

T Level Technical Qualification in Building Services Engineering for Construction (8710)

Building Services Engineering Core (8710-30) - Theory exam (1)
(8710-031)


Mark Scheme

Sample

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; $\frac{1}{2}$ 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- Mark crossed out work UNLESS it has been replaced by another response.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 th	4th	3rd
Substantially		4th	3rd	
Generally		3rd		2nd
		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.

	A02	A03a	A03b
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.	Unsupported evaluation through lack of application of knowledge and understanding. Unsupported 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

This 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 **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.

Section A

Q1	State one statutory document that specifically regulates each of the following activities. a) The use of power tools on a construction site. b) The hazards of working on live electrical systems during maintenance procedures.			
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO
	a) The Provision and Use of Work Equipment Regulations - PUWER b) The Electricity at Work Regulations - EWR	Award 1 mark for each Accept answers in full or acronyms	2	1.3 AO1a
KO	KO1 Health and safety			
Paper	4 lines			

Q2	Identify three solutions used to make a development socially sustainable.			
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO
	<ul style="list-style-type: none"> • Community centred housing • Sheltered housing • Integrated transport and networks • Security lighting • CCTV • Neighbourhood watch groups • Infrastructure (shops/medical centre etc.) 	Award 1 mark for each Accept any other answer that shows the words 'socially sustainable' have been understood Only accept one answer for each category e.g. medical centre (infrastructure) (1 mark), bus routes (transport) (1 mark)	3	5.2 AO1a
KO	KO5 Sustainability principles			
Paper	6 lines			

Q3	List two environmental technology systems that generate electricity.			
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO
	<ul style="list-style-type: none"> • Photo Voltaic (PV) • Micro-hydro • Micro-wind • Micro Combined Heat/Power (MCHP) 	Award 1 mark for each Accept any other answer that shows an understanding but where wording differs e.g. Hydro power or wind power	2	5.10 AO1a
KO	KO5 Sustainability principles			
Paper	4 lines			

Q4	List two professional bodies in Building Services Engineering, including the specialism they are affiliated with.			
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO
	<ul style="list-style-type: none"> • IET- Institution of Engineering and Technology-electrical • CIBSE- Chartered Institution of Building Services Engineers-general building services • CIPHE- Chartered Institute of Plumbing and Heating Engineering - plumbing heating • Institute of Refrigeration (IoR) – Refrigeration 	Both the professional body and the specialism is required for 1 mark . Accept any other answer that identifies a professional body relevant to BSE	2	7.5 AO1a
KO	KO7 Building technology principles			
Paper	4 lines			

Q5	State two methods of tendering for a project.			
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO
	<ul style="list-style-type: none"> • Open • Selective • Negotiated • Two-stage • Preferred supplier 	Award 1 mark for each Accept any other suitable answers	2	4.4 AO1a
KO	KO4 Construction & the built environment industry			
Paper	4 lines			

Q6	A risk assessment has been created to work in an excavation on a busy site to lay services. Describe one potential risk and an appropriate control measure to mitigate the risk.			
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO
	Risks (mitigation) Falling into excavation (fencing/securing the excavation) Collapse (use of trench box/support/store excavated material away from excavation) Unauthorised use (tools and equipment locked away/no form of access when not in use) Flooding (identification of flood risk/use of pumps/other methods of water diversion)	Award a maximum of 1 mark for a potential risk and a maximum of 1 mark for an appropriate control measure to mitigate the risk Only 1 control measure needs to be given to award 1 mark.	2	1.6 AO1b
KO	KO1 Health and safety			
Paper	4 lines			

Q7	What is the most appropriate type of automatic fire detector for use in a shower room?			
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO
	One from the following <ul style="list-style-type: none"> • ionised smoke, or • heat 	Accept - radioisotope as alternative to ionisation Accept - rate of rise or fixed heat Do not accept - optical smoke	1	5.11 AO1b
KO	KO5 Sustainable Principles			
Paper	2 lines			

Q8	Explain what is meant by modular construction, giving one benefit of this construction type over traditional site base construction.			
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO
	Accept any suitable answer that demonstrates an understanding of modular construction. The building is fabricated off site (1) and it is fully built in modules to be delivered to site (1). Benefits could include: <ul style="list-style-type: none"> • Reduced construction time • Less delays due to weather constraints • Safer controlled working environment • Less environmental impact • Usually more cost effective. 	Award a maximum of 2 marks for the explanation of modular construction. Award 1 mark for a suitable benefit	3	7.1 AO1b
KO	KO7 Building technology principles			
Paper	6 lines			

Q9	<p>a) Explain the difference between an incident and an accident.</p> <p>b) Explain the difference in recording and reporting procedures for an incident and an accident.</p>						
	Acceptable answer(s)	Guidance	<table border="1"> <tr> <td>Max marks</td> <td>Test Spec ref & AO</td> </tr> </table>	Max marks	Test Spec ref & AO		
Max marks	Test Spec ref & AO						
	<p>a) An incident has the potential to cause harm (but by fortune, doesn't) (1)</p> <p>An accident is where harm has been caused (1)</p> <p>b) Incidents must be recorded - only where there was a potential to cause harm and are specified by HSE (1)</p> <p>All accidents must be recorded (1) and where severe, or cause someone to not undertake work duties for 7 days, be reported under RIDDOR (1)</p>	<p>a) Award marks for an explanation which demonstrates the difference between an accident and an incident, up to 2 marks.</p> <p>b) Award marks for an explanation which demonstrates the differences between the recording and reporting procedures, up to 3 marks.</p>	<table border="1"> <tr> <td>Q9a 2</td> <td>1.10</td> </tr> <tr> <td>Q9b 3</td> <td>AO1b</td> </tr> </table>	Q9a 2	1.10	Q9b 3	AO1b
Q9a 2	1.10						
Q9b 3	AO1b						
KO	KO1 Health and Safety						
Paper	10 lines						

Q10	Explain two responsibilities of the Local Authority Planning Officer once planning permission has been submitted.			
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO
	<p>Award marks for answers that demonstrate understanding of the role of the Local Authority Planning Officer, to include:</p> <p>Responsibility</p> <p>To report to planning committee (1)</p> <p>Explanation</p> <p>To advise on the requirements of the building plans (1)</p> <p>Responsibility</p> <p>To collate comments for submission to planning meetings and ensure all stakeholders are informed of plans (1)</p> <p>Explanation</p> <p>So stakeholders/ planning committee can assess whether the proposed development is likely to be given permission (1)</p>	<p>Award 1 mark for each responsibility up to a maximum of 2 marks</p> <p>Award 1 mark for each explanation of the responsibility up to a maximum of 2 marks</p> <p>Accept any suitable alternative answers that relate to the context of the question</p> <p>Do not accept - advising the person submitting on potential outcomes</p>	4	3.3 AO1b
KO	KO3 Construction design principles			
Paper	8 lines			

Q11	Explain two benefits of using Business Information Modelling (BIM) for teams working on the same project.			
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO

	<p>Award marks for answers in the form of an explanation that cover the following points:</p> <p>Each team receives the same (1) up-to-date information (1) in context with other work proceeding at the same time (1) encouraging teamwork/collaborative working (1) promoting efficiency in time and materials (1)</p>	<p>Award 1 mark for each benefit up to a maximum of 2 marks</p> <p>Award 1 mark for each explanation of benefit up to a maximum of 2 marks</p> <p>Accept alternative explanations that demonstrates a clear understanding of the benefits of BIM for teams working on the same project</p>	4	4.8 AO1b
KO	KO4 Construction & the built environment industry			
Paper	8 lines			

Q12	Describe the purpose of the Environmental Protection Act when dealing with controlled waste.			
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO
	<p>Description to include the following key points for marks</p> <ul style="list-style-type: none"> waste strategy/plans/provision (1) prevent illegal activities/ unauthorised disposal of controlled waste. (1) 	<p>Award 1 mark for each point.</p> <p>Accept alternative descriptions that demonstrates a clear understanding of the purpose of the Environmental Protection Act when dealing with controlled waste.</p>	2	5.3 AO1b
KO	KO5 Sustainable Principles			
Paper	12 lines			

Q13	Explain how the continued safety of power tools is monitored within a building services organisation.			
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO
	Award marks for answers that explain the continued safety of power tools, to include a sense of : <ul style="list-style-type: none"> • A <u>system</u> that is <u>maintained</u> (1) • All tools being <u>logged</u> /Asset register/equipment log (1) • A <u>record</u>/ history of tools/details of tools <u>over time</u> (1) • A <u>schedule</u> / planned in advance (1) for • PAT/ inspected and tested (1) • at a frequency appropriate for the tool (1) • That it is <u>monitored</u> and is completed with a suitable frequency for the circumstances/ environment for which it is used and kept up to date (1) 	Accept alternative ways of explaining that show an understanding of maintenance and safety of power tools i.e. If a clear sense of the aspect listed is seen, with particular focus on the underlined words, award 1 mark	6	14.1 14.2 AO1b
KO	KO14 Tools, equipment and materials			
Paper	12 lines			

Q14	A contractor has won the contract to design and build a high-rise block of flats. The building will be constructed using a structural steel frame.			
	Give four advantages of steel that makes it suitable for the structural frame of the high-rise building.			
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO
	Award 1 mark for each of the following points up to a maximum of 4 marks : <ul style="list-style-type: none"> • High strength • Relatively low weight • Ease of installation • Availability of a wide range of ready-made structural sections • Ability to resist dynamic forces such as wind and earthquakes 	Do not accept properties of steel that are not relevant to the context	4	7.7 AO2
KO	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 minimum length of ladder required in order to maintain a correct ladder ratio. Show your workings.			
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO
Correct ration – 1 out:4 up (1) $\frac{8.3}{4} = 2.08 \text{ m out from wall (2)}$ Using Pythagoras $\sqrt{2.08^2 + 8.3^2} = 8.55 \text{ m} + 1 = \mathbf{9.55 \text{ m}}$ (2)	1 mark for using correct ladder ratio 1 mark for applying ratio for distance out 1 mark for calculated distance out 1 mark for application of Pythagoras 1 mark for correct distance Other methods acceptable such as trigonometry	5	1.6/ 1.15 AO2	

		Award full marks for correct answers without workings shown.		
KO	KO1 Health and safety			
Paper	6 lines			

Q16	Explain the installation methods used when installing an underfloor heating system on a joisted floor and how they improve the systems performance.			
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO
	<p>Award marks for an explanation of the installation methods that would be relevant for the installation of an underfloor heating system on a joisted floor</p> <p>Points could include: UFH pipe is stapled to insulation (1) Fitted onto battens in between the joists (1) Laying a mix of sand and cement around the pipes (1) Laying mix between the joists and level to the top of the joists (1) The mix gives the floor extra thermal mass (1) Improving the overall output of the floor heating system (1)</p>	Accept alternative suitable answers that are relevant to the context	6	7.2 AO2
KO	KO7 Building technology principles			
Paper	12 lines			

Q17	<p>A contract which has a value of £2700.00 has over run and the client has decided to impose a penalty clause of 5% of the costs for every working week the job over runs.</p> <p>Calculate the penalty if the work over runs by three days. Show your workings.</p>			
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO
	<p>3 days = 3% penalty (1% per one day) (1)</p> <p>3% of £2700 = £81 (1)</p> <p>Calculation may be</p> $2700 \times 0.03 = \text{£}81$ <p>Or</p> $\frac{2700}{100} \times 3 = \text{£}81$	<p>1 mark for determining correct percentage</p> <p>1 mark for correct amount in £</p> <p>Award full marks for correct answers without workings shown.</p>	2	3.1 AO2
KO	KO3 Construction design principles			
Paper	6 lines			

Q18	<p>A contractor has won the contract to design and build a high-rise block of flats. The building will be constructed using a concrete slab and wooden joisted floors.</p> <p>Describe the requirements for drilling holes in wooden joists.</p>			
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO
	<p>A description that includes the following points:</p> <ul style="list-style-type: none"> Holes should only be drilled on the centre line of the joist. This is where the compressive and tensile load distribution is neutralised (1) 	Award 1 mark for each point	4	7.7 AO2

	<ul style="list-style-type: none"> • Holes should have a diameter of no greater than 0.25 times the depth of the joist (1) • Holes should be no closer together than 3 times the largest diameter permitted (1) • Holes should be no closer to the support than 0.25 times the span and no further away than 0.40 times the span (1) 			
KO	KO7 Building technology principles			
Paper	6 lines			

Sample

Q19	<p>During the refurbishment of a commercial property new thermal insulation is to be installed to improve the efficiency of the building.</p> <p>Explain two implications that the new insulation materials can have on building services systems (cables and pipes).</p>			
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO
	<p>Accept any suitable answer that demonstrates an understanding of the implications of new thermal insulation methods on pipes and cables</p> <p>Insulation contains chemicals (1) which can react with plastic cable and pipes causing them to break down (1)</p> <p>Insulation cables get hot and break down (1) which means cable and pipe need to be run in areas avoiding thermal insulation (1)</p> <p>When insulation is installed, hot and cold-water services should not be insulated together (1) to prevent the risk of heat transfer (1)</p>	<p>Award 1 mark for each factor up to a maximum of 2 marks</p> <p>Award 1 mark for each implication up to a maximum of 2 marks</p>	4	5.11 AO2
KO	KO5 Construction sustainability principles			
Paper	8 lines			

Q20	<p>Explain one environmental technology system that can reduce the costs of each of the following metered supplies. Use a different environmental technology for each.</p> <p>a) Water b) Gas c) Electricity</p>			
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO
	<p>a) Award marks for answers that provide a suitable explanation of an environmental technology systems that reduce the cost of water supplies, points to include</p> <ul style="list-style-type: none"> • Suitably applied technology system (1) • Understanding of operating principle (1) • Usage – cost-effectiveness (1) <p>b) Award marks for answers that provide a suitable explanation of an environmental technology system that reduce the cost of gas supplies, points to include</p> <ul style="list-style-type: none"> • Suitably applied technology system (1) • Understanding of operating principle (1) • Usage – cost-effectiveness (1) <p>c) Award marks for answers that provide a suitable explanation of an environmental technology systems that reduce the cost of electricity supplies, points to include</p> <ul style="list-style-type: none"> • Suitably applied technology system (1) • Understanding of operating principle (1) • Usage – cost-effectiveness (1) 	<p>Suitable technologies could include:</p> <ul style="list-style-type: none"> • Grey water system • Hydro-electric • Air ground source heating pumps • Micro combined heat power systems • Solar Photovoltaic generation • Water source heat pumps • Heat recovery systems <p>Accept any other suitable alternatives.</p> <p>Award a maximum of 3 marks for each part of the question (a,b,c)</p>	9	5.10 5.1 5.5 AO2
KO	KO5 Sustainable Principles			
Paper	27 lines			

Q21	Explain how a Building Management System (BMS) works, to ensure building services for heat, ventilation and light are utilised efficiently.			
	Acceptable answer(s)	Guidance	Max marks	Test Spec ref & AO
	<p>Award marks for answers that include an explanation giving a sense of:</p> <ul style="list-style-type: none"> • <u>Computerised system</u> interlinking building systems • <u>Parameters set</u> for heat, light and air quality using central <u>control panel</u> • <u>sensors</u> (around the building) <u>measure/monitor</u> heat, light and air quality • readings <u>fed back to</u> the computer system • computer brings the building systems <u>on or off line</u> <u>automatically</u> to keep parameters steady / sense of a feedback loop 	<p>If a clear sense of the aspect listed is seen, with particular focus on the underlined words, award 1 mark</p> <p>Accept alternative ways of explaining that show an understanding of how BMS promotes efficient usage</p> <p>Do not accept other systems such as smart metering as these do not make decisions and switch system in or out</p>	5	5.10 5.11 5.1 5.5 AO2
KO	KO5 Sustainable principles			
Paper	10 lines			

Section B

<p>Q22</p>	<p>You are part of a team who are responsible for the design and build of a new office complex in a rural location. You are specifically involved in the building services technologies. The client wishes to maximise the use of environmental and smart technology systems and measures to reduce and monitor consumption, and therefore costs, of metered utility supplies such as water, gas, and electricity.</p> <p>Analyse the uses of smart metering in relation to this project, discussing its likely effectiveness.</p>			
	<p>Indicative content</p>	<p>Guidance</p>	<p>Max marks</p>	<p>Test Spec ref & AO</p>
	<p>Intention: <i>To allow learners to analyse the use of smart metering in this construction/BSE project. Considering both the benefits and the limitations of this technology and its effectiveness for the given project</i></p> <p>Indicative content Advantages include</p> <ul style="list-style-type: none"> • Real time usage displayed to user providing awareness on usage, cost and allows decision making on spreading loading. Where dual tariffs exist, certain appliances may be used at better times for cost • Accurate billing information automatically provided meaning estimated bills are avoided • Ability to spot leaks faults (water/gas mainly) where energy is being metered where appliances are not used • Allows for prosumer (feed in energy) so provides financial benefits of environmental technologies such as Photovoltaic systems 	<p><i>For no awardable content, award 0 marks.</i></p> <p><u>Band 1 1-3 marks</u></p> <p>Analysis of the different types of smart metering is basic</p> <p>Some advantages identified but with little application to the context of the project</p> <p>Basic reasoning or justification given in isolation and not clearly linked to the project</p> <p><u>Band 2 4-6 marks</u></p> <p>Analysis of the different types of smart metering is good</p> <p>Some advantages and limitations identified but with little application to the context of the project</p> <p>Good reasoning or justification attempted to support the effectiveness of smart metering, but this does not always clearly link to the project</p>	<p>12</p>	<p>5.11</p> <p>AO2 4</p> <p>AO3a 4</p> <p>AO3b 4</p>

	<p>Disadvantages include</p> <ul style="list-style-type: none"> • Most current 1st generation meters incompatible between providers leading to Dumb meters if supplier switched by consumer • Still relies on human decision making for efficiency savings 	<p><u>Band 3 7-9 marks</u></p> <p>Analysis of the different types of smart metering is thorough</p> <p>Advantages and limitations identified which have mostly been applied to the context of the project</p> <p>Thorough reasoning or justification given to support the effectiveness of smart metering for this project</p> <p><u>Band 4 10-12 marks</u></p> <p>Analysis of the different types of smart metering is comprehensive</p> <p>Advantages and limitations identified and all applied to the context of the project</p> <p>Comprehensive reasoning or justification given to support the effectiveness of smart metering for this project</p>		
KO	KO5 Sustainability principles			
Paper	36 lines			

Q23	Analyse, using current examples, how PESTLE factors affect the residential sector.			
	Indicative content	Guidance	Max marks	Test Spec ref & AO
	<p>Intention: <i>To allow learners to analyse factors affecting industry using the PESTLE factors</i></p> <p>Indicative content</p> <ul style="list-style-type: none"> 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 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 Technology - Advances in building methods affect building products and materials which in turn affects labour needs and costs of materials. Other technologies could include advances in broadband or methods of delivering broadband 	<p><i>For no awardable content, award 0 marks.</i></p> <p>Accept current examples of PESTLE factors as some factors can change quickly in a constantly changing political and social landscape (COVID 19)</p> <p><u>Band 1 1-3 marks</u></p> <p>Demonstrates a basic use of analysis of some of the PESTLE factors</p> <p>Demonstrates basic application of knowledge and understanding and limited links made between how the PESTLE factors affect the residential sector</p> <p><u>Band 2 4-6 marks</u></p> <p>Demonstrates a good use of analysis of all of the PESTLE factors</p> <p>Demonstrates a good use of application of knowledge and understanding in relation to the PESTLE factors and how they affect the residential sector</p> <p><u>Band 3 7-9 marks</u></p> <p>Demonstrates a comprehensive use of</p>	9	4.8 5.1 AO2 3 AO3a 6

	<p>such as satellite reception rather than traditional cable links</p> <ul style="list-style-type: none"> • 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 • 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 <p>Answers must be relevant to the residential sector</p> <p>Do not accept points that are not relevant to the context</p>	<p>analysis of all of the PESTLE factors</p> <p>Demonstrates comprehensive use of application of knowledge and understanding in relation the PESTLE factors and how they affect the residential sector</p>		
KO	KO4 and KO5			
Paper	27 lines			

<p>Q24</p>	<p>A client wants a two-storey extension constructed on the back of an office. The site has very easy access for materials and machinery. The main constraint is that the time allowed for the construction work on site, from commencement to handover, is extremely limited.</p> <p>Evaluate the different types of construction methods and processes and suggest the most suitable for this project.</p>		
	<p>Indicative content</p>	<p>Guidance</p>	<p>Max marks</p> <p>Test Spec ref & AO</p>
	<p>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</p> <p>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</p> <p>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</p> <p>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</p>	<p><i>For no awardable content, award 0 marks.</i></p> <p><u>Band 1 1-3 marks</u></p> <p>Demonstrates a basic use of analysis of the different types of construction methods</p> <p>Demonstrates basic application of knowledge and understanding of the use of different construction methods relevant to the time constraints</p> <p>Demonstrates basic evaluative skills with limited reasoning to which method would be most suitable</p> <p><u>Band 2 4-6 marks</u></p> <p>Demonstrates a good use of analysis of the different types of construction methods</p> <p>Demonstrate good application of knowledge and understanding of the use of different construction methods relevant to the time constraints</p> <p>Demonstrates good evaluative skills with clear reasoning to</p>	<p>12</p> <p>7.1</p> <p>7.7</p> <p>AO2 4</p> <p>AO3a 4</p> <p>AO3b 4</p>

		<p>which method would be most suitable</p> <p><u>Band 3 7-9 marks</u></p> <p>Demonstrates a thorough use of analysis of the different types of construction methods</p> <p>Demonstrate thorough application of knowledge and understanding the use of different construction methods relevant to the time constraints</p> <p>Demonstrates thorough evaluative skills with thorough reasoning and justifications to which method would be most suitable.</p> <p><u>Band 4 10-12 marks</u></p> <p>Demonstrates comprehensive use of analysis of the different types of construction methods</p> <p>Demonstrate comprehensive application of knowledge and understanding the use of different construction methods relevant to the time constraints</p> <p>Demonstrates comprehensive evaluative skills comprehensive reasoning and justifications to which method would be most suitable.</p>		
KO	KO 7 Building technology systems			
Paper	36 lines			

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