

# Examiners' Report/ Lead Examiner Feedback

June 2014

NQF BTEC Level 1/Level 2 Firsts in  
Construction

Unit 11: Sustainability in Construction  
(21635E)

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## **Introduction**

This report has been written by the Lead Examiner for BTEC Construction and the Built Environment Unit 11 – Sustainability in Construction. It is designed to help you understand how learners performed overall in the exam. For each question there is a brief analysis of learner responses. You will also find some examples of learner responses at Level 2 Pass, Merit and Distinction. We hope you will find this will help you to prepare your learners for future examination series.

## **General Comments on Exam**

This was the first examination for this unit, and overall the paper produced a reasonable range of responses.

It is noticeable that a number of learners did not attempt a number of the questions. However, learners did appear to manage their time effectively and appeared to be able to complete the paper in the allotted time. There did not appear to be evidence of rushed work towards the end of the paper.

The more demanding questions provided learners with an opportunity to apply their knowledge in response to sustainability issues related to a range of construction scenarios. Learners may have some prior learning in respect of environmental and sustainability issues, but it is important that learners are taught sustainability in the context of construction covering the lifecycle of a development.

Learners would, however, benefit from being taught examination skills and techniques as often they did not appear to have read the question properly. This resulted in questions not being answered using an appropriate methodology. Where questions required students to 'identify' many provided extended responses where only naming is required. Learners should be familiar with the command verbs to be able to effectively answer questions that require them to 'describe', 'explain' or 'discuss'.

## Section A

### Question 1

This question required the identification of sustainable materials

**Targeted Specification Area: Learning Aim B.2**

**Q1:** Many learners were able to identify the timber-based products, 'Structural insulated panels' and 'Recycled particleboard sheets'.

### Question 2

This question required identifying the means of reducing noise pollution from construction operations.

**Targeted Specification Area: Learning Aim A2.4**

**Q2:** Many learners were able to identify the use of 'silencers', 'maintenance of machinery' or 'acoustic hoardings'. However, there were a number of learners who did not appear to understand the question and gave responses about how to provide sound insulation to adjacent buildings.

### Question 3

This question required the identification of alternative energy sources.

**Targeted Specification Area: Learning Aim B.3**

**Q3:** Many learners were able to identify at least one of the two alternative energy sources, 'Photovoltaic roof tiles' or 'solar hot water panels'.

### Question 4

This question required the identification of low embodied energy materials

**Targeted Specification Area: Learning Aim B.1**

**Q4:** Many learners were able to identify at least one low embodied energy material. Popular answers included timber or wood, stone and straw bales.

## Question 5

This question assessed the understanding of the use of bund walls to reduce pollution.

**Targeted Specification Area: Learning Aim A2.4**

**Q5:** Some learners were able to provide an explanation of one way how bund walls are used to reduce land contamination. Few student responses made reference to bund walls being used around fuel or chemical storage, but students did identify that bund walls form a barrier to contain materials from causing land contamination. The use of bund walls is referred to within the specification, A2.4 Pollution.

Level 2 Pass example:

5 Explain **one** way bund walls are used to reduce land contamination.

To stop the passage of pollution, and keep contaminated things in one area without them getting out and contaminating everywhere.

## Question 6

This question required the identification of reducing pollution at power stations.

**Targeted Specification Area: Learning Aim A3.2**

**Q6:** Many learners were able to identify at least one of the two ways to reduce pollutants at power stations, 'Use of filters' or 'Use of scrubbers'.

## Question 7

This question assessed the understanding of green roof technology through the identification of features (Q7a) and the explanation of advantages (Q7b).

**Targeted Specification Area: Learning Aim B4**

**Q7(a):** A number of learners were able to identify at least one feature of a green roof. The most common response was the growing of plants. Many learners did not appear to understand what green roof construction is and referred to roof terraces or solar panels.

Level 2 Pass example:

7 A sustainable building technique is the use of green roof technology.

(a) Identify **two** features of a green roof.

(2)

1 ~~be~~ Aesthetically pleasing (looks natural)

2 lowers the risk of flooding as it absorbs water.

**Q7(b):** Most learners were able to gain 1 or 2 marks by identifying advantages. However, to access the Distinction marks learners need to provide a linked response. The 4 marks cannot be gained by providing 4 advantages. To be awarded 4 marks learners need to identify 2 advantages and link these to a statement providing an explanation of the advantage.

Level 2 Distinction example:

(b) Explain **two** advantages of using green roof technology.

(4)

1 The more green roofs there are the less chance of floods because when the ~~grass~~ roads or pavements are built they don't allow the ground to suck the water whereas greenroofs do suck the water in.

2 Green roofs gives natural habitats more space, they're beneficial to biodiversity & humans/animals as trees and plants provide fresh oxygen & air, also they're cheap.

### Question 8

This question assessed the understanding of small-scale wind turbines as an alternative form of energy.

**Targeted Specification Area: Learning Aim B3**

**Q8:** This question generated a range of responses. A number of learners were able to give one or two disadvantages and more able students were able to access the Distinction marks by providing a linked explanation. A common response was that if there is no wind, the turbine will not provide any power. A few learners stated noise as a disadvantage. This is however included in the question and is therefore not a

valid answer. Learners should be reminded that they should not repeat the question as their response.

Level 2 distinction example:

Explain **two** other disadvantages of small-scale wind turbines.

1 They won't work <sup>if there is</sup> ~~with~~ no wind to drive them, this means no electricity is generated.

2 They can be considered an ~~eye~~ eye sore ~~to~~ ~~see~~, especially in rural areas, as they don't fit in with their environment.

### Question 9

This question required the identification of water saving solutions.

**Targeted Specification Area: Learning Aim B.1**

**Q9:** Many learners were able to identify at least one of the two water saving solutions, 'Low volume flush toilets' and 'Tap flow restriction devices'.

### Question 10

This question required the identification of an aspect of the natural environment that needs to be protected.

**Targeted Specification Area: Learning Aim A1.1**

**Q10:** The majority of learners were able to state one aspect of the local natural environment that must be protected in a sustainable development. For example, 'natural habitats' or 'trees'.

Level 2 Pass example:

**10** A key concept of sustainability is protectecting aspects of the natural environment.

State **one** aspect of a local natural environment that must be protected in a sustainable development.

Natural habitats of protected animals.

### Question 11

This question assessed learners' understanding of infrastructure design to reduce the use of private cars.

**Targeted Specification Area: Learning Aim B.1**

**Q11:** A number of learners were able to give at least one way infrastructure can be designed to reduce the use of private cars e.g. 'cycle tracks' or 'mass transport'. However, many learners did not appear to understand the term 'infrastructure' and consequently gave inappropriate responses as their responses did not relate to infrastructure design. The inappropriate responses included 'raising the cost of fuel' or 'increase the cost of cars'.

Level 2 Pass example:

11 Give **two** ways infrastructure can be designed to reduce the use of private cars.

1. ~~cycle~~ routes for cyclists or walkers

2. Train stations to provide ~~the~~ transport without use of cars.

### Question 12

This question assessed the understanding of how developers can reduce the impact of development on the local community.

**Targeted Specification Area: Learning Aim A3.2**

**Q12:** The majority of learners provided a response to the question, but many were awarded 1 or 2 marks for identifying ways of developers reducing the impact of development on the local community. More able learners were able to access the Merit marks by providing a statement linked to the identification to provide a description of how the identified way will reduce the impact of development on the local community. Common responses were 'newsletter', 'leaflets' and 'meetings'.

Level 2 Merit example:

12 Describe **two** ways a developer can liaise with the local community to minimise the impact of a construction project on the community.

1 Posters and adverts in newspapers to inform the community of this project.

2 Set up a committee so people can say their views on the projects.

## Section B

### Question 13

This question was scenario- based and required the identification of sustainable design and technology solutions within a given building.

**Targeted Specification Area: Learning Aim B.1**

**Q13:** The majority of learners were able to identify two of the sustainable design and technology solutions included in the scenario.

### Question 14

This question was scenario- based and tested the understanding of the use of a recycled material (a), and the identification of materials requiring disposal at specialist disposal sites (b).

**Targeted Specification Area: Learning Aim B.2**

**Q14(a):** Learners provided a range of responses, but in many cases did not demonstrate a clear understanding of the use of crushed hardcore. An acceptable response would have been 'fill' or 'fill material'. Foundations was accepted as an acceptable response, but learners did not in all cases identify exactly where the 'hardcore' was used. Other responses accepted were 'under paths' or 'level the site'. Incorrect responses included 'in walls'.

**Q14(b):** Many learners were able to identify at least one of the materials from the scenario that required disposal at a specialist disposal site, 'asbestos' and

'fluorescent tubes'. Lead pipes was not accepted as a correct response as lead can be recycled. Some learners responded with 'plasterboard', but this is not included within the scenario, and thus was not accepted as a correct response.

Level 2 Pass example:

(b) Identify **two** materials used in Building 1 that require disposal at a specialist disposal site. (2)

1 Asbestos

2 fluorescent tube lighting

### Question 15

This question was scenario-based and required an understanding of the advantages of brownfield sites to developers.

**Targeted Specification Area: Learning Aim B.4**

**Q15:** This question was answered poorly by learners. Many students may not have fully understood the question as responses related to the new structure and not the site. More able students were able to identify that the site for Building 2 was a brownfield site for the first mark, then went on to provide a linked explanation of the cost advantage to the developer, attracting the additional mark.

Level 2 Distinction example:

15 Explain **one** cost advantage, for the developer, of the site for Building 2.

It has been built on a brownfield site (an ~~old~~ disused warehouse), so that means it will already have all of the services.

### Question 16

This question was scenario-based and required an understanding of sustainable design in relation to minimising the use of artificial lighting during daylight.

**Targeted Specification Area: Learning Aim B.1**

**Q16:** The majority of learners provided a correct response to this question. Common responses were bigger windows, more windows or orientate the building to face south.

Level 2 Pass example:

**16** Building 1 is being replaced by five new houses.

Give **one** way that new houses can maximise natural light.

Have a South facing orientation.

### Question 17

This question was scenario-based and required learners to show an understanding of the factors that contribute to structural timber offering a sustainable solution to building construction.

**Targeted Specification Area: Learning Aim B.2**

**Q17:** Learners demonstrated a poor understanding of how a structural timber frame helped to minimise the environmental impact of the building. Responses were largely limited to the sustainable aspects of timber as a material. The limited variation in responses may be due to a lack of learner knowledge on the use of structural timber frame construction and learners have relied on their knowledge of timber as a construction material. The mark scheme provides a range of possible responses. For learners to obtain 4 marks they are required to provide 2 linked responses that link a reason with a statement explaining why using timber in the structural frame helped the developer to minimise the environmental impact of the building. The reason may be at any stage within the life cycle of the building.

Level 2 Distinction example:

**17** Explain **two** reasons why using timber in the structural frame in Building 2 helped the developer to minimise the environmental impact of the building.

1. Timber is a natural product, it can be regrown and re-planted. This means the biodiversity in the area is ~~is~~ less affected.

2. Timber is a low-energy embodied material, meaning from harvesting to manufacturing to delivery on site, timber uses low energy amounts minimising pollution, therefore the environmental impact.

(Total for Question 17 = 4 marks)

## Question 18

This question was scenario- based and required a discussion of the social impact on the community of the two given buildings.

**Targeted Specification Area: Learning Aim A1.1 & A3.1**

**Q18:** The majority of learners provided a response to this question, but responses were limited by providing a few key points or a limited discussion of one or two points and were thus awarded few marks. The question requires that learners investigate the current social impact on the local community of Building 1 and Building 2. A number of learners referred to the social impact in the future after the potential redevelopment of Building 1 had taken place. The response to this discussion question requires learners to investigate the current social impact of the two buildings by reasoning or argument. Learners should identify similarities and differences, e.g. both buildings are in the same area, but are visually different and thus will have different social impacts on the local community. Evidence should be gathered from the scenarios making reference to both the text and photographs. Learners should be made aware of how marks will be awarded for this extended writing question. The descriptors within the mark scheme provide guidance on the evidence requirements for the mark bands. Marks in the lower mark band are awarded for a few points identified in list form or one point described in some detail. Additional marks will be awarded as the range of points increase and these are described or explained in a balanced way giving weight to all viewpoints. The mark scheme provides the areas from which evidence may be drawn. These are, 'the environment and visual appearance of each building', 'how others will be attracted to the area', 'safety and security' and 'lifecycle and running costs'.

Level 2 Pass example:

18 Discuss the current social impact on the local community of Building 1 and Building 2.

Building 1 has a negative social impact. This is caused by the fact that it is run down. <sup>This</sup> ~~depresses~~ the attractiveness of an area decreasing peoples local pride and therefore self-respect, this would create an incline of crime. Another issue is that with it being derelict, it is sitting on top of space that could otherwise be used for housing or a possible green space, deducting from local residents quality of life.

~~The~~ Building 2 has a positive social impact. It has essentially turned a dis-used ugly warehouse on a brownfield site, into a modern, sustainable residential build. ~~The~~ Within the local area. This means the area has been regenerated and local greenfield areas have been preserved, creating a positive quality of life. Another impact is that it's improved the ability of locals to commute. Before, people may have had to travel from poor quality outskirts houses to work. But now there is ~~good~~ good quality housing closer to the centre of town, reducing commute distance. This can have a positive environmental impact also, reducing the amount of emissions created by vehicles.

## Grade Boundaries

### External assessment

The suite of 'next generation' NQF BTECs include an element of external assessment. This external assessment may be through a timetabled paper-based examination, an onscreen, on demand test or a set-task conducted under controlled conditions.

### What is a grade boundary?

A grade boundary is where we 'set' the level of achievement required to obtain a certain grade for the externally assessed unit. We set grade boundaries for each grade (Distinction, Merit, Pass and Level 1 fallback).

### Setting grade boundaries

When we set grade boundaries, we look at the performance of every learner who took the assessment. When we can see the full picture of performance, our experts are then able to decide where best to place the grade boundaries - this means that they decide what the lowest possible mark should be for a particular grade.

When our experts set the grade boundaries, they make sure that learners receive grades which reflect their ability. Awarding grade boundaries ensures that a learner who receives a 'Distinction' grade next year, will have similar ability to a learner who has received an 'Distinction' grade this year. Awarding grade boundaries is conducted to make sure learners achieve the grade they deserve to achieve, irrespective of variation in the external assessment.

### Variations in externally assessed question papers

Each exam we set asks different questions and may assess different parts of the unit content outlined in the specification. It would be unfair to learners if we set the same grade boundaries year on year because then it wouldn't take into account that a paper may be slightly easier or more difficult than the year before.

Grade boundaries for this, and all other papers, can be found on the website on this link:

<http://www.edexcel.com/iwantto/Pages/grade-boundaries.aspx>

Grade	Unclassified	Level 1 Pass	Level 2 Pass	Level 2 Merit	Level 2 Distinction
Boundary Mark	0	13	22	31	41

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