Write your name here

| Surname | Other names |
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**Pearson BTEC Level 1/Level 2 First Certificate**

Centre Number

Learner Registration Number

# Construction and the Built Environment

## Unit 11: Sustainability in Construction

Friday 20 May 2016 – 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 6 7 6 5 A 0 1 1 6

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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** ways in which dust from construction sites can be reduced.

- ☒ **A** Use of bund walls
- ☒ **B** Damping down
- ☒ **C** Absorbent mats
- ☒ **D** Use of settlement tanks
- ☒ **E** Wheel cleaning

**(Total for Question 1 = 2 marks)**

**2** Name **two** types of pollution that may affect the local environment during the construction of a large building.

1 .....

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2 .....

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

**3** Identify **two** ways to reduce air leakage from buildings.

- ☒ **A** Use of weather stripping materials
- ☒ **B** Use of cavity trays
- ☒ **C** Use of automatic external door closers
- ☒ **D** Use of intumescent paint
- ☒ **E** Use of engineered timber joists

**(Total for Question 3 = 2 marks)**

**4** Sustainable construction requires the safe disposal of waste materials.

(a) Give **one** reason for the categorisation of waste materials on a construction site.

**(1)**

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(b) Give **one** reason why a licensed waste disposal contractor should be used.

**(1)**

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(c) Name **two** materials from a traditionally built house that could be recycled when the building is demolished.

**(2)**

1 .....

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2 .....

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

**5** Explain **one** way in which a major new construction development can provide employment and training opportunities to the local community.

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**(Total for Question 5 = 2 marks)**

**6** (a) Give **two** community facilities that need to be considered when planning sustainable developments.

**(2)**

1 .....

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2 .....

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(b) Give **two** features of the built environment that can promote increased feelings of community safety.

**(2)**

1 .....

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2 .....

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**(Total for Question 6 = 4 marks)**

**7** Give **two** reasons why a developer would involve the local community at the design stage of a construction project.

1 .....

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2 .....

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**(Total for Question 7 = 2 marks)**

**8** Identify **two** benefits to the community of reducing crime.

- ☒ **A** Would attract commercial enterprise
- ☒ **B** Could use local suppliers
- ☒ **C** Would reduce insurance costs
- ☒ **D** Would be fewer planning objections
- ☒ **E** Could reduce industrial action

**(Total for Question 8 = 2 marks)**

**9** An eco-tourism visitor centre is being created at a bird sanctuary as part of a local development.

State **two** benefits the visitor centre could provide to the local community.

1 .....

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2 .....

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**(Total for Question 9 = 2 marks)**

**10** Explain **one** way that the depletion of finite resources can be reduced.

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**(Total for Question 10 = 2 marks)**

**11** Noise from a construction site can disturb the local community. The use of silencers and maintenance of machinery reduce noise from a construction site.

Explain **one** other way in which a contractor could minimise noise from construction work that must take place at night.

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**(Total for Question 11 = 2 marks)**

**12** Explain **two** benefits for the community of a developer building on a site that is disused and contaminated.

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 STARTS ON PAGE 8**

## SECTION B: School Buildings

**Read the source material below and then answer the questions.**

**Building 1: School Building 1900**

This school was built over 100 years ago in the centre of a town. It has a series of classrooms with a central assembly hall. The building is oriented east-west. Toilets are provided in separate blocks adjacent to the main building.

The building is of solid brick wall construction and has a clay tiled roof. Materials were sourced locally. The window frames are made of timber, with single glazing and provide ventilation. Heating was originally provided through solid fuel boilers and radiators, but more recently gas-fired boilers have been fitted. There are few controls for the heating. Lighting is currently provided by fluorescent tubes.

Outside the building there is a playground but no car parking for staff. The local authority has put in place transport strategies to reduce car use in the town centre.

**Building 2: School Building 2010**

This school was built to current standards to create an energy-efficient, sustainable building. The building is located on the edge of a village in a rural area.

The interior has been designed to have flexible teaching spaces, and in addition to areas for dining and assemblies, there are specialist zones for design technology.

The building is of steel frame construction with precast concrete floors and insulated external wall panels. The floors and roof incorporate large amounts of insulation. Heating and ventilation are provided through a computer controlled system with heat recovered from air expelled from the building. Air is heated via energy-efficient gas-fired burners. Windows are tripled glazed with energy-efficient glass and cannot be opened manually. Lighting is provided through LED lights with proximity sensors.

Rainwater from the roof of the building is harvested and a grey water system is also in operation. There is a large car park for staff as well as play areas and sports facilities for the pupils.

**13** (a) Identify **two** sustainable materials that could be used to insulate Building 1 against heat loss.

**(2)**

1 .....

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2 .....

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(b) Identify **two** locations, within Building 1, where insulation material could be placed to reduce heat loss.

**(2)**

1 .....

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2 .....

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

**14** Cycle tracks have been introduced in the town where Building 1 is located.

Explain **two** other transport strategies to reduce the use of cars in a town centre.

1 .....

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2 .....

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**(Total for Question 14 = 4 marks)**

**15** Building 2 uses rainwater harvesting and a grey water system to reduce the amount of mains water required. Toilets are flushed using grey water.

Explain **two** design features of a grey water system.

1 .....

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2 .....

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**(Total for Question 15 = 4 marks)**

**16** Discuss the technologies and features of Building 2 that make it more sustainable than Building 1.

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**(Total for Question 16 = 8 marks)**

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

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