

# T Level Technical Qualification in Onsite Construction (8711)

Onsite Construction Core (8711-30) - Theory exam (1) (8711-031)

## **Mark Scheme**



#### Marker guidance

Unless otherwise stated in the marker guidance for a specific question, the following conventions apply:

- All marking, from start to finish must be consistent and in line with the mark scheme guidance. Continue to refer to the mark scheme throughout marking.
- For questions that ask for a specific number of points, accept the first answers given up to the number requested e.g. State three... only accept the first three answers listed, and disregard any additional answers provided.
- For questions requiring continuous prose answers, mark positively all correct answers should receive the appropriate mark according to the mark scheme. Any wrong (**but neutral**) answers should be ignored, and no marks should be lost.
- In some circumstances, it is appropriate to disallow a candidate answer that initially appears to give the correct answer as given in the mark scheme, if it is undermined by the fact that it goes on to actively **contradict** its intention. Sometimes the minimal wording used in the mark scheme allows a match that in reality is trivial and it is clear the candidate is referring to the wrong knowledge/understanding. Only the part of the response to which the contradiction applies should be disallowed, not the whole response. Material that is irrelevant/neutral but not contradictory should be ignored and positive marking applied as above.
- Use all marks for a question as described by the mark scheme e.g. for a 2-mark question, 0, 1 or 2 marks will always be available to award (never just 0 or 2). For levels marking, the full range of marks should be used freely as described by the mark scheme including 0 and full marks.
- Always award whole marks; ½ marks cannot be awarded.
- Allow phonetic misspellings as long as the meaning is clear, i.e. not so similar to another relevant but wrong term that you have to guess which was intended.
- Only allow 'it' as reference to the question topic if it is clear what 'it' refers to.
- Mark crossed out work UNLESS it has been replaced by another response.
- Where judgement is required, apply the guidance. Where the guidance does not sufficiently support for a particular candidate response/interpretation, contact your Team Lead.
- Contact your Team Lead if any additional correct answers arise which need to be added to the mark scheme.
- For level of response mark schemes:
  - First, read the full candidate response and decide which band descriptor best fits the overall level of quality of the response.
  - Then, to decide on a mark within the band, consider the *degree to which* the **response fits the criteria** depending on the number of marks in the band.

Comprehensively	Top of mark range for the band	5 <sup>th</sup>	4th	3rd
Substantially		4th	3rd	
		3rd		2nd
Generally		2nd	2nd	
Borderline	Positively mark and place on the bottom of the band	1st	1st	1st

The table below provides further detail on the descriptors used within each of the mark bands and what is expected at each level. Use the descriptors below alongside the mark scheme to support accurate and consistent judgment of candidate's response and allocation of marks.

	AO2	AO3a	AO3b
Basic	Limited understanding that is relevant to the context or question. Limited accuracy in interpretation through lack of application of relevant knowledge and understanding.	Limited accuracy in analysis through lack of application of relevant knowledge and understanding.	Un-supported evaluation through lack of application of knowledge and understanding. Un- supported judgement through lack of application of knowledge and understanding.
Good	Some understanding that is relevant to the context or question. Some accuracy in interpretation through the application of some relevant knowledge and understanding.	Some accuracy in analysis through the application of some relevant knowledge and understanding.	Partially supported evaluation through the application of some relevant knowledge and understanding. Partially supported judgement through the application of some relevant knowledge and understanding.
Thorough	A range of accurate understanding that is relevant to the context or question. Accurate interpretation through the application of relevant knowledge and understanding.	Accurate analysis through the application of relevant knowledge and understanding.	Supported evaluation through the application of relevant knowledge and understanding. Supported judgement through the application of relevant knowledge and understanding.
Comprehensive	A range of detailed and accurate understanding that is fully relevant to the context or question. Detailed and accurate interpretation through the application of relevant knowledge and understanding.	Detailed and accurate analysis through the application of relevant knowledge and understanding.	Detailed and substantiated evaluation through the application of relevant knowledge and understanding. Detailed and substantiated judgement through the application of relevant knowledge and understanding.

#### **Assessment Objectives**

AO1a	AO1b	AO2	AO3
Recall of knowledge	Demonstrates understanding	Apply knowledge and understanding to different situations and contexts	Analyse and evaluate information and issues

The exam has been split into two sections.

Below details the types of questions and marks available for each section. Please allow time for each section accordingly.

Section A is made up of 60 marks and includes 18 low tariff and medium tariff, short answer questions, which target recall of knowledge, demonstration of understanding and application of knowledge and understanding.

Section B is made up of 30 marks and includes 3 extended response questions, which target application of knowledge and understanding **and** analysis and evaluation of information and issues.

## Section A

Q1	A construction operative is required to k to working in construction. State <b>two</b> types of CPD that could fulfil		es specific	ally related
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO
	<ul> <li>In-house training</li> <li>External training courses</li> <li>Professional bodies training</li> <li>Technical/professional conferences</li> <li>Open distance learning</li> <li>Sharing best practice</li> <li>Trade journals</li> </ul>	Award 1 mark for each up to a maximum of 2 Accept any other suitable answer that show types of CPD available in the construction Industry	2	4.6 AO1a
ко	KO4 Construction & the built environme	ent industry		-
Paper	4 lines			

Q2	State <b>two</b> methods of tendering for a p	roject.		
	Acceptable answer(s)		Max marks	Test Spec ref & AO
	<ul> <li>Open</li> <li>Selective</li> <li>Two-stage</li> <li>Preferred supplier</li> <li>Negotiated</li> </ul>	Award <b>1 mark</b> for each up to a maximum of 2 Accept any other suitable answers	2	4.4 AO1a
КО	KO4 Construction & the built environme	ent industry	-	1
Paper	2 lines			

Q3	Name parts A and B of the foundation connect	ion in fig X		
	fig X	A		
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref
				& AO
	A = base plate/ column base plate/ stanchion base/ steel base plate	Award <b>1 mark</b> for each	2	& AO 7.2 AO1a
KO	base/ steel base plate B = Holding down bolts	Award <b>1 mark</b> for each	2	7.2
ко	base/ steel base plate	Award <b>1 mark</b> for each	2	7.2
KO Paper	base/ steel base plate B = Holding down bolts	Award <b>1 mark</b> for each	2	7.2

Q4	Construction work can result in the production of waste materials that are considered to be hazardous and therefore require specialist measures when disposing of them. Identify <b>three</b> materials where this is required.				
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO	
	<ul> <li>Asbestos</li> <li>Solvents/chemicals/paint</li> <li>Plasterboard</li> <li>Oils</li> <li>Batteries</li> <li>Refrigerants</li> </ul>	Award <b>1 mark</b> for each up to a maximum of 3 Accept any other answers that identifies other hazardous material that require specialist waste measures	3	5.8 AO1a	
ко	KO5 Construction sustainability princip	les	-	1	
Paper	3 lines				

Q5	Give <b>three</b> examples of safe working proc conscious behaviours within a construction	cedures that aim to promote and support safety on environment.		
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO
	Award marks for a suitable description that covers the following points: Company management systems Risk assessments Method statements Permits to work Safety notices CSCS cards	Award <b>1 mark</b> for each up to a maximum of 3 Accept any other answers that provides examples of safe systems	3	1.5 AO1b
КО	KO1 Health and safety	·		
Paper	6 lines			

Q6	You are contracted to assist in the refurbishment of a grade II listed building. State the <b>two</b> main cost factors that would need to be consider during the planning and				
	design stage of the refurbishment of the G	•	anning ar	IC	
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO	
	<ul> <li>Award marks for a suitable answer that covers the following points:</li> <li>Listed buildings require specialist materials which cost more</li> <li>Use of specialist labour skills which cost more</li> <li>Paying for professional fees</li> </ul>	Award <b>1 mark</b> for each up to a maximum of 2	2	3.1 AO1b	
КО	KO3 Construction design principles				
Paper	4 lines				

Q7	Give <b>two</b> examples of the purpose of the Envir controlled waste.	ronmental Protection Act in dea	aling with	
	Acceptable answer(s)	Guidance	Max mark s	Test Spec ref & AO
	<ul> <li>Award marks for answers that give examples of the purpose of the Environmental Protection Act in dealing with controlled waste, to include:</li> <li>Waste strategy/plans/provision (1)</li> <li>Prevent unauthorised/illegal activities (1)</li> </ul>	Award <b>1 mark</b> each up to a maximum of 2 Award marks for any other relevant example of the purpose of the Environmental Protection Act that relates to dealing with controlled waste	2	5.3 AO1b
ко	KO5 Sustainability principles		•	
Paper	6 lines			

	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO
	Award marks for answers that demonstrate an understanding of the role of the Local Authority Planning Officer, to include: <b>Responsibility</b> To report to the planning committee (1) <b>Explanation</b> To advise them on the requirements of the building plans (1) <b>Responsibility</b> To collate comments for submission to planning meetings and ensure all stakeholders are informed of plans (1) <b>Explanation</b> So stakeholders/ planning committee can assess whether the proposed development is likely to be given permission (1)	Award <b>1 mark</b> for each responsibility up to a maximum of 2 marks Award <b>1 mark</b> for each explanation of responsibility up to a maximum of 2 marks Accept any suitable alternative answers that relate to the context of the question. <b>Do not accept</b> - advising the person submitting on potential outcomes	4	3.3 AO1b
KO	KO3 Construction design principles			

	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO
	Award marks for answers in the form of an explanation that cover the following points:	Award 1 mark for each benefit up to a maximum of 2 marks	4	4.7 AO1b
	Each team receives the same (1) up-to- date information (1) in context with other work proceeding at the same time (1)	Award <b>1 mark</b> for each explanation of benefit up to a maximum of 2 marks		
	encouraging teamwork/collaborative working (1) promoting efficiency in time and materials (1)	Accept alternative explanations that demonstrates a clear understanding of the benefits of BIM for teams working on the same project		
КО	KO4 Construction & the built environment	industry	1	
Paper	8 lines			

Q10	Describe <b>two</b> methods of establishing whe regulations approval.	ether a construction project requi	res buildin	g
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO
	<ul> <li>Answers may include the following methods</li> <li>Checking the .gov website on building regulations approval</li> <li>Checking with the Local Authority building control officer</li> <li>Consulting with an independent specialist</li> <li>Consulting the competent persons scheme provider</li> </ul>	Award <b>1 mark</b> for each suitable method up to a maximum of 2 marks Accept any other relevant method to determine whether a construction project requires building regulations approval	2	7.3 AO1b
ко	KO7 Building technology principles			
Paper	4 lines			

Q11	What advantages are there in using an int	egrated supply chain on constr	construction projects?			
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO		
	Award marks for answers that demonstrate understanding of an integrated supply chain on construction projects, may include: Reduced resource costs (1) without reducing margins (1), which encourages reduced waste (1) lower construction costs (1), better value for money for the client (1)	Award <b>1 mark</b> for each advantage to a maximum of 4 marks Accept any other answers that demonstrate understanding of the advantages of using an integrated supply chain supply chain on construction projects.	4	4.3 AO1b		
ко	KO4 Construction & the built environment	industry				
Paper	8 lines					

Q12	State <b>one</b> benefit of off-site construction.	Give an explanation of your an	nswer.			
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO		
	Award marks for answers that demonstrate understanding of off-site construction methods and its benefits. Answers to include an explanation any of the following: Wastage Safety Efficiency Cost effective	Award <b>1 mark</b> for the benefit Award <b>1 mark</b> for the explanation of the benefit Award marks for any alternative benefit and suitable explanation	2	7.1 AO1b		
ко	KO7 Building Technology Principles					
Paper	4 lines					

Q13	A small domestic dwelling is to be built on Suggest the most suitable type of foundati detailed explanation or your recommendat	on that would be used for this p	-	ing a
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO
	<ul> <li>Strip foundations (1).</li> <li>Award marks for answers that explain the reason for using a strip foundation in this context.</li> <li>Reasons: <ul> <li>Suitable for land to be built on (i.e. good bearing capacity) (1)</li> <li>Cost effective (1)</li> <li>Easy to build (1)</li> <li>Ability to withstand great loads (1)</li> <li>Very long service life (1)</li> </ul> </li> </ul>	Award <b>1 mark</b> for the answer and up to a maximum of 5 marks for the reasons Accept alternative suitable reasons that are relevant to the context	6	7.2 AO2
КО	KO7 Building technology principles			
Paper	8 lines			

Q14	A client has decided to build using structural insulated panels (SIPS) rather than more traditional methods of construction.				
	Explain the advantages of using this method	od.			
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO	
	Accept answers that demonstrates an understanding of structural insulated panels (SIPS)	Award <b>1 mark</b> for each explanation up to a maximum of 4 marks	4	7.1 AO2	
	The panels are prefabricated ensuring better quality control (1) are very strong (1) but lightweight compared to other methods (1) due to fewer materials used (1) are very thermally efficient (1) and allow open loft spaces (1)	Accept alternative suitable answers that are relevant to the context			
КО	KO7 Building technology principles				
Paper	8 lines				

Q15	A ladder needs to scale a wall 8.3 m high and pass the top of the wall by a further 1 m.					
	Determine the <b>minimum</b> length of ladder required in order to maintain a correct ladder ratio.					
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO		
	Correct ratio - 1 out:4 up (1) $\frac{8.3}{4} = 2.08 \text{ m out from wall}$ (2) Using Pythagoras $\sqrt{2.08^2 + 8.3^2} = 8.55 \text{ m} + 1 = 9.55 \text{ m}$ (2)	<ol> <li>mark for using correct ladder ratio</li> <li>mark for applying ratio for distance out</li> <li>mark for calculated distance out</li> <li>mark for application of Pythagoras</li> <li>mark for correct distance Other methods acceptable such as trigonometry</li> </ol>	5	1.13 AO2		
ко	KO1 Health and safety					
Paper	6 lines					

Q16	Work needs to be undertaken on re-pointing a chimney at a residential property. Explain the <b>five</b> steps required to produce a risk assessment for this work.				
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO	
	<ul> <li>Award marks for explanations that cover all 5 steps that are clearly linked to the context of working at height.</li> <li>Identify all the hazards e.g. working at height (access to the scaffold, debris falling from roof, cement/lime dust being blown around below) (1)</li> <li>Determine who could be harmed e.g. the person working on the chimney, passers-by (1)</li> <li>Evaluate the risk of likelihood and ways of reducing e.g. using a scaffold rather than ladders or using a harness (1)</li> <li>Record findings on a risk assessment form (1)</li> <li>Review the assessment before and during work to ensure any further findings are taken into account such as weak structure (1)</li> </ul>	Award <b>1 mark</b> for each up to maximum of 5 Award marks for any other suitable explanation that is relevant to the context	5	1.5 AO2	
КО	KO1 Health and Safety				
Paper	10 lines				

Q17	Whist managing the design project of a new build plastics factory, you are directed to oversee the estimating and buying personnel.				
	Describe what key duties you would expect	ct these members of the team to p	perform.		
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO	
	The buyer will source all the materials needed to complete a project by obtaining quotations from suppliers for materials (1), with delivery times and quality assurance. (1)	Award marks for any other suitable description that is relevant to the context	4	4.6 AO2	
	The estimator will break down the Bill of Quantities into unit parts (1) which represent the amount it will cost a contractor to complete each stage (1)				
KO	KO4 Construction and the built environme	nt industry			
Paper	8 lines				

	Explain what must be considered to deal v Acceptable answer(s)	vith the hazard before work proce Guidance	eeds. Max mark s	Test Spec ref & AO
	<ul> <li>Award marks for answers that demonstrate understanding of the considerations of dealing with asbestos relative to the context, to include</li> <li>Management of demolition (1)</li> <li>Extends beyond unlicensed work (1)</li> <li>Pipe lagging is licenced (1)</li> <li>Specialist contractors must be used to remove and dispose of these items (1)</li> </ul>	Award marks for any other suitable explanations that is relevant to the context	4	1.3 AO2
ко	KO1 Health and safety			
Paper	8 lines			

## **Section B**

19 Analy	yse, using current examples, how PES			Γ
Indic	cative content	Guidance	Max marks	Test Spec ref & AO
To al affec facto	<ul> <li>Political - how government policy impacts organisations such as BREXIT having an impact on migrant workers which in turn affects future wage demands and costs. Labour shortages can mean project times are extended. Environmental - emissions targets, such as reductions in fossil fuelled vehicle production will lead to the need for more Electric Vehicle charging points in all residential properties, this in turn impacts building design allowing for off street parking or communal charging locations being allowed for.</li> <li>Social - ageing population or more single people needing housing changes the way buildings are designed. More people working from home following COVID-19 means allowances may be required for dwellings to incorporate study areas.</li> </ul>	For no awardable content, award 0 marks. Accept current examples of PESTLE factors as some factors can change quickly in a constantly changing political and social landscape (COVID- 19). No more than 1 mark if factors are simply listed with no knowledge of factor or application provided. Band 1 1- 3 marks Demonstrates a basic use of analysis of some of the PESTLE factors Demonstrates basic application of knowledge and understanding and limited links made between how the PESTLE factors affect the residential sector Band 2 4- 6 marks Demonstrates a good use of analysis of all of the PESTLE factors Demonstrates a good use of analysis of all of the PESTLE factors	9	4.8 5.1 AO2 3 AO3a 6

	<ul> <li>methods of delivering broadband such as satellite reception rather than traditional cable links.</li> <li>Legal - Changes in Regulations could impact on building design and needs. Planning legislation could increase or decrease need if laws are passed for land protection or land release. Changes in building regulations such as energy efficiency impact on design such as insulation requirements or use of alternative fuels.</li> <li>Economic - government spending is a major factor which affects the scale of growth in housing or economic climates impact on demand for housing. In an affluent economic society, housing demand increases which in turn affects prices paid. Alternatively, economic downturns increase the need for more affordable housing.</li> </ul>	knowledge and understanding in relation to the PESTLE factors and how they affect the residential sector <b>Band 3 7-9 marks</b> Demonstrates a comprehensive use of analysis of all of the PESTLE factors Demonstrates comprehensive use of application of knowledge and understanding in relation the PESTLE factors and how they affect the residential sector		
КО	KO4 Construction & the built environment	industry	II	
	KO5 Sustainability principles			
Paper	1 page			

	easy access for materials and machinery. construction work on site, from commence			
	Discuss the construction method most suit	able for this time constraint.		
	Indicative content	Guidance	Max marks	Test Spec ref & AO
	As the amount of time allowed on site is extremely limited, a modular or pre- manufactured superstructure is the best option. This is where the main structure of the building is constructed elsewhere or off-site and then broken down into sections, moved to site then assembled or put together in a much shorter time. As the site has easy access, the items can easily be delivered and lifting equipment can place it in correct position for quick assembly. This system requires long planning times for construction. Co-ordination between superstructure size and sub-structure installation and dimensions is very important to minimise problems. Discussion can also be negative such as reasons for not using traditional methods of construction due to the time taken on site to set out, build, and cure. It is important for the discussion to note the risks such as the super structure and sub-structure being built in different places, so communication is key to ensure correct dimensions.	For no awardable content, award 0 marks. Band 1 1-3 marks Demonstrates a basic use of analysis of the different types of construction methods Demonstrates basic application of knowledge and understanding of the use of different construction methods relevant to the time constraints Demonstrates basic evaluative skills with limited reasoning to which method would be most suitable Band 2 4-6 marks Demonstrates a good use of analysis of the different types of construction methods Demonstrate good application of knowledge and understanding of the use of different construction methods relevant to the time constraints	9	7.1 AO2 3 AO3a 3 AO3b 3
		Demonstrates good evaluative skills with clear reasoning to which method would be most suitable		

		Band 3 7-9 marks	
		Demonstrates a thorough use of analysis and of the different types of construction methods	
		Demonstrate a thorough application of knowledge and understanding of the use of different construction methods relevant to the time constraints	
		Demonstrates thorough evaluative skills with thorough reasoning and justifications to which method would be most suitable	
КО	KO7 Building technology systems		
Paper	1 page		

Q21	A client wants to plan and develop sustainable offices for small business enterprises on a brownfield site surrounded by a mixture of residential and commercial properties.					
	Discuss the environmental performance measures that need to be considered during the design stage of this project to support the planning application to the local authority.					
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO		
	Intention: To allow learners to evaluate a retail/commercial development in terms of the environmental factors that are faced by in order to develop a sustainable project.	For no awardable content, award 0 marks. Band 1 1-3 marks Demonstrates a basic use	12	3.1 5.1 5.2 5.5 5.7		
	Indicative content:	of analysis of a basic range of performance measures		AO2 6 AO3a 3 AO3b 3		
	<ul> <li>Performance measures include, as examples</li> <li>Materials: these should be sympathetic with other buildings in the surrounding location and preferably locally sourced</li> <li>Energy Sources and consumption: measures should be taken to reduce energy consumption with careful selection of fuel sources so the development will not have a negative impact on the supplies to surrounding properties</li> <li>Water sources/consumption: Consideration should be given to water recycling and conservation such as rainwater harvesting or greywater recycling to reduce mains water consumption</li> <li>Transport: Links to public transport to reduce parking conflicts and vehicle use. Provision of electric charging points to promote electric vehicles, provision of secure cycle storage to promote cycling</li> <li>Ecology: landscape and planting to soften development and promote eco systems</li> <li>Pollution: restrictions on the type of</li> </ul>	Demonstrates basic application of knowledge and understanding of environmental factors to develop sustainable projects Demonstrates basic use of evaluative skills linking the environmental performance measures to develop sustainable projects <b>Band 2 4-6 marks</b> Demonstrates a good use of analysis of a good range of performance measures Demonstrates a good use of and application of knowledge and understanding of environmental factors to develop sustainable projects				
	businesses allowed to use development to reduce pollution such as noise, smell. Designs to reduce	Demonstrates a good use of evaluative skills linking				

	<u>г т т т</u>
<ul> <li>light pollution and as well as visual impact.</li> <li>Other environmental considerations acceptable with justification including emissions, product use etc.</li> </ul>	the environmental performance measures to develop sustainable projects Band 3 7-9 marks
	Demonstrates thorough use of analysis of a comprehensive range of performance measures Demonstrates thorough use of application of knowledge and understanding of environmental factors to develop sustainable projects
	Demonstrates thorough use of evaluative skills linking the environmental performance measures to develop sustainable projects
	Band 4 10-12 marks
	Demonstrates comprehensive use of analysis of a comprehensive range of performance measures
	Demonstrates comprehensive use of application of knowledge and understanding of environmental factors to develop sustainable projects
	Demonstrates comprehensive use of evaluative skills linking the environmental performance measures to

		develop sustainable projects,	
КО	KO3 Construction design principles KO5 Sustainability principles		
Paper	2 pages		



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