

Mark Scheme (Final)

June 2019

BTEC Level 1/Level 2 First Certificate
Construction and the Built Environment
(21635E)

Unit 11: Sustainability in Construction

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SECTION A

Question Number	Answer	Mark
1	<p>One mark for each correct answer:</p> <p>B- Low carbon content E- Low embodied energy</p>	(2)

Question Number	Answer	Mark
2	<p>Award one mark for giving each form of pollution that may make living near a large construction site unpleasant. Up to two marks.</p> <p>Any two from:</p> <ul style="list-style-type: none"> • Carbon emissions (1) • Particulates (1) • Dust (1) • Light (1) • Noise (1) • Wind-blown debris/litter (1) <p>Accept any other appropriate answer.</p>	(2)

Question Number	Answer	Mark
3	<p>One mark for each correct answer:</p> <p>A- Excavation spoil from foundations C- Building material packaging</p>	(2)

Question Number	Answer	Mark
4	<p>Award one mark for stating each form of construction technology that will reduce noise transmission within buildings. Up to two marks.</p> <p>Any two from:</p> <ul style="list-style-type: none"> • Double/triple glazing (1) • Insulating materials (1) • Reduce air leakage (1) • Baffles/dampers in ventilation ducts (1) • Isolating membranes (1) • High density concrete blockwork (1) • Use of sheet material to form an acoustic barrier (1) • Sound-proof doors (1) • Structural discontinuity (1) <p>Accept any other appropriate answer.</p>	(2)

Question Number	Answer	Mark
5	<p>Award one mark for stating each use of timber from a demolition site. Up to two marks.</p> <p>Any two from:</p> <ul style="list-style-type: none"> • Reused (1) • Manufacture into new products (1) • Recycled into sheet materials (1) • Use as a fuel (1) <p>Accept any other appropriate answer.</p>	(2)

Question Number	Answer	Mark
6	<p>Award one mark for stating each benefit to a community of a new swimming pool. Up to two marks.</p> <p>Any two from:</p> <ul style="list-style-type: none"> • Helps people keep fit (1) • People can meet up with friends and socialise (1) • Clubs can be started (1) • Swimming lessons (1) • Water sports (1) • Employment opportunities (1) • Pride of civic amenity (1) • Encourages visitors to the area (1) <p>Accept any other appropriate answer.</p>	(2)

Question Number	Answer	Mark
7	<p>One mark for giving one reason why notices are placed around a development site when planning permission has been applied for.</p> <p>Any one from:</p> <ul style="list-style-type: none"> • So neighbours are aware of what is going on (1) • Neighbours are able to comment on the proposals (1) <p>Accept any other appropriate answer.</p>	(1)

Question Number	Answer	Mark
8	<p>One mark for each correct answer:</p> <p>B- Regular maintenance of equipment C- Reporting procedures</p>	(2)

Question Number	Answer	Mark
9	<p>A linked response that makes reference to any two of the following points. Up to two marks for each description.</p> <p>Any two from the following descriptions:</p> <ul style="list-style-type: none"> • Reduces the volume of water discharged to waste (1) as water is reused (1) • The reuse of water (1) reduces the volume of potable/fresh/mains water required (1) • Reduction in the volume of potable/fresh/mains water produced (1) as water demand is decreased (1) <p>Accept any other appropriate answer.</p>	(4)

Question Number	Answer	Mark
10	<p>One mark for each correct answer:</p> <p>C- Transport costs are reduced E- Reduced competition for local business</p>	(2)

Question Number	Answer	Mark
11	<p>Award one mark for giving each reason for making construction sites secure. Up to two marks.</p> <p>Any two from:</p> <ul style="list-style-type: none"> • Keep people safe (1) • Prevent theft (1) • Control who enters the site (1) • Reduce vandalism (1) <p>Accept any other appropriate answer.</p>	(2)

Question Number	Answer	Mark
12	<p>Award one mark for stating each stage in the life of a material that will count as embodied energy, other than transportation.</p> <p>Up to two marks.</p> <p>Any two from:</p> <ul style="list-style-type: none"> • Extraction (1) • Manufacture (1) • Placing (1) • Processing (1) <p>Accept any other appropriate answer.</p>	(2)

Question Number	Answer	Mark
13	<p>One mark for stating one way exhaust fumes from plant and equipment can be reduced, other than by the use of alternative fuels and filters.</p> <p>Any one from:</p> <ul style="list-style-type: none"> • Regular maintenance (1) • Servicing (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 each explanation.</p> <p>Any two from the following explanations:</p> <ul style="list-style-type: none"> • Adequate lighting (1) so people can see other people clearly (1) • Installation of CCTV (1) so people know that someone will be monitoring what is going on (1) • No dark corners or alleyways (1) as these are places where people can't be easily seen (1) <p>Accept any other appropriate answer.</p>	(4)

SECTION B

Question Number	Answer	Mark
15	<p>One mark for stating one way that the heat loss through the windows of Building 1 can be improved, other than by heavy fabric curtains.</p> <p>Any one from:</p> <ul style="list-style-type: none"> • Install double glazing (1) • Install triple glazing (1) • Install secondary glazing (1) • Install weather seal/draught strips (1) <p>Accept any other appropriate answer.</p>	(1)

Question Number	Answer	Mark
16	<p>One mark for stating one reason why heat will be lost through the stone floor of Building 1.</p> <p>Any one from:</p> <ul style="list-style-type: none"> • No insulation is incorporated (1) • Stone is a poor insulator (1) <p>Accept any other appropriate answer.</p>	(1)

Question Number	Answer	Mark
17	<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"> • Nearby residents may be disturbed by noise at night (1) due to 24 hour opening (1) • Nearby residents may suffer from odours (1) that are blown by the wind (1) • The surrounding area may become littered (1) due to it not being disposed of correctly (1) • Car use may be encouraged (1) adding to congestion/emissions (1) <p>Accept any other appropriate answer.</p>	(4)

Question Number	Answer	Mark
18	<p>A linked response that makes reference to any one 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"> • The insulation will take up space in the rooms (1) due to the thickness of the insulation (1) • Existing wall finishes will be lost (1) and new wall finishes will need to be provided (1) • Existing fixtures fixed to the external walls will have to be removed (1) to allow the insulation to be fitted (1) • Walls window reveal will become much thicker (1) making them unsightly/restrict the ingress of light (1) <p>Accept any other appropriate answer.</p>	(2)

Question Number	Answer	Mark
19	<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"> • Timber is a natural material (1) and can be regrown (1) • The use of fossil fuels can be reduced (1) by burning a renewable fuel (1) • Carbon neutral (1) as carbon dioxide taken in during growth is balanced by the carbon dioxide given off during burning (1) <p>Accept any other appropriate answer.</p>	(4)

Question Number	Indicative content	Mark
20	<p>Discussion on why prefabricated building techniques can be considered a sustainable form of construction for a fast food restaurant chain. The response required is a discussion on why prefabricated building techniques can be considered a sustainable form of construction for a fast food restaurant chain. The discussion should be based on the materials provided within the scenario.</p> <p><u>Key points to consider:</u> Shorter on-site construction time than for traditional construction – labour and plant required for shorter period – facility able to open sooner and produce income Sections made in a factory environment – high quality – consistent quality – reducing waste – separation of waste for recycling Prefabricated sections can be manufactured with finishes completed, such as floor tiling – services installed On-site construction does not require fully skilled workers and much of the construction can be completed by semi-skilled, multitasking workers The same design can be used for many restaurants – reduces design costs – allows suppliers to develop bespoke components</p> <p><u>Level 3 model answer:</u></p> <p>The use of prefabricated building techniques to construct the fast food restaurant, Building 2, can be considered to be sustainable for a number of reasons.</p> <p>Prefabricated buildings are normally constructed in a factory. Factory conditions allow for sections to be built to a high and consistent standard. This is due to them being put together in a dry environment and the use of jigs. Being built to a high standard should reduce the need for remedial work and reduce future maintenance. Factory construction also allows for better use of materials as cutting can be planned to reduce wastage, and waste materials can be separated and collected for recycling.</p> <p>As a fast food company will be looking to build a number of restaurants the same design can be used for all the restaurants. The factory can set up production lines for the manufacture of the prefabricated units and may develop components or techniques to build the sections.</p>	

	<p>This will help with producing sustainable buildings, as this can lead to efficient manufacture that reduces the use of materials, energy used in the manufacture and labour. The building sections can be of high quality and with a long anticipated life.</p> <p>Prefabricated buildings have a greatly reduced construction time on site. Once the groundworks are completed the building can be erected in a much shorter time than for traditional forms of construction. There is virtually no on-site wastage and no cutting is required. The erection of the building will also not be so dependent on the weather conditions. Prefabricated sections can have finishes such as floor tiles already laid and services can be incorporated and plugged together with adjacent sections. This means that as soon as the building is weather resistant, furniture and other fixtures can be installed.</p> <p>Due to the amount of factory manufacture there is a reduced need for skilled labour on-site and much of the erection and fit out can be carried out by unskilled, multitasking labour. The resulting buildings can be of a high quality and require little maintenance, and contain a large amount of sustainable materials.</p> <p>The shorter on-site construction period results in a reduction of on-site resources and the length of time disturbance may be caused by the on-site activities. The restaurant will also be able to open sooner and provide a service to customers, employ staff and make money for the restaurant.</p> <p>In summary, the building of fast food restaurants can be considered a sustainable form of construction as it enables building sections to be built efficiently within a factory environment with little waste and to a high quality. The prefabricated components can be assembled on-site by multitasking labour to produce a quality building that should require little maintenance and have a long life expectancy.</p>	(8)
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Level	Descriptor
0 0 marks	No rewardable material
1 1-3 marks	A few points identified, or one point described. 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. Shows a basic understanding of sustainable construction.
2 4-6 marks	Some points identified, or a few key points described or explained. The answer is unbalanced. Most points made will be relevant to the situation in the question, but the link will not always be clear. Shows a good understanding of sustainable construction.
3 7-8 marks	Range of points described, or a few key points explained in depth. The majority of points made will be relevant and there will be a clear link to the situation in the question. Shows a developed understanding of sustainable construction.

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