

## Welcome to the T Level Core Component Workshop

### Building Service Engineering (BSE)

The workshop will begin shortly

Access to the T Level Technical Qualification  
in BSE for Construction (8710) Technical  
Qualification Specification is required as part  
of the workshop activities

An e-copy of the Specification is located  
[here](#).

# Using the Teams platform



**If you need to comment, or have a question, please raise your hand. You can use the chat function as well to ask questions.**



**Please mute when not speaking to avoid background noise. We are delivering from home so apologies for any background noise**



**Feel free to start your video. We will be recording the session, if that's okay with everyone.**



## Agenda

1	Introduction to the workshop panel
2	Technical Qualification Specification core content activity
3	Overview of assessment of core content
4	Q&A



- The 14 knowledge outcomes of the BSE core
- The assessment requirements of these knowledge outcomes



- Occupational specialisms
- Progression
- Industry placements
- Reviewing content



# Introduction to the workshop panel



**Jason Howe**

Technical Advisor- Construction

M: 07912 042313

[Jason.Howe@cityandguilds.com](mailto:Jason.Howe@cityandguilds.com)



**Michael Scarrott**

Product Specialist- EAL

M: 07970 772015

[Michael.Scarrott@eal.org.uk](mailto:Michael.Scarrott@eal.org.uk)



**Rob Mallender**

Technical Advisor- BSE

M: 07789 926163

[Robert.Mallender@cityandguilds.com](mailto:Robert.Mallender@cityandguilds.com)



**Alison Whittle**

Technical Advisor- Post 16

M: 07808330385

[Alison.Whittle@cityandguilds.com](mailto:Alison.Whittle@cityandguilds.com)

# Technical Qualification Specification core content workshop activity

An e-copy of the Specification is  
located [here](#)

# Technical Qualification Specification (Page 53)

## Underpinning knowledge outcomes

On completion of the BSE Core, learners will understand

1. Health and safety in construction
2. Construction science principles
3. Construction design principles
4. Construction and the built environment industry
5. Construction sustainability principles
6. Construction measurement principles
7. Building technology principles
8. Construction information and data principles
9. Relationship management in construction
10. Digital technology in construction
11. Construction commercial/business principles
12. Building Services Engineering (BSE) systems
13. Maintenance principles
14. Tools, equipment and materials

Completion of the Building Services Engineering core will give learners the opportunity to develop their maths, English and digital skills. Details are presented in the skills section of each criterion.

# Technical Qualification Specification (Pages 54 - 60)

## Underpinning knowledge outcome

### 1. Health and safety in construction

- 1.1 legislation and regulations
- 1.2 public liability and employer's liability
- 1.3 approved construction codes of practice
- 1.4 development of safe systems of work
- 1.5 safety conscious procedures
- 1.6 safety inspection of a work environment
- 1.7 implications of not following H&S legislation
- 1.8 safe working practices for the safe isolation of systems

# Technical Qualification Specification (Pages 61 - 66)

## Underpinning knowledge outcome

### 2. Construction science principles

- 2.1 international system of units
- 2.2 derived SI units
- 2.3 materials science principles
- 2.4 mechanical science principles
- 2.5 electricity principles
- 2.6 structural science principles
- 2.7 heat principles
- 2.8 light principles
- 2.9 acoustics principles
- 2.10 earth science principles



# Technical Qualification Specification (Pages 67 - 69)

## Underpinning knowledge outcome

### 3. Construction design principles

- 3.1 benefits of good design
- 3.2 design principles
- 3.3 role of different disciplines involved in design
- 3.4 design process from conception to completion
- 3.5 the concept of the 'whole building', including life cycle assessment

# Technical Qualification Specification (Pages 70 - 74)

## Underpinning knowledge outcome

### 4. Construction and the built environment industry

- 4.1 structure of the construction industry
- 4.2 how the construction industry serves the economy as a whole
- 4.3 integration of the supply chain through partnering and collaborative practices
- 4.4 procurement of projects within the construction sector
- 4.5 managing change requests from various parties
- 4.6 roles and responsibilities of the construction professions and operatives
- 4.7 the role of CPD in developing the knowledge and skills of those working in the sector
- 4.8 building information modelling (BIM)
- 4.9 PESTLE factors
- 4.10 documentation used in construction projects
- 4.11 procedures for handing over projects to clients

# Technical Qualification Specification (Pages 75 - 80)

## Underpinning knowledge outcome

### 5. Construction sustainability principles

- 5.1 sustainability when planning and delivering a construction project
- 5.2 types of sustainable solutions
- 5.3 environmental legislation
- 5.4 environmental performance measures
- 5.5 principles of heritage and conservation
- 5.6 lean construction
- 5.7 waste management legislation
- 5.8 waste management
- 5.9 energy production and energy use
- 5.10 renewable energy and energy conservation
- 5.11 digital technologies

# Technical Qualification Specification (Pages 81 - 82)

## Underpinning knowledge outcome

### 6. Construction measurement principles

- 6.1 accurate and appropriate measurement
- 6.2 standard units of measurement and measurement techniques
- 6.3 measurement standards, guidance and practice

# Technical Qualification Specification (Pages 83 - 86)

## Underpinning knowledge outcome

### 7. Building technology principles

- 7.1 construction methods
- 7.2 forms of construction
- 7.3 key content and required notifications of UK Building Regulations and Approved Documents
- 7.4 building standards
- 7.5 trade Associations and Professional Engineering Bodies in relation the BSE sector
- 7.6 manufacturers' instructions
- 7.7 building structure and fabric
- 7.8 approved documents and guidance for penetrating building structure and fabric

# Technical Qualification Specification (Pages 87 - 89)

## Underpinning knowledge outcome

### 8. Construction information and data principles

- 8.1 data
- 8.2 sources of information
- 8.3 data management and confidentiality
- 8.4 drawings, circuit diagrams and schematics
- 8.5 programming and set up of digital systems using various IT resources

# Technical Qualification Specification (Pages 90 - 94)

## Underpinning knowledge outcome

### 9. Relationship management in construction

- 9.1 stakeholders
- 9.2 roles, expectations, and interrelationships
- 9.3 collaborative working to project delivery and reporting
- 9.4 customer service principles
- 9.5 team work to team and project performance
- 9.6 team dynamics
- 9.7 equality, diversity and representation
- 9.8 negotiation techniques
- 9.9 conflict management techniques
- 9.10 methods and styles of communication
- 9.11 employment rights and responsibilities
- 9.12 ethics and ethical behaviour
- 9.13 sources of information

# Technical Qualification Specification (Pages 95 - 96)

## Underpinning knowledge outcome

### 10. Digital technology in construction

- 10.1 internet of things
- 10.2 digital engineering techniques
- 10.3 opportunities for the use of technology



# Technical Qualification Specification (Pages 97 - 100)

## Underpinning knowledge outcome

### 11. Construction commercial/business principles

- 11.1 business structures
- 11.2 business objectives
- 11.3 business values
- 11.4 principles and examples of corporate social responsibility
- 11.5 principles of entrepreneurship and innovation
- 11.6 measuring success
- 11.7 project management
- 11.8 quality management

# Technical Qualification Specification (Pages 101 - 104)

## Underpinning knowledge outcome

### 12. Building Service Engineering (BSE) systems

- 12.1 building Services Engineering systems
- 12.2 the potential effects on building performance during installation, commissioning and decommissioning of BSE systems
- 12.3 mechanical principles of components
- 12.4 electrical supply
- 12.5 earthing arrangements
- 12.6 cables, accessories and equipment used in older electrical installations
- 12.7 pipework and ductwork, components and systems

# Technical Qualification Specification (Pages 105 - 106)

## Underpinning knowledge outcome

### 13. Maintenance principles

- 13.1 types of maintenance
- 13.2 maintenance plans
- 13.3 typical timeframes between maintenance tasks
- 13.4 documentation required for maintenance and verification of maintenance activities
- 13.5 actions required when faults cannot be rectified

# Technical Qualification Specification (Pages 107 - 108)

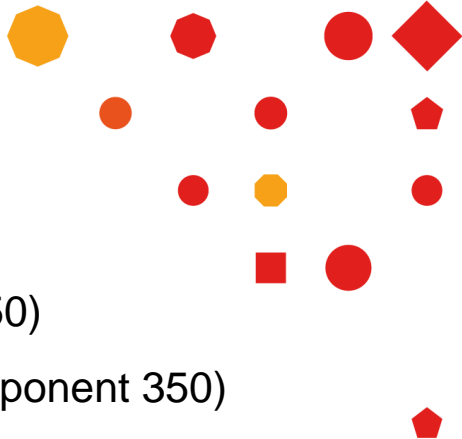
## Underpinning knowledge outcome

### 14. Tools, equipment and materials

- 14.1 methods used to ensure tools, equipment and materials are fit for purpose
- 14.2 maintenance of tools, equipment and materials

# Overview of assessment for core content

# Overview of the Core Assessments



**Learners must complete:**

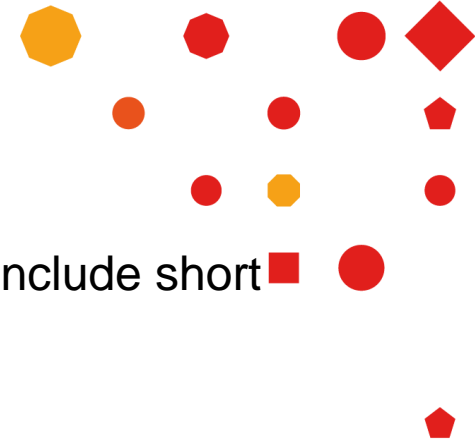
- **Two** externally set exams covering knowledge from the building services engineering core (component 350)
- **One** employer-set project covering knowledge and skills from the building services engineering core (component 350)

**Technical qualification scheme of assessment overview**

Core Component – Learners must complete all assessment components						
Assessment component (number)	Method	Duration	Marks	Weighting	Marking	Grading
Exam paper 1 (031)	Externally set exam	2.5 hours	110	35%	Externally marked	This component will be awarded on the grade scale A* - E
Exam paper 2 (032)	Externally set exam	2.5 hours	110	35%	Externally marked	
Employer-set project (033)	Externally set project	17 hours	100	30%	Externally marked	

- 320 marks in total aggregated to one total score

# Core Theory Exam Paper 1



The exam has been split into two sections which will be made up of different question types that include short answer questions, structured questions, and extended response questions

Each exam paper is made up of two parts:

- Part A (70%)
  - Part B (30%)
- 
- Section A is made up of 77 marks and includes 21 short answer and medium answer questions.
  - Section B is made up of 33 marks and includes 3 extended response questions.
- Both core exams will follow the same structure but each core exams covers different technical content.
- The level of difficulty will increase through the paper with lower demand questions at the beginning of the question paper to higher demand questions at the end of the question paper.

## Content overview:

Health and safety in construction  
Construction design principles  
Construction and the built environment industry  
Construction sustainability principles  
Building technology principles  
Tools, equipment and materials

# Core Theory Exam Paper 2

The exam has been split into two sections which will be made up of different question types that include short answer questions, structured questions, and extended response questions

Each exam paper is made up of two parts:

- Part A (70%)
  - Part B (30%)
- 
- Section A is made up of 77 marks and includes 25 short answer and medium answer questions.
  - Section B is made up of 33 marks and includes 3 extended response questions.

Both core exams will follow the same structure but each core exams covers different technical content.

The level of difficulty will increase through the paper with lower demand questions at the beginning of the question paper to higher demand questions at the end of the question paper.

## **Content overview:**

Construction science principles

Construction measurement principles

Construction information and data principles

Relationship management in construction Digital technology in construction

Construction commercial/business principles

Building Services Engineering (BSE) systems

Maintenance principles



# Employer set project (ESP) sample

Consists of a number of different tasks

Task	Time allocated	Marks
1.1 – Research	3 hours	9 marks
1.2 – Report	6 hours	26 marks
1.3 – Project plan	3 hours	24 marks
1.4 – Presentation	2 ½ hours	18 marks
2.1 – Collaborative problem-solving	1 ½ hours	15 marks
2.2 – Evaluation	1 hour	8 marks
	<b>Total time 17 hours</b>	<b>Total marks 100 marks</b>

- Tasks will be released in order of sequence
- The time allocated and allocation of marks are not related.
- It is the weighting and level of skills being assessed that determine the marks for each task.

# More Information on the ESP

- The employer-set project samples knowledge drawn from across the core content. However, due to their importance all versions of the employer-set project will cover content from the following core underpinning knowledge outcomes of :

- Health and safety
- Construction design principles
- Sustainability principles
- Building services engineering (BSE) systems

## Assessment overview:

- The employer-set project is an assessment made up of several tasks that will take place within controlled conditions, assessing the knowledge and skills learned as part of the core element of the T Level.
- The project only draws on the content from the common core knowledge that sits across all specialisms for BSE
- Students will be marked on the quality and accuracy of the written work they produce.

# Assessment Objectives and Weightings-Employer Set project

Assessment objective	Typical evidence (examples in brief)	Approximate weighting
AO1 Planning skills and strategies	Clearly structured response to brief, cohesive response with ordered sections, logical approach to referencing, research and sources	14%
AO2 Apply knowledge and skills to the context of the project	Relevant core knowledge applied to respond to brief, references relevant legislation, building controls, materials, concepts, waste disposal and site access considerations.	54%
AO3 Analyse contexts to make informed decisions	Analysis of key issues, evidence of risk rating and prioritisation of key issues relating to brief.	10%
AO4 Use maths, English and digital skills	Use of correct terminology, abbreviations, units of measurement in context, (technical versus nontechnical wording), use of calculations/graphs etc appropriately, consideration of the use of ICT in presentation.	16%
AO5 Carry out tasks and evaluate for fitness for purpose	Considered analysis and evaluation of project outcome, what went well and what could be improved.	6%

Employer-Set Project mark distribution

This table illustrates how the 100 marks for the Employer-Set Project are distributed against the tasks and mapped to each assessment objective. These have been set by subject matter experts and employers and will support the comparability between versions of the Employer-Set Project over time.

Tasks	AO1	AO2a	AO2b	AO3	AO4a	AO4b	AO4c	AO5a	AO5b	Total
Part 1										
1.1 Research	2	3	0	2	0	0	2	0	0	9
1.2 Report	6	6	6	2	2	2	2	0	0	26
1.3 Project plan	4	10	6	2	2	0	0	0	0	24
1.4 Presentation	2	6	6	2	0	2	0	0	0	18
Total	14	25	18	8	4	4	4	0	0	77
Part 2										
2.1 Collaborative problem-solving	0	6	5	2	0	0	0	2	0	15
2.2 Evaluation	0	0	0	0	0	4	0	0	4	8
Total	0	6	5	2	0	4	0	2	4	23
AO	14	54		10	16			6		100

## Assessment objectives

The Employer-Set Project is assessed against five assessment objectives (AOs). The assessment objectives are mapped against each task within the marking grids:

	Assessment Objective
AO1	Plan their approach to meeting the project brief
AO2	Apply core knowledge and skills as appropriate
• AO2a	○ core knowledge
• AO2b	○ core skills <ul style="list-style-type: none"><li>- <b>i) communication</b> e.g. providing information and advice to customers and / or wider stakeholders on the potential risks of a change to an industrial system, or making a presentation to a stakeholder on the implications of change</li><li>- <b>ii) work collaboratively</b> with other team members and stakeholders e.g. to develop content to bid for a construction project</li><li>- <b>iii) applying a logical approach to solving problems</b>, identifying issues and proposing solutions e.g. through setting criteria for successful implementation of a system, using cost / benefit analysis of the introduction of new procedures or equipment</li><li>- <b>iv) primary research</b> e.g. obtaining measurements related to a design and / or customer requirement.</li></ul>
AO3	Select relevant techniques and resources to meet the brief
AO4	Use maths, English and digital skills as appropriate
• AO4a	○ maths
• AO4b	○ English
• AO4c	○ digital
AO5	Realise a project outcome and review how well the outcome meets the brief
• AO5a	○ realise a project outcome – was the right outcome achieved
• AO5b	○ review how well the outcome meets the brief, how well was the brief met, the quality of the outcome in relation to the brief

# Questions & answers!

## Survey Link

<https://forms.office.com/Pages/ResponsePage.aspx?id=KTVTy09n106NoplvWJ6pS50Mzlp9eMVKp7Z0j8JQGY9UQ0UzQ0xRV1MzWE1STFIWVzFCQUVN MVM3NS4u>



# Thank you

