Pearson Edexcel Level 3 Diploma in Building Services Engineering for Technicians

Specification

Pearson competence-based qualifications
Issue 2: June 2016

First registration February 2013

Pearson Education Ltd is one of the UK's largest awarding organisations, offering academic and vocational qualifications and testing to schools, colleges, employers and other places of learning, both in the UK and internationally. Qualifications offered include GCSE, AS and A Level, NVQ and our BTEC suite of vocational qualifications, ranging from Entry Level to BTEC Higher National Diplomas. Pearson Education Ltd administers work-based qualifications.

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This specification is Issue 2. Key changes listed in summary table on next page. We will inform centres of any changes to this issue. The latest issue can be found on the Pearson website: qualifications.pearson.com

This qualification was previously entitled:

Edexcel Level 3 Diploma in Building Services Engineering for Technicians (QCF)

The QN remains the same.

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

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Summary of Pearson Edexcel Level 3 Diploma in Building Services Engineering for Technicians specification Issue 2 changes

Summary of changes made between previous issue and this current issue	Page/section number
All references to QCF have been removed throughout the specification	
Definition of TQT added	Section 1
Definition of sizes of qualifications aligned to TQT	Section 1
Credit value range removed and replaced with lowest credit value for the shortest route through the qualification	Section 2
TQT value added	Section 2
GLH range removed and replaced with lowest GLH value for the shortest route through the qualification	Section 2
Reference to credit transfer within the QCF removed	Section 5
QCF references removed from unit titles and unit levels in all units	Section 12
Guided learning definition updated	Section 12

Earlier issue(s) show(s) previous changes.

If you need further information on these changes or what they mean, contact us via our website at: qualifications.pearson.com/en/support/contact-us.html.

Contents

Qualification title covered by this specification

This specification gives you the information you need to offer the Pearson Edexcel Level 3 Diploma in Building Services Engineering for Technicians:

Qualification title	Qualification Number (QN)	Accreditation start date
Pearson Edexcel Level 3 Diploma in Building Services Engineering for Technicians	600/7813/3	01/02/13

This qualification has been accredited within the Regulated Qualifications Framework and is eligible for public funding as determined by the Department for Education (DfE) under Section 96 of the Learning and Skills Act 2000.

The qualification title listed above features in the funding lists published annually by the DfE and the regularly updated website. It will also appear on the Learning Aim Reference Application (LARA), where relevant.

You should use the Qualification Number (QN), when you wish to seek public funding for your learners. Each unit within a qualification will also have a unique reference number, which is listed in this specification.

The qualification title and unit reference numbers will appear on learners' final certification documents. Learners need to be made aware of this when they are recruited by the centre and registered with Pearson.

Key features of the Pearson Edexcel Level 3 Diploma in Building Services Engineering for Technicians

This qualification:

- is nationally recognised
- is based on the Engineering Council's Engineering Technician (EngTech) registration criteria.

The Pearson Edexcel Level 3 Diploma in Building Services Engineering for Technicians prepares learners for Licentiate Membership of the Chartered Institution of Building Services Engineers (LCIBSE) and for professional registration as an Engineering Technician with the Engineering Council.

What is the purpose of this qualification?

The purpose of the qualification is to offer a programme of work-based study for building services engineering apprentices. Building services involve the implementation and maintenance of, for example, heating, plumbing, security, lighting, air conditioning etc. The qualification provides the competencies required for the design pathway within the Advanced Apprenticeship in Building Services Engineering Technology and Project Management Framework for Technicians.

Who is this qualification for?

This qualification is for all learners aged 16 and above who are capable of reaching the required standards.

Pearson's policy is that the qualification should:

- be free from any barriers that restrict access and progression
- ensure equality of opportunity for all wishing to access the qualification(s).

Demonstrating competence in some construction and built environment site based occupation may prove to be a barrier to some learners with impaired abilities, however alternative assessment opportunities may be appropriate.

What are the benefits of this qualification to the learner and employer?

Apprentices who complete this qualification successfully can apply for Licentiate membership of LCIBSE and Engineering Technician registration with the Engineering Council, which in turn will entitle successful applicants to the use of post-nominals EngTech LCIBSE.

What are the potential job roles for those working towards this qualification?

- Building Services Engineering for Technicians work in a variety of settings, for example with contractors, consultants, government agencies and local authorities.

What progression opportunities are available to learners who achieve this qualification?

Learners can progress to the Pearson BTEC Higher National Certificate in Construction and the Pearson BTEC Higher National Diploma in Construction.

The Pearson Edexcel BTEC Level 3 Diploma in Construction and Built Environment (Building Services Engineering) is available as the related knowledge component qualification in the Advanced Apprenticeship in Building Services Engineering Technology and Project Management.

Progression will also be possible to Foundation Degrees, BSc and BEng degrees in construction and building services engineering. Ultimately learners can progress to MEng and MSc.

Further information is available in *Annexe A*.

Sizes of Specialist qualifications

For all regulated qualifications, we specify a total number of hours that learners are expected to undertake in order to complete and show achievement for the qualification – this is the Total Qualification Time (TQT). The TQT value indicates the size of a qualification.

Within the TQT, we identify the number of Guided Learning Hours (GLH) that a centre delivering the qualification needs to provide. Guided learning means activities that directly or immediately involve tutors and assessors in teaching, supervising, and invigilating learners, for example lectures, tutorials, online instruction and supervised study.

As well as guided learning, there may be other required learning that is directed by tutors or assessors. This includes, for example, private study, preparation for assessment and undertaking assessment when not under supervision, such as preparatory reading, revision and independent research.

As well as TQT and GLH, qualifications can also have a credit value – equal to one tenth of TQT, rounded to the nearest whole number.

TQT and credit values are assigned after consultation with users of the qualifications.

BTEC Specialist qualifications are available in the following sizes:

- Award – a qualification with a TQT value of 120 or less (equivalent to a range of 1–12 credits)
- Certificate – a qualification with a TQT value in the range of 121–369 (equivalent to a range of 13–36 credits)
- Diploma – a qualification with a TQT value of 370 or more (equivalent to 37 credits and above).

What is the qualification structure for the Pearson Edexcel Level 3 Diploma in Building Services Engineering?

Individual units can be found in the *Units* section. The level and credit value are given on the first page of each unit.

Learners must complete all units to achieve the qualification. A total of 103 credits and 1030 TQT need to be achieved.

Unit	Title	Credit value	GLH	QN
1	Techniques and Procedures for Building Services Engineering Tasks	16	56	A/504/6056
2	Developing Building Services Engineering Solutions	17	51	F/504/6057
3	Management and Leadership in Building Services Engineering	10	28	L/504/6059
4	Working Independently in Building Services Engineering	12	33	F/504/6060
5	Commercial Activities in Building Services Engineering	8	24	J/504/6061
6	Health, Safety and Welfare for Building Services Engineers	16	56	L/504/6062
7	Sustainable Development in Building Services Engineering	8	25	Y/504/6064
8	Interpersonal Skills and Communication in Building Services Engineering	12	51	D/504/6065
9	Professional Values for Building Services Engineers	4	10	H/504/6066
	Total	103	334	

How is the qualification graded and assessed?

The overall grade for the qualification is a 'pass'. The learner must achieve all the required units within the specified qualification structure.

To pass a unit the learner must:

- achieve **all** the specified learning outcomes
- satisfy **all** the assessment criteria by providing sufficient and valid evidence for each criterion
- show that the evidence is their own.

The qualifications are designed to be assessed:

- in the workplace or
- in conditions resembling the workplace, as specified in the assessment requirements/strategy for the sector, or
- as part of a training programme.

Assessment requirements

The assessment requirements for this qualification have been included in *Annexe D*. They have been developed by the Chartered Institution of Building Service Engineers (CIBSE) in partnership with employers, training providers, the sector skills council, the awarding organisation and the regulatory authorities. The assessment strategy includes details on:

- criteria for defining realistic working environments
- roles and occupational competence of assessors, expert witnesses, internal verifiers, standards verifiers and CIBSE mentors.

Evidence of competence may come from:

- **current practice,** where evidence is generated from a current job role
- a **programme of development,** where evidence comes from assessment opportunities built into a learning/training programme whether at or away from the workplace
- the **Recognition of Prior Learning (RPL),** where a learner can demonstrate that they can meet the assessment criteria within a unit through knowledge, understanding or skills they already possess without undertaking a course of learning. They must submit sufficient, reliable and valid evidence for internal and standards verification purposes. RPL is acceptable for accrediting a unit, several units or a whole qualification
- a **combination** of these.

It is important that the evidence is:

Valid	relevant to the standards for which competence is claimed
Authentic	produced by the learner
Current	sufficiently recent to create confidence that the same skill, understanding or knowledge persist at the time of the claim
Reliable	indicates that the learner can consistently perform at this level
Sufficient	fully meets the requirements of the standards.

Types of evidence (to be read in conjunction with the assessment strategy in *Annexe D*)

To successfully achieve a unit the learner must gather evidence which shows that they have met the required standard in the assessment criteria. Evidence can take a variety of different forms including the examples below. Centres should refer to the assessment strategy for information about which of the following are permissible.

- direct observation of the learner's performance by their assessor (O)
- outcomes from oral or written questioning (Q&A)
- products of the learner's work (P)
- personal statements and/or reflective accounts (RA)
- outcomes from simulation, where permitted by the assessment strategy (S)
- professional discussion (PD)
- assignment, project/case studies (A)
- authentic statements/witness testimony (WT)
- expert witness testimony (EPW)
- evidence of Recognition of Prior Learning (RPL).

The abbreviations may be used for cross-referencing purposes.

Learners can use one piece of evidence to prove their knowledge, skills and understanding across different assessment criteria and/or across different units. It is, therefore, not necessary for learners to have each assessment criterion assessed separately. Learners should be encouraged to reference the assessment criteria to which the evidence relates.

Evidence must be made available to the assessor, internal verifier and Pearson standards verifier. A range of recording documents is available on the Pearson website: qualifications.pearson.com. Alternatively, centres may develop their own.

Centre recognition and approval

Centre recognition

Centres that have not previously offered Pearson qualifications need to apply for and be granted centre recognition as part of the process for approval to offer individual qualifications. New centres must complete both a centre recognition approval application and a qualification approval application.

Existing centres will be given 'automatic approval' for a new qualification if they are already approved for a qualification that is being replaced by the new qualification and the conditions for automatic approval are met. Centres already holding Pearson approval are able to gain qualification approval for a different level or different sector.

Approvals agreement

All centres are required to enter into an approvals agreement which is a formal commitment by the head or principal of a centre to meet all the requirements of the specification and any linked codes or regulations. Pearson will act to protect the integrity of the awarding of qualifications, if centres do not comply with the agreement. This could result in the suspension of certification or withdrawal of approval.

Quality assurance

Detailed information on Pearson's quality assurance processes is given in *Annexe B*.

What resources are required?

Each qualification is designed to support learners working in the construction and built environment sector. Physical resources need to support the delivery of the qualifications and the assessment of the learning outcomes and must be of industry standard. Staff assessing the learner must meet the requirements within the overarching assessment strategy for the sector. Full account must be taken by a centre and staff involved in the delivery of a qualification of Health and Safety requirements. Where provision is made for assessment to be undertaken in a Realistic Working Environment (RWE), the RWE must provide conditions the same as the normal day-to-day working environment, with a similar range of demands, pressures and requirements for cost-effective working.

Units

Unit 1: Techniques and Procedures for Building Services Engineering Tasks

Unit reference number: A/504/6056

Level: 3

Credit value: 16

Guided learning hours: 56

Unit summary

This unit allows learners to demonstrate appropriate technical skills to enable them to perform building services engineering tasks.

Assessment requirements/evidence requirements

Portfolio of evidence.

Assessment methodology

This unit is assessed in the workplace or in conditions resembling the workplace. Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Indicative mapping

This unit reflects the following competencies from the Engineering Council's Engineering Technician (EngTech) registration criteria:

A1, A2

This unit reflects the following units from the National Occupational Standards in Building Services Engineering Technology and Project Management Level 3:

SST/NOS 2

SST/NOS 3

SST/NOS 7

SST/NOS 8

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Suggested development activity	Evidence type	Portfolio reference and date
1 Understand appropriate techniques to perform building services engineering tasks	1.1 Describe appropriate techniques to perform building services engineering tasks 1.2 Evaluate appropriate techniques to perform building services engineering tasks	Identify the engineering principles used in the learner's work.		
2 Understand appropriate procedures to perform building services engineering tasks	2.1 Explain how engineering codes and standards underpin organisational procedures 2.2 Select the appropriate procedures to perform a minimum of three building services engineering tasks 2.3 Justify selected procedures to perform a minimum of three building services engineering tasks	Acquire engineering knowledge through project work. Link the knowledge of core engineering principles to relevant codes, standards and specifications within own area of operations. Use standard documentation, eg factory acceptance tests, witness testing on site.		

Learning outcomes	Assessment criteria	Suggested development activity	Evidence type	Portfolio reference and date
3 Be able to use appropriate techniques and procedures to perform building services engineering tasks	3.1 Apply the appropriate techniques and procedures to perform a minimum of three building services engineering tasks 3.2 Compare quality control methods used on-site and off-site 3.3 Produce design solutions for building engineering services projects	Apply knowledge of theory to practical tasks in the workplace. Prepare engineering specifications using engineering codes and standards. Use appropriate software packages and hardware devices to obtain and present information on a given building services engineering project.		

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Unit 2: Developing Building Services Engineering Solutions

Unit reference number: F/504/6057

Level: 3

Credit value: 17

Guided learning hours: 51

Unit summary

This unit allows learners to demonstrate appropriate technical skills that will enable them to develop building services engineering solutions.

Assessment requirements/evidence requirements

Portfolio of evidence.

Assessment methodology

This unit is assessed in the workplace or in conditions resembling the workplace. Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Indicative mapping

This unit reflects the following competencies from the Engineering Council's Engineering Technician (EngTech) registration criteria:

B1

This unit reflects the following units from the National Occupational Standards in Building Services Engineering Technology and Project Management Level 3:

SST/NOS 2

SST/NOS 3

SST/NOS 5

SST/NOS 7

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Suggested development activity	Evidence type	Portfolio reference and date
1 Be able to analyse building services engineering problems	1.1 Identify building services engineering problems: • technical • contractual • budgetary 1.2 Diagnose building services engineering problems drawing on scientific, technical and engineering principles	Apply engineering principles. Discuss the consequences of neglect or error in, eg design of processes, selection of equipment.		
2 Be able to propose solutions to building services engineering problems	2.1 Propose alternative solutions to building services engineering problems 2.2 Critically compare alternative solutions to building services engineering problems 2.3 Justify recommendations for the preferred solution	Consider: health, safety, and welfare; viability and practicality issues; the relationship between quality, costs and time; the impact of sustainability. Link the choice to relevant codes, standards and specifications. Consider which solution will lead to the optimum outcome. Produce technical documents to show the solutions the learner has worked on.		

Learning outcomes	Assessment criteria	Suggested development activity	Evidence type	Portfolio reference and date
3 Be able to implement revised solutions into a building service engineering project	3.1 Reconcile revised solution against original specification 3.2 Produce technical documents of the revision to the original brief to illustrate the solution has been implemented	Consider the revision and its implementation in terms of the overall solution. Produce documents that comply with specification, use standard hatching, symbols and conventions.		

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 3: Management and Leadership in Building Services Engineering

Unit reference number: L/504/6059

Level: 3

Credit value: 10

Guided learning hours: 28

Unit summary

This unit allows learners to demonstrate an appropriate level of supervisory management expertise in relation to building services engineering works.

Assessment requirements/evidence requirements

Portfolio of evidence.

Assessment methodology

This unit is assessed in the workplace or in conditions resembling the workplace. Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Indicative mapping

This unit reflects the following competencies from the Engineering Council's Engineering Technician (EngTech) registration criteria:

C1, C3

This unit reflects the following units from the National Occupational Standards in Building Services Engineering Technology and Project Management Level 3:

SST/NOS 1, SST/NOS 2, SST/NOS 3, SST/NOS 4, SST/NOS 5, SST/NOS 6, SST/NOS 7, SST/NOS 8

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Suggested development activity	Evidence type	Portfolio reference and date
1 Be able to manage building services engineering activities within own field of responsibility	1.1 Organise own work schedule to meet milestones 1.2 Work without close supervision to complete given tasks to agreed standards			
2 Be able to manage the work of others	2.1 Schedule the work of a team to meet specified time and quality requirements 2.2 Monitor the work of a team and record progress against the schedule 2.3 Apply quality processes to confirm that installation has met relevant criteria	Undertake programming tasks and development of spreadsheets. Allocate tasks to others to meet project outcomes. Coordinate activities to meet objectives.		

Learning outcomes	Assessment criteria	Suggested development activity	Evidence type	Portfolio reference and date
3 Be able to lead project planning activities in building services engineering	3.1 Administer building services engineering projects to enable completion on time and within budget 3.2 Identify the factors affecting project implementation 3.3 Create a method statement to implement project 3.4 Create a programme to implement project 3.5 Identify necessary resources needed to implement project 3.6 Communicate with, and brief, the project implementation team 3.7 Identify necessary contractual arrangements with other stakeholders: • client • subcontractors • suppliers	Follow quality processes and procedures. Attend and participate in site meetings. Contribute to preparations /handling of handover/closing documentation.		

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 4: Working Independently in Building Services Engineering

Unit reference number: F/504/6060

Level: 3

Credit value: 12

Guided learning hours: 33

Unit summary

This unit allows the learner to demonstrate that they are able to apply independent judgement and exercise a level of responsibility appropriate to their position in the building services engineering team.

Assessment requirements/evidence requirements

Portfolio of evidence.

Assessment methodology

This unit is assessed in the workplace or in conditions resembling the workplace. Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Indicative mapping

This unit reflects the following competencies from the Engineering Council's Engineering Technician (EngTech) registration criteria:

A2, B2, C2

This unit reflects the following units from the National Occupational Standards in Building Services Engineering Technology and Project Management Level 3:

SST/NOS 1

SST/NOS 2

SST/NOS 5

SST/NOS 6

SST/NOS 7

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Suggested development activity	Evidence type	Portfolio reference and date
1 Understand own responsibilities within building services engineering	1.1 Explain scope of own responsibility within different contexts: • organisational • regulatory • legal • statutory 1.2 Explain remit of own role within a building services engineering project 1.3 Compare issues which may be decided within own authority from those falling outside it	Link own work with the legislative and regulatory framework governing the building services engineering sector and identify relevant issues. Reports critical incidents occurring in the workplace. Prepare a review of the organisation within which the learner works and how their own role fits into this context. Research extent and limits of own authority.		
2 Be able to work independently in building services engineering	2.1 Explain the limits of own knowledge and skills in relation to a given task 2.2 Make independent decisions within the scope of own responsibility 2.3 Work without close supervision to complete a given task	Take responsibility for identifying those areas which are beyond own current engineering knowledge and skills. Link own experience and responsibilities and consider the judgements made when taking decisions. Recognise the importance of differing approaches to the selection of products or equipment to meet project objectives.		

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 5: Commercial Activities in Building Services Engineering

Unit reference number: J/504/6061

Level: 3

Credit value: 8

Guided learning hours: 24

Unit summary

This unit allows the learner to demonstrate that they have built an appropriate awareness of commercial constraints and skills enabling them to participate in commercial activities in building services engineering.

Assessment requirements/evidence requirements

Portfolio of evidence.

The commercial activities specified in this unit focus on cost control and applying contract conditions. Learners are not expected to take responsibility for commercial decisions but need to be aware of them and make appropriate contributions at this level.

Assessment methodology

This unit is assessed in the workplace or in conditions resembling the workplace. Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Indicative mapping

This unit reflects the following competencies from the Engineering Council's Engineering Technician (EngTech) registration criteria:

B2

This unit reflects the following units from the National Occupational Standards in Building Services Engineering Technology and Project Management Level 3:

SST/NOS 4, SST/NOS 6, SST/NOS 7, SST/NOS 8

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Suggested development activity	Evidence type	Portfolio reference and date
1 Be able to control costs against agreed budgets in building services engineering projects	1.2 Appraise the relationship between budget and costs on a building services engineering project 1.2 Identify opportunities for cost savings on a building services engineering project 1.3 Implement cost control systems 1.4 Identify variations to contract requirements 1.5 Implement appropriate remedial action to ensure costs are controlled	Participate in estimating and tendering processes and budget setting. Appreciate cost/benefit calculations. Preparation of variations and instructions within the overall contract terms.		
2 Be able to maintain records for financial control in building services engineering projects	2.1 Use workplace systems to maintain effective records in relation to contractual matters 2.2 Record contract instructions and variations using standard documents and forms	Participate in the process of evaluating contract instructions and variations.		

Learning outcomes	Assessment criteria	Suggested development activity	Evidence type	Portfolio reference and date
	2.3 Calculate additional costs involved of accommodating variations against the original specification			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 6: Health, Safety and Welfare for Building Services Engineers

Unit reference number: L/504/6062

Level: 3

Credit value: 16

Guided learning hours: 56

Unit summary

This unit allows the learner to demonstrate an appropriate level of knowledge in relation to their health, safety and welfare responsibilities.

Assessment requirements/evidence requirements

Portfolio of evidence.

Assessment methodology

This unit is assessed in the workplace or in conditions resembling the workplace. Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Indicative mapping

This unit reflects the following competencies from the Engineering Council's Engineering Technician (EngTech) registration criteria:

C1, E2

This unit reflects the following units from the National Occupational Standards in Building Services Engineering Technology and Project Management Level 3:

SST/NOS 1

SST/NOS 2

SST/NOS 7

SST/NOS 8

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Suggested development activity	Evidence type	Portfolio reference and date
1 Understand the health, safety and welfare legislation relevant to building services engineering	1.1 Explain the impact of relevant health, safety and welfare legislation for the design of a specific building services engineering project 1.2 Explain the use of risk assessments and method statements in meeting the requirements of health, safety and welfare for a specific building services project	Identify and take responsibility for own health, safety and welfare issues. Implement and/or operate health, safety and welfare systems. Apply risk assessments, method statements. Recommend improvements to health, safety and welfare systems. Be proactive about health, safety and welfare practice, including the importance of safety briefings. Annotate a completed design to highlight health and safety provisions incorporated in it.		
2 Be able to work safely in building services engineering	2.1 Apply current health, safety and welfare legislation to building services engineering projects	Achievement of a relevant Construction Skills Construction Scheme Health, Safety and Welfare card.		

Learning outcomes	Assessment criteria	Suggested development activity	Evidence type	Portfolio reference and date
	2.2 Manage health and safety hazards and risks within own control 2.3 Implement safe systems of work including the preparation of: • risk assessments • method statements 2.4 Supervise the safe working of others			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 7: Sustainable Development in Building Services Engineering

Unit reference number: Y/504/6064

Level: 3

Credit value: 8

Guided learning hours: 25

Unit summary

This unit allows the learner to demonstrate that they are aware of sustainability issues in design and working practices and have built an appropriate set of skills in relation to the development of sustainability in building services engineering.

Assessment requirements/evidence requirements

Portfolio of evidence.

Assessment methodology

This unit is assessed in the workplace or in conditions resembling the workplace. Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Indicative mapping

This unit reflects the following competencies from the Engineering Council's Engineering Technician (EngTech) registration criteria:

B2, E3

This unit reflects the following units from the National Occupational Standards in Building Services Engineering Technology and Project Management Level 3:

SST/NOS 3

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Suggested development activity	Evidence type	Portfolio reference and date
1 Understand sustainable practice in building services engineering	1.1 Explain the impact of environmental legislation and regulations on building services engineering design solutions 1.2 Evaluate specialist building service engineering product information based on a sustainable, whole-life design strategy 1.3 Evaluate design solutions to environmental problems arising in building services engineering projects	Read the environmental legislation, regulations and best practice that impacts on own work. Participate in decision making on sustainability matters. Produce reports of actions and decisions relating to environmental sustainability.		

Learning outcomes	Assessment criteria	Suggested development activity	Evidence type	Portfolio reference and date
2 Be able to comply with environmental legislation, regulations and best practice guidelines to create building services engineering solutions	2.1 Produce design proposals for a specific building services engineering function 2.2 Implement environmentally sustainable practices to design solutions in building services engineering projects 2.3 Evaluate completed projects to confirm adherence to design specification for sustainability			

Learner name: _____ Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 8: Interpersonal Skills and Communication in Building Services Engineering

Unit reference number: D/504/6065

Level: 3

Credit value: 12

Guided learning hours: 51

Unit summary

This unit allows the learner to demonstrate that they have built a set of interpersonal skills to communicate with others both directly and through ICT so that project outcomes are met.

Assessment requirements/evidence requirements

Portfolio of evidence.

Assessment methodology

This unit is assessed in the workplace or in conditions resembling the workplace. Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Indicative mapping

This unit reflects the following competencies from the Engineering Council's Engineering Technician (EngTech) registration criteria:

D1, D2

This unit reflects the following units from the National Occupational Standards in Building Services Engineering Technology and Project Management Level 3:

SST/NOS 2

SST/NOS 8

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Suggested development activity	Evidence type	Portfolio reference and date
1 Be able to use appropriate interpersonal skills in engineering settings	1.1 Select appropriate workplace communication methods to meet project outcomes 1.2 Use non-verbal communication on both technical and non-technical matters to create: • technical drawings • amendments and variations • reports • product details • specifications 1.3 Use verbal communication on both technical and non-technical matters to explain: • technical details • function of building services engineering installations	Differentiate between appropriate modes of address for communicating with supervisors, peers, colleagues and clients. Gain experience of effective communication across a variety of media (oral, written and graphic communication). Practice discussing ideas and plans relating to building services engineering with your peers and colleagues. Utilise relevant systems including automated systems to contribute to efficient working. Choose appropriate formats for conveying business and technical data, eg 3D models, drawings spreadsheets, emails etc. Consult with others and understand the working relationships that are required when working with others.		

Learning outcomes	Assessment criteria	Suggested development activity	Evidence type	Portfolio reference and date
	• specification and tolerances of building services engineering equipment			
	1.4 Demonstrate appropriate interpersonal skills when working with others to meet project outcomes: • supervisors • peers • colleagues • clients			
2 Be able to interpret and use building engineering services documents to communicate technical information	2.1 Interpret an engineering drawing to obtain a specification 2.2 Create a building services engineering diagram using appropriate standards, symbols and conventions 2.3 Create a schedule of building services engineering components, fixtures and fittings			

Learner name: Date: _____

Learner signature: _____ Date: _____

Assessor signature: _____ Date: _____

Internal verifier signature: _____ Date: _____
(*if sampled*)

Unit 9: Professional Values for Building Services Engineers

Unit reference number: H/504/6066

Level: 3

Credit value: 4

Guided learning hours: 10

Unit summary

This unit allows the learner to demonstrate that they have developed knowledge and skills in relation to the professional commitment standards in building services engineering.

Assessment requirements/evidence requirements

Portfolio of evidence.

Assessment methodology

This unit is assessed in the workplace or in conditions resembling the workplace. Learners can enter the types of evidence they are presenting for assessment and the submission date against each assessment criterion. Alternatively, centre documentation should be used to record this information.

Indicative mapping

This unit reflects the following competencies from the Engineering Council's Engineering Technician (EngTech) registration criteria:

E1, E4

This unit reflects the following units from the National Occupational Standards in Building Services Engineering Technology and Project Management Level 3:

SST/NOS 4

SST/NOS 7

Learning outcomes and assessment criteria

Learning outcomes	Assessment criteria	Suggested development activity	Evidence type	Portfolio reference and date
1 Understand the ethical practice of building services engineers	1.1 Summarise the provisions of the Royal Academy of Engineering's (RAEng) Statement of Ethical Principles 1.2 Describe the guidelines and conduct of building services engineers as required by the Engineering Council 1.3 Explain the relevance of the Engineering Council's Code of Conduct to: • learners • employers • building services engineers • society as a whole	Read and understand the Chartered Institute of Building Services Engineers' (CIBSE) Code of Conduct and its provenance and use. Read and understand the RAEng Statement of Ethical Principles and its provenance and use Research the codes of conduct of cognate professional bodies and organisations. Promote equal opportunities. Read relevant Professional Engineering Institutes' (PEIs) Continuing Professional Development (CPD) guidance documents.		

Learning outcomes	Assessment criteria	Suggested development activity	Evidence type	Portfolio reference and date
	1.4 Explain the meaning of: • public interest • reputation • fidelity • conflict of interest • equality of opportunity in the context of your role as a building services engineering technician			
2 Be able to comply with the Engineering Council Code of Conduct	2.1 Explain ethical challenges which may arise at work 2.2 Plan and record own Continuing Professional Development (CPD) in accordance with professional body guidelines 2.3 Discuss CPD requirements of colleagues and members of a team	Plan and record own CPD in accordance with professional body guidelines. Where possible, assist in others' CPD. Identify, record and discuss ethical challenges which (may) arise at work. Support CIBSE activities through engagement with events, seminars, Branch activities, Young Engineers' Network etc.		

Learning outcomes	Assessment criteria	Suggested development activity	Evidence type	Portfolio reference and date
3 Be able to produce CPD plans and records to meet the requirements of a professional engineering institution	3.1 Critically evaluate own professional development needs 3.2 Create own CPD plan to meet the professional body code of practice	Maintain professional standards in relation to one's employer and society as well as the wider profession.		

Learner name: _____ Date:_____

Learner signature: _____ Date:_____

Assessor signature: _____ Date:_____

Internal verifier signature: _____ Date:_____
(*if sampled*)

Useful publications

Related information and publications include:

- *Pearson NVQs, SVQs and Competence-based Qualifications Delivery Requirements and Quality Assurance Guidance published* annually
- *Centre Handbook for Pearson NVQs and Competence-based Qualifications* published annually
- functional skills publications – specifications, tutor support materials and question papers
- the current Pearson publications catalogue and update catalogue
- Route to CIBSE Membership (contact by email: membership@cibse.org).

Pearson publications concerning the Quality Assurance System and the internal and standards verification of vocationally related programmes can be found on the Pearson website.

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

How to obtain National Occupational Standards

To obtain the National Occupational Standards for this qualification please go to: www.ukstandards.org.uk.

Professional development and training

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

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

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

The national programme of training we offer can be viewed on our website (qualifications.pearson.com). You can request customised training through the website or by contacting one of our advisers in the Training from Pearson team via Customer Services to discuss your training needs.

The training we provide:

- is active
- is designed to be supportive and thought provoking
- builds on best practice
- may be suitable for those seeking evidence for their continuing professional development.
- CIBSE offers training and advice on using this qualification as part of an advanced apprenticeship framework. For initial enquiries please call CIBSE on telephone number 0208 675 5211.
- For any other enquiries about this qualification and its relationship to the Advanced Apprenticeship in Building Services Engineering Technology and Project Management Framework for Technicians please contact the Pearson Work Based Learning team:

Telephone: 0844 576 0045

Email: wblcustomerservices@pearson.com

Annexe A: Progression pathways

The Pearson qualification framework for the construction and built environment sector

Level	General qualifications	Diplomas	BTEC vocationally-related qualifications	BTEC Specialist / Professional qualification	NVQ / competence
7					Edexcel Level 7 NVQ Diploma in Built Environment Design and Consultancy Practice Edexcel Level 7 NVQ Diploma in Construction Senior Management.

Level	General qualifications	Diplomas	BTEC vocationally-related qualifications	BTEC Specialist / Professional qualification	NVQ / competence
6					Edexcel Level 6 NVQ Diploma in Built Environment Design Management Edexcel Level 6 NVQ Diploma in Construction Contracting Operations Management Edexcel Level 6 NVQ Diploma in Construction Site Management Edexcel Level 6 NVQ Diploma in Senior Site Inspection
5			Pearson BTEC Level 5 HN Diploma in Construction		
4			Pearson BTEC Level 4 HN Certificate in Construction		

Level	General qualifications	Diplomas	BTEC vocationally-related qualifications	BTEC Specialist / Professional qualification	NVQ / competence
3		Pearson Edexcel Level 3 Diploma in Construction and the Built Environment	Pearson BTEC Level 3 Certificate, Subsidiary Diploma, Diploma Extended Diploma in Construction and the Built Environment	Pearson BTEC Level 3 Award, Extended Certificate and Diploma in Construction and the Built Environment	We have many related qualifications at this level. Please go to qualifications.pearson.com for details.
2		Pearson Level 2 Diploma in Construction and the Built Environment	Pearson BTEC Level 2 Certificate, Extended Certificate and Diploma in Construction	Pearson BTEC Level 2 Award, Certificate and Extended Certificate in Construction and the Built Environment (Craft) and Construction and the Built Environment (Technician)	We have many related qualifications at this level. Please go to qualifications.pearson.com for details.
1		Pearson Level 1 Diploma in Construction and the Built Environment	Pearson BTEC Level 1 Award, Certificate, Diploma in Construction	Pearson BTEC Level 1 Award, Certificate, Extended Certificate in Construction and the Built Environment	We have many related qualifications at this level. Please go to qualifications.pearson.com for details.
Entry			Pearson Entry Level BTEC Award in Construction (Entry 3)		

Annexe B: Quality assurance

Key principles of quality assurance

- A centre delivering Pearson qualifications must be an Pearson-recognised and approved centre and must have approval for the individual qualifications that it is offering.
- The centre agrees, as part of gaining recognition and centre approval, to abide by specific terms and conditions relating to the effective delivery and quality assurance of assessment. The centre must abide by these conditions throughout the period of delivery.
- Pearson makes available to centres a range of materials and opportunities to exemplify the processes required for effective assessment and provide examples of effective standards. Approved centres must use the guidance on assessment to ensure that staff who are delivering Pearson qualifications are applying consistent standards.
- An approved centre must follow agreed protocols for: standardisation of assessors; planning, monitoring and recording of assessment processes; internal verification and recording of internal verification processes and dealing with special circumstances, appeals and malpractice.

Quality assurance processes

The approach to quality assured assessment is made through a partnership between a recognised and approved centre and Pearson. Pearson is committed to ensuring that it follows best practice and employs appropriate technology to support quality assurance processes where practicable. The specific arrangements for working with centres will vary. Pearson seeks to ensure that the quality-assurance processes it uses do not inflict undue bureaucratic processes on centres, and works to support them in providing robust internal quality-assurance processes.

The learning outcomes and assessment criteria in each unit within this specification set out the standard to be achieved by each learner in order to gain each unit and through satisfying the rules of combination for the whole qualification. Pearson operates a quality-assurance process, designed to ensure that these standards are maintained by all assessors and verifiers.

For the purposes of quality assurance, all individual qualifications and units are considered as a whole. Centres offering these qualifications must be committed to ensuring the quality of the units and qualifications they offer, through effective standardisation of assessors and internal verification of assessor decisions. Centre quality assurance and assessment processes are monitored by Pearson.

The Pearson quality-assurance processes will involve:

- gaining centre recognition and approval and qualification approval, if a centre is not currently approved to offer Pearson qualifications, through satisfying Pearson approved centre criteria
- annual visits by occupationally competent and qualified Pearson Standards Verifiers for sampling of internal verification and assessor decisions for the occupational sector. The number of visits may be changed to reflect the circumstances at a centre.
- the provision of support, advice and guidance towards the achievement of National Occupational Standards.

Centres are required to declare their commitment to ensuring quality and appropriate opportunities for learners that lead to valid and accurate assessment outcomes.

Annexe C: Centre certification and registration

Pearson Standards Verifiers will provide support, advice and guidance to centres to achieve Direct Claims Status (DCS). Pearson will maintain the integrity of Pearson NVQs and competence qualifications through ensuring that the awarding of these qualifications is secure. Where there are quality issues identified in the delivery of programmes, Pearson will exercise the right to:

- direct centres to take action
- limit or suspend certification
- suspend registration.

The approach of Pearson in such circumstances is to work with the centre to overcome the problems identified. If additional training is required, Pearson will aim to secure the appropriate expertise to provide this.

What are the access arrangements and special considerations for the qualifications in this specification?

Centres are required to recruit learners to Pearson qualifications with integrity.

Appropriate steps should be taken to assess each applicant's potential and a professional judgement should be made about their ability to successfully complete the programme of study and achieve the qualification. This assessment will need to take account of the support available to the learner within the centre during their programme of study and any specific support that might be necessary to allow the learner to access the assessment for the qualification. Centres should consult Pearson's policy on learners with particular requirements.

Pearson's policy on access arrangements and special considerations for Pearson qualifications aims to enhance access to the qualifications for learners with disabilities and other difficulties (as defined by the 2010 Equality Act) without compromising the assessment of skills, knowledge, understanding or competence. Please refer to *Access Arrangements and Special Considerations for BTEC and Edexcel NVQ Qualifications* for further details. www.edexce.com.

Annexe D: Assessment requirements/strategy

The work setting

The assessment requirements for this qualification have been developed by the Chartered Institution of Building Services Engineers (CIBSE) in partnership with employers, training providers, Summitskills, the sector skills council building services engineering, Pearson and the regulatory authorities.

The qualification may be part of a work-based apprenticeship scheme or a CIBSE approved Training and Development scheme. It is recognised as a competence qualification within the 'Design' pathway of the Advanced Apprenticeship in Building Services Engineering Technology and Project Management. CIBSE approval of such a scheme ensures that the working environment enables the learner to achieve the qualification substantively in realistic working environment. Employing companies should contact CIBSE on telephone number 0208 772 3605 if they are interested in approval of their Training Scheme.

Educational institutions providing day/evening/block release will normally have been approved to offer Pearson's BTEC construction and built environment qualifications.

Criteria for defining realistic working environments

A realistic working environment or simulation may be used when learners are unable to obtain direct evidence from the workplace. This may be because:

- some safety issues may not arise in the course of the training period
- some activities may be hazardous
- certain work situations may occur infrequently or not at all within a particular organisation.

Realistic working environments should follow the SummitSkills guidelines in their consolidated assessment strategy (available from www.summitskills.org.uk/qualifications/473) and may include the following:

- equipment such as tools, instruments, materials and ICT, including software; types of contingencies; standards and quality specifications; timescales; physical conditions; quantity of work; relationships with people; information and data.

The use of simulation and/or a realistic working environment should be agreed between the assessor and the learner and with the internal verifier.

Roles and occupational competence of assessors, expert witnesses, mentors, internal verifiers and standards verifiers

- Assessors and verifiers will either have, or be working towards, the relevant Assessor and Quality Assurance qualifications.
- Assessors and verifiers should have recent and relevant industrial experience and up-to-date knowledge at or above Level 3. This may be demonstrated through:
  - cv and references
  - possession of a relevant qualification
  - membership of a relevant professional institution
  - CPD records.
- CIBSE registered engineers and delegated engineers will act as mentors and supervisors in the workplace setting.

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For more information on Edexcel and BTEC qualifications please visit our website: qualifications.pearson.com

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