

Mark Scheme (Results)

June 2014

NQF BTEC Level 1/Level 2 Firsts in
Construction and the Built Environment

Unit 11: Sustainability in Construction
(21635E)

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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 judgement 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.

Question Number	Answer	Mark
1	1 mark for each correct answer: B) Structural insulated panels (1) D) Recycled particleboard sheets (1)	(2)

Question Number	Answer	Mark
2	1 mark for giving an example of reducing noise. Any one from: <ul style="list-style-type: none"> • Use of silencers (1) • Maintenance of machinery (1) • Manual work methods rather than machines (1) • Acoustic hoardings (1) Accept any other appropriate answer.	(1)

Question Number	Answer	Mark
3	1 mark for each correct answer: B) Photovoltaic roof tiles (1) C) Solar hot water panels (1)	(2)

Question Number	Answer	Mark
4	1 mark for each embodied low energy material, up to 2 marks. Any two from: <ul style="list-style-type: none"> • Stone (1) • Slate (1) • Timber (1) • Straw bales (1) • Reeds (1) • Hemp (1) • (Sheep's) wool (1) Accept any other appropriate answers.	(2)

Question Number	Answer	Mark
5	<p>1 mark for identifying use of a bund wall around a fuel tank, and 1 mark for how this minimises fuel and oil spillage.</p> <p>Bund walls are used around fuel tanks/as a shield/barrier (1) to catch/contain contaminates leaking into the ground (1).</p> <p>Accept any other appropriate answers.</p>	(2)

Question Number	Answer	Mark
6	<p>1 mark for each correct answer:</p> <p>A Use of filters</p> <p>C Use of scrubbers</p>	(2)

Question Number	Answer	Mark
7 (a)	<p>Award 1 mark for each feature identified, up to 2 marks.</p> <p>Any two from:</p> <ul style="list-style-type: none"> • Vegetation/plants • soil • flat roof • aesthetics (e.g. different coloured plants) • provides insulation • eco-friendly/environmentally friendly • wildlife • absorbs water • waterproof membrane <p>Accept any other appropriate answers.</p> <p>Do not accept 'collects water'.</p>	(2)

Question Number	Answer	Mark
7 (b)	<p>A linked response that makes reference to any two of the following points. Up to 2 marks for each explanation.</p> <p>Any two from the following advantages:</p> <ul style="list-style-type: none"> • habitat for wildlife (1) as the vegetation provides both food source and home for some species of wildlife (1) • aesthetics (1) because the vegetation can break up an urban landscape/allow a building to blend in a rural situation (1) • thermal properties (1) as the mass of soil can provide thermal insulation to keep heat in/to prevent solar gain (1) • rainwater attenuation (1) because the growing medium will absorb rainwater and attenuate the run off of rainfall (1) • environmentally friendly (1) because it reduces CO₂ by absorption by plants/vegetation (1) <p>Accept any other appropriate answers.</p> <p>Do not award credit for responses that relate to any alternative roof structure – e.g. roof terraces.</p>	(4)

Question Number	Answer	Mark
8	<p>A linked response that makes reference to any two of the following points. Up to 2 marks for each explanation.</p> <p>Any two from the following disadvantages:</p> <ul style="list-style-type: none"> • Negative aesthetic impact (1) because they are intrusive on the landscape (1) • Not suitable for all locations (1) because some areas do not have sufficient wind (1) • Not economically viable (1) as electricity generated may not cover installation cost (1) • Power is not produced all the time/unreliable primary source (1) because the wind varies in strength (1) • Danger to birds (1) because rotation of blades of higher speeds catches and kills birds (1) <p>Accept any other appropriate answers.</p> <p>Do not accept reference to 'cost' unless in the context of cost-benefit.</p>	(4)

Question Number	Answer	Mark
9	1 mark for each correct answer: A) Low volume flush toilets (1) C) Tap flow restriction devices (1)	(2)

Question Number	Answer	Mark
10	1 mark for identifying an aspect of the local natural environment. Any one from: <ul style="list-style-type: none"> • Protecting the quality of air • Groundwater • Marine environment • Soil • Natural habitats • Flora and fauna/wildlife • Eco-systems • Landscapes • Trees and hedgerows Accept any other appropriate answers.	(1)

Question Number	Answer	Mark
11	1 mark for identifying each way that the use of private cars can be reduced, up to 2 marks. Any two from: <ul style="list-style-type: none"> • provision of cycle tracks (1) • mass transport – trams, trains or buses (1) • designated ‘two people lanes’ (1) • parking restrictions/charges (1) • local transport subsidies / initiatives (1) • bicycle hire (as in London)/bike storage (1) • congestion charging schemes (as in London and Durham) (1) • footpaths/pedestrian routes Accept any other appropriate answers.	(2)

Question Number	Answer	Mark
12	A linked response that makes reference to the following points. Up to 2 marks for each description. Any two from: <ul style="list-style-type: none"> • consult with the local community/recruit a 	(4)

	<p>community liaison officer (1) to develop a dialogue/channel for discussion/complaints (1)</p> <ul style="list-style-type: none"> • newsletters/leaflets (1) providing the community with information so they know what is happening (1) • provide a website/social media profile (1) to provide real-time/immediate information (1) • meetings/presentations to explain what is proposed (1) allowing the community to express their views (1) • displays and exhibitions/signage (1) allowing the community to see what is being proposed (1) • survey of local residents (1) to find out their views (1) <p>Accept any other appropriate answers.</p>	
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Question Number	Answer	Mark
13	<p>1 mark for each sustainable feature identified, up to 2 marks. Any two from:</p> <ul style="list-style-type: none"> • recycled glass mineral wool (in the walls and floors) (1) • sheep's wool (in the roof) (1) • double glazing (1) • draught proofing (1) • automatic door control system / Automatic door closing system (1) <p>Accept any other appropriate answer.</p>	(2)

Question Number	Answer	Mark
14 (a)	<p>1 mark for a use of this material:</p> <ul style="list-style-type: none"> • Fill material • Backfill • Bulkfill • Substructures • Foundations • Soakaways • Temporary roads • Hardstandings • Ground floors/floors/slabs <p>Accept any other appropriate answer. Accept any answer that specifies the location on-site where the fill material can be used – e.g. patio, driveways, paths, level uneven surfaces</p>	(1)

Question Number	Answer	Mark
14 (b)	<p>1 mark for each material identified. Any two from:</p> <ul style="list-style-type: none"> • Asbestos (1) • Fluorescent tubes/lighting (1) 	(2)

Question Number	Answer	Mark
15	<p>A linked response that makes reference to any one of the following cost advantages. Up to 2 marks for an explanation.</p> <p>Any one from the following cost advantages:</p> <ul style="list-style-type: none"> • lower initial site purchase cost (1) because the previous warehouse would need to be demolished/decontamination works/site clearance/potential underground hazards (1) • it is a brownfield site (1) therefore already has services and infrastructure in place • the value of the existing structure/site (1) due to possible recycling/reclamation/re use/re sale of materials from the demolition of the warehouse (1) <p>Do not award credit for answers referring to re-use of foundations as the site is being used for a different form of construction.</p> <p>Accept any other appropriate answer.</p>	(2)

Question Number	Answer	Mark
16	<p>1 mark for a way to maximise natural light:</p> <ul style="list-style-type: none"> • Bigger glass surface area/ more windows/skylights • Windows/building orientated south • Sun/light tubes/collectors • Light coloured reflective wall finishes <p>Do not accept 'windows' on its own</p> <p>Accept any other appropriate answer.</p>	(1)

Question Number	Answer	Mark
17	<p>A linked response that makes reference to the following ways minimise the environmental impact of the building. Up to 2 marks for each explanation.</p> <p>Any two from the following ways:</p> <ul style="list-style-type: none"> • timber for the structural frame can be sustainably sourced /sustainably locally sourced (1) therefore not consuming finite resources /can be replanted/reducing transport costs (1) • produces an energy-efficient building (1) because timber has low embodied energy (1) • minimising the time the construction process impacted on the environment (1) because the timber frame is partially constructed off-site/in a factory (1) • reduces the energy requirements to heat the building (1) because timber is naturally a good thermal insulator/allows insulation to be incorporated within the structure (1) • reduced need for disposal in landfills (1) because less waste is produced on site (1) • less raw materials are required (1) because waste is recycled in the factory that produces the frames (1) • allows increased insulation to be installed (1) because of the flexibility within the construction of the timber frame (1) • reduces the environmental impact of the building over its life cycle (1) because the frame can be recycled at the end of the buildings life (1) <p>Accept any other appropriate answers.</p>	(4)

Question Number	Indicative content	Mark
18	<p>Discussion of the current social impact on the local community of Building 1 and Building 2:</p> <p>The environment and visual appearance of each building:</p> <ul style="list-style-type: none"> • The visual appearance of Building 1 is poor as compared to Building 2. • Building 2 has car parking hidden from the road frontages and dedicated provision for the storage of refuse. • Building 2 has been specifically designed to be in sympathy with the local area. <p>How others will be attracted to the area:</p> <ul style="list-style-type: none"> • Building 1 is unlikely to encourage people/businesses to relocate to the area and may have a negative effect on the value of neighbouring properties. • Building 2 will be regarded as being attractive and safe and is likely to attract people to relocate to the area and create a sense of local community. This may stimulate the local economy and generate improvements to local services and infrastructure. <p>Safety and security:</p> <ul style="list-style-type: none"> • Building 2 has been built with safety considered at the design stage. • The resident's car park is in the enclosed courtyard with controlled access. • However, Building 2 is a high-density development, which increases the traffic flow in the area. This may lead to congestion and accidents. • Building 1 has no off street parking and vehicles have to be parked on the streets. This may lead to congestion. • Access to the flats in Building 2 is via a number of secure entry points and these are fitted with door entry systems and CCTV. These features are lacking from Building 1. • As Building 1 is vacant it may become a danger to anyone entering the site e.g. children, vagrants. • Both buildings are in a deprived area that is likely to have a high crime rate. • Building 1 is dilapidated and could encourage criminal activity, such as vandalism, theft of materials (lead). 	(8)

	<ul style="list-style-type: none"> • Vagrants/rough sleepers/squatters may also be attracted to the shelter the building provides, which adds to the negative perception of the area. <p>Life-cycle and running costs:</p> <ul style="list-style-type: none"> • Building 1 is at the end of its life with few sustainable technologies to reduce running costs. • In comparison Building 2 provides sustainable long-term housing for future generations and has been built with a range of sustainable technologies to minimise running costs. • Building 2 is only a few years old and requires little maintenance. • Building 1 requires a large amount of money spent on it to improve its condition. <p>Accept other appropriate answers.</p>	
Level	Descriptor	
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0 0 marks	No rewardable material	
1 1-3 marks	A few key points identified, or one point described in some detail. The answer is likely to be in the form of a list. Only one viewpoint considered. Points made will be superficial/generic and not applied/directly linked to the situation in the question.	
2 4-6 marks	Some points identified, or a few key points described. Consideration of more than one viewpoint but there will be more emphasis on one of them. The answer is unbalanced. Most points made will be relevant to the situation in the question, but the link will not always be clear.	
3 7-8 marks	Range of points described, or a few key points explained in depth. All sides of the case are considered and the answer is well-balanced, giving weight to all viewpoints. The majority of points made will be relevant and there will be a clear link to the situation in the question.	