

Write your name here

Surname

Other names

**Pearson BTEC  
Level 1/Level 2  
First Certificate**

Centre Number

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Learner Registration Number

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# Construction and the Built Environment

## Unit 11: Sustainability in Construction

Monday 22 May 2017 – Afternoon

**Time: 1 hour 15 minutes**

Paper Reference

**21635E**

**You do not need any other materials.**

Total Marks

### Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and learner registration number.
- Answer **all** questions.
- Answer the questions in the spaces provided  
– *there may be more space than you need.*

### Information

- The total mark for this paper is 50.
- The marks for **each** question are shown in brackets  
– *use this as a guide as to how much time to spend on each question.*

### Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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Answer ALL questions.

Some questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

SECTION A

1 Identify **two** benefits of designing in a sustainable way.

- A Inclusion of green spaces
- B Rundown locations are produced
- C Waste is sent to landfill
- D Habitats are destroyed
- E Nice places to live are built

(Total for Question 1 = 2 marks)

2 Give **one** way that construction may lead to the depletion of finite resources.

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(Total for Question 2 = 1 mark)

3 Identify **two** economic benefits to think about when planning a construction project.

- A Accident reporting
- B Environmental impact
- C Employment opportunities
- D Financial return
- E Naturally occurring products

(Total for Question 3 = 2 marks)

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4 Give **two** benefits of using locally sourced materials.

1 .....

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2 .....

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(Total for Question 4 = 2 marks)

5 State **one** benefit to residents of designing a new development with low density of housing.

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(Total for Question 5 = 1 mark)

6 Identify **two** sustainable site practices that minimise the effect on the physical environment.

- A Erection of site accommodation
- B Segregation of waste
- C Protective fencing around trees
- D Combined drainage system
- E Construction Health and Safety Plan

(Total for Question 6 = 2 marks)

7 Give **two** ways to improve the efficiency of domestic heating systems.

1 .....

2 .....

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(Total for Question 7 = 2 marks)



8 Temporary surface water drainage is going to be installed on a construction site that has sandy soil conditions.

Explain **one** way the temporary drains can be constructed to prevent the drains from blocking.

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(Total for Question 8 = 2 marks)

9 One method of providing natural ventilation to buildings is the use of windows that open.

State **two** other ways of providing natural ventilation to buildings.

1 .....

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2 .....

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(Total for Question 9 = 2 marks)

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10 (a) State **two** characteristics of solar hot water panels.

(2)

1 .....

2 .....

(b) State the ideal direction in which solar hot water panels should face.

(1)

.....

(c) State **one** way solar hot water panels help sustainability.

(1)

.....

(Total for Question 10 = 4 marks)

11 (a) Identify **two** sustainable timber-based products.

(2)

- A Engineered joists
- B Aerated blocks
- C GRP panels
- D Cedar boarding
- E Foam board

(b) Give **two** reasons why timber is a sustainable material.

(2)

1 .....

2 .....

(Total for Question 11 = 4 marks)



**12** A road sign that briefly lights up to warn drivers of a hazard ahead is to be installed in a rural location where mains electricity is not available.

Explain **one** way in which the road sign can be provided with a constant, reliable low maintenance source of electricity.

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**(Total for Question 12 = 2 marks)**

**13** A developer is considering purchasing a former chemical factory as a site for a housing development and will need to consider a variety of cost factors.

Explain **two** costs that the developer needs to think about when deciding how much to pay for the site.

1 .....

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2 .....

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**(Total for Question 13 = 4 marks)**

**TOTAL FOR SECTION A = 30 MARKS**

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**SECTION B BEGINS ON THE NEXT PAGE**



## SECTION B: Retail Development

Read the source material below and then answer the questions.



### Building 1: Recently Constructed Local Supermarket

Building 1 is a recently constructed local supermarket. The supermarket has been included in a new development. The new development includes both residential and commercial buildings. The supermarket building is a steel frame construction with solid first floors, rendered elevations and a synthetic slate roof. The front of the supermarket is glazed and there are automatic glass doors for customers. The developer has tried to make the building energy efficient and reduce the amount of electricity used. Disposal of surface water from the site is part of a sustainable urban drainage system (SUDs).

The area in front of the supermarket is landscaped and provides a small green open space. It is often windy across the green area to the front of the supermarket.

A cashpoint machine is provided on the external elevation of the building.

The supermarket is on the edge of a medium-sized town in a residential area. This area is located near a main road providing access to the town. It was important during the construction of the development to minimise disruption to the local people.

There is a small car park for shoppers.

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### **Building 2: Large Shopping Centre**

Building 2 is a large shopping centre developed in the last ten years. The shopping centre is on the edge of a large town and is on an important road junction providing access to suburbs. The shopping centre has been built on a brownfield site.

The roads around the shopping centre have become increasingly congested since it opened and traffic delays are caused to traffic passing by the shopping centre and to local traffic visiting the shopping centre. The centre is on local bus routes.

The opening of the shopping centre has resulted in the closure of shops in other shopping centres within the urban area and there is a fear that these areas may become run down due to the success of the new shopping centre.

The shopping centre also includes a doctors' surgery, dental practice, opticians, a cinema, bingo, casino and a range of restaurants and coffee shops. Free car parking is provided for the users of the shopping centre and the other facilities.

The buildings have been built to the current Building Regulations and include a range of sustainable practices. The surface water from the site is drained to soakaways and is part of a sustainable urban drainage system (SUDs).

The contractor that built the development was a member of the Considerate Constructors Scheme.



14 State **one** way of reducing the amount of mud being transferred to local roads during the construction of Building 1.

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(Total for Question 14 = 1 mark)

15 Give **one** way that the energy used by the internal lighting in Building 1 could be minimised.

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(Total for Question 15 = 1 mark)

16 Explain **one** reason why the automatic doors to Building 1 help sustainability.

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(Total for Question 16 = 2 marks)

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17 (a) Explain **one** reason why the disposal of surface water from the site of Building 2 can be considered sustainable.

(2)

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(b) Explain **one** way the car park to Building 1 could be constructed to allow surface water to be disposed of on site without the use of road gullies or drainage channels.

(2)

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**(Total for Question 17 = 4 marks)**

18 Explain **two** ways the Considerate Constructors Scheme reduces the impact of a construction project on the local community.

1 .....

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2 .....

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**(Total for Question 18 = 4 marks)**



19 Discuss the benefits and drawbacks of Building 2 in terms of the social and economic sustainability of the town.

(8)

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**(Total for Question 19 = 8 marks)**

**TOTAL FOR SECTION B = 20 MARKS**  
**TOTAL FOR PAPER = 50 MARKS**





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