Write your name here

Surname	Other names

Pearson BTEC Level 1/Level 2 First Certificate

Centre Number

Learner Registration Number

Construction and the Built Environment

Unit 11: Sustainability in Construction

Wednesday 18 January 2017 – Morning
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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P 4 8 2 7 2 A 0 1 1 6

Pearson

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** ways of reducing noise from construction operations.

- ☒ **A** Use of scrubbers
- ☒ **B** Use of silencers
- ☒ **C** Locally sourced materials
- ☒ **D** Safe transportation off site
- ☒ **E** Maintenance of machinery

(Total for Question 1 = 2 marks)

2 Give **one** way the use of modern fuel-efficient vehicles and plant can help sustainability.

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(Total for Question 2 = 1 mark)

3 Identify **two** sustainable site practices.

- ☒ **A** Correct storage of fuels and chemicals
- ☒ **B** Specifying modular dimensions
- ☒ **C** Life cycle costing
- ☒ **D** Relocation of animal habitats
- ☒ **E** Mass rapid transport links

(Total for Question 3 = 2 marks)

4 (a) Minimising fuel and oil spillages from construction work will reduce land contamination.

Give **two** other ways to reduce land contamination from construction work.

(2)

1 .....

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2 .....

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(b) Waste materials are often sent to landfill or recycling sites.

Give **one** other way of disposing of waste materials.

(1)

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(c) Give **one** type of environmental damage that may be caused by the transportation of waste to landfill sites.

(1)

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(Total for Question 4 = 4 marks)

5 Identify **two** ways a contractor can minimise the impact of construction work on the local community.

- ☒ **A** Temporary lighting for night work
- ☒ **B** Noise reduction equipment
- ☒ **C** Wheel cleaning facilities
- ☒ **D** Minimal on-site storage
- ☒ **E** Road closures

(Total for Question 5 = 2 marks)

6 Structural insulated panels (SIPs) are made from timber. Timber is a sustainable material.

(a) Name **one** other timber-based construction product.

(1)

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(b) Give **two** other advantages of structural insulated panels (SIPs).

(2)

1 .....

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2 .....

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(Total for Question 6 = 3 marks)

7 Explain **one** way a building can be designed to minimise damage from flooding.

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(Total for Question 7 = 2 marks)

8 Name **one** insulation product made from recycled materials.

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(Total for Question 8 = 1 mark)

9 Community liaison is where council workers or developers speak to local people about construction projects.

Give **one** other example of community liaison.

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(Total for Question 9 = 1 mark)

10 State **two** ways low embodied energy construction materials help sustainability.

1 .....

.....

2 .....

.....

(Total for Question 10 = 2 marks)

11 Straw bales are produced by the farming industry and are used in sustainable construction.

(a) Name the element of a building that straw bales are used to construct.

(1)

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(b) Name **one** technique of building using straw bales.

(1)

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(c) Explain **two** reasons why straw bales are a sustainable construction material.

(4)

1 .....

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2 .....

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(Total for Question 11 = 6 marks)

12 A new holiday park is being developed in an area with a limited supply of mains water. As a result a grey water system is being considered.

Explain **two** reasons why a grey water system would not meet all the water requirements at the holiday park.

1 .....

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2 .....

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(Total for Question 12 = 4 marks)

TOTAL FOR SECTION A = 30 MARKS

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SECTION B BEGINS ON THE NEXT PAGE

SECTION B: Domestic Homes

Read the source material and then answer the questions.

Building 1: 1950s Semi-Detached Bungalow

Building 1 is a semi-detached bungalow built in the 1950s using traditional construction methods. The property was constructed with cavity brick and block walls, solid ground floors, and timber rafters with concrete interlocking tiles to the roof. The concrete interlocking tiles do not give much thermal insulation. The original windows were timber and single glazed, but have been changed to PVCu double glazed units. The timber fascias have also been changed to PVCu. The gutters are precast concrete with the outer surfaces painted. Gas-fired central heating was installed in the 1980s and this also provides hot water.

The bungalow is on a quiet residential estate and lots of the bungalows have elderly people living in them. The estate is on a local bus route and also has a small shop and post office.

Building 2: 2014 Detached House

Building 2 is a large four bedroom detached house built in 2014 on a new estate. The front of the house faces north. The walls are cavity construction using brick and block with insulation in the cavity. Some of the front of the house is rendered and painted. The ground floors are constructed using beam and block and have insulation and pipes for underfloor heating. The first floor joists are eco-joists. The roof is constructed using trussed rafters, with insulation placed between and over the rafters and concrete tiles. The soffits and fascias are PVCu. The windows have timber frames treated with a white stain and are triple glazed with solar glass.

The house has two bathrooms and a ground floor cloakroom. There are no walls between the kitchen and living room. None of the internal walls are load bearing. Hot water and heating is provided by a combined heat and power unit.

13 Name **two** water saving fittings that could be installed in Building 2.

1 .....

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2 .....

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(Total for Question 13 = 2 marks)

14 Trussed rafters are prefabricated roof components that have been used in Building 2.

State **two** other features of trussed rafters.

1 .....

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2 .....

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(Total for Question 14 = 2 marks)

15 Eco-joists are a sustainable building component.

Explain why the use of engineered eco-joists provides a sustainable solution in Building 2.

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(Total for Question 15 = 2 marks)

16 The owner of Building 2 is thinking about having photovoltaic panels fitted.

Explain **one** reason, other than aesthetics, why the panels would not be fitted to the roof at the front of the house.

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(Total for Question 16 = 2 marks)

17 Explain **two** energy saving solutions that could be put in Building 1 to reduce its carbon footprint. You should suggest an energy saving solution that has an expected payback period of five years or less.

1 .....

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2 .....

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(Total for Question 17 = 4 marks)

18 Discuss the ongoing running and maintenance costs of Building 1 and Building 2.

(8)

(Total for Question 18 = 8 marks)

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

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