit based), e.g. EdD
7	Master's degrees Postgraduate diplomas Postgraduate Certificate in Education (PGCE)
6	Bachelor's degrees, e.g. BA, BSc Professional Graduate Certificate in Education Graduate certificates and diplomas
5	<b>BTEC HNDs</b> (Higher National Diplomas) Foundation Degrees, e.g. FdA, FdSc Diplomas of Higher Education (Dip HE)
4	<b>BTEC HNCs</b> (Higher National Certificates) Certificates of Higher Education (Cert HE) Level 4 National Vocational Qualifications (NVQs)
3	BTEC Level 3 Extended Diplomas BTEC Level 3 Diplomas BTEC Level 3 Subsidiary Diplomas BTEC Level 3 Certificates GCE Advanced Level Level 3 NVQs Advanced Diplomas

## **UNITS**

**The units for the Pearson BTEC Higher Nationals in Construction and the Built Environment (QCF) are on the CD ROM that accompanies this specification and on our website.**

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# Qualification titles covered by this specification

**Pearson BTEC Level 4 HNC Diploma in Construction and the Built Environment (QCF)**

**Pearson BTEC Level 5 HND Diploma in Construction and the Built Environment (QCF)**

**Pearson BTEC Level 4 HNC Diploma in Construction and the Built Environment (Building Services Engineering) (QCF)**

**Pearson BTEC Level 5 HND Diploma in Construction and the Built Environment (Building Services Engineering) (QCF)**

**Pearson BTEC Level 4 HNC Diploma in Construction and the Built Environment (Civil Engineering) (QCF)**

**Pearson BTEC Level 5 HND Diploma in Construction and the Built Environment (Civil Engineering) (QCF)**

These qualifications have been accredited to the Qualifications and Credit Framework (QCF). The Qualification Numbers (QNs) for these qualifications are listed below.

These qualification titles are as they will appear on learners' certificates. Learners need to be made aware of this when they are recruited by the centre and registered with Pearson. 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.

The Quality Assurance Agency for Higher Education (QAA) has produced guidelines for centres in preparing programme specifications (reference *Guidelines for preparing programme specifications: UK Quality Code for Higher Education, Part A Chapter A3.*)

# Qualification Numbers

The Qualifications and Credit Framework (QCF) code is known as a Qualification Number (QN). Each unit within a qualification will also have a QCF unit code.

The QCF qualification and unit codes will appear on learners' final certification documentation.

The QNs for the qualifications in this publication are:

- 500/8276/0 Pearson BTEC Level 4 HNC Diploma in Construction and the Built Environment (QCF)
- 500/8276/0 Pearson BTEC Level 4 HNC Diploma in Construction and the Built Environment (Building Services Engineering) (QCF)
- 500/8276/0 Pearson BTEC Level 4 HNC Diploma in Construction and the Built Environment (Civil Engineering) (QCF)
- 500/8274/7 Pearson BTEC Level 5 HND Diploma in Construction and the Built Environment (QCF)
- 500/8274/7 Pearson BTEC Level 5 HND Diploma in Construction and the Built Environment (Building Services Engineering) (QCF)
- 500/8274/7 Pearson BTEC Level 5 HND Diploma in Construction and the Built Environment (Civil Engineering) (QCF)

## Introduction

This specification contains the units and associated guidance for the Pearson BTEC Level 4 HNC in Construction and the Built Environment (QCF) and the Pearson BTEC Level 5 HND in Construction and the Built Environment (QCF).

Each unit sets out the required learning outcomes, assessment criteria and content and may also include advice regarding essential delivery and assessment strategies.

This document also contains details of the teaching, learning, assessment and quality assurance of these qualifications. It includes advice about our policies regarding access to our qualifications, the design of programmes of study and delivery modes.

# Structure of the qualification

## **BTEC Level 4 HNC**

The Pearson BTEC Level 4 HNC in Construction and the Built Environment (QCF) is a qualification with a minimum of 120 credits of which 65 are mandatory core.

The Pearson BTEC Level 4 HNC in Construction and the Built Environment (Building Services Engineering) (QCF) is a qualification with a minimum of 120 credits of which 65 are mandatory core.

The Pearson BTEC Level 4 HNC in Construction and the Built Environment (Civil Engineering) (QCF) is a qualification with a minimum of 125 credits of which 125 are mandatory core.

The BTEC Level 4 HNC programme must contain a minimum of 65 credits at level 4.

## **BTEC Level 5 HND**

The Pearson BTEC Level 5 HND in Construction and the Built Environment (QCF) is a qualification with a minimum of 240 credits of which 95 are mandatory core.

The Pearson BTEC Level 5 HND in Construction and the Built Environment (Building Services Engineering) (QCF) is a qualification with a minimum of 240 credits of which 160 are mandatory core.

The Pearson BTEC Level 5 HND in Construction and the Built Environment (Civil Engineering) (QCF) is a qualification with a minimum of 240 credits of which 155 are mandatory core.

The BTEC Level 5 HND programme must contain a minimum of 125 credits at level 5 or above.

# Rules of combination for BTEC Levels 4 and 5 Higher National qualifications

The rules of combination specify the:

- total credit value of the qualification
- minimum credit to be achieved at the level of the qualification
- mandatory core unit credit
- specialist unit credit
- maximum credit that can be centre devised or imported from other QCF BTEC Higher National qualifications.

When combining units for a BTEC Higher National qualification it is the centre's responsibility to ensure that the following rules of combination are adhered to:

## **Pearson BTEC Level 4 HNC in Construction and the Built Environment (QCF)**

- 1 Qualification credit value: a minimum of 120 credits. (A maximum of 30 credits may be at level 3; a maximum of 55 credits may be at level 5.)
- 2 Minimum credit to be achieved at the level of the qualification (level 4): 65 credits.
- 3 Mandatory core unit credit: 65 credits
- 4 Specialist unit credit: 55 credits.
- 5 A maximum of 30 credits can be centre devised or imported from other QCF BTEC Higher National qualifications to meet local needs. Level rules and mandatory core units must not be changed.

## **Pearson BTEC Level 4 HNC in Construction and the Built Environment (Building Services Engineering) (QCF)**

- 1 Qualification credit value: a minimum of 120 credits. (A maximum of 30 credits may be at level 3; a maximum of 55 credits may be at level 5.)
- 2 Minimum credit to be achieved at the level of the qualification (level 4): 65 credits.
- 3 Mandatory core unit credit: 65 credits
- 4 Specialist unit credit: 55 credits.
- 5 A maximum of 30 credits can be centre devised or imported from other QCF BTEC Higher National qualifications to meet local needs. Level rules and mandatory core units must not be changed.

**Pearson BTEC Level 4 HNC in Construction and the Built Environment  
(Civil Engineering) (QCF)**

- 1 Qualification credit value: a minimum of 125 credits. (A maximum of 30 credits may be at level 3; a maximum of 55 credits may be at level 5.)
- 2 Minimum credit to be achieved at the level of the qualification (level 4): 65 credits.
- 3 Mandatory core unit credit: 125 credits
- 4 Specialist unit credit: 0 credits.
- 5 A maximum of 30 credits can be centre devised or imported from other QCF BTEC Higher National qualifications to meet local needs. Level rules and mandatory core units must not be changed.

**Pearson BTEC Level 5 HND in Construction and the Built Environment  
(QCF)**

- 1 Qualification credit value: a minimum of 240 credits. (A maximum of 30 credits may be at level 6.)
- 2 Minimum credit to be achieved at the level of the qualification (level 5) or above: 125 credits.
- 3 Mandatory core unit credit: 95 credits.
- 4 Specialist unit credit: 145 credits.
- 5 The requirements of the HNC have to be met.
- 6 A maximum of 60 credits can be centre devised or imported from other QCF BTEC Higher National qualifications to meet local needs. Level rules and mandatory core units must not be changed.

**Pearson BTEC Level 5 HND in Construction and the Built Environment  
(Building Services Engineering) (QCF)**

- 1 Qualification credit value: a minimum of 240 credits. (A maximum of 30 credits may be at level 6.)
- 2 Minimum credit to be achieved at the level of the qualification (level 5) or above: 125 credits.
- 3 Mandatory core unit credit: 160 credits.
- 4 Specialist unit credit: 80 credits.
- 5 The requirements of the HNC have to be met.
- 6 A maximum of 60 credits can be centre devised or imported from other QCF BTEC Higher National qualifications to meet local needs. Level rules and mandatory core units must not be changed.

**Pearson BTEC Level 5 HND in Construction and the Built Environment  
(Civil Engineering) (QCF)**

- 1 Qualification credit value: a minimum of 240 credits. (A maximum of 30 credits may be at level 6.)
- 2 Minimum credit to be achieved at the level of the qualification (level 5) or above: 125 credits.
- 3 Mandatory core unit credit: 155 credits.
- 4 Specialist unit credit: 85 credits.
- 5 The requirements of the HNC have to be met.
- 6 A maximum of 60 credits can be centre devised or imported from other QCF BTEC Higher National qualifications to meet local needs. Level rules and mandatory core units must not be changed.

## Structure of the Pearson BTEC Level 4 HNC in Construction and the Built Environment (QCF)

<b>Unit number</b>	<b>Mandatory core units – all four units must be taken</b>	<b>Unit level</b>	<b>Unit credit</b>
1	Design Principles and Application for Construction and the Built Environment	4	15
2	Science and Materials for Construction and the Built Environment	4	15
5	Group Project in the Construction Industry	5	20
6	Health, Safety and Welfare for Construction and the Built Environment	4	15
<b>Specialist units – choose units with a minimum credit value of 55 credits</b>			
3	Applied Mathematics for Construction and the Built Environment	4	15
4	Management Principles and Application for Construction and the Built Environment	5	15
7	Construction and Maintenance of Buildings	4	15
8	Technology of Complex Buildings	5	15
9	Law and Contract for Construction and the Built Environment	4	15
10	Building Services Design, Installation and Maintenance in Construction	4	15
11	Contractual Procedures and Procurement for Construction and the Built Environment	5	15
12	Conversion and Adaptation of Buildings	5	15
13	Environmental Impact of Construction	4	15
14	Economics for Construction and the Built Environment	5	15
15	Production Management for Construction	5	15
16	Measuring, Tendering and Estimating for Construction and the Built Environment	4	15
17	Project Management for Construction and the Built Environment	5	15
18	Measurement Processes for Construction	4	15
19	Building Control Procedures and Legislation	5	15
20	Construction Methods and Design Solutions	5	15
21	Specification and Contract Documentation for Construction	4	15
22	Structural Behaviour and Detailing	4	15

<b>Unit number</b>	<b>Specialist units – choose units with a minimum credit value of 55 credits (continued)</b>	<b>Unit level</b>	<b>Unit credit</b>
23	Advanced Measurement for Construction	5	15
24	Design Procedures for Construction	4	15
25	Design Technology for Construction	5	15
26	Properties and Performance of Construction Materials	5	15
27	Site Surveying Procedures for Construction and the Built Environment	4	15
28	IT Applications for Construction	4	15
29	Computer-aided Design for Construction	4	15
30	Work-based Learning and Assessment in Construction and the Built Environment	5	15
31	Work-based Training and Development in Construction and the Built Environment	5	15
59	Employability Skills	5	15
60	Personal and Professional Development	5	15
61	Project Design, Implementation and Evaluation	5	20
62	Research Project	5	20
63	Work-based Experience	5	15

**The BTEC Level 4 HNC programme must contain a minimum of 65 credits at level 4.**

**Structure of the Pearson BTEC Level 4 HNC in Construction and the Built Environment (Building Services Engineering) (QCF)**

<b>Unit number</b>	<b>Mandatory core units – all four units must be taken</b>	<b>Unit level</b>	<b>Unit credit</b>
1	Design Principles and Application for Construction and the Built Environment	4	15
5	Group Project in the Construction Industry	5	20
6	Health, Safety and Welfare for Construction and the Built Environment	4	15
58	Application of Scientific Principles to Building Services Engineering	4	15
<b>Specialist units – choose units with a minimum credit value of 55 credits*</b>			
3	Applied Mathematics for Construction and the Built Environment	4	15
4	Management Principles and Application for Construction and the Built Environment	5	15
30	Work-based Learning and Assessment in Construction and the Built Environment	5	15
31	Work-based Training and Development in Construction and the Built Environment	5	15
36	Applied Mathematics for Complex Engineering Problems	5	15
40	Thermofluids and Acoustic Criteria for Building Services Engineering	5	15
41	Air Conditioning for Industrial and Commercial Buildings	4	15
42	Low Pressure Hot Water Heating for Non-domestic Buildings	4	15
43	Electricity and Lighting for Building Services Engineering	4	15
44	Air Conditioning for Complex Industrial and Commercial Buildings	5	15
45	Heating Systems for Industrial and Specialist Applications	5	15
46	Piped Distribution Services for Non-domestic Buildings	4	15
47	Energy Utilisation and Efficiency for Building Services Engineering	5	15
48	Refrigeration Technology for Construction and the Built Environment	5	15
49	Electrical and Electronic Control Principles for Building Services Engineering	4	15

<b>Unit number</b>	<b>Specialist units – choose units with a minimum credit value of 55 credits*</b> <b>(continued)</b>	<b>Unit level</b>	<b>Unit credit</b>
50	Electrical Installation for Building Services Engineering	4	15
51	Lighting Applications for Industrial and Commercial Buildings	4	15
52	Power Supplies for Building Services Engineering	5	15
53	Electrical Protection and Transportation Installations for Non-domestic Buildings	5	15
54	Building Management Systems for Building Services Engineering	4	15
55	Refrigeration Applications for Construction and the Built Environment	5	15
56	Refrigeration Design for Construction and the Built Environment	5	15
57	Project Management for Building Services Engineering	5	15
59	Employability Skills	5	15
60	Personal and Professional Development	5	15
61	Project Design, Implementation and Evaluation	5	20
63	Work-based Experience	5	15

\* The choice of Specialist units for the Pearson BTEC Level 4 HNC in Construction and the Built Environment (Building Services Engineering) (QCF) should ensure adequate coverage of the technology units required for the discipline progression route being followed. It should also provide a good balance and integration of theory and practice to ensure that the qualification supports both employer related and academic progression.

A BTEC Level 4 HNC in Construction and the Built Environment (Building Services Engineering) programme must not include more than one of the Specialist units listed below:

- Unit 36: Applied Mathematics for Complex Engineering Problems
- Unit 54: Building Management Systems for Building Services Engineering
- Unit 57: Project Management for Building Services Engineering.

**The BTEC Level 4 HNC programme must contain a minimum of 65 credits at level 4.**

**Structure of the Pearson BTEC Level 4 HNC in Construction and the Built Environment (Civil Engineering) (QCF)**

<b>Unit number</b>	<b>Mandatory core units – all eight units must be taken</b>	<b>Unit level</b>	<b>Unit credit</b>
1	Design Principles and Application for Construction and the Built Environment	4	15
2	Science and Materials for Construction and the Built Environment	4	15
3	Applied Mathematics for Construction and the Built Environment	4	15
5	Group Project in the Construction Industry	5	20
27	Site Surveying Procedures for Construction and the Built Environment	4	15
32	Engineering Geology and Soil Mechanics	4	15
33	Civil Engineering Technology	4	15
34	Structural Analysis and Design	5	15
<b>Specialist units (optional)</b>			
64	Railway Track Engineering	5	15

**The BTEC Level 4 HNC programme must contain a minimum of 65 credits at level 4.**

## Structure of the Pearson BTEC Level 5 HND in Construction and the Built Environment (QCF)

Unit number	Mandatory core units – all six units must be taken	Unit level	Unit credit
1	Design Principles and Application for Construction and the Built Environment	4	15
2	Science and Materials for Construction and the Built Environment	4	15
3	Applied Mathematics for Construction and the Built Environment	4	15
4	Management Principles and Application for Construction and the Built Environment	5	15
5	Group Project in the Construction Industry	5	20
6	Health, Safety and Welfare for Construction and the Built Environment	4	15
<b>Specialist units – choose units with a minimum credit value of 145 credits</b>			
7	Construction and Maintenance of Buildings	4	15
8	Technology of Complex Buildings	5	15
9	Law and Contract for Construction and the Built Environment	4	15
10	Building Services Design, Installation and Maintenance in Construction	4	15
11	Contractual Procedures and Procurement for Construction and the Built Environment	5	15
12	Conversion and Adaptation of Buildings	5	15
13	Environmental Impact of Construction	4	15
14	Economics for Construction and the Built Environment	5	15
15	Production Management for Construction	5	15
16	Measuring, Tendering and Estimating for Construction and the Built Environment	4	15
17	Project Management for Construction and the Built Environment	5	15
18	Measurement Processes for Construction	4	15
19	Building Control Procedures and Legislation	5	15
20	Construction Methods and Design Solutions	5	15
21	Specification and Contract Documentation for Construction	4	15
22	Structural Behaviour and Detailing	4	15

<b>Unit number</b>	<b>Specialist units – choose units with a minimum credit value of 145 credits (continued)</b>	<b>Unit level</b>	<b>Unit credit</b>
23	Advanced Measurement for Construction	5	15
24	Design Procedures for Construction	4	15
25	Design Technology for Construction	5	15
26	Properties and Performance of Construction Materials	5	15
27	Site Surveying Procedures for Construction and the Built Environment	4	15
28	IT Applications for Construction	4	15
29	Computer-aided Design for Construction	4	15
30	Work-based Learning and Assessment in Construction and the Built Environment	5	15
31	Work-based Training and Development in Construction and the Built Environment	5	15
59	Employability Skills	5	15
60	Personal and Professional Development	5	15
61	Project Design, Implementation and Evaluation	5	20
62	Research Project	5	20
63	Work-based Experience	5	15

**The BTEC Level 5 HND programme must contain a minimum of 125 credits at level 5.**

**Structure of the Pearson BTEC Level 5 HND in Construction and the Built Environment (Building Services Engineering) (QCF)**

<b>Unit number</b>	<b>Mandatory core units – all 10 units must be taken</b>	<b>Unit level</b>	<b>Unit credit</b>
1	Design Principles and Application for Construction and the Built Environment	4	15
3	Applied Mathematics for Construction and the Built Environment	4	15
4	Management Principles and Application for Construction and the Built Environment	5	15
5	Group Project in the Construction Industry	5	20
6	Health, Safety and Welfare for Construction and the Built Environment	4	15
36	Applied Mathematics for Complex Engineering Problems	5	15
54	Building Management Systems for Building Services Engineering	4	15
57	Project Management for Building Services Engineering	5	15
58	Application of Scientific Principles to Building Services Engineering	4	15
62	Research Project	5	20
<b>Specialist units – choose units with a minimum credit value of 80 credits</b>			
30	Work-based Learning and Assessment in Construction and the Built Environment	5	15
31	Work-based Training and Development in Construction and the Built Environment	5	15
40	Thermofluids and Acoustic Criteria for Building Services Engineering	5	15
41	Air Conditioning for Industrial and Commercial Buildings	4	15
42	Low Pressure Hot Water Heating for Non-domestic Buildings	4	15
43	Electricity and Lighting for Building Services Engineering	4	15
44	Air Conditioning for Complex Industrial and Commercial Buildings	5	15
45	Heating Systems for Industrial and Specialist Applications	5	15
46	Piped Distribution Services for Non-domestic Buildings	4	15

<b>Unit number</b>	<b>Specialist units – choose units with a minimum credit value of 80 credits (continued)</b>	<b>Unit level</b>	<b>Unit credit</b>
47	Energy Utilisation and Efficiency for Building Services Engineering	5	15
48	Refrigeration Technology for Construction and the Built Environment	5	15
49	Electrical and Electronic Control Principles for Building Services Engineering	4	15
50	Electrical Installation for Building Services Engineering	4	15
51	Lighting Applications for Industrial and Commercial Buildings	4	15
52	Power Supplies for Building Services Engineering	5	15
53	Electrical Protection and Transportation Installations for Non-domestic Buildings	5	15
55	Refrigeration Applications for Construction and the Built Environment	5	15
56	Refrigeration Design for Construction and the Built Environment	5	15
59	Employability Skills	5	15
60	Personal and Professional Development	5	15
61	Project Design, Implementation and Evaluation	5	20
63	Work-based Experience	5	15

**The BTEC Level 5 HND programme must contain a minimum of 125 credits at level 5.**

## Structure of the Pearson BTEC Level 5 HND in Construction and the Built Environment (Civil Engineering) (QCF)

Unit number	Mandatory core units – all 10 units must be taken	Unit level	Unit credit
1	Design Principles and Application for Construction and the Built Environment	4	15
2	Science and Materials for Construction and the Built Environment	4	15
3	Applied Mathematics for Construction and the Built Environment	4	15
4	Management Principles and Application for Construction and the Built Environment	5	15
5	Group Project in the Construction Industry	5	20
6	Health, Safety and Welfare for Construction and the Built Environment	4	15
27	Site Surveying Procedures for Construction and the Built Environment	4	15
32	Engineering Geology and Soil Mechanics	4	15
33	Civil Engineering Technology	4	15
34	Structural Analysis and Design	5	15
<b>Specialist units – choose units with a minimum credit value of 85 credits</b>			
9	Law and Contract for Construction and the Built Environment	4	15
11	Contractual Procedures and Procurement for Construction and the Built Environment	5	15
16	Measuring, Tendering and Estimating for Construction and the Built Environment	4	15
17	Project Management for Construction and the Built Environment	5	15
30	Work-based Learning and Assessment in Construction and the Built Environment	5	15
31	Work-based Training and Development in Construction and the Built Environment	5	15
35	The Use of Information and Communication Technology for Construction and the Built Environment	4	15
36	Applied Mathematics for Complex Engineering Problems	5	15
37	Advanced Civil Engineering	5	15
38	Hydraulic Principles and Applications	5	15

<b>Unit number</b>	<b>Specialist units – choose units with a minimum credit value of 85 credits (continued)</b>	<b>Unit level</b>	<b>Unit credit</b>
39	Transportation for Construction and the Built Environment	5	15
59	Employability Skills	5	15
60	Personal and Professional Development	5	15
61	Project Design, Implementation and Evaluation	5	20
62	Research Project	5	20
63	Work-based Experience	5	15
64	Railway Track Engineering	5	15

**The BTEC Level 5 HND programme must contain a minimum of 125 credits at level 5.**

# Key features

BTEC Higher Nationals are designed to provide a specialist vocational programme, linked to professional body requirements and National Occupational Standards where appropriate.

They offer a strong, sector-related emphasis on practical skills development alongside the development of requisite knowledge and understanding.

The qualifications provide a thorough grounding in the key concepts and practical skills required in their sector and their national recognition by employers allows direct progression to employment.

A key progression path for BTEC HNC and HND learners is to the second or third year of a degree or honours degree programme, depending on the match of the BTEC Higher National units to the degree programme in question.

The Pearson BTEC Higher Nationals in Construction and the Built Environment (QCF) provide a progression route to the professional qualifications offered by the Chartered Institute of Architectural Technologists (CIAT), the Chartered Institute of Building (CIOB), the Royal Institution of Chartered Surveyors (RICS), the Chartered Institution of Building Services Engineers (CIBSE), the Chartered Institution of Highways and Transportation (CIHT), the Institution of Civil Engineers (ICE), the Institute of Highway Engineers (IHE) and the Institution of Structural Engineers (IStructE).

Pearson BTEC Higher Nationals in Construction and the Built Environment (QCF) have been developed to focus on:

- national qualifications, with detailed common standards, learning outcomes and unit grading recognisable to centres, learners, employers and professional bodies
- recognition by the appropriate professional bodies
- a common core of study applicable to the construction and built environment sector
- a choice of optional specialist curriculum studies appropriate to the main career disciplines within construction, building services engineering and civil engineering
- a flexible approach to curriculum content within a nationally recognised framework
- changing training and educational needs relevant to construction, building services engineering and civil engineering disciplines
- progression to degree programmes and professional body membership
- contributing to the knowledge, understanding and skills required to underpin relevant National Occupational Standards and NVQs at levels 4 and 5
- providing opportunities for learners to focus on the development of higher-level skills in a technological and management context

- the development of learners' practical knowledge, understanding and skills that underpin performance in the workplace
- preparation for employment and further training and professional development.

## **Progression from the BTEC Level 4 HNC**

The Pearson BTEC Level 4 Higher Nationals in Construction and the Built Environment (QCF) provide a specialist work-related programme of study that covers the key knowledge, understanding and practical skills required in the construction and built environment sector and also offers particular specialist emphasis through the choice of specialist units.

BTEC Level 4 HNCs provide a nationally recognised qualification offering career progression and professional development for those already in employment and opportunities to progress into higher education. The qualifications are primarily undertaken by part-time learners studying over two years. In some sectors there are opportunities for those wishing to complete an intensive programme of study in a shorter period of time.

This specification gives centres a framework to develop engaging programmes for higher education learners who are clear about the area of employment that they wish to enter.

The Pearson BTEC Level 4 HNC in Construction and the Built Environment (QCF) offers a progression route for learners who are employed in the construction and built environment sector.

Learners studying the BTEC Level 4 HNC will be able to enter employment in the construction and built environment sector or progress onto further studies for example HND in Construction and the Built Environment or a related degree.

## **Progression from the BTEC Level 5 HND**

The BTEC Level 5 HND provides greater breadth and specialisation than the BTEC Level 4 HNC. BTEC HNDs are followed predominately by full-time learners. They allow progression into or within employment in the construction and built environment sector, either directly on achievement of the award or following further study to degree level.

The Pearson BTEC Level 5 HND in Construction and the Built Environment (QCF) provides opportunities for learners to apply their knowledge and practical skills in the workplace. Full-time learners have the opportunity to do this through formal work placements or part-time employment experience.

The qualification prepares learners for employment in the construction and built environment sector and will be suitable for learners who have already decided that they wish to enter this area of work. Some adult learners may wish to make the commitment required by this qualification in order to enter a specialist area of employment in construction and the built environment or progress into higher education. Other learners may want to extend the specialism that they followed on the BTEC Level 4 HNC programme.

Progression from this qualification may well be into or within employment in the construction and built environment sector where learners may work towards membership of CIAT, CIOB, RICS, CIBSE, CIHT, ICE, IHE and IStructE, or other relevant professional bodies.

The Pearson BTEC Level 5 HND in Construction and the Built Environment (QCF) offers a progression route for learners who are studying on an HNC in Construction and the Built Environment or a relevant Level 3 qualification for example BTEC national in Construction and the Built Environment.

Learners studying the BTEC Level 5 HND will be able to enter employment in the construction and built environment sector or progress onto further studies for example a related degree.

## **Professional body recognition**

The Pearson BTEC Higher Nationals in Construction and the Built Environment (QCF) have been developed with career progression and professional body recognition in mind. It is essential that learners gain the maximum benefit from their programme of study.

The following is an indication of relevant professional bodies who recognise the BTEC Higher Nationals in Construction and the Built Environment and their recommended unit structure, as qualifications that contribute towards their requirements and also meet the requirements of the Engineering Council (UK) – Standards for Professional Engineering Competence:

- Chartered Institute of Architectural Technologists (CIAT)
- Chartered Institute of Building (CIOB)
- Royal Institution of Chartered Surveyors (RICS).

The following is an indication of relevant professional bodies who recognise the BTEC Higher Nationals in Construction and the Built Environment (Building Services Engineering) and their recommended unit structure, as qualifications that contribute towards their requirements and also meet the requirements of the Engineering Council (UK) – Standards for Professional Engineering Competence:

- Chartered Institution of Building Services Engineers (CIBSE).

The following is an indication of relevant professional bodies who recognise the BTEC Higher Nationals in Construction and the Built Environment (Civil Engineering) and their recommended unit structure, as qualifications that contribute towards their requirements and also meet the requirements of the Engineering Council (UK) – Standards for Professional Engineering Competence:

- Chartered Institution of Highways and Transportation (CIHT)
- Institution of Civil Engineers (ICE)
- Institute of Highway Engineers (IHE)
- Institution of Structural Engineers (IStructE).

In addition to individual recognition by the main professional bodies, the Pearson BTEC Higher Nationals in Construction and the Built Environment (QCF) have also been validated and approved by the ConstructionSkills Standards and Qualifications Validation Group (SQVG), which represents the construction and built environment sector.

## National Occupational Standards

Pearson BTEC Higher Nationals in Construction and the Built Environment (QCF) are designed to relate to the National Occupational Standards in the construction and built environment sector at levels 4 and 5, which in turn form the basis of the construction, building services engineering and civil engineering National Vocational Qualifications (NVQs). BTEC Higher Nationals do not purport to deliver occupational competence in the sector, which should be demonstrated in a work context. However, the qualifications provide underpinning knowledge for the National Occupational Standards, as well as developing practical skills in preparation for work and possible achievement of NVQs in due course.

Links to National Occupational Standards are indicated in *Annexe B*.

Through the study of core and relevant specialist units learners will cover much of the underpinning knowledge, skills and understanding for Level 4 NVQ in Built Environment Design, Level 4 NVQ in Construction Contracting Operations, Level 4 NVQ in Construction Site Management, Level 4 NVQ in Site Inspection, Level 5 NVQ in Built Environment Design and Consultancy, Level 5 NVQ in Construction Management and Level 5 NVQ in Construction Senior Management.

## Qualification Frameworks for Higher National Diplomas

In England, Wales and Northern Ireland, BTEC HNC and HND Diplomas may either be awarded by degree-awarding bodies under a licence from Pearson (which allows them to devise, deliver and award Higher National qualifications themselves), or they may be awarded directly by Pearson, as an awarding body regulated by Ofqual. The majority of BTEC HNC and HND Diplomas are awarded by Pearson. Only those HNC and HND Diplomas that are awarded by degree-awarding bodies are included on the Framework for Higher Education Qualifications (FHEQ) (because this framework comprises qualifications awarded by degree-awarding bodies.) BTEC HNC and HND Diplomas awarded directly by Pearson are regulated qualifications at Level 4 and Level 5 on the Qualifications and Credit Framework (QCF) and the Credit and Qualifications Framework for Wales (CQFW) and are subject to the academic standards and regulations of Pearson and the requirements of the QCF and CQFW.

The QCF level descriptors have been used to describe the relative intellectual demand, complexity, depth of learning and learner autonomy associated with the level 4 or 5 level of learning and achievement.

QAA subject and qualification benchmark statements have been used to provide points of reference for each level.

Employers and higher education providers can expect that typical learners studying for the Pearson BTEC Higher Nationals in Construction and the Built Environment (QCF) should have developed certain higher level skills and abilities and studied a mandatory curriculum and selected optional specialist units. This detail is contained in the 'Qualification Requirements' in *Annexe A* of this specification.

# Teaching, learning and assessment

Learners must achieve a minimum of 120 credits (of which at least 65 must be at level 4) on their programme of learning to be awarded a BTEC Level 4 HNC and a minimum of 240 credits (of which at least 125 must be at level 5 or above) to be awarded a BTEC Level 5 HND.

The assessment of BTEC Higher National qualifications is criterion-referenced and centres are required to assess learners' evidence against published learning outcomes and assessment criteria.

All units will be individually graded as 'pass', 'merit' or 'distinction'. To achieve a pass grade for the unit learners must meet the assessment criteria set out in the specifications. This gives transparency to the assessment process and provides for the establishment of national standards for each qualification.

The units in BTEC Higher National qualifications all have a standard format which is designed to provide guidance on the requirements of the qualification for learners, assessors and those responsible for monitoring national standards.

**NB** Any level 3 units in BTEC Higher National specifications will appear as they are found in the relevant level 3 specifications (minus references to personal, learning and thinking skills [PLTS] and functional skills [FS].) This means that their format and assessment requirements will be slightly different to level 4 and level 5 units. 'Links' within the level 3 units will relate to units found in the level 3 specification and not to those within the level 4 and level 5 specifications.

## Unit format

Each unit is set out in the following way.

### Unit title, unit code, QCF level and credit value

The unit title is accredited on the QCF and this form of words will appear on the learner's Notification of Performance.

Each unit is assigned a level, indicating the relative intellectual demand, complexity and depth of study, and learner autonomy. All units and qualifications within the QCF will have a level assigned to them, which represents the level of achievement. There are nine levels of achievement, from Entry level to level 8. The level of the unit has been informed by the QCF level descriptors and, where appropriate, the National Occupational Standards (NOS) and/or other sector/professional benchmarks.

Each unit in BTEC Higher National qualifications has a credit value which specifies the number of credits that will be awarded to a learner who has achieved all the learning outcomes of the unit. Learners will be awarded credits for the successful completion of whole units.

### Aim

The aim provides a clear summary of the purpose of the unit and is a succinct statement that summarises the learning outcomes of the unit.

## **Unit abstract**

The unit abstract gives the reader an appreciation 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 unit and the key knowledge, skills and understanding gained 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**

The learning outcomes identify what each learner must do in order to pass the unit. Learning outcomes state exactly what a learner should 'know, understand or be able to do' as a result of completing the unit. Learners must achieve all the learning outcomes in order to pass the unit.

## **Unit content**

The unit content identifies the breadth of knowledge, skills and understanding needed to design and deliver a programme of learning to achieve each of the learning outcomes. This is informed by the underpinning knowledge and understanding requirements of relevant National Occupational Standards (NOS) where appropriate.

Each learning outcome is stated in full and then the key phrases or concepts related to that learning outcome are listed in italics followed by the subsequent range of related topics.

The information below shows how unit content is structured and gives the terminology used to explain the different components within the content.

- Learning outcome: this is given in bold at the beginning of each section of content.
- Italicised sub-heading: it contains a key phrase or concept. This is content which must be covered in the delivery of the unit. Colons mark the end of an italicised sub-heading.
- Elements of content: the elements are in roman text and amplify the sub-heading. The elements must also be covered in the delivery of the unit. Semi-colons mark the end of an element.
- Brackets contain amplification of elements of content which must be covered in the delivery of the unit.
- 'e.g.' is a list of examples used for indicative amplification of an element (that is, the content specified in this amplification that could be covered or that could be replaced by other, similar material).

It is not a requirement of the unit specification that all of the content is assessed.

## **Learning outcomes and assessment criteria**

Each unit contains statements of the evidence that each learner should produce in order to receive a pass.

## Guidance

This section provides additional guidance and amplification related to the unit to support tutors/deliverers and assessors. Its subsections are given below.

- *Links* – sets out possible links between units within the specification. Provides opportunities for the integration of learning, delivery and assessment. Links to relevant National Occupational Standards and Professional Bodies Standards will be highlighted here.
- *Essential requirements* – essential, unique physical and/or staffing resources or delivery/assessment requirements needed for the delivery of this unit are specified here.
- *Employer engagement and vocational contexts* – this is an optional section. Where relevant it offers suggestions for employer contact to enhance the delivery of the unit.

These subsections should be read in conjunction with the learning outcomes, unit content, assessment criteria and the generic grade descriptors.

The centre will be asked to ensure that essential resources are in place when it seeks approval from Pearson to offer the qualification.

## Learning and assessment

The purpose of assessment is to ensure that effective learning has taken place of the content of each unit. Evidence of this learning, or the application of the learning, is required for each unit. The assessment of the evidence relates directly to the assessment criteria for each unit, supported by the generic grade descriptors.

The process of assessment can aid effective learning by seeking and interpreting evidence to decide the stage that learners have reached in their learning, what further learning needs to take place and how best to do this. Therefore, the process of assessment should be part of the effective planning of teaching and learning by providing opportunities for both the learner and assessor to obtain information about progress towards learning goals.

The assessor and learner must be actively engaged in promoting a common understanding of the assessment criteria and the grade descriptors (what it is they are trying to achieve and how well they achieve it) for further learning to take place. Therefore, learners need constructive feedback and guidance about how they may improve by capitalising on their strengths and clear and constructive comments about their weaknesses and how these might be addressed.

Assessment instruments are constructed within centres. They should collectively ensure coverage of all assessment criteria within each unit and should provide opportunities for the evidencing of all the grade descriptors.

It is advised that assessment criteria and contextualised grade descriptors are clearly indicated on each assessment instrument to provide a focus for learners (for transparency and to ensure that feedback is specific to the criteria) and to assist with internal standardisation processes. Tasks/activities should enable learners to produce evidence that relates directly to the assessment criteria and grade descriptors.

When centres are designing assessment instruments, they need to ensure that the instruments are valid, reliable and fit for purpose, building on the application of the assessment criteria. Centres are encouraged to place emphasis on practical application of the assessment criteria, providing a realistic scenario for learners to adopt, making maximum use of work-related practical experience and reflecting typical practice in the sector concerned. **The creation of assessment instruments that are fit for purpose is vital to achievement.**

## Grading Higher National units

The grading of BTEC Higher National qualifications is at the unit and the qualification level.

Each successfully completed unit will be graded as a pass, merit or distinction.

A pass is awarded for the achievement of all outcomes against the specified assessment criteria.

Merit and distinction grades are awarded for higher-level achievement. The generic merit and distinction grade descriptors listed in *Annexe C* are for grading the total evidence produced for each unit and describe the learner's performance over and above that for a pass grade.

Each of the generic merit and distinction grade descriptors should be amplified by use of **indicative characteristics** which exemplify the merit and distinction grade descriptors. These give a guide to the expected learner performance, and support the generic grade descriptors. The indicative characteristics should reflect the nature of a unit and the context of the sector programme.

The indicative characteristics shown in the table for each of the generic grade descriptors in *Annexe C* **are not exhaustive**. Consequently, centres should select appropriate characteristics from the list **or construct others** that are appropriate for their sector programme and level.

It is important to note that each assessment activity does not need to incorporate all the merit and/or distinction grade descriptors.

### Contextualising the generic grade descriptors

The generic merit and distinction grade descriptors need to be viewed as a qualitative extension of the assessment criteria for pass within each individual unit. The relevant generic grade descriptors must be identified and specified within an assignment and the relevant indicative characteristics should be used to place the required evidence in context.

Additional guidance on contextualisation of grade descriptors can be found in HN Delivery Guides on the website.

## Summary of grades

In order to achieve a <b>pass</b> in a unit	<ul style="list-style-type: none"><li>all learning outcomes and associated assessment criteria have been met</li></ul>
In order to achieve a <b>merit</b> in a unit	<ul style="list-style-type: none"><li>pass requirements achieved</li><li>all merit grade descriptors achieved and all prescribed indicative characteristics.</li></ul>
In order to achieve a <b>distinction</b> in a unit	<ul style="list-style-type: none"><li>pass and merit requirements achieved</li><li>all distinction grade descriptors achieved and all prescribed indicative characteristics.</li></ul>

## Calculation of the qualification grade

### Pass qualification grade

Learners who achieve the minimum eligible credit value specified by the rule of combination will achieve the qualification at a pass grade (see section *Rules of combination for the BTEC Level 4 and 5 Higher National qualifications*). The Rules of combination have been summarised below:

#### BTEC HNC Diplomas

To achieve the qualification a learner must:

- achieve at least 120 credits at or above the level of the qualification (a maximum of 55 credits may be at Level 5)
- achieve a minimum of 65 credits at Level 4
- complete a valid combination of units.

#### BTEC HND Diplomas

To achieve the qualification a learner must:

- achieve at least 240 credits at or above the level of the qualification
- achieve a minimum of 125 credits at Level 5 or above.

The best valid combination of units is used to calculate the overall grade, e.g. if a learner has completed more than the minimum number of optional units at the appropriate level the best performance from these will be used.

All learners will receive a Notification of Performance showing all unit grades whether or not they were included in the calculation for the overall grade.

### Qualification grades above pass grade

#### BTEC HNC Diplomas

Calculation of the BTEC HNC qualification grade is based on the learner's best performance in units at or above the level of the qualification to the value of 75 credits:

- The best 75 credits must come from a maximum of 120 credits as a valid rule of combination

- The units from which the best 75 credits are selected come from the whole qualification including the mandatory core credit.

This means that credit from some mandatory core units is likely to form part of the best 75 credits in most programmes (the mandatory core credit units will automatically be included in the calculation once the maximum amount of credit for optional specialist units for the rule of combination is used up.)

It is the responsibility of a centre to ensure that a correct unit combination is adhered to.

### **Qualification grades**

Learners will be awarded a pass, merit or distinction qualification grade using the points gained through the 75 best credits based on unit achievement.

#### **Unit credit points available for specified unit grades, for either Level 4 or Level 5 units**

<b>Unit points per credit</b>		
<b>Pass</b>	<b>Merit</b>	<b>Distinction</b>
0	1	2
<b>Example for level 4 or level 5 unit of 15 credits</b>		
<b>Pass</b>	<b>Merit</b>	<b>Distinction</b>
0	15	30

#### **BTEC Level 4 HNC overall qualification grades**

<b>Points range</b>	<b>Grade</b>	
0–74	Pass	P
75–149	Merit	M
150	Distinction	D

### **BTEC HND Diplomas**

The grade achieved in units from an appropriate HNC may contribute to an HND grade.

If a learner moves from HNC to HND, credits at Level 5 or above from both the HNC and HND can contribute to the best 75 credits of the overall HND grade. Note that for HND learners, level 4 units do not count towards the qualification grade.

Calculation of the BTEC HND qualification grade is based on the learner's best performance in units at or above the level of the qualification – i.e. **only units at level 5** can be counted towards the value of 75 credits:

- The best 75 credits must come from a maximum of 240 credits as a valid rule of combination
- The units from which the 75 best credits are selected come from the whole qualification including the mandatory core credit, but must be level 5 units or above.

This means that credit from some mandatory core units is likely to form part of the best 75 credits in most programmes (the mandatory core credit units will automatically be included in the calculation once the maximum amount of credit for optional specialist units for the rule of combination is used up.)

It is the responsibility of a centre to ensure that a correct unit combination is adhered to.

### **Qualification grades**

Learners will be awarded a pass, merit or distinction qualification grade using the points gained through the 75 best credits based on unit achievement.

#### **Unit credit points for specified unit grades at Level 5 only**

Unit points per credit		
Pass	Merit	Distinction
0	1	2

#### **BTEC Level 5 HND overall qualification grades**

Points range	Grade	
0–74	Pass	P
75–149	Merit	M
150	Distinction	D

*Annexe E* gives examples of how qualification grades are calculated.

### **Recognition of Prior Learning**

Recognition of Prior Learning (RPL) is a method of assessment (leading to the award of credit) that considers whether a learner can demonstrate that they can meet the assessment requirements for a unit through knowledge, understanding or skills they already possess and so do not need to develop through a course of learning.

Pearson encourages centres to recognise learners' previous achievements and experiences whether at work, home and at leisure, as well as in the classroom. RPL provides a route for the recognition of the achievements resulting from continuous learning.

RPL enables recognition of achievement from a range of activities using any valid assessment methodology. Provided that the assessment requirements of a given unit or qualification have been met, the use of RPL is acceptable for accrediting a unit, units or a whole qualification. Evidence of learning must be valid and reliable.

For full guidance about Pearson's policy on RPL, please see our *Recognition of Prior Learning Policy and Process* on our website.

# Quality assurance of BTEC Higher Nationals

Pearson's quality assurance system for all BTEC higher-level programmes on the QCF at Levels 4–7 will ensure that centres have effective quality assurance processes to review programme delivery. It will also ensure that the outcomes of assessment are to national standards.

The quality assurance process for centres offering BTEC higher-level programmes on the QCF at Levels 4–7 comprises three key components.

## 1) Approval process

Centres new to the delivery of this programme will be required to seek approval through the existing qualification and centre approval process. Prior to approval being given, centres will be required to submit evidence to demonstrate that they:

- have the human and physical resources required for effective delivery and assessment
- understand the implications for independent assessment and agree to abide by these
- have a robust internal assessment system supported by 'fit for purpose' assessment documentation
- have a system to internally verify assessment decisions, to ensure standardised assessment decisions are made across all assessors and sites.

Such applications have to be supported by the head of the centre (principal, chief executive etc) and include a declaration that the centre will operate the programmes strictly as approved and in line with Pearson requirements.

## 2) Monitoring of internal centre systems

Centres will be required to demonstrate ongoing fulfilment of the centre approval criteria over time and across all programmes. The process that assures this is external examination, which is undertaken by External Examiners. Centres will be given the opportunity to present evidence of the ongoing suitability and deployment of their systems to carry out the required functions. This includes the consistent application of policies affecting learner registrations, appeals, effective internal examination and standardisation processes. Where appropriate, centres may present evidence of their operation within a recognised code of practice, such as that of the Quality Assurance Agency for Higher Education. Pearson reserves the right to confirm independently that these arrangements are operating to Pearson's satisfaction.

Pearson will affirm, or not, the ongoing effectiveness of such systems. Where system failures are identified, sanctions (appropriate to the nature of the problem) will be applied in order to assist the centre in correcting the problem.

### **3) Independent assessment review**

The internal assessment outcomes reached for all BTEC higher-level programmes on the Qualifications and Credit Framework at Levels 4-7 are subject to an independent assessment review by a Pearson-appointed External Examiner.

The outcomes of this process will be to:

- confirm that internal assessment is to national standards and allow certification

or

- make recommendations to improve the quality of assessment outcomes before certification is released

or

- make recommendations about the centre's ability to continue to be approved for the qualifications in question.

### **Additional arrangement for ALL centres**

Regardless of the type of centre, Pearson reserves the right to withdraw either qualification or centre approval when it deems there is an irreversible breakdown in the centre's ability either to quality assure its programme delivery or its assessment standards.

# Programme design and delivery

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

In BTEC Higher National qualifications each unit's credit value usually consists of multiples of 5 credits. Most units are 15 credits in value. These units have been designed from a learning time perspective. **Each 15-credit unit approximates to a learning time of 150 hours.**

It is expected that these BTEC Level 5 HNDs, accredited onto the Qualifications and Credit Framework (QCF), will also require approximately 960 guided learning hours (GLH).

Consequently, using the above approach, the BTEC Level 4 HNCs, are half the size of the BTEC Level 5 Higher National Diplomas which will require approximately 480 GLH.

Within the information relating to these units on the QCF, each 15-credit unit has been allocated a figure of 60 GLH to help guide centres (other units with smaller or larger credit values have figures calculated on a pro rata basis). Centres delivering these qualifications are required to use their professional expertise in their design and delivery within the overall guided learning hours for the qualification.

Guided learning hours are defined as all the time when a tutor, trainer or facilitator is present to give specific guidance towards the learning aim being studied on a programme. This definition includes lectures, tutorials and supervised study in, for example, open learning centres and learning workshops.

Learning time is defined as the time taken by learners at the level of the unit, on average, to complete the learning outcomes of the unit to the standard determined by the assessment criteria. It should address all learning (including assessment) relevant to the learning outcomes, regardless of where, when and how the learning has taken place. It does not include time spent by staff in day-to-day marking of assignments where the learner is not present.

Centres are advised to consider this definition when planning the programme of study associated with this specification.

*Annexe D* provides information for centres and learners who wish to compare, for teaching and learning purposes, the units of the Pearson Level 5 BTEC Higher Nationals in Construction and the Built Environment (NQF) with the new units of the Pearson BTEC Higher Nationals in Construction and the Built Environment (QCF).

## Mode of delivery

Pearson does not define the mode of study for the BTEC Higher National qualifications. Centres are free to offer the qualification(s) using any mode of delivery that meets the needs of their learners. This may be through traditional classroom teaching, open learning, distance learning or a combination of these. Whatever mode of delivery is 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.

Our 'Distance Learning' and 'Distance Assessment' policies are given on our website.

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 instruments based on learners' work environments should be encouraged. Those planning the programme should aim to enhance the vocational nature of the BTEC Higher National qualification by:

- liaising with employers to ensure that the course is 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 experiences of work and life that learners bring to the programme.

## Resources

BTEC Higher National qualifications are designed to prepare learners for employment in specific industry sectors.

Physical resources need to support the delivery of the programme and the proper assessment of the outcomes and, therefore, should normally be of industry standard.

Staff delivering programmes and conducting the assessments should be familiar with current practice, legislation and standards used in the sector concerned.

Centres will need to meet any specialist resource requirements when they seek approval from Pearson.

Please refer to the *Essential requirements* section in individual units for specialist resource requirements.

## Delivery approach

It is important that centres develop an approach to teaching and learning that supports the specialist vocational nature of the BTEC Higher National qualification. Specifications contain 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 practice and that the knowledge base is applied to the sector. This will require the development of relevant and up-to-date teaching materials that allow learners to apply their learning to actual events and activities within the sector. Maximum use should be made of the learner's experience.

## Meeting local needs

Centres should note that the qualifications set out in these specifications have been developed in consultation with centres, employers and relevant professional organisations.

The units are designed to meet the skill needs of the sector and the specialist units allow coverage of the full range of employment within the sector. Centres should make maximum use of the choice available to them within the specialist units to meet the needs of their learners, as well as the local skills and training needs.

Where centres identify a specific need that cannot be addressed using the units in this specification, centres can seek approval from Pearson to use units from other BTEC Higher National qualifications on the QCF. Centres will need to justify the need for importing units from other specifications and Pearson will ensure that the vocational focus of the qualification remains the same.

Applications must be made **in advance** of delivery by 31 January in the year of registration (see the website for details).

The flexibility to import standard units from other QCF BTEC Higher National specifications is **limited to a maximum of 30 credits in a BTEC HNC qualification and a maximum of 60 credits only in any BTEC HND qualification**. This is an overall maximum and centres should check the 'Rules of Combination' information for the specific qualification to confirm the actual requirements. These units cannot be used at the expense of the mandatory core units in any qualification nor can the qualification rules of combination level rules be compromised. The centre must ensure that approved units are used only in eligible combinations.

# Access and recruitment

Pearson's policy regarding access to our qualifications is that:

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

Centres are required to recruit learners to BTEC Higher National 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 will need to review the profile of qualifications and/or experience held by applicants, considering whether this profile shows an ability to progress to level 4 or level 5 qualifications. For learners who have recently been in education, the entry profile is likely to include one of the following:

- a BTEC Level 3 qualification in Construction and the Built Environment
- a GCE level profile that demonstrates strong performance in a relevant subject or an adequate performance in more than one GCE subject. This profile is likely to be supported by GCSE grades at A\* to C
- other related level 3 qualifications
- an Access to Higher Education Certificate received from an approved further education institution
- related work experience.

Mature learners may present a more varied profile of achievement that is likely to include extensive work experience (paid and/or unpaid) and/or achievement of a range of professional qualifications in their work sector.

## Restrictions on learner entry

BTEC Higher National qualifications are accredited on the QCF for learners aged 18 years and over.

## **Equality Act 2010 and Pearson equality policy**

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Equality and fairness are central to our work. Our equality policy requires all learners to have equal opportunity to access our qualifications and assessments, and our qualifications are required to be awarded in a way that is fair to every learner.

We are committed to making sure that:

- learners with a protected characteristic (as defined by the Equality Act 2010) are not, when they are undertaking one of qualifications, disadvantaged in comparison with learners who do not share that characteristic
- all learners achieve the recognition they deserve for undertaking a qualification and that this achievement can be compared fairly to the achievement of their peers.

You can find details on how to make adjustments for learners with protected characteristics in the policy document *Access Arrangements, Reasonable Adjustments and Special Considerations*, available on our website.

An adjustment may not be considered reasonable if it involves unreasonable costs and/or timeframes or affects the security or integrity of the assessment.

There is no duty on awarding organisations to make any adjustment to the Assessment Objectives being tested in an assessment.

## **English language expectations**

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Centres delivering BTEC level 4 to 7 programmes are expected to ensure that all learners who are non-native English speakers or who have not studied the final two years of school in English, can demonstrate capability in English at a standard commensurate with:

- IELTS 5.5, with a minimum of 5.0 being awarded on individual sections for a level 4 or 5 qualification
- IELTS 6.5 for a level 6 or 7 qualification

Pearson's Standard Verifiers (EE) will expect centres to demonstrate that their learners meet these expectations.

## **Professional body contact details**

Chartered Institute of Architectural Technologists (CIAT)  
397 City Road  
London EC1V 1NH

Telephone: 020 7278 2206  
Email: [info@ciat.org.uk](mailto:info@ciat.org.uk)  
Website: [www.ciat.org.uk](http://www.ciat.org.uk)

The Chartered Institute of Building (CIOB)  
1 Arlington Square  
Downshire Way  
Bracknell  
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# Professional development and training

Pearson supports UK and international customers with training related to BTEC qualifications. This support is available through a choice of training options offered on our website at: [qualifications.pearson.com/en/support/training-from-pearson-uk](http://qualifications.pearson.com/en/support/training-from-pearson-uk)

The support we offer focuses on a range of issues, such as:

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

The national programme of training we offer is on our website. You can request centre-based training through the website or you can contact one of our advisers in the Training from Pearson UK team via Customer Services to discuss your training needs.

## **BTEC training and support for the lifetime of the qualifications**

**Training and networks:** our training programme ranges from free introductory events through sector-specific opportunities to detailed training on all aspects of delivery, assignments and assessment. We also host some regional network events to allow you to share your experiences, ideas and best practice with other BTEC colleagues in your region.

**Regional support:** our team of Curriculum Development Managers and Curriculum Support Consultants, based around the country, are responsible for providing advice and support in centres. They can help you with planning and curriculum developments.

To get in touch with our dedicated support teams please visit our website [qualifications.pearson.com/en/support/contact-us](http://qualifications.pearson.com/en/support/contact-us)

# Annexe A

## Qualification Requirements

### Rationale

The Pearson BTEC Higher Nationals in Construction and the Built Environment (QCF) have been developed to focus on:

- national qualifications, with detailed common standards, learning outcomes and unit grading recognisable to centres, learners, employers and professional bodies
- recognition by the appropriate professional bodies
- a common core of study applicable to the construction and built environment sector
- a choice of optional specialist curriculum studies appropriate to the main career disciplines within construction, building services engineering and civil engineering
- a flexible approach to curriculum content within a nationally recognised framework
- changing training and educational needs relevant to construction, building services engineering and civil engineering disciplines
- progression to degree programmes and professional body membership
- contributing to the knowledge, understanding and skills required to underpin relevant National Occupational Standards and NVQs at levels 4 and 5
- providing opportunities for learners to focus on the development of higher-level skills in a technological and management context
- the development of learners' practical knowledge, understanding and skills that underpin performance in the workplace
- preparation for employment and further training and professional development.

### Aims of the qualification

These qualifications meet the needs of the above rationale by:

- preparing learners for a range of technical, professional and management careers in construction and the built environment by providing specialised studies which are directly related to individual occupations and professions learners are currently working in or in which they intend to seek employment
- enabling learners to make an immediate contribution in employment in the construction and built environment sector

- providing learners with flexibility, knowledge, understanding, skills and motivation as a basis for progression to graduate and postgraduate studies
- developing a range of skills and techniques, personal qualities and attitudes essential for successful performance in working life
- providing further study, career development and progression from a Technical Certificate at level 3 within or following an Advanced Apprenticeship
- providing a significant education base for progression to membership of professional bodies in construction, building services engineering and civil engineering
- providing a significant education base for progression to Incorporated Engineer level.

## **BTEC Higher National course structures and curriculum content**

The content of the programmes should be based on the core curriculum that supports the appropriate specialist content for a discipline or disciplines within the construction, building services engineering or civil engineering pathways.

Programmes and courses should develop learners' knowledge, understanding, skills and awareness necessary to provide them with the potential to progress to technical, supervisory and managerial positions in construction, building services engineering and civil engineering.

Programmes should make provision for:

- sufficient time to achieve consistency of learning outcome standards and, when coupled with enhanced further learning, will enable learners to achieve the educational base required for an Incorporated Engineer
- both breadth and depth of coverage to meet the needs of industry in relation to technical and personal skills
- the development of higher-level skills
- the foundation for subsequent study and developing a commitment to lifelong learning.

All courses should include the development of learner skills in managing and developing themselves, working with others and being part of a team, communicating, managing tasks, solving problems, applying numeracy, IT, design and creativity. An understanding of health, safety, environmental and sustainability issues, and the need to design, install and maintain safe systems of work, is essential and courses should expose learners to these issues, hazards and risk assessment, environmental and legal requirements.

## **Mandatory curriculum content**

### **Design Principles and Application for Construction and the Built Environment:**

**Environment:** planning, design and production phases of the construction process, the coordination and management of each phase; factors affecting the selection of materials, systems and equipment; environmental impact of energy and other constraints on the planning, design and construction processes; roles, responsibilities and obligations (including liability for health, safety and welfare) of all parties involved in construction projects; cost implications and how technology affects the design of construction projects and the design processes and procedures used for the production phase.

### **Science and Materials for Construction and the Built Environment:**

scientific principles and an understanding of the properties and use of materials needed to successfully complete the other core and specialist content; analyse, apply, investigate and evaluate properties and behaviour of materials and components used for structural designs and construction operations; determine comfort levels in the design and use of buildings; experimentation and modelling of scientific principles.

### **Applied Mathematics for Construction and the Built Environment:** application of analytical techniques needed to successfully complete the core and specialist content, to include algebra, graphical techniques, laws of motion, matrices, trigonometry, calculus, statistics and probability, surveying and setting out procedures and construction/engineering problems.

### **Management Principles and Application for Construction and the Built Environment:**

**Environment:** principles of management, the work of pioneers and founders of management, their evolution and application to modern day practice; construction and the built environment markets and activities; the roles of the professions/disciplines in project teams and the management principles appropriate to organisations within the construction and built environment sector; application of management techniques to organisation, work planning, coordination, control of resources, cost control, quality, communication and client liaison involved in the design and construction processes; methods of procurement and contracting; partnering and supply chain management.

**Note:** The content of management principles and application should be based on the principles of the Latham and Egan reports, which advocate non-adversarial multi-discipline teamworking and partnering.

**Group Project in the Construction Industry:** evaluate and resolve realistic practical problems by working as part of a team for a major piece of work or project that reflects the type of performance expected of technologists in a construction discipline; this work should involve interpreting an agreed brief that contains an agreed timescale for the staged development of an overall 'plan of work' and be within given, defined constraints, with the teamworking towards an acceptable and viable solution; enabling learners to demonstrate the application of individual high-level skills in managing self, working as a member of a team and presenting technical solutions.

**Health, Safety and Welfare for Construction and the Built Environment:**

main health, safety and welfare legislation and approved codes of practice applicable to the construction and built environment sector, including The Construction (Design and Management) Regulations 2007; the main requirements of an effective health and safety policy, procedures and the organisational arrangements necessary for its implementation; hazard and risk identification; risk assessment and review; control measures to prevent or mitigate ill health and injury; monitoring effectiveness of safety policies and procedures.

**Site Surveying Procedures for Construction and the Built Environment:**

range of instruments used for surveying and setting-out processes; principles of surveying and setting-out; calculate the information required from raw data for cartographic detailing and setting-out of construction and civil engineering work; surveying controls; use of electronic and laser instruments; GPS systems; total station instruments and the application of computer software to calculate and produce surveying solutions.

**Engineering Geology and Soil Mechanics:** engineering characteristics of geological materials and the formation of rock and soils; description and classification of geological materials; common rock types, their mode of formation, geographical/geological distribution and uses within construction and the built environment; engineering performance of rock materials; determination of basic soil properties by common soil tests and the associated analysis of laboratory data; classify soils to establish their design parameters; primary design parameters for soils, including methods of ground investigation techniques.

**Civil Engineering Technology:** construction methods and techniques used in earthworks, substructures and superstructures. Hazards arising from civil engineering activities and solving problems arising from civil engineering activities.

**Structural Analysis and Design:** analysis and calculation for the design of common structural elements to the appropriate British Standards, codes of practice or European Codes of Practice; bending moments and shear forces for statically determinate structures; bending deflections for statically determinate structures; the behaviour of elastic columns subjected to axial loading; design methods for simply supported beams in steel, reinforced concrete and timber; design methods for columns in steel, reinforced concrete, timber and masonry; bending moments and shear forces in three pin frames.

**Applied Mathematics for Complex Engineering Problems:** properties of trigonometric functions; algebraic equations representing engineering problems; calculus techniques to determine definite integrals to calculate areas and volumes; statistical techniques for engineering; solve engineering problems using differential equations and communicate results.

**Project Management for Building Services Engineering:** project management techniques related to building services engineering; objectives of project and contract management in terms of cost, quality, performance and continuous improvement; procedures and processes involved in procuring projects, producing tenders and estimates and factors that affect profitability; management structures and relationships involved in project delivery; what constitutes a contract, standard forms of contract, rights and obligations, commercial and financial risks; project management systems and procedures for forecasting, planning, allocating and controlling human, material and financial resources; continuous quality improvement strategy.

**Application of Scientific Principles to Building Services Engineering:**

understanding of scientific principles and concepts used in a wide range of building services engineering applications, provides a basis from which the more specialised building service applications can be developed; fundamental principles and formulae of fluid flow, heat transfer, acoustics, electrical networks and control systems; human and environmental factors influencing thermal comfort; energy losses in fluid flow; principles of single-phase AC electrical networks; transmission and propagation of sound and vibration and performance of associated control systems.

**Specialist curriculum content****Construction and Maintenance of Buildings; Technology of Complex Buildings; Construction Methods and Design Solutions:**

site investigation and evaluation techniques, methods used to classify soils; understand how site investigation and site evaluation techniques influence the types of substructure used in buildings and the methods used to construct such substructures; superstructure design and construction used in buildings; causes of decay and deterioration of buildings; range of materials and constructional forms available for the erection of multi-storey buildings; range of systems currently used to provide flexibility of internal layouts to meet design requirements; features of 'buildability' in terms of safety, efficiency, economy and quality standards; development of 'sustainable construction' strategies; contractual and legal constraints involved in the alteration, remediation and safe demolition of complex structures; current construction issues and practices; modern methods of construction; research and analytical techniques to support the design process; presentation of the chosen design solution by oral, graphical and written communication.

**Law and Contract for Construction and the Built Environment:** introduction to the national legal system and the Law of Contract; nature and significance of the principles and procedures of law and legislation as applied to the construction and built environment sector; liabilities and responsibilities of parties to a contract; application of the principles and procedures of law to the effective organisation and practice of a company or partnership; legal principles and requirements when undertaking construction contracts in Europe.

**Building Services Design, Installation and Maintenance in Construction:**

principles, methods and techniques used to coordinate the planning, design, installation and maintenance of building services for space heating, ventilation and air conditioning; building services disposal systems; design and installation of lifts and escalators in buildings; problems associated with integration, accommodation and access for maintenance of mechanical and electrical services in buildings.

**Contractual Procedures and Procurement for Construction and the Built Environment:**

purpose of legal requirements and contracts; types of procurement arrangements used within the construction and built environment sector; factors affecting the choice of procurement and contractual arrangements; current issues and best practice associated with the procurement of construction projects through reference to government and industry sponsored reports and recommendations; roles and activities of the parties and organisations involved in the procurement of construction contracts; analysis of the forms of contract with particular reference to time, cost, quality and performance; evaluation of the forms of contract in terms of supply chain management.

**Conversion and Adaptation of Buildings:** feasibility of modifying existing buildings for specific purposes; requirements of a 'design brief' for the modification of existing buildings; drawings and specifications for the modification of existing buildings; alteration designs and construction plans for the execution of the work.

**Environmental Impact of Construction:** the impact of the construction and built environment sector on the environment; local and global environmental issues of concern to the construction and built environment sector and how these might be addressed; indoor environmental effects for example Sick Building Syndrome (SBS) and recommendations on how these effects may be minimised; commonly used environmental assessment systems.

**Economics for Construction and the Built Environment:** methods of allocation of scarce resources and the determination of price within the construction and built environment sector; factors affecting the economics of an organisation; size and economic significance of the work carried out by different sectors within construction and the built environment; government economic activity and how it affects the construction and built environment sector.

**Production Management for Construction:** principles and application of effective site management; effective communication, the use of ICT and the essentials of planning and resource management; cost forecasting, control and reporting techniques; planning and programming of construction projects and the design of systems for production control; implications of quality and environmental considerations during the production process.

**Measuring, Tendering and Estimating for Construction and the Built Environment:** application of the tendering procedures; principles and techniques of estimating as an integral part of the tender process; methods of pricing to formulate an estimate for construction projects; commercial awareness for estimates of construction operations; information required to produce a tender; use of SMM and CESMM; evaluation of different tendering procedures and contractual arrangements.

**Project Management for Construction and the Built Environment:** principles and application of project management; competencies and training required of project managers in the construction and built environment sector; analyse duties and responsibilities of project managers; contribution of project management in adding value to projects; achieving client objectives of time, cost, quality and performance; key performance indicators (KPIs) and best practice for projects.

**Measurement Processes for Construction; Advanced Measurement for Construction:** measurement techniques and their application during the various project stages; taking-off and production of quantities for foundations, substructures, superstructures and simple mechanical devices; apply mathematical calculations to the measurement process; standard methods of measurement, manual and computer preparation of different forms of bills of quantities, schedules and contract documentation; preamble and preliminary items for inclusion in the bill of quantities; interim certificates and final accounts.

**Building Control Procedures and Legislation:** principles of the building control system and the primary legislation; origins of statutory regulations and controls in England and Wales; enforcement of legislation regarding building control regulations; interpretation and application of the various statutory controls and regulations for construction works.

**Specification and Contract Documentation for Construction:** type of contract documents required for construction projects; how construction works are specified in respect of standards and quality; contractual provisions of contract documents, their relationship to each other and their application to all stages of construction projects.

**Structural Behaviour and Detailing:** properties of typical structural materials; loading conditions for simple structures, behaviour of the structure from superstructure to foundation level; statically determinate structures, including simple frames, stress in individual elements of that structure; design elements of a structure using manual methods and computer software; detailing elements of a structure using manual methods and computer-aided design (CAD).

**Design Procedures for Construction:** nature of design, its processes and procedures, technological developments and initiatives; the evolving role and responsibilities of the design technologist in terms of retrieving information and leading the team successfully; roles and responsibilities of the design technologist during the project management phase of the construction process.

**Design Technology for Construction:** specification of materials, systems and methods used to realise a design solution and achieve quality in design; graphical communication techniques; how construction materials fail in use and preventative and remedial measures; concepts of 'buildability' and 'sustainability' to address current environmental issues confronting the construction and built environment sector.

**Properties and Performance of Construction Materials:** physical and chemical properties of common structural materials; how structural materials fail in use and methods to minimise or prevent such failures; modern composite materials and their superior properties in use; embodied energy costs associated with common construction materials and potential energy savings for a given building.

**IT Applications for Construction:** manipulation of software to edit, save, retrieve and print out files; change and format text and images in word processing, spreadsheet and database applications; application of spreadsheet formulae to aid calculations and display the results in graphical format; manipulate information from a database application using the built-in query and report system.

**Computer-aided Design for Construction:** 2D and 3D drawings of professional quality; solid modelling; dimensioned plans; fully rendered set of elevations; plot drawings using different media and scales; create and export CAD files in different formats; application of safe working practises when using computers and software facilities.

**The Use of Information and Communication Technology for Construction and the Built Environment:** application of software for various purposes within the construction and built environment sector; available technology for example PCs, CPUs, memory, data storage and retrieval, input and output devices, voice scanners, digitisers, plotters; electronic communication techniques; use of intranets and the internet; implications of the growing use of new technologies; security and control issues.

**Advanced Civil Engineering:** construction methods and techniques used in tunnelling activities, hydraulic structures, marine works, highway construction and railway works. Solving problems arising from complex civil engineering activities, with proper regard for safety, environmental, sustainability, quality, technical, and economic considerations.

**Hydraulic Principles and Applications:** forces in fluids, predominantly water, both at rest and in motion; analysis of hydrostatic forces acting on submerged bodies; application of pressure measuring devices; experimental procedures for hydrostatic forces; analysis of fluid flow in pipelines and channels to determine required pipe or channel size; analysis of hydraulic structures and characteristics to determine channel flow; selection of appropriate pump characteristics to suit a given hydraulic situation.

**Transportation for Construction and the Built Environment:** understanding of principles required to justify transportation projects; analysis of data and preparation of project briefs; utilise basic project information to present overall design concepts; drawing and schedules for final detailed designs; importance of an environmental impact study.

**Thermofluids and Acoustic Criteria for Building Services Engineering:** principles of thermofluids (modes of heat and vapour transfer in building services systems); performance of heat exchangers and refrigeration plant; application of dimensional analysis to fundamental and empirical formulae; design effective acoustic environments for building services applications.

**Air Conditioning for Industrial and Commercial Buildings; Air Conditioning for Complex Industrial and Commercial Buildings:** principles of design and operation of air conditioning equipment and installations; ventilation and air conditioning requirements for industrial and commercial buildings; cooling loads for buildings and peak summertime temperatures for spaces without air conditioning; appropriate cooling plant and associated equipment for air conditioning systems; determination of energy requirements of buildings using climate data, meteorological data, operating characteristics, occupancy and use, and future needs; design of ventilation systems for comfort and safety in complex industrial and commercial buildings; fire and smoke management; design of large multi-zone air conditioning systems including the use of high pressure/velocity systems; design, operation and application of refrigeration systems within air conditioning applications using pipe and ductwork distribution.

**Low Pressure Hot Water Heating for Non-domestic Buildings; Heating Systems for Industrial and Specialist Applications:** heating requirements for industrial and commercial buildings; space heating loads and energy requirements for heating systems; design briefs for heating installations; appropriate heating plant and energy sources for space heating and hot water generation systems; design for steam and process heating systems; design for high pressure hot water space and process heating systems; group and district heating schemes; electrical heating systems.

**Electricity and Lighting for Building Services Engineering:** design and installation requirements of electrical power and lighting installations; methods of electrical distribution for commercial, public and industrial buildings; legislation and standards applicable to the design of electrical installations and fire protection; application of motors and control installations for mechanical services plant.

**Piped Distribution Services for Non-domestic Buildings:** design and operation of piped distribution installations in non-domestic buildings; design of cold and hot water supply systems; design of fuel gas, industrial and medical gas installations; application of legislation and standards to the design of mechanical firefighting and suppression installations.

**Energy Utilisation and Efficiency for Building Services Engineering:** environmental impact of energy utilisation in buildings and their services; sustainability of alternative energy sources and water supplies; appraisal of the energy efficiency of building services installations using energy performance indicators; energy audits for buildings and building services installations; energy minimisation methods and heat recovery techniques to improve the energy efficiency of buildings.

**Refrigeration Technology for Construction and the Built Environment:** properties of primary and secondary refrigerants and appropriate refrigerants for specific applications; performance of single-stage and multi-stage vapour compression systems; design and performance of refrigeration systems together with their components and controls; design of refrigeration systems using primary and secondary refrigerants; heat recovery systems and their control.

**Electrical and Electronic Control Principles for Building Services Engineering; Electrical Installation for Building Services Engineering:** principles of information transmission systems using analogue and digital techniques; design plant control systems and data distribution networks for non-domestic buildings; DC/AC motors and rectification systems for controlling plant and equipment; application of legislation and standards to building electrical systems; application of design criteria and constraints to electrical systems; data distribution associated with high technology buildings; requirements for protection of circuits, equipment and personnel.

**Lighting Applications for Industrial and Commercial Buildings:** principles that underpin the design, installation and operation of natural and artificial lighting systems; lighting requirements of industrial and commercial buildings; lighting solutions for complex industrial and commercial applications; lighting equipment and the visual effects of lighting; design of interior and exterior lighting schemes for industrial and commercial buildings; design and operation of emergency lighting systems according to legislation and standards.

**Power Supplies for Building Services Engineering:** application of circuit theorems and complex quantities to the analysis of AC power supply networks; principles and applications of transformers in power transmission and distribution; use of transformers for metering and protection; calculation of fault currents in power supply networks and appropriate high voltage (HV) switchgear and protection equipment; suitability of HV distribution systems and factors affecting choice of switchgear, transformer and protection systems; effects of 'abnormal loads' on power supply systems (supply constraints, design of tariffs and supply contracts).

**Electrical Protection and Transportation Installations for Non-domestic Buildings:** principles and application of circuit protection; standby power and uninterruptible power supplies (UPS) for non-domestic buildings; modes of vertical and horizontal transportation for buildings; design and specify fire detection and alarm systems in compliance with associated legislation and standards.

**Refrigeration Applications for Construction and the Built Environment:** refrigeration applications for food, medical, technological and leisure sectors; methods and processes that are dependant on refrigeration; factors affecting the quality of stored food; processing and transportation requirements for food products; manufacturing of ice for food and leisure applications; refrigeration methods used for medical and technological applications.

**Refrigeration Design for Construction and the Built Environment:** design of refrigeration systems to meet specific requirements; selection of appropriate equipment; appropriate control specifications for refrigeration systems; operational parameters for complex vapour compression systems and alternative refrigeration processes; energy efficient designs for industrial refrigeration systems.

## Higher-level skills

Learners studying for Pearson BTEC Higher Nationals in Construction and the Built Environment (QCF) will be expected to develop the following skills during the programme of study:

- locate, extract, read and use appropriate literature drawn from multiple sources with a full and critical understanding
- design, plan, conduct and report investigations and research to solve problems and communicate the results of their study accurately and reliably
- seek solutions to routine and unfamiliar problems through the analysis and synthesis of a range of concepts, knowledge and skills to formulate evidence-based arguments and evaluate and summarise information critically
- analyse and interpret data and present quantitative and qualitative information, together with analysis, argument and commentary, in a form appropriate to the intended audience, using appropriate quantitative techniques, relevant IT software and media
- relate academic knowledge, skills and understanding to skills in the workplace and, where appropriate, demonstrate their integration through workplace experience and activities
- think independently and apply complex theories to practical, realistic work situations, some requiring innovation and creativity
- apply their subject-related and transferable skills in contexts where the scope of the task and the criteria for decisions are generally well defined but where some personal responsibility and initiative are required
- recognise the moral and ethical issues of construction, sustainability, the environment, and scientific enquiry and experimentation
- appreciate the need for ethical standards and professional codes of conduct and apply insight and judgement in relation to the margins and consequences of error
- develop an understanding of the interdisciplinary nature of construction, and of the skills required to work in non-adversarial integrated teams
- take responsibility to manage and direct their own and, where appropriate, the activities of others
- identify and address their learning needs within defined contexts, recognise their learning style and undertake further guided learning in new areas.

The Construction Industry Council has an agreed set of Common Learning Outcomes for all sub-degree and degree level courses, these are summarised in *Annexe B*.



## Annexe B

### National Occupational Standards (NOS)

#### Mapping against the Level 4 NVQ in Built Environment Design

The grid below maps the knowledge covered in the Level 4 NVQ in Built Environment Design against the underpinning knowledge of the Pearson BTEC Higher Nationals in Construction and the Built Environment (QCF).

NVQ unit titles	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8	Unit 9	Unit 10	Unit 11	Unit 12	Unit 13	Unit 14	Unit 15	Unit 16	Unit 17	Unit 18	Unit 19	Unit 20
HNC/D units																				
C01 Develop and design team programmes and working methods	F			F	P	F														F
C02 Develop and advise on design recommendations	F	P			F	P	P				P	P						P	P	
C03 Develop and agree detailed designs	F	P			F	P	P	P		P	P	P						P	F	
C04 Develop and maintain professional relationships and practice	P		P	F												P	P			
O05 Investigate and assess development options																P	F			P
O06 Confirm project requirements and needs	P	P			F	P	P				P	P				P	P	P	P	P
O07 Manage the brief, development programme and project risks and opportunities	F	P	P	F	P	P	P			P	P	P			P	P	P	P	P	

HNC/D units	NVQ unit titles	Unit 1		Unit 2		Unit 3		Unit 4		Unit 5		Unit 6		Unit 7		Unit 8		Unit 9		Unit 10		Unit 11		Unit 12		Unit 13		Unit 14		Unit 15		Unit 16		Unit 17		Unit 18		Unit 19		Unit 20	
		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P						
O08 Form and induct a project team																																									
O09 Conduct condition surveys																																									
O10 Investigate development factors and solutions																																									
O11 Specify, manage and analyse testing																																									
O12 Establish regulatory requirements and secure consents																																									
O13 Manage project information																																									
O14 Prepare specifications																																									
O15 Obtain and select tenders																																									
O16 Prepare and submit tenders																																									
O17 Prepare and agree forms of contract																																									
O18 Control projects																																									
O19 Manage project completion and handover																																									
O20 Develop self and other people and contribute to improving design services																																									

HNC/D units	NVQ unit titles	Unit 63									
		Unit 61					Unit 60				
	C01 Develop and design team programmes and working methods										
	C02 Develop and advise on design recommendations	P	P	P							
	C03 Develop and agree detailed designs	F	P	P	F	P	P				
	C04 Develop and maintain professional relationships and practice						P	P	P	P	P
	O05 Investigate and assess development options	P		P	P					P	P
	O06 Confirm project requirements and needs									P	P
	O07 Manage the brief, development programme and project risks and opportunities			P	P					P	F
	O08 Form and induct a project team					P					P
	O09 Conduct condition surveys	P		P	P						
	O10 Investigate development factors and solutions	P		P	P					P	
	O11 Specify, manage and analyse testing					P					P

<b>HNC/D titles</b>	<b>NVQ unit titles</b>	Unit 63									
		Unit 61		Unit 60		Unit 59		Unit 57		Unit 35	
O12 Establish regulatory requirements and secure consents								P	P	P	P
O13 Manage project information	P										
O14 Prepare specifications	F							P	P	P	P
O15 Obtain and select tenders	P	P						P	P	P	P
O16 Prepare and submit tenders	P	P	P	P							
O17 Prepare and agree forms of contract	P										
O18 Control projects								F	F	F	F
O19 Manage project completion and handover								P	P	P	P
O20 Develop self and other people and contribute to improving design services								P	P	P	P

## Mapping against the Level 4 NVQ in Construction Contracting Operations

The grid below maps the knowledge covered in the Level 4 NVQ in Construction Contracting Operations against the underpinning knowledge of the Pearson BTEC Higher Nationals in Construction and the Built Environment (QCF).

HNC/D units	Unit 1	Unit 2	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8	Unit 10	Unit 11	Unit 12	Unit 13	Unit 15	Unit 16	Unit 17	Unit 18	Unit 19	Unit 20	Unit 21	Unit 23	Unit 24
Unit C01 Maintain health, safety and welfare systems					F													P		
Unit C02 Manage the performance of teams and individuals	P	P	P															P	P	
Unit C03 Chair meetings and take decisions				P														P		
Unit C04 Enhance working relationships				P	P												P	P		
Unit O05 Plan measured surveys						P											F			
Unit O06 Ascertain the condition of property	P				F	P	P	P										P	P	
Unit O07 Identify, assess and evaluate project requirements	P	P			P	P	P	P	P								F		P	P
Unit O08 Develop and agree detailed project designs	F	P				P	P	P									P		P	P
Unit O09 Specify and control production documents	P	P	P		P	P	P	P									P	P	P	P
Unit O10 Prepare procurement schedules and programmes of works					F	P											F	P	P	P

<b>HNC/D titles</b>	<b>NVQ unit titles</b>	<b>Unit 1</b>	<b>Unit 2</b>	<b>Unit 4</b>	<b>Unit 5</b>	<b>Unit 6</b>	<b>Unit 7</b>	<b>Unit 8</b>	<b>Unit 10</b>	<b>Unit 11</b>	<b>Unit 12</b>	<b>Unit 13</b>	<b>Unit 15</b>	<b>Unit 16</b>	<b>Unit 17</b>	<b>Unit 18</b>	<b>Unit 19</b>	<b>Unit 20</b>	<b>Unit 21</b>	<b>Unit 23</b>	<b>Unit 24</b>	
Unit O11 Implement strategic and integrated supply chain management and sourcing partnerships		P																				
Unit O12 Obtain tenders and appoint successful contractors		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Unit O13 Evaluate enquiries and submit tenders		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Unit O14 Evaluate and confirm work methods and programme		F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Unit O15 Analyse, monitor and optimise materials, plant and services		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Unit O16 Control contract work		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Unit O17 Optimise and control contract progress and costs		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Unit O18 Prepare and agree contract accounts and claims																						

<b>HNC/D titles</b>	<b>NVQ unit titles</b>	Unit 25	Unit 26	Unit 27	Unit 31	Unit 57	Unit 59	Unit 60	Unit 61	Unit 63
Unit C01 Maintain health, safety and welfare systems				P						
Unit C02 Manage the performance of teams and individuals				P						
Unit C03 Chair meetings and take decisions				P						
Unit C04 Enhance working relationships				P	P		P			P
Unit O05 Plan measured surveys				P						
Unit O06 Ascertain the condition of property	P	P								
Unit O07 Identify, assess and evaluate project requirements		P				F		P		
Unit O08 Develop and agree detailed project designs	P	P				P		P		
Unit O09 Specify and control production documents		P				P		P		
Unit O10 Prepare procurement schedules and programmes of works						P				

HNC/D titles	Unit 25	Unit 26	Unit 27	Unit 31	Unit 57	Unit 59	Unit 60	Unit 61	Unit 63
Unit O11 Implement strategic and integrated supply chain management and sourcing partnerships									
Unit O12 Obtain tenders and appoint successful contractors	P		P						
Unit O13 Evaluate enquiries and submit tenders	P		P						
Unit O14 Evaluate and confirm work methods and programme			P						
Unit O15 Analyse, monitor and optimise materials, plant and services	P		P						
Unit O16 Control contract work	P		P						
Unit O17 Optimise and control contract progress and costs			P						
Unit O18 Prepare and agree contract accounts and claims									

## Mapping against the Level 4 NVQ in Construction Site Management

The grid below maps the knowledge covered in the Level 4 NVQ in Construction Site Management against the underpinning knowledge of the Pearson BTEC Higher Nationals in Construction and the Built Environment (QCF).

HNC/D titles	Unit 1	Unit 2	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8	Unit 9	Unit 12	Unit 13	Unit 15	Unit 16	Unit 17	Unit 18	Unit 20	Unit 21	Unit 22	Unit 24	Unit 26
NVQ unit titles																			
VR 210 Develop and Maintain Good Working Relationships		P	P																
VR 713 Allocate Work and Check People's Performance		P	P																
VR 714 Enable Learning Opportunities		P	P																
VR 715 Contribute to the Identification of a Work Team		P	P																
VR 716 Plan Highways Maintenance or Repair Activities				P															
VR 719 Provide Customer Service in Construction	P															P			
VR 720 Plan Historical Conservation/Restoration Activities		P			P	P	P			P	P				P		P	P	
VR 722 Plan Demolition Activities		P			P	P	P			P	P				P		P	P	
VR 726 Establish, Implement and Maintain Systems for Managing Health, Safety and Welfare					F	P	P			P	P				P		P	P	

<b>HNC/D titles</b>	<b>NVQ unit titles</b>	<b>Unit 1</b>	<b>Unit 2</b>	<b>Unit 3</b>	<b>Unit 4</b>	<b>Unit 5</b>	<b>Unit 6</b>	<b>Unit 7</b>	<b>Unit 8</b>	<b>Unit 9</b>	<b>Unit 10</b>	<b>Unit 11</b>	<b>Unit 12</b>	<b>Unit 13</b>	<b>Unit 14</b>	<b>Unit 15</b>	<b>Unit 16</b>	<b>Unit 17</b>	<b>Unit 18</b>	<b>Unit 19</b>	<b>Unit 20</b>	<b>Unit 21</b>	<b>Unit 22</b>	<b>Unit 23</b>	<b>Unit 24</b>	<b>Unit 25</b>	<b>Unit 26</b>	
		VR 727 Establish, Control and Monitor Environmental Factors and Sustainability						P	P							P												
VR 728 Evaluate and Select Work Methods			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
VR 729 Plan the Preparation of the Site for the Project					P																							
VR 730 Monitor Project Activities			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
VR 731 Ensure that Work Activities and Resources Meet Project Work Requirements			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
VR 732 Identify, Allocate and Plan the Deployment and Use of Plant, Equipment or Machinery					P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
VR 733 Organise, Control and Monitor Supplies of Materials																P										P		
VR 734 Establish and Monitor Communication Systems and Organisational Procedures								P																		P		
VR 735 Control Project Progress against Agreed Quality Standards			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		
VR 736 Establish Dimensional Control Criteria			P						P	P	P	P													P	P	P	

<b>HNC/D titles</b>	<b>NVQ unit titles</b>	VR 737 Control Project Progress against Agreed Programmes	P	P	P	P	P	P	P	P
		VR 738 Control Project Quantities and Costs		P	P	P	P	P	P	P
<b>HNC/D titles</b>	<b>NVQ unit titles</b>	VR 739 Evaluate Feedback Information and Recommend Improvements	P		P		P		P	P
		VR 740 Manage Your Personal Development		P		P		P		P
<b>HNC/D titles</b>	<b>NVQ unit titles</b>	VR 741 Plan and Schedule the Maintenance or Remedial Activities of Property, Systems or Services	P	P	P	P	P	P	P	P
		VR 742 Manage Project Handover		P	P	P		P	P	P

HNC/D titles	NVQ unit titles	Unit 27			Unit 30			Unit 33			Unit 37			Unit 59			Unit 60			Unit 61			Unit 63		
		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
VR 210 Develop and Maintain Good Working Relationships	VR 713 Allocate Work and Check People's Performance	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
VR 714 Enable Learning Opportunities	VR 715 Contribute to the Identification of a Work Team	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
VR 716 Plan Highways Maintenance or Repair Activities	VR 719 Provide Customer Service in Construction	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
VR 720 Plan Historical Conservation/Restoration Activities	VR 722 Plan Demolition Activities																								
VR 726 Establish, Implement and Maintain Systems for Managing Health, Safety and Welfare	VR 727 Establish, Control and Monitor Environmental Factors and Sustainability																								
VR 728 Evaluate and Select Work Methods		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	

<b>HNC/D titles</b>	<b>NVQ unit titles</b>	<b>Unit 27</b>	<b>Unit 30</b>	<b>Unit 31</b>	<b>Unit 33</b>	<b>Unit 37</b>	<b>Unit 57</b>	<b>Unit 59</b>	<b>Unit 60</b>	<b>Unit 61</b>	<b>Unit 63</b>
		VR 729 Plan the Preparation of the Site for the Project	P	P	P	P	P	P	P	P	P
VR 730 Monitor Project Activities	VR 731 Ensure that Work Activities and Resources Meet Project Work Requirements										
	VR 732 Identify, Allocate and Plan the Deployment and Use of Plant, Equipment or Machinery				P	P					
	VR 733 Organise, Control and Monitor Supplies of Materials										
	VR 734 Establish and Monitor Communication Systems and Organisational Procedures						P				
	VR 735 Control Project Progress against Agreed Quality Standards					P	P	P			
	VR 736 Establish Dimensional Control Criteria					P	P	P			
	VR 737 Control Project Progress against Agreed Programmes							P			
	VR 738 Control Project Quantities and Costs					P	P	P			

HNC/D titles	Unit 27	Unit 30	Unit 31	Unit 32	Unit 33	Unit 37	Unit 57	Unit 59	Unit 60	Unit 61	Unit 63
NVQ unit titles	VR 739 Evaluate Feedback Information and Recommend Improvements	VR 740 Manage Your Personal Development	VR 741 Plan and Schedule the Maintenance or Remedial Activities of Property, Systems or Services	VR 742 Manage Project Handover							

## Mapping against the Level 4 NVQ in Site Inspection

The grid below maps the knowledge covered in the Level 4 NVQ in Site Inspection against the underpinning knowledge of the Pearson BTEC Higher Nationals in Construction and the Built Environment (QCF).

HNC/D titles	Unit 1	Unit 2	Unit 4	Unit 5	Unit 6	Unit 7	Unit 10	Unit 11	Unit 12	Unit 15	Unit 17	Unit 27	Unit 28	Unit 30	Unit 57	Unit 59	Unit 60	Unit 61	Unit 63
NVQ unit titles																			
Unit SI4 C01 Monitor contract, quality and progress				P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
Unit SI4 C02 Verify the dimensional control of construction and installation contracts							P	P	P	P	P	P	P	P	P	P	P	P	
Unit SI4 C03 Monitor health, safety and welfare systems							P	F				P	P	P	P	P	P	P	
Unit SI4 C04 Set up and use technical information systems and gather feedback							P							P					
Unit SI4 C05 Develop and maintain effective working relationships							P	P				P	P	P	P	P	P	P	
Unit SI4 C06 Provide advice on problems within an ethical framework													P						
Unit SI4 O08 Monitoring quantities data and witness commissioning												P	P	P	P	P	P	P	
Unit SI4 O09 Select and confirm test methods							P		P										

<b>HNC/D titles</b>	<b>NVQ unit titles</b>	<b>Unit 1</b>	<b>Unit 2</b>	<b>Unit 4</b>	<b>Unit 5</b>	<b>Unit 6</b>	<b>Unit 7</b>	<b>Unit 10</b>	<b>Unit 11</b>	<b>Unit 12</b>	<b>Unit 15</b>	<b>Unit 17</b>	<b>Unit 27</b>	<b>Unit 28</b>	<b>Unit 30</b>	<b>Unit 59</b>	<b>Unit 60</b>	<b>Unit 61</b>	<b>Unit 63</b>
Unit SI4 O10 Test, monitor and report on physical characteristics		P				P													
Unit SI4 O11 Ascertain the condition of property		P			P	P													
Unit SI4 O12 Plan, implement and improve the maintenance of property, systems and services		P	P		P	P													
Unit SI4 O13 Ensure activities meet customer requirements																			
Unit SI4 O14 Select personnel for activities			P																
Unit SI4 O15 Manage the performance of teams and individuals				P	P														

## Mapping against the Level 5 NVQ in Built Environment Design and Consultancy

The grid below maps the knowledge covered in the Level 5 NVQ in Built Environment Design and Consultancy against the underpinning knowledge of the Pearson BTEC Higher Nationals in Construction and the Built Environment (QCF).

HNC/D titles	Unit 1	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8	Unit 9	Unit 10	Unit 11	Unit 12	Unit 13	Unit 14	Unit 17	Unit 20	Unit 21	Unit 24	Unit 25	Unit 30	Unit 31	Unit 57
NVQ unit titles																				
Unit C01 Direct design projects	P			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
Unit C02 Direct design and consultancy services				P									P	P	P	P	P	P	P	
Unit C03 Direct design teams and communication	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
Unit C04 Direct professional and ethical practice	P																	P	P	
Unit 005 Direct procurement and contract processes									P					P	P	P	P	P	P	
Unit 006 Direct investigation and research														P						
Unit 007 Direct the control of projects	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
Unit 008 Direct the resolution of disputes				P	P	P	F	P			P	P	P		P	P	P	P	P	
Unit 009 Direct business development															P	P			P	
Unit 010 Direct income and expenditure				P	P	P	P	P						P	P		P	P	P	
Unit 011 Direct the evaluation and appraisal of property															P	P	P	P	P	

<b>HNC/D titles</b>	<b>NVQ unit titles</b>		
	<b>Unit 59</b>	<b>Unit 60</b>	<b>Unit 61</b>
Unit C01 Direct design projects	P		
Unit C02 Direct design and consultancy services	P		
Unit C03 Direct design teams and communication	P		
Unit C04 Direct professional and ethical practice	P	P	P
Unit 005 Direct procurement and contract processes			
Unit 006 Direct investigation and research		F	
Unit 007 Direct the control of projects			
Unit 008 Direct the resolution of disputes			
Unit 009 Direct business development		F	
Unit 010 Direct income and expenditure			
Unit 011 Direct the evaluation and appraisal of property			

## Mapping against the Level 5 NVQ in Construction Management

The grid below maps the knowledge covered in the Level 5 NVQ in Construction Management against the underpinning knowledge of the Pearson BTEC Higher Nationals in Construction and the Built Environment (QCF).

HNC/D units	Unit 1	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8	Unit 9	Unit 10	Unit 11	Unit 13	Unit 14	Unit 15	Unit 16	Unit 17	Unit 18	Unit 19	Unit 20	Unit 21	Unit 23	Unit 24	
NVQ unit titles																					
C01 Manage health, safety, welfare and environmental factors				F																	
C02 Manage project risks, opportunities, systems and teams		P	P																		
C03 Control projects		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
C04 Manage teams and individuals		P	P																P	P	P
C05 Enhance working relationships and develop self		P	P															P	P	P	P
O06 Manage factors affecting project feasibility		P		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
O07 Manage project design	P		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
O08 Establish and implement project partnering	P																	P	P	P	P
O09 Manage invited tenders	P		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
O10 Manage and submit tenders	P		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
O11 Prepare and agree contracts	P																	P	P	P	P

HNC/D titles	NVQ unit titles	O12 Manage financial expenditure and recovery	O13 Manage disputes	O14 Manage project handover and evaluate feedback	O15 Manage organisational development	O16 Manage finance for the business
Unit 1					P	
Unit 4						
Unit 5						
Unit 6		P				
Unit 7		P				
Unit 8		P				
Unit 9		P				
Unit 10		P				
Unit 11		P				
Unit 13		P				
Unit 14		P				
Unit 15		P				
Unit 16		P				
Unit 17		P				
Unit 18		P				
Unit 19		P				
Unit 20		P				
Unit 21		P				
Unit 23		P				
Unit 24		P				

HNC/D units	NVQ unit titles	Unit 30			Unit 57			Unit 59			Unit 60			Unit 61			Unit 63		
		C01	C02	C03	C04	C05	C06	C07	C08	C09	C10	C11	C12	C13	C14	C15	C16		
	C01 Manage health, safety, welfare and environmental factors	P			P			P			P								
	C02 Manage project risks, opportunities, systems and teams		P			P			P		P								
	C03 Control projects		P				P			P		P							
	C04 Manage teams and individuals		P		P	P	P												
	C05 Enhance working relationships and develop self		P		P	P	P				P								
	C06 Manage factors affecting project feasibility			P			P			P									
	C07 Manage project design					P			P										
	C08 Establish and implement project partnering																		
	C09 Manage invited tenders																		
	C10 Manage and submit tenders																		
	C11 Prepare and agree contracts																		
	C12 Manage financial expenditure and recovery																		

<b>HNC/D units</b>	<b>NVQ unit titles</b>	<b>Unit 63</b>			
		<b>Unit 61</b>	<b>Unit 60</b>	<b>Unit 59</b>	<b>Unit 57</b>
	O13 Manage disputes				
	O14 Manage project handover and evaluate feedback	P			
	O15 Manage organisational development	P			
	O16 Manage finance for the business	P			

## Mapping against the Level 5 NVQ in Construction Senior Management

The grid below maps the knowledge covered in the Level 5 NVQ in Construction Senior Management against the underpinning knowledge of the Pearson BTEC Higher Nationals in Construction and the Built Environment (QCF).

HNC/D units	NVQ unit titles										Unit 31
	Unit 1	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8	Unit 9	Unit 11	Unit 13	Unit 14	
Unit 001 Manage teams	P	P	P	P	P	P	P	P	P	P	Unit 30
Unit 002 Lead and participate in meetings	P	P	P	P	P	P	P	P	P	P	Unit 31
Unit 003 Provide ethical advice, judgement and service	P	P	P	P	P	P	P	P	P	P	Unit 31
Unit 004 Develop self and others	P	P	P	P	P	P	P	P	P	P	Unit 31
Unit 005 Prepare and agree a brief and development programme	P	P	P	P	P	P	P	P	P	P	Unit 31
Unit 006 Manage design development and processes	P	P	F	P	P	P	P	P	P	P	Unit 31
Unit 007 Assess and evaluate the environmental impact of developments	P	P	P	P	P	P	P	P	P	P	Unit 31
Unit 008 Evaluate sustainable resources and requirements	P	P	P	P	P	P	P	P	P	P	Unit 31
Unit 009 Establish project procurement arrangements	P	P	P	P	P	P	P	P	P	P	Unit 31
Unit 010 Implement strategic sourcing partnerships	P	P	P	P	P	P	P	P	P	P	Unit 31



<b>HNC/D units</b>	<b>NVQ unit titles</b>		
	<b>Unit 35</b>	<b>Unit 57</b>	<b>Unit 59</b>
	<b>Unit 60</b>	<b>Unit 61</b>	<b>Unit 63</b>
Unit O01 Manage teams	F	P	P
Unit O02 Lead and participate in meetings	P		
Unit O03 Provide ethical advice, judgement and service	P		F
Unit O04 Develop self and others	P	P	F
Unit O05 Prepare and agree a brief and development programme	P		P
Unit O06 Manage design development and processes	P		P
Unit O07 Assess and evaluate the environmental impact of developments			
Unit O08 Evaluate sustainable resources and requirements	P		
Unit O09 Establish project procurement arrangements	P		
Unit O10 Implement strategic sourcing partnerships	P		
Unit O11 Manage procurement processes			

HNC/D units	NVQ unit titles	Unit 35	Unit 57	Unit 59	Unit 60	Unit 61	Unit 63
Unit O12 Prepare and submit estimates, bids and tenders							
Unit O13 Ensure that contracts are prepared, negotiated and concluded							
Unit O14 Manage project processes		P					
Unit O15 Control projects		P					
Unit O16 Control income and expenditure		P					
Unit O17 Evaluate and progress the resolution of disputes		P					
Unit O18 Manage marketing and customer service			P				
Unit O19 Manage project completion		P		P			

#### KEY

P – Partial mapping (indicates partial coverage of the NVQ unit)

F – Full mapping (indicates that the BTEC HN unit covers all of the underpinning knowledge of the NVQ unit)

# Annexe C

## Grade descriptors

### Pass grade

A **pass grade** is achieved by meeting all the requirements defined in the assessment criteria for pass for each unit.

### Merit grade

<b>Merit grade descriptors</b>	<b>Exemplar indicative characteristics</b>  <b>Centres can identify and use other relevant characteristics. This is NOT a tick list.</b>
In order to achieve a <b>merit</b> the learner must:	The learner's evidence shows, for example:
• identify and apply strategies to find appropriate solutions	<ul style="list-style-type: none"><li>effective judgements have been made</li><li>complex problems with more than one variable have been explored</li><li>an effective approach to study and research has been applied</li></ul>
• select/design and apply appropriate methods/techniques	<ul style="list-style-type: none"><li>relevant theories and techniques have been applied</li><li>a range of methods and techniques have been applied</li><li>a range of sources of information has been used</li><li>the selection of methods and techniques/sources has been justified</li><li>the design of methods/techniques has been justified</li><li>complex information/data has been synthesised and processed</li><li>appropriate learning methods/techniques have been applied</li></ul>
• present and communicate appropriate findings	<ul style="list-style-type: none"><li>the appropriate structure and approach has been used</li><li>coherent, logical development of principles/concepts for the intended audience</li><li>a range of methods of presentation have been used and technical language has been accurately used</li><li>communication has taken place in familiar and unfamiliar contexts</li><li>the communication is appropriate for familiar and unfamiliar audiences and appropriate media have been used.</li></ul>

## Distinction grade

<b>Distinction grade descriptors</b>	<b>Exemplar indicative characteristics</b> <b>Centres can identify and use other relevant characteristics. This is NOT a tick list.</b>
<b>In order to achieve a distinction the learner must:</b>	The learner's evidence shows, for example:
<ul style="list-style-type: none"> <li>● use critical reflection to evaluate own work and justify valid conclusions</li> </ul>	<ul style="list-style-type: none"> <li>● conclusions have been arrived at through synthesis of ideas and have been justified</li> <li>● the validity of results has been evaluated using defined criteria</li> <li>● self-criticism of approach has taken place</li> <li>● realistic improvements have been proposed against defined characteristics for success</li> </ul>
<ul style="list-style-type: none"> <li>● take responsibility for managing and organising activities</li> </ul>	<ul style="list-style-type: none"> <li>● autonomy/independence has been demonstrated</li> <li>● substantial activities, projects or investigations have been planned, managed and organised</li> <li>● activities have been managed</li> <li>● the unforeseen has been accommodated</li> <li>● the importance of interdependence has been recognised and achieved</li> </ul>
<ul style="list-style-type: none"> <li>● demonstrate convergent/lateral/creative thinking</li> </ul>	<ul style="list-style-type: none"> <li>● ideas have been generated and decisions taken</li> <li>● self-evaluation has taken place</li> <li>● convergent and lateral thinking have been applied</li> <li>● problems have been solved</li> <li>● innovation and creative thought have been applied</li> <li>● receptiveness to new ideas is evident</li> <li>● effective thinking has taken place in unfamiliar contexts.</li> </ul>

## Annexe D

### Unit mapping overview

QCF versions of the BTEC Higher National units in Construction and the Built Environment (specification start date 01/09/2010) are mapped against the NQF BTEC Higher National units in Construction (C), Building Services Engineering (BSE) and Civil Engineering (CE) (specification end date 31/08/2010), in the following tables.

Unit number	QCF unit title	Maps to NQF unit number	Level of similarity between units
<b>1</b>	Design Principles and Application for Construction and the Built Environment	1 (C), (BSE), (CE)	F
<b>2</b>	Science and Materials for Construction and the Built Environment	2 (C), (CE)	F
<b>3</b>	Applied Mathematics for Construction and the Built Environment	3 (C), (BSE), (CE)	F
<b>4</b>	Management Principles and Application for Construction and the Built Environment	4 (C), (BSE), (CE)	F
<b>5</b>	Group Project in the Construction Industry	5 (C), (BSE), (CE)	F
<b>6</b>	Health, Safety and Welfare for Construction and the Built Environment	6 (C), (BSE), (CE)	F
<b>7</b>	Construction and Maintenance of Buildings	7 (C)	F
<b>8</b>	Technology of Complex Buildings	8 (C)	F
<b>9</b>	Law and Contract for Construction and the Built Environment	9 (C), 19 (CE)	F
<b>10</b>	Building Services Design, Installation and Maintenance in Construction	10 (C)	F
<b>11</b>	Contractual Procedures and Procurement for Construction and the Built Environment	11 (C), 21 (CE)	F
<b>12</b>	Conversion and Adaptation of Buildings	12 (C)	F
<b>13</b>	Environmental Impact of Construction	13 (C)	F
<b>14</b>	Economics for Construction and the Built Environment	14 (C)	F

<b>Unit number</b>	<b>QCF unit title</b>	<b>Maps to NQF unit number</b>	<b>Level of similarity between units</b>
<b>15</b>	Production Management for Construction	16 (C)	F
<b>16</b>	Measuring, Tendering and Estimating for Construction and the Built Environment	17 (C), 20 (CE)	F
<b>17</b>	Project Management for Construction and the Built Environment	18 (C), 16 (CE)	F
<b>18</b>	Measurement Processes for Construction	19 (C)	F
<b>19</b>	Building Control Procedures and Legislation	20 (C)	F
<b>20</b>	Construction Methods and Design Solutions	22 (C)	F
<b>21</b>	Specification and Contract Documentation for Construction	23 (C)	F
<b>22</b>	Structural Behaviour and Detailing	24 (C)	F
<b>23</b>	Advanced Measurement for Construction	25 (C)	F
<b>24</b>	Design Procedures for Construction	26 (C)	F
<b>25</b>	Design Technology for Construction	27 (C)	F
<b>26</b>	Properties and Performance of Construction Materials	28 (C)	F
<b>27</b>	Site Surveying Procedures for Construction and the Built Environment	29 (C), 9 (CE)	F
<b>28</b>	IT Applications for Construction	30 (C)	X
<b>29</b>	Computer-aided Design for Construction	32 (C)	X
<b>30</b>	Work-based Learning and Assessment in Construction and the Built Environment	34 (C), 22 (CE), 33 (BSE)	F
<b>31</b>	Work-based Training and Development in Construction and the Built Environment	35 (C), 23 (CE), 34 (BSE)	F
<b>32</b>	Engineering Geology and Soil Mechanics	7 (CE)	F
<b>33</b>	Civil Engineering Technology	8 (CE)	F
<b>34</b>	Structural Analysis and Design	10 (CE)	F

<b>Unit number</b>	<b>QCF unit title</b>	<b>Maps to NQF unit number</b>	<b>Level of similarity between units</b>
<b>35</b>	The Use of Information and Communication Technology for Construction and the Built Environment	12 (CE)	F
<b>36</b>	Applied Mathematics for Complex Engineering Problems	13 (CE), 8 (BSE)	F
<b>37</b>	Advanced Civil Engineering	14 (CE)	F
<b>38</b>	Hydraulic Principles and Applications	15 (CE)	F
<b>39</b>	Transportation for Construction and the Built Environment	18 (CE)	X
<b>40</b>	Thermofluids and Acoustic Criteria for Building Services Engineering	11 (BSE)	F
<b>41</b>	Air Conditioning for Industrial and Commercial Buildings	12 (BSE)	F
<b>42</b>	Low Pressure Hot Water Heating for Non-domestic Buildings	13 (BSE)	F
<b>43</b>	Electricity and Lighting for Building Services Engineering	14 (BSE)	F
<b>44</b>	Air Conditioning for Complex Industrial and Commercial Buildings	15 (BSE)	F
<b>45</b>	Heating Systems for Industrial and Specialist Applications	16 (BSE)	F
<b>46</b>	Piped Distribution Services for Non-domestic Buildings	17 (BSE)	F
<b>47</b>	Energy Utilisation and Efficiency for Building Services Engineering	18 (BSE)	F
<b>48</b>	Refrigeration Technology for Construction and the Built Environment	20 (BSE)	F
<b>49</b>	Electrical and Electronic Control Principles for Building Services Engineering	24 (BSE)	X
<b>50</b>	Electrical Installation for Building Services Engineering	25 (BSE)	X
<b>51</b>	Lighting Applications for Industrial and Commercial Buildings	26 (BSE)	F
<b>52</b>	Power Supplies for Building Services Engineering	27 (BSE)	F

<b>Unit number</b>	<b>QCF unit title</b>	<b>Maps to NQF unit number</b>	<b>Level of similarity between units</b>
<b>53</b>	Electrical Protection and Transportation Installations for Non-domestic Buildings	29 (BSE)	F
<b>54</b>	Building Management Systems for Building Services Engineering	30 (BSE)	F
<b>55</b>	Refrigeration Applications for Construction and the Built Environment	31 (BSE)	F
<b>56</b>	Refrigeration Design for Construction and the Built Environment	32 (BSE)	F
<b>57</b>	Project Management for Building Services Engineering	7 (BSE)	F
<b>58</b>	Application of Scientific Principles to Building Services Engineering	2 (BSE)	F
<b>59</b>	Employability Skills	N	Not applicable
<b>60</b>	Personal and Professional Development	N	Not applicable
<b>61</b>	Project Design, Implementation and Evaluation	N	Not applicable
<b>62</b>	Research Project	N	Not applicable
<b>63</b>	Work-based Experience	N	Not applicable

## 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))

N – New unit

## Unit mapping in depth

QCF versions of the BTEC Higher National units in Construction and the Built Environment (specification start date 01/09/2010) are mapped against the NQF BTEC Higher National units in Construction (C), Building Services Engineering (BSE) and Civil Engineering (CE) (specification end date 31/08/2010).

New QCF units		NQF units		Mapping / comments (new topics in <b>italics</b> )
Number	Name	Number	Name	
<b>1</b>	Design Principles and Application for Construction and the Built Environment	1 (C), (BSE), (CE)	Design Principles and Application	No change or only minimal change to learning outcomes. No new topics in content.
<b>2</b>	Science and Materials for Construction and the Built Environment	2 (C), (CE)	Science and Materials	No change or only minimal change to learning outcomes. No new topics in content.
<b>3</b>	Applied Mathematics for Construction and the Built Environment	3 (C), (BSE), (CE)	Analytical Methods	No change or only minimal change to learning outcomes. No new topics in content.
<b>4</b>	Management Principles and Application for Construction and the Built Environment	4 (C), (BSE), (CE)	Management Principles and Application	No change or only minimal change to learning outcomes. No new topics in content.
<b>5</b>	Group Project in the Construction Industry	5 (C), (BSE), (CE)	Group Project	No change or only minimal change to learning outcomes. No new topics in content.
<b>6</b>	Health, Safety and Welfare for Construction and the Built Environment	6 (C), (BSE), (CE)	Health, Safety and Welfare	No change or only minimal change to learning outcomes. No new topics in content.
<b>7</b>	Construction and Maintenance of Buildings	7 (C)	Technology A	No change or only minimal change to learning outcomes. No new topics in content.
<b>8</b>	Technology of Complex Buildings	8 (C)	Technology B	No change or only minimal change to learning outcomes. No new topics in content.

New QCF units				NQF units				Mapping / comments (new topics in <i>italics</i> )			
Number	Name	Number	Name	Number	Name	Number	Name	Number	Name	Number	Name
<b>9</b>	Law and Contract for Construction and the Built Environment	9 (C), 19 (CE)	Law and Contract								No change or only minimal change to learning outcomes. No new topics in content.
<b>10</b>	Building Services Design, Installation and Maintenance in Construction	10 (C)	Building Services Engineering Technology								No change or only minimal change to learning outcomes. No new topics in content.
<b>11</b>	Contractual Procedures and Procurement for Construction and the Built Environment	11 (C), 21 (CE)	Contractual Procedures								No change or only minimal change to learning outcomes. No new topics in content.
<b>12</b>	Conversion and Adaptation of Buildings	12 (C)	Refurbishment and Adaptation								No change or only minimal change to learning outcomes. No new topics in content.
<b>13</b>	Environmental Impact of Construction	13 (C)	Environment								No change or only minimal change to learning outcomes. No new topics in content.
<b>14</b>	Economics for Construction and the Built Environment	14 (C)	Construction Economics								No change or only minimal change to learning outcomes. No new topics in content.
<b>15</b>	Production Management for Construction	16 (C)	Production Management								No change or only minimal change to learning outcomes. No new topics in content.
<b>16</b>	Measuring, Tendering and Estimating for Construction and the Built Environment	17 (C), 20 (CE)	Tendering and Estimating								No change or only minimal change to learning outcomes. No new topics in content.
<b>17</b>	Project Management for Construction and the Built Environment	18 (C), 16 (CE)	Project Management								No change or only minimal change to learning outcomes. No new topics in content.
<b>18</b>	Measurement Processes for Construction	19 (C)	Measurement A								No change or only minimal change to learning outcomes. No new topics in content.

New QCF units				NQF units				Mapping / comments (new topics in <i>italics</i> )			
Number	Name	Number	Name	Number	Name	Number	Name	Number	Name	Number	Name
19	Building Control Procedures and Legislation	20 (C)	Building Control and Inspection								No change or only minimal change to learning outcomes. No new topics in content.
20	Construction Methods and Design Solutions	22 (C)	Technology C								No change or only minimal change to learning outcomes. No new topics in content.
21	Specification and Contract Documentation for Construction	23 (C)	Specification and Contract Documentation								No change or only minimal change to learning outcomes. No new topics in content.
22	Structural Behaviour and Detailing	24 (C)	Structural Behaviour and Detailing								No change or only minimal change to learning outcomes. No new topics in content.
23	Advanced Measurement for Construction	25 (C)	Measurement B								No change or only minimal change to learning outcomes. No new topics in content.
24	Design Procedures for Construction	26 (C)	Design Procedures								No change or only minimal change to learning outcomes. No new topics in content.
25	Design Technology for Construction	27 (C)	Design Technology								No change or only minimal change to learning outcomes. No new topics in content.
26	Properties and Performance of Construction Materials	28 (C)	Materials Properties and Performance								No change or only minimal change to learning outcomes. No new topics in content.
27	Site Surveying Procedures for Construction and the Built Environment	29 (C), 9 (CE)	Site Surveying Procedures								No change or only minimal change to learning outcomes. No new topics in content.
28	IT Applications for Construction	30 (C)	IT Applications – General (0.5 unit)								Added content to increase unit size from 0.5 unit to 1.0 unit. More in-depth and up-to-date treatment of existing content; added section on benefits of software used for quantity surveying, project planning, design, computer-aided design (CAD) and surveying.

New QCF units				NQF units				Mapping / comments (new topics in <i>italics</i> )			
Number	Name	Number	Name	Number	Name	Number	Name	Number	Name	Number	Name
<b>29</b>	Computer-aided Design for Construction	32 (C)	IT Applications – Computer-aided Design (0.5 unit)								Added content to increase unit size from 0.5 unit to 1.0 unit. More in-depth and up-to-date treatment of existing content; fuller treatment of full range of drawings, both 2D and 3D, and conversion.
<b>30</b>	Work-based Learning and Assessment in Construction and the Built Environment	34 (C), 22 (CE), 33 (BSE)	Work-based Learning A								No change or only minimal change to learning outcomes. No new topics in content.
<b>31</b>	Work-based Training and Development in Construction and the Built Environment	35 (C), 23 (CE), 34 (BSE)	Work-based Learning B								No change or only minimal change to learning outcomes. No new topics in content.
<b>32</b>	Engineering Geology and Soil Mechanics	7 (CE)	Geology and Soil Mechanics								No change or only minimal change to learning outcomes. No new topics in content.
<b>33</b>	Civil Engineering Technology	8 (CE)	Civil Engineering Construction A								No change or only minimal change to learning outcomes. No new topics in content.
<b>34</b>	Structural Analysis and Design	10 (CE)	Structural Analysis and Design								No change or only minimal change to learning outcomes. No new topics in content.
<b>35</b>	The Use of Information and Communication Technology for Construction and the Built Environment	12 (CE)	Design and Production Computer Analysis								No change or only minimal change to learning outcomes. No new topics in content.
<b>36</b>	Applied Mathematics for Complex Engineering Problems	13 (CE), 8 (BSE)	Engineering Mathematics								No change or only minimal change to learning outcomes. No new topics in content.
<b>37</b>	Advanced Civil Engineering	14 (CE)	Civil Engineering Construction B								No change or only minimal change to learning outcomes. No new topics in content.

New QCF units				NQF units				Mapping / comments (new topics in <i>italics</i> )			
Number	Name	Number	Name	Number	Name	Number	Name	Number	Name	Number	Name
<b>38</b>	Hydraulic Principles and Applications	15 (CE)	Fluids and Hydraulics								No change or only minimal change to learning outcomes. No new topics in content.
<b>39</b>	Transportation for Construction and the Built Environment	18 (CE)	Transportation								Unit reconstructed to take account of changes in modern transportation methods. Focus now on project development, design and management.
<b>40</b>	Thermofluids and Acoustic Criteria for Building Services Engineering	11 (BSE)	Thermofluids and Acoustic Criteria								No change or only minimal change to learning outcomes. No new topics in content.
<b>41</b>	Air Conditioning for Industrial and Commercial Buildings	12 (BSE)	Air Conditioning A								No change or only minimal change to learning outcomes. No new topics in content.
<b>42</b>	Low Pressure Hot Water Heating for Non-domestic Buildings	13 (BSE)	Heating A								No change or only minimal change to learning outcomes. No new topics in content.
<b>43</b>	Electricity and Lighting for Building Services Engineering	14 (BSE)	Electricity and Lighting								No change or only minimal change to learning outcomes. No new topics in content.
<b>44</b>	Air Conditioning for Complex Industrial and Commercial Buildings	15 (BSE)	Air Conditioning B								No change or only minimal change to learning outcomes. No new topics in content.
<b>45</b>	Heating Systems for Industrial and Specialist Applications	16 (BSE)	Heating B								No change or only minimal change to learning outcomes. No new topics in content.
<b>46</b>	Piped Distribution Services for Non-domestic Buildings	17 (BSE)	Piped Distribution Services								No change or only minimal change to learning outcomes. No new topics in content.

New QCF units				NQF units		Mapping / comments (new topics in <i>italics</i> )	
Number	Name	Number	Name	Number	Name		
<b>47</b>	Energy Utilisation and Efficiency for Building Services Engineering	18 (BSE)	Energy Utilisation and Efficiency			No change or only minimal change to learning outcomes. No new topics in content.	
<b>48</b>	Refrigeration Technology for Construction and the Built Environment	20 (BSE)	Refrigeration Technology			No change or only minimal change to learning outcomes. No new topics in content.	
<b>49</b>	Electrical and Electronic Control Principles for Building Services Engineering	24 (BSE)	Electrical and Electronics Control Principles (0.5 unit)			Added content to increase unit size from 0.5 unit to 1.0 unit. More in-depth and up-to-date treatment of existing content; improved link between principles and design and stronger focus on design.	
<b>50</b>	Electrical Installation for Building Services Engineering	25 (BSE)	Electrical Installation A (0.5 unit)			Added content to increase unit size from 0.5 unit to 1.0 unit. More in-depth and up-to-date treatment of existing content; stronger focus on circuit theorems and motor theory.	
<b>51</b>	Lighting Applications for Industrial and Commercial Buildings	26 (BSE)	Lighting Applications			No change or only minimal change to learning outcomes. No new topics in content.	
<b>52</b>	Power Supplies for Building Services Engineering	27 (BSE)	Power Supplies to Buildings			No change or only minimal change to learning outcomes. No new topics in content.	
<b>53</b>	Electrical Protection and Transportation Installations for Non-domestic Buildings	29 (BSE)	Electrical Installation B			No change or only minimal change to learning outcomes. No new topics in content.	
<b>54</b>	Building Management Systems for Building Services Engineering	30 (BSE)	Building Management Systems			No change or only minimal change to learning outcomes. No new topics in content.	

New QCF units				NQF units				Mapping / comments (new topics in <i>italics</i> )			
Number	Name	Number	Name	Number	Name	Number	Name				
<b>55</b>	Refrigeration Applications for Construction and the Built Environment	31 (BSE)	Refrigeration Applications					No change or only minimal change to learning outcomes. No new topics in content.			
<b>56</b>	Refrigeration Design for Construction and the Built Environment	32 (BSE)	Refrigeration Design and Plant Specification					No change or only minimal change to learning outcomes. No new topics in content.			
<b>57</b>	Project Management for Building Services Engineering	7 (BSE)	Services Project Management					No change or only minimal change to learning outcomes. No new topics in content.			
<b>58</b>	Application of Scientific Principles to Building Services Engineering	2 (BSE)	Services Science					No change or only minimal change to learning outcomes. No new topics in content.			
<b>59</b>	Employability Skills	N/A	New common unit					Not applicable			
<b>60</b>	Personal and Professional Development	N/A	New common unit					Not applicable			
<b>61</b>	Project Design, Implementation and Evaluation	N/A	New common unit					Not applicable			
<b>62</b>	Research Project	N/A	New common unit					Not applicable			
<b>63</b>	Work-based Experience	N/A	New common unit					Not applicable			



# Annexe E

## Calculation of the qualification grade

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### Pass qualification grade

Learners who achieve the minimum eligible credit value specified by the rule of combination will achieve the qualification at pass grade (see section *Rules of combination for BTEC Levels 4 and 5 Higher National qualifications*).

### Qualification grades above pass grade

Learners will be awarded a merit or distinction qualification grade by the aggregation of points gained through the successful achievement of individual units. **The graded section of both qualifications is based on the learner's best performance in units at the level or above of the qualification to the value of 75 credits.**

The number of points available is dependent on the unit grade achieved and the credit size of the unit (as shown in the table below).

### Points available per credit at specified unit grades

Points per credit		
Pass	Merit	Distinction
0	1	2

So a 15 credit unit awarded a merit grade will gain 15 points.

### Qualification grades

#### BTEC Level 4 HNC

Points range	Grade	
0-74	Pass	P
75-149	Merit	M
150	Distinction	D

#### BTEC Level 5 HND

Points range	Grade	
0-74	Pass	P
75-149	Merit	M
150	Distinction	D

These are some examples of how the HNC Diploma grades are calculated:

**Example 1: Achievement of a BTEC HNC Diploma with Pass grade**

		Level	Credit	Grade	Grade points	Points per unit (weighting x credit points)
Unit 1	Mandatory core unit	4	15	P	0	
Unit 2	Mandatory core unit	4	15	P	0	
Unit 3	Mandatory core unit	4	15	M	1	15
Unit 4	Mandatory core unit	4	15	M	1	15
Unit 15	Specialist unit	5	15	P	0	
Unit 17	Specialist unit	5	15	P	0	
Unit 18	Specialist unit	4	15	M	1	15
Unit 12	Specialist unit	4	15	M	1	15
Unit 14	Specialist unit	4	10	D	2	20
<b>Qualification total requirement 120</b>			<b>130</b>			<b>60</b>

Unit 14 is not included as it is an additional unit on top of the 120 credit qualification

The learner can only include the points from the best 75 out of 120 credits in a valid combination.

**Example 2: Achievement of a BTEC HNC Diploma with Merit grade**

		Level	Credit	Grade	Grade points	Points per unit (weighting x credit points)
Unit 1	Mandatory core unit	4	15	M	1	15
Unit 2	Mandatory core unit	4	15	P	0	
Unit 3	Mandatory core unit	4	15	M	1	15
Unit 4	Mandatory core unit	4	15	P	0	
Unit 15	Specialist unit	5	15	P	0	
Unit 9	Specialist unit	4	15	M	1	15
Unit 18	Specialist unit	4	15	M	1	15
Unit 12	specialist unit	4	15	M	1	15
<b>Qualification total requirement 120</b>			<b>120</b>			<b>75</b>

The best 75 credits include both core and optional units.

The learner has sufficient points for a merit.

**Example 3: Achievement of an HNC Diploma with Distinction grade**

		Level	Credit	Grade	Grade points	Points per unit (weighting x credit points)
Unit 1	Mandatory core unit	4	15	M	1	(15)
Unit 2	Mandatory core unit	4	15	P	0	
Unit 3	Mandatory core unit	4	15	D	2	30
Unit 4	Mandatory core unit	4	15	P	0	
Unit 15	Specialist unit	4	15	D	2	30
Unit 17	Specialist unit	4	15	D	2	30
Unit 9	Specialist unit	4	15	D	2	30
Unit 12	Specialist unit	4	15	D	2	30
<b>Qualification total requirement- 120</b>			<b>120</b>			<b>150</b>

The learner has grade points in more than 75 credits. The best performance is used to calculate the grade.

These can be level 4/5 for the HNC

The learner has enough points for a Distinction from 75 credits.

### Examples for the HND Diploma:

The tables below give examples of how the overall grade is determined.

**Only points from units at or above the level of the qualification can be counted towards the grade.**

**Examples used are for illustrative purposes only. Other unit combinations are possible.**

#### Example 1: Achievement of an HND Diploma with a pass grade

		Level	Credit	Grade	Grade points	Points per unit (weighting x credit points)
Unit 1	Mandatory core unit	4	15	P	X	(15)
Unit 2	Mandatory core unit	4	15	M	X	
Unit 3	Mandatory core unit	4	15	M	X	30
Unit 4	Mandatory core unit	4	15	M	X	
Unit 5	Mandatory core unit	4	15	M	X	
Unit 6	Mandatory core unit	5	15	P	0	
Unit 7	Mandatory core unit	5	15	M	1	15
Unit 8	Mandatory core unit	5	20	P	0	
Unit 20	Specialist unit	5	15	M	1	15
Unit 21	Specialist unit	5	15	P	0	
Unit 23	Specialist unit	5	15	P	0	
Unit 25	Specialist unit	4	15	P	X	
Unit 26	Specialist unit	5	15	M	1	15
Unit 29	Specialist unit	4	15	M	X	
Unit 33	Specialist unit	4	15	M	X	
Unit 35	Specialist unit	5	15	M	1	15
<b>Qualification grade totals</b>		<b>Min 125 at level 5</b>	<b>245</b>			<b>60</b>

Count the points from level 5 units for the best 75 credits  
X these units are **below** the level of the HND Diploma so not counted for grading

The learner has sufficient points for a pass grade.

## Example 2

### Achievement of an HND Diploma with a Merit grade

		Level	Credit	Grade	Grade points	Points per unit (weighting × credit points)
Unit 1	Mandatory core unit	4	15	P	X	
Unit 2	Mandatory core unit	4	15	M	X	
Unit 3	Mandatory core unit	4	15	M	X	
Unit 4	Mandatory core unit	4	15	M	X	
Unit 5	Mandatory core unit	4	15	M	X	
Unit 6	Mandatory core unit	5	15	M	1	15
Unit 7	Mandatory core unit	5	15	D	2	30
Unit 8	Mandatory core unit	5	20	D	2	40
Unit 20	Specialist unit	5	15	M	1	15
Unit 21	Specialist unit	5	15	M	1	(15)
Unit 23	Specialist unit	5	15	P	0	
Unit 25	Specialist unit	4	15	P	X	
Unit 26	Specialist unit	5	15	M	1	(15)
Unit 29	Specialist unit	4	15	M	X	
Unit 33	Specialist unit	4	15	M	X	
Unit 35	Specialist unit	5	15	M	1	(15)
Unit 36	Specialist unit	5	10	D	2	20
	<b>Qualification grade totals</b>	<b>Min 125 at level 5</b>	<b>260</b>			<b>105</b>

The learner can be considered for a merit:  
only count the points from **the best 75** credits from a valid combination of 240 credits  
X these units are **below** the level of the qualification so **cannot** be counted for grading  
The best 75 credits include both mandatory core and optional units  
( ) these units are not counted in the overall score

The learner has sufficient points for a merit grade.

### Example 3

#### Achievement of an HND Diploma with a distinction grade

		Level	Credit	Grade	Grade points	Points per unit (weighting × credit points)
Unit 1	Mandatory core unit	4	15	P	X	
Unit 2	Mandatory core unit	4	15	M	X	
Unit 3	Mandatory core unit	4	15	D	X	
Unit 4	Mandatory core unit	4	15	D	X	
Unit 5	Mandatory core unit	4	15	M	X	
Unit 6	Mandatory core unit	5	15	D	2	30
Unit 7	Mandatory core unit	5	15	D	2	30
Unit 8	Mandatory core unit	5	20	D	2	30
Unit 20	Specialist unit	5	15	D	2	30
Unit 21	Specialist unit	5	15	D	2	30
Unit 23	Specialist unit	5	15	P	0	
Unit 25	Specialist unit	4	15	P	X	
Unit 26	Specialist unit	5	15	M	1	(15)
Unit 29	Specialist unit	4	15	M	X	
Unit 33	Specialist unit	4	15	M	X	
Unit 35	Specialist unit	5	15	M	1	(15)
Unit 36	Specialist unit	4	15	P	X	
<b>Qualification grade totals</b>		<b>Min 125 at level 5</b>	<b>245</b>			<b>150</b>

The learner can be considered for a distinction:  
only count the points from level 5 units for the best 75 credits from a valid combination of **240** credits  
( ) these units are not counted in the overall score  
X not counted as **below the** level of the qualification.

The learner has sufficient points for a distinction grade.

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