



Mark Scheme (Final)

June 2018

BTEC Level 1/Level 2 First Certificate
Construction and the Built Environment
(21635E)
Unit 11: Sustainability in Construction

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- All marks on the mark scheme should be used appropriately.
- All marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if a candidate's response is not worthy of credit according to the mark scheme.
- Where some judgment is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt about applying the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed-out work should be marked UNLESS the candidate has replaced it with an alternative response.

Section A

Question Number	Answer	Mark
1	C Push type taps (1) E Shower flow restrictors (1)	(2)

Question Number	Answer	Mark
2	Award 1 mark for giving each form of physical pollution to consider reducing during construction. Any two from: <ul style="list-style-type: none"> • Carbon emissions (1) • Particulates (smoke) (1) • Ground water (chemical/fuel spills) (1) • Litter (1) • Soil contamination (1) Accept any other appropriate answer.	(2)

Question Number	Answer	Mark
3	A Damping down (1) D Road sweeping (1)	(2)

Question Number	Answer	Mark
4	Award 1 mark for giving each benefit of providing green spaces within developments. Any two from: <ul style="list-style-type: none"> • Attractive place to live (1) • Aesthetically pleasing place to live (1) • Place to socialise/play (1) • Opportunities to maintain/improve biodiversity/wildlife habitat (1) Accept any other appropriate answer.	(2)

Question Number	Answer	Mark
5(a)	<p>Award 1 mark for naming each site practice that can be used to minimise the effects of the building work on the community apart from the use of hoardings and on-site car parking.</p> <p>Any two from:</p> <ul style="list-style-type: none"> • Use of noise reduction equipment (1) • Site access arrangements (1) • One-way systems (1) • Wheel cleaning facilities (1) • Timing of deliveries (1) • Agreed working hours (1) • Maintaining a clean and tidy site (1) • Floodlight shading (1) <p>Accept any other appropriate answer.</p>	(2)

Question Number	Answer	Mark
5(b)	<p>Award 1 mark for giving one reason why hoardings are used to reduce the effect of building work on the community.</p> <p>Any one from:</p> <ul style="list-style-type: none"> • Prevents people from getting on- site (site security) (1) • Prevents dust/litter from being blown off the site (1) • Reduces noise from the site (1) • Aesthetics (hiding work from view) (1) <p>Accept any other appropriate answer.</p>	(1)

Question Number	Answer	Mark
5(c)	<p>Award 1 mark for giving each reason why on-site parking may be provided to reduce the impact on the community.</p> <p>Any two from:</p> <ul style="list-style-type: none"> • Prevents neighbouring roads from becoming blocked (1) • Prevents community parking spaces from being taken up by site workers (1) • Enables workers/local community to get to work easily (1) • Reduces localised emissions (1) <p>Accept any other appropriate answer.</p>	(2)

Question Number	Answer	Mark
6	<p>Award 1 mark for giving each reason why a building contractor may provide training opportunities.</p> <p>Any two from:</p> <ul style="list-style-type: none"> • Keep a skilled workforce (1) • Develop a skilled workforce (1) • Need for additional workers (1) • Social responsibility (1) • Financial incentives (1) • Statutory obligations, e.g. health, safety and welfare requirements (1) <p>Accept any other appropriate answer.</p>	(2)

Question Number	Answer	Mark
7	<p>A linked response that makes reference to any two of the following points. Up to two marks for an explanation.</p> <p>Any one from the following explanations:</p> <ul style="list-style-type: none"> • Select an area of the site away from the bat colony (1) because this will not disturb the colony that will be protected (1) • Apply for a licence to relocate the colony (1) which will enable building on this part of the site (1) <p>Accept any other appropriate answer.</p>	(2)

Question Number	Answer	Mark
8	<p>C Tram (1)</p> <p>E Bus (1)</p>	(2)

Question Number	Answer	Mark
9(a)	<p>Life cycle costing (1)</p>	(1)

Question Number	Answer	Mark
9(b)	<p>Award 1 mark for naming each cost of running a building apart from utility services.</p> <p>Any two from:</p> <ul style="list-style-type: none"> • Maintenance (1) • Repairs (1) • Improvements (1) • Alterations (1) • Insurance (1) • Business rates / council tax (1) <p>Accept any other appropriate answer.</p>	(2)

Question Number	Answer	Mark
10	<p>Award 1 mark for naming each material that may be collected for recycling.</p> <p>Any two from:</p> <ul style="list-style-type: none"> • Glass (1) • Paper/card (1) • Timber/wood (1) • Metal (1) • Plasterboard (1) • Plastic (1) <p>Accept any other appropriate answer.</p>	(2)

Question Number	Answer	Mark
11	<p>A linked response that makes reference to any two of the following points. Up to two marks for an explanation.</p> <p>Any one from the following explanations:</p> <ul style="list-style-type: none"> • Ongoing maintenance is required (1) because the planting will need regular attention (1) • Larger foundations and columns will be necessary (1) because of the increased roof loads (1) • Additional build cost/maintenance cost (1) because of the form of construction (1) <p>Accept any other appropriate answer.</p>	(2)

Question Number	Answer	Mark
12	<p>A linked response that makes reference to any two of the following points. Up to two marks for each explanation.</p> <p>Any two from the following explanations:</p> <ul style="list-style-type: none"> • Design is ideal for factory manufacture of panels (1) because of the repetitive design (1) • Site work can be reduced (1) because panels can be fitted with services, windows and insulation (1) • Tight construction timescale is achievable (1) because of high on- site production rate possible with timber panels (1) • Use of softwood (1) which is a renewable/sustainable material/ lower embodied energy (1) <p>Accept any other appropriate answer.</p>	(4)

Section B

Question Number	Answer	Mark
13(a)	<p>Award 1 mark for naming one sustainable timber suitable for the cladding.</p> <ul style="list-style-type: none">• Cedar (1)• Siberian Larch (1)• Douglas Fir (1) <p>Accept any other appropriate answer.</p>	(1)

Question Number	Answer	Mark
13(b)	<p>Award 1 mark for giving one reason why timber is a sustainable material.</p> <p>Any one from:</p> <ul style="list-style-type: none">• Renewable (1)• Recyclable (1)• Naturally occurring (1)• High thermal resistance (1)• Low embodied energy (1)• Can be sourced from sustainable forests (1)• Softwoods are fast growing (1) <p>Accept any other appropriate answer.</p>	(1)

Question Number	Answer	Mark
14	<p>A linked response that makes reference to any two of the following points. Up to two marks for an explanation.</p> <p>Any one from the following explanations:</p> <ul style="list-style-type: none"> • Allow patients to access the centre (1) who don't have access to alternative public transport (1) • To provide staff parking (1) which will save time when staff are called out/return from house calls (1) • Prevent patients and staff from driving around looking for parking (1) which will save on unnecessary emissions from vehicles (1) • Provide parking for those with mobility issues (1) who require the use of their adapted private transport (1) <p>Accept any other appropriate answer.</p>	(2)

Question Number	Answer	Mark
15	<p>A linked response that makes reference to any two of the following points. Up to two marks for an explanation.</p> <p>Any two from the following explanations:</p> <ul style="list-style-type: none"> • Placing insulation on the outside of the building (1) which increases the U value of the wall (1) • Construct a new internal wall (1) which will create a cavity that can be filled with insulation (1) • Place insulation on the internal face of the external wall (1) which raises the thermal resistance of the wall (1) <p>Accept any other appropriate answer.</p>	(4)

Question Number	Answer	Mark
16(a)	<p>A linked response that makes reference to any two of the following points. Up to two marks for an explanation.</p> <p>Any one from the following explanations:</p> <ul style="list-style-type: none"> • Due to the plant room being small (1) there is unlikely to be space for a larger biomass boiler. (1) • A biomass boiler requires space for storage of fuel (1) which is unlikely to be available within the existing building (1) • A biomass boiler would require partial manual operation (1) which is inconvenient/requires a trained member of staff (1) <p>Accept any other appropriate answer.</p>	(2)

Question Number	Answer	Mark
16(b)	<p>A linked response that makes reference to any two of the following points. Up to two marks for an explanation.</p> <p>Any one from the following explanations:</p> <ul style="list-style-type: none"> • Waste heat energy is used to generate electricity (1) maximum use is made of input energy/ overall reduction in energy use (1) • Electrical energy will be generated for much of the working day (1) as the surgery will need constant hot water and heating in colder periods (1) <p>Accept any other appropriate answer.</p>	(2)

Question Number	Indicative content	Mark
17	<p>Discussion on why the buildings on site 2 can be considered sustainable buildings. The discussion should be based on the materials provided within the scenario.</p> <p><u>Key points to consider:</u></p> <ul style="list-style-type: none"> • Still in use today as community buildings, which was their original purpose. Part of the buildings have been converted to a cinema. • The basic structure of the buildings are still sound after over 100 years. Other original features have been retained. Thus retaining part of the town's heritage. • It was considered cost effective to refurbish the buildings. • The refurbishment of the buildings has included incorporating technology to bring them up to current standards. These include: <ul style="list-style-type: none"> ○ Insulation to the roof ○ New services ○ Solar panels ○ Roof lights ○ Natural ventilation. <p><u>Level 3 model response:</u></p> <p>The buildings on site 2 can be considered to be sustainable as they were built in 1900 and are still in use today. The buildings were built for community use and are still being used for the benefit of the community today. The hall is used for various activities and a cinema has also been added providing a further social facility for the community. The adjacent public car park allows those who don't live in the town centre to make use of the facilities.</p> <p>The buildings have been recently refurbished, but the basic structure has been retained and existing features, such as windows, have been retained. Thus, these historic buildings have been and are being retained for future generations.</p> <p>The refurbishment of the buildings has incorporated many modern technologies that will reduce the carbon footprint and the running costs of the buildings.</p> <p>Insulation has been installed within the roof that will increase the thermal efficiency of the buildings and reduce heat loss. The false ceiling has been removed within the main hall to increase the volume of the space. To add natural light and reduce the need for artificial lighting during the daylight hours roof lights have been incorporated in the roof. Solar,</p>	(8)

	<p>photovoltaic panels have been fitted to the roof. These will help supply electricity or feed surplus electricity to the grid.</p> <p>Within an assembly hall some form of ventilation is necessary. A natural ventilation system has been installed with rotating roof cowls for the stale air to exit the building.</p> <p>New services and a commercial kitchen have been installed. These will be to the latest standard and so will be more energy efficient to meet current Building Regulations.</p> <p>In conclusion, the buildings are sustainable buildings as they were built over 100 years ago and are still being used for their original purpose. The recent refurbishment has improved their carbon footprint and will enable them to be used for a good many more years.</p>	
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Level	Descriptor	Marks
0	No rewardable material.	0 marks
1	<p>A few key points identified, or one point described in some detail.</p> <p>The answer is likely to be in the form of a list. Points made will be superficial/generic and not applied/directly linked to the situation in the question. The learner shows a basic understanding of sustainability.</p>	1-3 marks
2	<p>Some points identified, or a few key points described. The answer is unbalanced.</p> <p>Most points made will be relevant to the situation in the question, but the link will not always be clear. The learner shows a good understanding of sustainability.</p>	4-6 marks
3	<p>Range of points described, or a few key points explained in depth.</p> <p>The majority of points made will be relevant and there will be a clear link to the situation in the question. The learner shows a developed understanding of sustainability.</p>	7-8 marks

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