

T Level Technical Qualification in Building Services Engineering for Construction

8710-30 Core Report (Summer 2022)

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Foreword

Summer 2022 Results

The technical qualification is made up of two components, both of which need to be successfully achieved to attain the T Level Technical Qualification in Building Services Engineering for Construction. This document covers the Core component only.

As this is the first assessment series, we discussed the approach to standard setting with Ofqual and the other awarding organisations before setting the grade boundaries. We have agreed to award the Core more generously this summer, to recognise the unfamiliarity of providers with the new assessments. This reflects the approach to first awarding in other new or reformed qualifications. It is also designed to avoid learners being disadvantaged in the context of Covid-19 related disruption to learning continuing into the 2021-2022 academic year and where learners taking other qualifications are also seeing some acknowledgement of this in the way the grade boundaries have been determined this year ([What's behind this summer's VTQ results? - The Ofqual blog](#)).

0. Introduction

This document has been prepared to be used as a feedback tool for providers in order to enhance teaching and preparation for assessment. It is advised that this document is referred to when planning delivery and when preparing candidates for the T Level Technical Qualification (TQ) in Building Services Engineering for Construction **core** assessments.

This report provides general commentary on candidate performance in both the examination papers and Employer-Set Project (ESP). It highlights common themes in relation to the technical aspects explored within the assessment, giving areas of strengths and weakness demonstrated by the cohort of candidates who sat assessments in the summer 2022 assessment series.

The grade boundaries (and notional boundaries where appropriate) that were used to determine candidate's final summer 2022 results are also provided. **For summer 2022, as per Ofqual guidance, these grades recognise that these are new qualifications, and the ongoing impact of the pandemic.**

More information regarding T Levels TQ grading, awarding, UMS and rules for retakes can be found in the T Levels Technical Qualifications Grading Guide available on the [City & Guilds T Levels Resources and Support Hub](#).

1. 8710-031 Paper 1

This exam paper covers the following elements of the Buildings Services Engineering core content:

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

This exam paper allowed for candidates to demonstrate a broad range of subject knowledge within the Building Services Engineering core element.

The exam has been split into **two** sections. Below details the types of questions and marks available for each section.

Section A is made up of **77** marks and includes **19** short answer and medium answer questions.

Section B is made up of **33** marks and includes **3** extended response questions.

The exam is designed to provide sufficient sampling across the content and consists of a mixture of short answer questions (SAQs), some of which will be structured, and extended response questions (ERQs). The exam assesses across assessment objectives (AOs) 1a/b, 2 and 3 that will allow for the appropriate differentiation of candidates to support the reliable setting of boundaries. The assessment objectives represent the following:

- **AO1 a** Demonstrate knowledge
- **AO1 b** Demonstrate understanding
- **AO2** Apply knowledge and understanding to different situations and context
- **AO3** Analyse and evaluate information and issues

This was the first year for the exam component. Overall, the majority of candidates within the cohort were able to demonstrate knowledge of the core content, often scoring marks for recalling knowledge when asked to name, state or identify information. There was a clear differentiation of performance within the cohort when candidates were asked to demonstrate understanding, application, analysis, or evaluation. Often lower scoring candidates achieved marks by demonstrating knowledge, but struggled to show any further depth of understanding of the subject.

It was very noticeable that candidate's responses to some questions, clearly identifies that technical terminology is not understood, in terms of the meaning of words/language. This misunderstanding and limited interpretation of technical terminology meant that some candidates did not answer what these questions were asking and therefor were unable to achieve any/many of the available marks.

Topic areas that were well responded to by most candidates were:

- Health and Safety
- Construction design principles
- Tools, equipment and materials

Both the high achieving and low achieving candidates responded well to these topic areas, with the high achieving candidates responding with more depth and detail in their responses, in comparison to the low achieving candidates.

Topic areas that were not well responded to by most candidates were:

- Construction and the built environment industry
- Construction sustainability principles
- Construction building technology principles

Overall, the low achieving candidates seemed to find these topic areas very challenging and some candidates didn't respond at all. The majority of the high achieving candidates attempted these topic-based questions, responding with some depth and detail.

Most candidates responded well to Q16, which was the only maths type question in the paper, correctly interpreting the Gantt chart provided.

Overall, it was evident that candidates would benefit from support in developing their extended response answering techniques, as candidates underperformed in Section B of this exam. Candidates did not supply sufficiently coherent content within their responses to gain access to the full range of higher marks. Candidates should take particular care to read the extended response questions carefully and ensure they answer all elements of the questions. Many candidates focussed on particular elements of the extended response questions, rather than holistically looking at the questions as a whole.

For example, one of the ERQ questions asked candidates to analyse the **uses** and **purposes** of BIM within a construction project. The question further asks the candidates to **discuss** the **government level** of BIM. Candidates' responses overall did not address the question fully, as responses never encompassed all question elements to access the higher marks available. Candidates were able to demonstrate knowledge of BIM, its uses and purpose within construction, however they struggled to evaluate the government level of BIM, therefore limiting them to the lower mark bands.

ERQ performance could be further enhanced by preparing candidates to consider in-depth explanations, analysis and evaluation on different scenarios, such as systems, processes and sequences etc. Candidates should also develop their ability to take their knowledge of subject matter and consider the wider impact of that concept on industry.

2. 8710-032 Paper 2

This exam paper covers the following elements of the Buildings Services Engineering core content:

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

This exam paper allowed for candidates to demonstrate a broad range of subject knowledge within the BSE core element.

The exam has been split into **two** sections. Below details the types of questions and marks available for each section.

Section A is made up of **77** marks and includes **20** short answer and medium answer questions.

Section B is made up of **33** marks and includes **3** extended response questions.

The exam is designed to provide sufficient sampling across the content and consists of a mixture of short answer questions (SAQs), some of which will be structured, and extended response questions (ERQs). The exam assesses across assessment objectives (AOs) 1a/b, 2 and 3 that will allow for the appropriate differentiation of candidates to support the reliable setting of boundaries. The assessment objectives represent the following:

- **AO1 a** Demonstrate knowledge
- **AO1 b** Demonstrate understanding
- **AO2** Apply knowledge and understanding to different situations and context
- **AO3** Analyse and evaluate information and issues

This was the first year for the exam component.

Overall, the majority of candidates within the cohort were able to demonstrate knowledge of the core content, often scoring marks for recalling knowledge when asked to name, state or identify information. There was a clear differentiation of performance within the cohort when candidates were asked to demonstrate understanding, application, analysis, or evaluation. Often lower scoring candidates achieved marks by demonstrating knowledge, but struggled to show any further depth of understanding of the subject. This included not showing working out of both formulae and calculations, as well as not providing the units of measurement for values and figures calculated. Candidates also found it challenging when having to respond against and follow question command verbs. Again this was clearly evident across the exam cohort and throughout the paper. Providers should place an emphasis on how candidates should respond to the command verbs used in questions during the course delivery and exam preparation and revision.

It was very noticeable that candidate's responses to some questions, clearly identifies that technical terminology is not understood, in terms of the meaning of words/language. This misunderstanding and limited interpretation of technical terminology meant that some candidates did not answer what these questions were asking and therefore were unable to achieve any/many of the available marks.

The exam cohort as a whole found this paper extremely challenging across many of the questions. It was evident that there are significant gaps in candidate knowledge and understanding across the core content topics in general. Many candidates did not attempt a number of questions in the exam at all.

Topic areas that were well responded to by high achieving candidates are as follows:

- Construction science principles
- Construction measurement principles
- Relationship management in construction

However, few candidates responded well to these topic areas, responding with some depth and detail in some questions and able to achieve the majority of available marks. However, many candidates found the science and measurement principle questions extremely challenging and responses were either missing completely or poor.

Topic areas that were not very well responded to by most candidates, across the exam cohort as a whole, are as follows:

- Construction science principles
- Construction measurement principles
- Relationship management in construction
- Construction information and data principles
- Construction sustainability principles
- Digital technology in construction
- Construction commercial/business principles
- Building Services Engineering (BSE) systems
- Maintenance principles

Overall, the low achieving candidates found these topic areas very challenging, when making a response. Hence, some candidates didn't respond at all. The high achieving candidates attempted these topic-based questions, responding with some depth and detail.

The majority of candidates did not respond very well to the science and measurement principal type question in the paper. In many instances, candidates didn't attempt the questions, offering no response. It was evident that candidates had limited knowledge and understanding in these core topics. Centres need to address these topic areas in more depth, with purposeful revision questions for candidates to practise and improve their abilities.

Overall, it was clearly evident that candidates' extended response answering techniques need to be further developed in general, as candidates underperformed in this exam section. Candidates did not supply sufficiently coherent content within their responses to gain access to the full range of higher marks. Candidates should take particular care to read the extended response question carefully and ensure they answer all elements of the question. Many candidates focussed on particular elements of the extended response question, rather than holistically looking at the question as a whole.

For example, one of the ERQ questions asked candidates to explain how a proposed new development can create a flood risk, including evaluating flood risk reduction methods that could be implemented, to combat flooding issues. The question response needs to be two-fold, as the question is asking for two explanation/discussion points. Candidate's responses overall did not address the question fully, as responses never encompassed all question elements to access the higher marks available.

ERQ performance could be further enhanced by preparing candidates to consider in-depth explanations, analyses and evaluations on different scenarios, such as systems, processes and sequences etc.

3. 8710 Sub-Component: Exam

Providers should also be advised that there are resources available to help guide and support both provider staff and candidates. This includes a course textbook which is designed to assist in delivery of the BSE core content and exam preparation and revision.

There were some points that were noted across candidates' performance in both exam papers.

- Some of the papers had very unclear handwriting, making it difficult for the marker to read the response. Providers should encourage candidates to ensure their handwriting is legible. Writing in block capital letters is a possible solution if a candidate's handwriting is not legible.
- Providers should support candidates on developing their skills in writing responses to questions that ask for demonstrating of understanding, application of knowledge, analysis and evaluation.
- Candidates would benefit from understanding what different command verbs are asking of them. For example, the type of response required by an 'Explain' question requires a higher level of response than a 'Describe' question. Candidates should be reminded of the need to ensure they fully read and understand all questions before responding. In particular, the ERQ scenario-based questions in Section B and questions assessing both understanding and application of knowledge and understanding.
- An additional focus for candidates should be applied to making sense of what is being asked of them in the question. For example, they need to identify if the question is asking about a component's individual function or the component's function within a system.
- Providers should be aware, of using the sample and past series questions on the City & Guilds webpages, to help and guide both provider staff and candidates.

Grade boundaries

The table below shows the grade mark ranges for the Exam, along with the notional boundaries for Paper 1 and Paper 2 – **for the summer 2022 series.**

Grade	Mark range	Notional boundaries	
		Paper 1 (8710-031)	Paper 2 (8710-032)
A*	135 - 220	69 - 110	65 - 110
A	120 - 134	62 - 68	58 - 64
B	105 - 119	54 - 61	50 - 57
C	90 - 104	46 - 53	42 - 49
D	75 - 89	39 - 45	35 - 41
E	60 - 74	32 - 38	28 - 34
Unclassified (U)	0 - 59	0 - 31	0 - 27

4. 8710-033 Sub-Component: Employer-Set Project

The Employer-Set Project (ESP) assessment is a project comprised of a number of tasks, based on a scenario comparable to a real-life project in the industry. The assessment is designed to allow candidates to show how they can perform on a project using the core knowledge and skills. This approach to assessment emphasises to candidates the importance and applicability of the full range of their learning to industry practice.

The ESP covers the following elements of the Buildings Services Engineering core content:

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

The Employer-Set Project allowed for candidates to demonstrate a broad range of subject knowledge within the BSE Core element.

The ESP assesses across assessment objectives that will allow for the appropriate differentiation of candidates to support the reliable setting of boundaries. The assessment objectives represent the following:

- **AO1** Planning skills and strategies
- **AO2** Apply knowledge and skills to the context of the project
- **AO3** Analyse contexts to make informed decisions
- **AO4** Use maths, English and digital skills
- **AO5** Carry out tasks and evaluate for fitness for purpose

This was the first year for the exam component.

The project is based around a brief which provides information on a BSE project and specific relevant details and resources. Candidates have to draw on their Core knowledge and skills and independently select the correct processes and approaches to take to provide a solution and the evidence specified in the project brief. All tasks are completed under supervised/controlled conditions.

Generally, candidates responded well to the SP and its constituent tasks. Candidates demonstrated good research skills as a solid foundation to start the project. Presenting their work and debating within a team allowed candidates to demonstrate their knowledge confidently. Providers should be encouraged by the quality of the ESP produced by candidates. Candidates were able to use the time provided on the different tasks well, with very few weaknesses in the full answers given with no evident gaps.

Employer-Set Project tasks overview

Task	Task type	Assessment Objectives covered	Max mark	Task weighting
1.1	Research	AO1: Knowledge, AO2a: Apply knowledge, AO3: Select, AO4c: Digital	9	9%
1.2	Report	AO1: Knowledge	6	26%
		AO2a: Apply knowledge, AO2b: Apply skills	12	
		AO3: Select	2	
		AO4a: Maths, AO4b: English, AO4c: Digital	6	
1.3	Plan	AO1: Knowledge, AO3: Select, AO4a: Maths	8	24%
		AO2a: Apply knowledge, AO2b: Apply skills	16	
1.4	Presentation	AO1: Knowledge, AO3: Select, AO4b: English	6	18%
		AO2a: Apply knowledge, AO2b: Apply skills	12	
2.1	Collaborative Problem Solving	AO2a: Apply knowledge, AO2b: Apply skills, AO3: Select, AO5a: Realise project outcome	15	15%
2.2	Evaluation	AO4b: English, AO5b: Review outcome against brief	8	8%

Task 1.1 Research:

Research site requirements and provision for welfare, first aid, site administration, services and site evacuation plans.

- Overall, the research was undertaken successfully by the majority of candidates, although misunderstanding of the project brief cost marks for candidates.
- Not all elements of the project brief were considered by the candidates whilst conducting their research. Some candidates did not research everything specified in the list, despite the task instructions saying they needed to, which limited their access to higher mark bands.
- Candidate's research was not always referenced as required by the task and, in some instances, not referenced at all.
- Most candidates did not provide any explanation as to requirements of the task and where their research was relevant.
- A number of candidates used copy and paste to lift information directly from websites. This was evident on a number of completed tasks and included various fonts/sizes and text styles.

Actions providers can take to support assessment preparation for future series:

Providers are advised to ensure candidates are briefed in relation to task requirements and to ensure they meet the requirements of each task. Providers are also advised to work with candidates to improve their skills in relation to research and correct referencing.

Task 1.2 Report:

Produce a report detailing locations and provision of welfare, first aid, site administration, services and site evacuation plans.

- A number of candidates did not meet the requirements of the task, with elements of the task not addressed in the report.
- Most candidates found this task challenging and used the copy and paste function to reproduce the information obtained in Task 1.1, without amending the structure or tailoring content to meet the requirements of the report.
- Many candidates provided no reasoning/justification for decisions made.
- As with Task 1.1 not all elements of the project brief were considered, for example the location of welfare facilities and the justifications for this.
- The evidence offered from the majority of candidates was very brief.

Actions providers can take to support assessment preparation for future series:

Providers are advised to ensure candidates have the opportunity to develop their report writing skills including providing justifications where required.

Task 1.3 Project plan:

Choosing one BSE system, plan the key stages of the installation and commissioning of the system to tie in with the construction schedule in the project brief.

- There appeared to be some misunderstanding for some candidates in relation to the task requirements for Task 1.3 and not all were able to focus on **one** BSE system and discuss the installation stages of their chosen system. Not all candidates produced any type of programme of work plan, as required by the task.
- Some candidates produced a written statement, but it did not support or justify their programme of work plan.
- There were missed opportunities linking to the considerations included in the task brief including specialist equipment, contractors and waste management.
- The majority of candidates did not meet the requirements to an acceptable standard, missing out on higher mark bands due to a lack of demonstration of plan effectiveness and understanding.

Actions providers can take to support assessment preparation for future series:

Providers are advised to ensure candidates have the opportunity to develop the skills required, to plan a project including the production of Gantt charts and programme of works.

Task 1.4 Presentation:

Present your findings from Task 1.2 and Task 1.3 to the BSE installations team.

- A number of candidates had information and details omitted due to not fully reading the requirements of the brief and previous tasks. This had an impact on marks awarded.
- Some PowerPoint presentations included more text than needed on each slide.
- Some PowerPoints were copied directly from previous tasks.
- Some candidate's presentation skills were very weak with not all information being relayed effectively and the audience outlined in the task not considered.
- Not all candidates identified themselves at the beginning of the task, as per the guidance instructions.

Actions providers can take to support assessment preparation for future series:

Providers are advised to ensure observation reports are consistent, some providers used verbs and vocabulary from the marking grid which was helpful to markers, but most providers only made short comments.

Providers are reminded that observation records must be completed and uploaded as part of the evidence upload. These must be based on the candidate's performance using the terminology from the sample marking grids. Notes must be detailed, accurate and differentiating. They should identify areas of strength and weakness to distinguish different levels of performance quality.

Providers are advised to ensure candidates have the opportunity to develop their presentation skills including the production of presentations and presenting information to an audience.

Markers also noted that the video evidence uploaded by some providers did not play or had poor sound. Providers are advised to check the quality of video evidence prior to submitting it and to ensure that microphones are used.

Task 2.1 Collaborative problem-solving:

In small groups discuss a number of heating and hot water power source options including advantages and disadvantages relating to each.

- Most candidates completed this task to a reasonable standard including producing the supporting email.
- Some candidates failed to fully engage in the collaborative task due to a lack of preparation.
- Not all candidates identified themselves at the beginning of the task, as per the guidance instructions.

Actions providers can take to support assessment preparation for future series:

Providers are advised to ensure observation reports are consistent, some providers used verbs and vocabulary from the marking grid which was helpful to markers but most providers only made short comments. These records must use positive language throughout.

Providers are advised that this task should be completed with a maximum of three candidates at a time. Providers are reminded that tutors should not lead on this task.

Markers also noted that the video evidence uploaded by some providers did not play or had poor sound. Providers are advised to check the quality of video evidence prior to submitting it and to use microphones.

Providers to introduce candidates or give them ID sheet when working on the collaborative task to enable easy identification of candidates.

Task 2.2 Evaluation:

Complete an evaluation with reference to all tasks completed detailing how the work met the brief requirements, what elements were successful and what skills and knowledge have been developed.

- The evaluation was attempted reasonably well by most candidates.
- Not all candidates linked their evaluation to the task and project brief.
- Candidates did not provide explanations as to how they met the requirements of the brief.
- Most candidates gave a task-by-task explanation of their work.

Actions providers can take to support assessment preparation for future series:

Providers are advised to ensure candidates have the opportunity to develop their self-evaluation skills, including evaluation their performance against the requirements of each task, and how they could improve.

Best practice and guidance

Providers to ensure files and documents are named better to ensure consistency and ease of access. This also includes the use of assessment component headers.

Task_1.4_presentation_[Registration numbers #]_[surname]_[first letter of first name]

Task_1.4_observation record_[Registration numbers #]_[surname]_[first letter of first name]

In some instances, providers uploaded evidence for the incorrect candidate. Providers should be aware that this could lead to a delay in results being issued.

Providers are strongly encouraged to use evidence headers for each task, to allow for ease of identification of candidate evidence and efficiency in marking. All information within the task headers should be completed. Candidate evidence should be included within the header document and not as a separate file.

Observation records should be submitted as separate documents for each task and not scanned into one document.

The 'what must be presented for marking' section of each task outlines the minimum expectations of evidence that must be submitted for marking. Providers must detail where evidence has not been submitted.

Providers are advised that all tasks are marked in isolation and that each task has been weighted in relation to the assessment objectives covered. This information is detailed in the qualification handbook. Providers are advised that as all tasks are marked separately, where evidence is produced by a candidate contained elsewhere, in another task, within the Employer Set Project, no marks will be awarded for that evidence. The only evidence considered for the marking of an individual task is what is listed within the 'what must be produced for marking' section within the assessment materials. Evidence for another task that may demonstrate knowledge or skills will not be considered when marking that task.

Providers are advised to ensure the tutor and candidate both sign and date declarations prior to uploading evidence.

Providers should request that candidates include a word count for all written reports and tasks where applicable.

Grade boundaries

The table below shows the grade mark ranges for the Employer-Set Project – **for the summer 2022 series.**

Grade	Mark range
A*	74 - 100
A	65 - 73
B	56 - 64
C	47 - 55
D	38 - 46
E	30 - 37
Unclassified (U)	0 - 29

5. 8710-30 Building Services Engineering Core

The T Levels Technical Qualification (TQ) in Building Services Engineering for Construction core is made up of the below sub-components (and weightings).

- Exam (70%)
- Employer-Set Project (30%)

UMS grade boundaries

The table below shows the UMS values available for grades in the sub-components. It also shows the UMS values required to achieve each grade for the overall Core. This table will not vary across the series, the values are fixed for this TQ.

Grade boundary	Exam sub-component	ESP sub-component	Overall Core
A*	252 - 280	108 - 120	360 - 400
A	224 - 251	96 - 107	320 - 359
B	196 - 223	84 - 95	280 - 319
C	168 - 195	72 - 83	240 - 279
D	140 - 167	60 - 71	200 - 239
E	112 - 139	48 - 59	160 - 199
Unclassified (U)	0 - 111	0 - 47	0 - 159

Get in touch

The City & Guilds Quality team are here to answer any queries you may have regarding your T Level Technical Qualification delivery.

Should you require assistance, please contact us using the details below:

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Web chat available [here](#).

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