Examiners' Report/
Lead Examiner Feedback

June 2017

NQF BTEC Level 1/Level 2 Firsts in Construction

Unit 11: Sustainability in Construction (21635E)

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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 a 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	9	19	29	39

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 a range of different marks. We hope you will find this will help you to prepare your learners for future examination series.

Introduction to the Overall Performance of the Unit

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

It is noticeable that some learners did not attempt all 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. Therefore, where questions were not answered this may have been due to learners not having the knowledge to provide a response.

The more demanding questions require learners to apply their knowledge in response to sustainability issues related to a range of construction scenarios. It was evident from the responses to some questions that learners had limited knowledge of sustainability in relation to construction. 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 and the full range of topics covered in the unit specification. For example, learners appeared to have little knowledge and understanding of Sustainable Urban Drainage.

Learners would also 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 learners to 'give' 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', 'discuss' and 'compare'. Learners need to provide a response that answers the question and not just repeat information from either the question or the scenario in Section B. Some responses to Question 19 identified information provided in the scenario. Learners did not go on to discuss the benefits and drawbacks of Building 2 in terms of the social and economic sustainability of the towns.

Individual Questions

SECTION A

Question 1

A multiple choice question that required the identification of two benefits of designing in a sustainable way.

Targeted Specification Area: Learning Aim A1.2

Many learners were able to identify both of the correct answers 'inclusion of green spaces' and 'nice places to live are built'.

Question 2

This question required learners to give one way that construction may lead to the depletion of finite resources.

Targeted Specification Area: Learning Aim A2.1

Many learners provided a correct response. Frequent responses were 'using non-renewable materials or fossil fuels'.

Question 3

A multiple choice question that required the identification of two economic benefits to think about when planning a construction project.

Targeted Specification Area: Learning Aim A4

A number of learners were able to identify at least one of the correct responses 'employment opportunities' and 'financial return'.

Question 4

This question assessed learners' understanding on the benefits of using locally sourced materials.

Targeted Specification Area: Learning Aim B1

The majority of learners were able to give one benefit and some were able to give two benefits. Frequent responses were 'reduced transport costs/use', 'reduction in pollution/emissions from vehicles' and 'benefits local economy'.

Question 5

This question required learners to have an understanding of the density of housing.

Targeted Specification Area: Learning Aim B1

Learners did not appear to understand what is meant by low density housing. The question is taken from the specification 'designing the density of homes so they are not too compact'. A number of responses would have been correct if they included 'residents do not feel cramped or too close to each other', 'provide social/recreational space' or 'larger gardens'.

Question 6

A multiple choice question that required the identification of two sustainable site practices that minimise the effect on the physical environment.

Targeted Specification Area: Learning Aim B5

Many learners were able to identify at least one of the correct responses 'segregation of waste' and 'protective fencing around trees'.

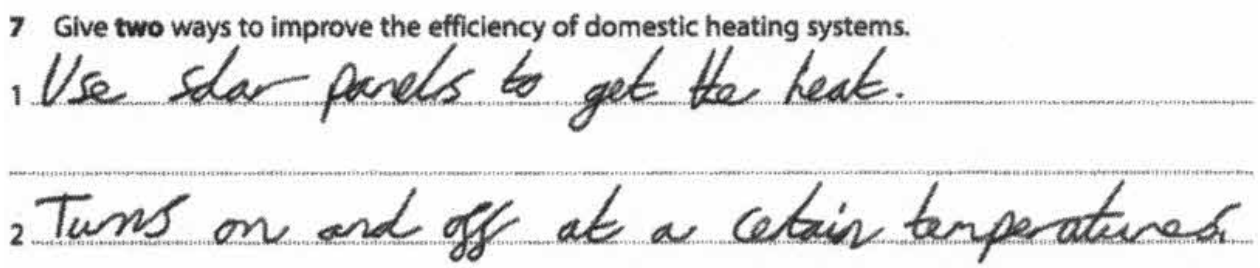
Question 7

This question required learners to have an understanding of domestic heating systems.

Targeted Specification Area: Learning Aim B1

Some learners were able to give one way and a few learners were able to provide two ways. The majority of learners gave a response related to the insulation of the building and not the heating system itself. Correct responses given included 'control systems' and 'maintenance'.

1 mark example: The first response relating to solar panels is incorrect.


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

1 Use solar panels to get the heat.

2 Turns on and off at a certain temperature.

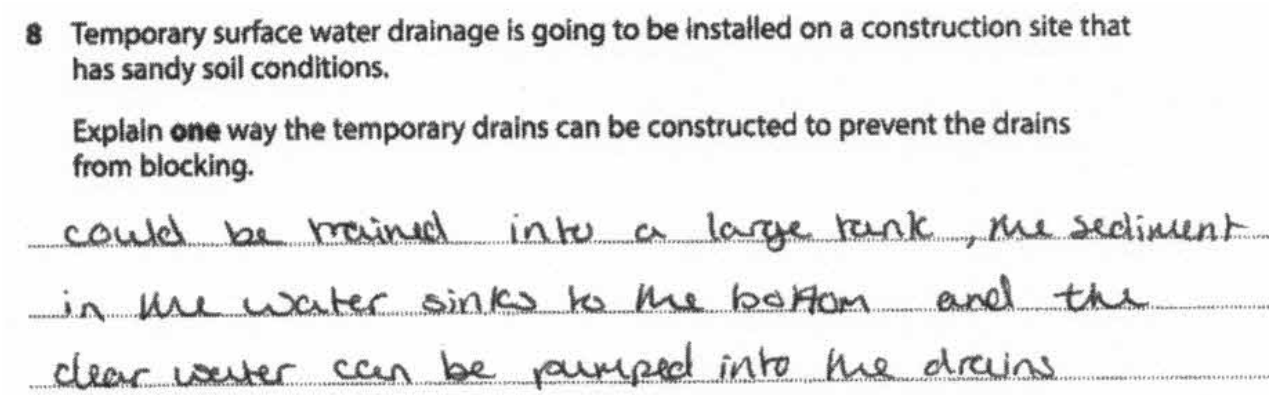
Question 8

This question required learners to have an understanding of sustainable site practices.

Targeted Specification Area: Learning Aim B5

Very few learners were able to provide a correct response to this question. A large number of learners gave the incorrect response of 'a grate' or 'filter'. The topic is covered in section B5 of the specification 'use of silt traps on temporary drains'. A correct response would have been 'silt trap/catch pit' with a linked response to explain its purpose 'to collect silt where it can be removed'.

2 mark example.


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.

could be trained into a large tank, the sediment in the water sinks to the bottom and the clear water can be pumped into the drains

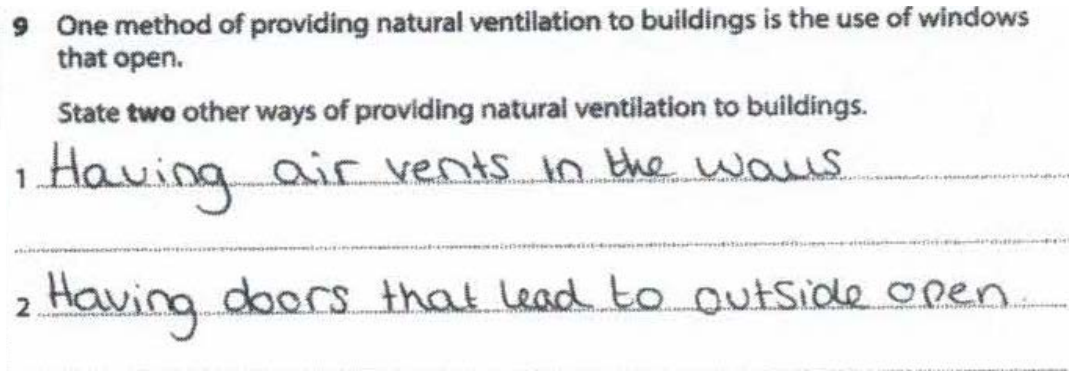
Question 9

This question required learners to state two ways of providing natural ventilation to buildings.

Targeted Specification Area: Learning Aim B1

The majority of learners were able to state one way with a number being able to state two. Frequent responses were 'vents in the wall' and 'doors'.

2 mark example:


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 Having air vents in the walls

2 Having doors that lead to outside open

Question 10

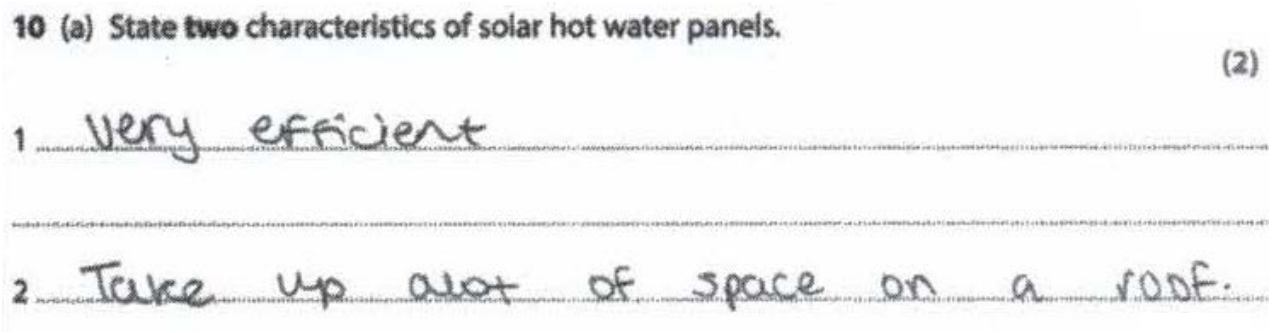
This question required learners to have an understanding of solar hot water panels.

Targeted Specification Area: Learning Aim B3

Q10(a)

Learners were required to state two characteristics of solar hot water panels. The majority of learners were able to state one characteristic, and some were able to state two characteristics. Many learners confused solar hot water panels with photovoltaic panels. Typical characteristics stated were 'dark in colour', 'filled with water' and 'takes up space on the roof'.

2 mark example:


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

(2)

1 Very efficient

2 Take up alot of space on a roof.

Q10(b)

Learners were required to state the ideal direction in which solar hot water panels should face. Many learners responded with the correct direction of 'south' or 'southwest'.

1 mark example:

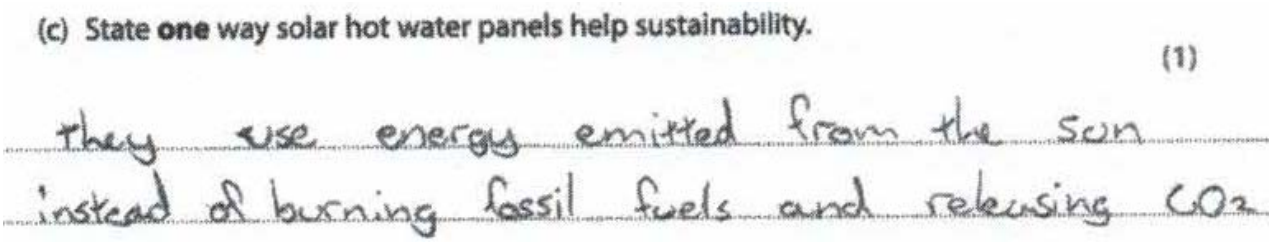

(b) State the ideal direction in which solar hot water panels should face.

South

Q10(c)

Learners were required to state one way solar hot water panels help sustainability. The majority of learners were able to provide a response and these covered all the responses given in the mark scheme, 'reduction in the use of fossil fuels/emissions', 'use of renewable energy' and 'reduction in energy usage/bills'.

1 mark example:


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

(1)

they use energy emitted from the sun instead of burning fossil fuels and releasing CO_2

Question 11

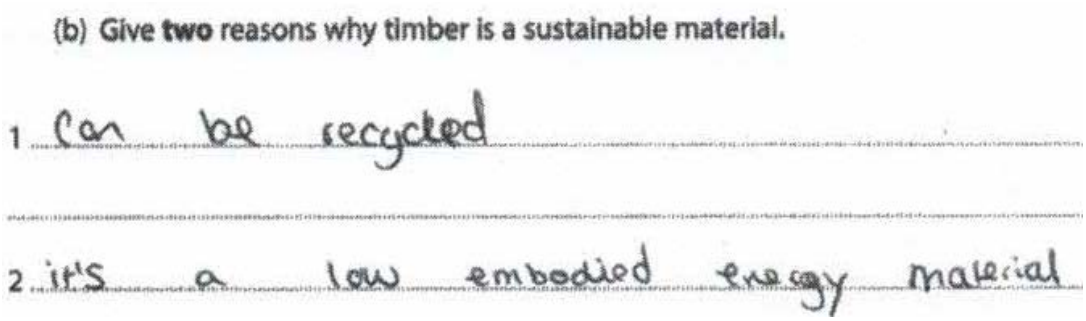
The question requires learners to have an understanding of timber as a sustainable material.

Targeted Specification Area: Learning Aim B2

Q11(a)
A multiple choice question that required the identification of two sustainable timber-based products. Many learners were able to identify one correct response with some identifying both of the correct responses, 'engineered joists' and 'cedar boarding'.

Q11(b)
Learners were required to give two reasons why timber is a sustainable material. The majority of learners were able to give one reason and a number were able to give two. Frequent responses included 'naturally occurring', 'can be regrown' and 'can be recycled'.

2 mark example:


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

1 Can be recycled

2 it's a low embodied energy material

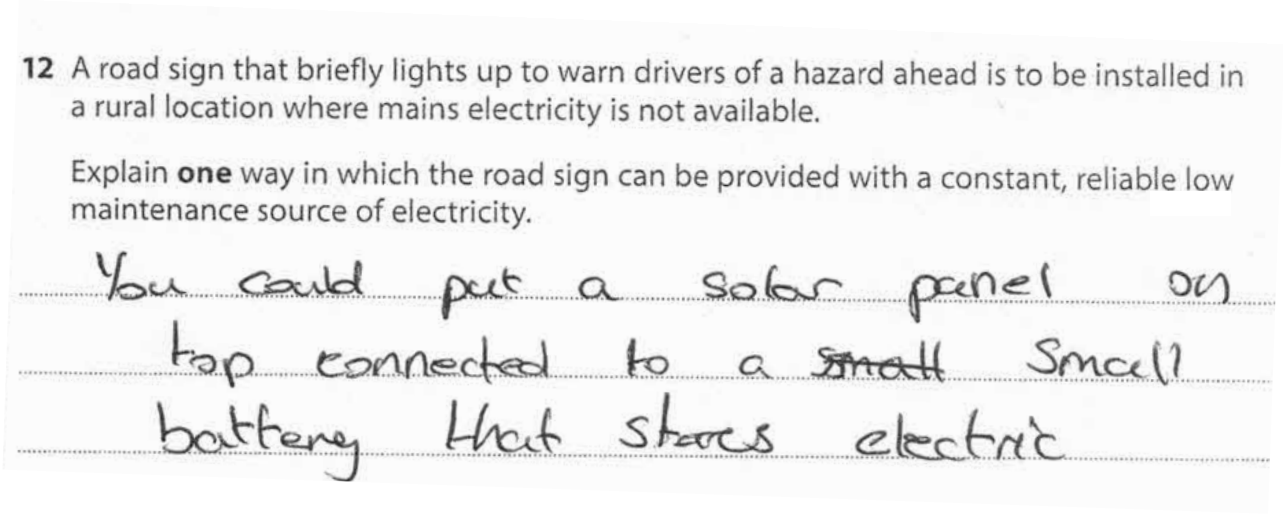
Question 12

This question assessed the learners' understanding of alternative energy sources.

Targeted Specification Area: Learning Aim B3

This question required learners to demonstrate an understanding of the application of using photovoltaic panels to recharge a battery that powers a light. Marks were only given where learners had identified rechargeable battery technology and a renewable means of charging. Few learners provided a correct response.

2 mark example:



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.

You could put a solar panel on top connected to a ~~small~~ small battery that stores electric

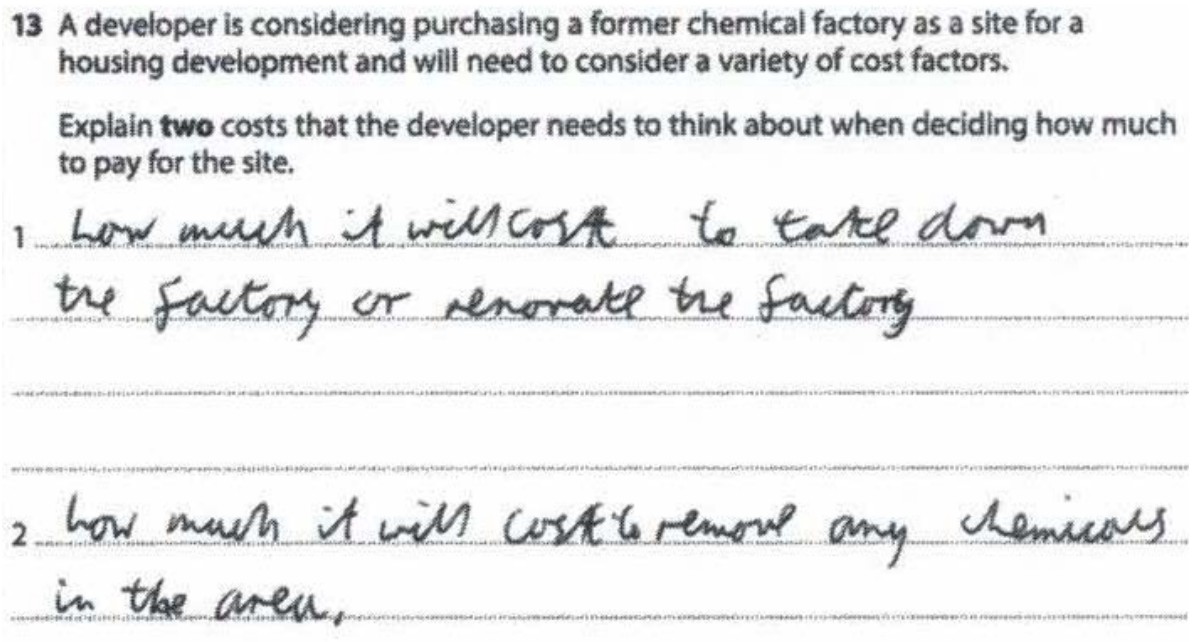
Question 13

This question required learners to demonstrate any understanding of the costs of developing a brownfield site.

Targeted Specification Area: Learning Aim A4

Learners were able to identify the need to remove the chemicals or demolish existing structures, but were not able to provide linked responses to explain the purpose of removing the chemicals or existing structures. This may not be totally due to a lack of knowledge of the topic, but lack of examination technique in providing high scoring answers. An acceptable response would be 'removal of any remaining chemicals' with a linked response of 'to make the site safe'.

2 mark example. No linked responses are provided to enable additional marks to be given.



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 how much it will cost to take down the factory or renovate the factory

2 how much it will cost to remove any chemicals in the area.

SECTION B

Question 14

This question was scenario-based and required learners to state a way of reducing the amount of mud being transferred to local roads during the construction of Building 1.

Targeted Specification Area: Learning Aim A3.2

A number of learners provided a correct response. The most frequent response being 'wheel washing'. Many learners appeared to have difficulty in providing a response. This may have been due to the question being linked to the scenario and learners were not able to assimilate what the question was asking. Some learners provided a response of 'road sweeping'. This is an incorrect response as the question is about reducing mud being transferred to the road.

Question 15

This question was scenario-based and required learners to give one way that energy used by the internal lighting in Building 1 could be minimised.

Targeted Specification Area: Learning Aim B1

This question did not yield high marks. Those learners that did provide correct response gave all the responses from the mark scheme 'low energy lighting', 'LED lighting', 'Maximising the use of daylight' and 'sensors/timers'. The question is asking a way energy use can be minimised in an existing building. Thus no marks could be given for adding 'further windows'.

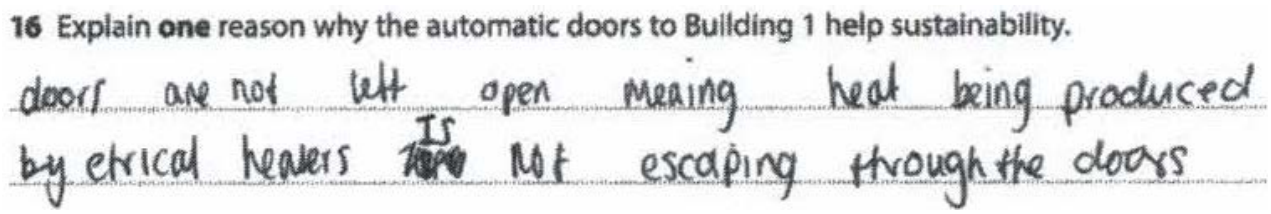
Question 16

This question was scenario-based and required learners to explain one reason why automatic doors in Building 1 help sustainability.

Targeted Specification Area: Learning Aim B1

Many learners gave incorrect or no response. Correct responses made reference to doors 'closing automatically/not being left open' with a linked response to explain how this helps sustainability 'preventing warmth from the building escaping/cooler air from outside entering the building'.

2 mark example:



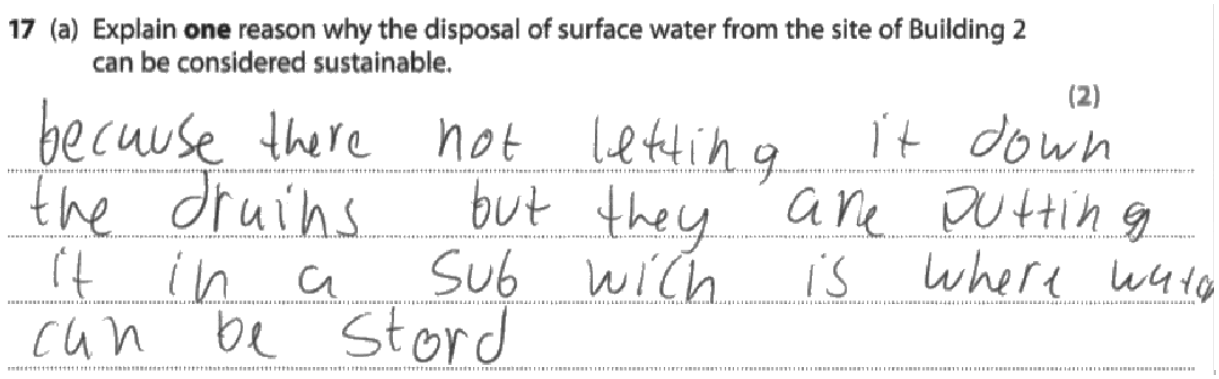
Question 17

This question was scenario-based and required learners to demonstrate an understanding of Sustainable Urban Drainage System techniques.

Targeted Specification Area: Learning Aim B4

Learners' responses showed little understanding of sustainable urban drainage systems and many incorrect statements were made. Learners incorrectly stated that water could be reused/recycled, see example below. Very few learners provided a correct response. The mark scheme gives three responses in answer to the question. The specification states that learners 'understand the characteristics, design and construction details, application and advantages/disadvantages of using sustainable urban drainage systems (SuDs) for domestic, public building and commercial construction.

2 mark example:

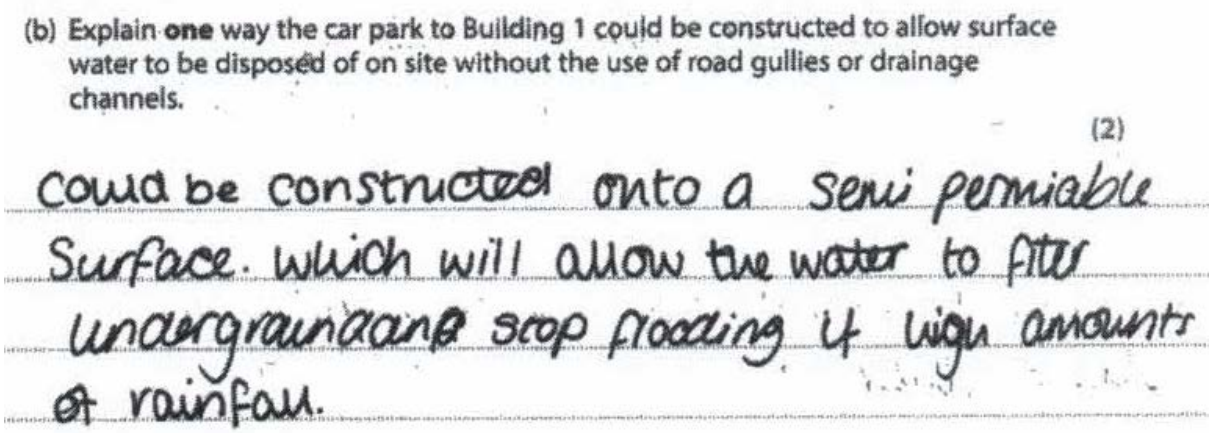

17 (a) Explain **one** reason why the disposal of surface water from the site of Building 2 can be considered sustainable.

(2)

because there not letting it down the druins but they are putting it in a sub wich is where wate can be stord

17(b)

Learners showed little understanding of the construction of surfacing that does not require the use of road gullies to drain surface water from the car park. Many learners provided an incorrect response of building the car park on a slope. A correct response is the use of 'permeable surfacing' and a linked response 'will enable the storm water to flow through the surfacing and to the subsoil'.


(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)

could be constructed onto a semi permiable surface. which will allow the water to filter underground stop flooding if high amounts of rainfall.

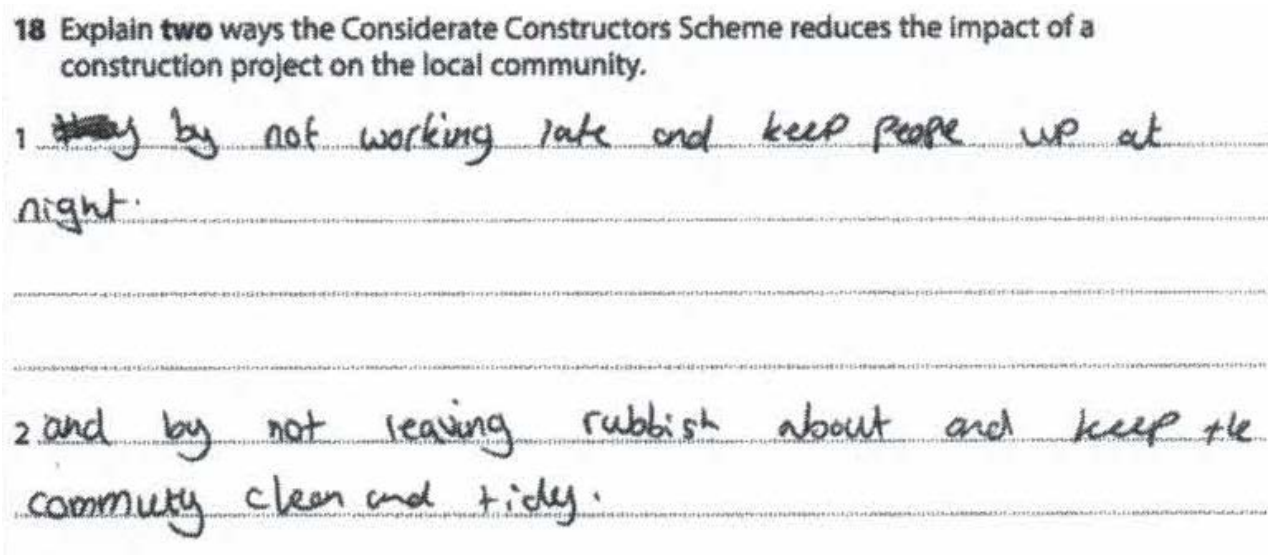
Question 18

This question was scenario-based and required learners to demonstrate an understanding of the Considerate Constructors Scheme.

Targeted Specification Area: Learning Aim A3.2

A number of learners demonstrated an understanding of the Considerate Constructors Scheme and were able to identify one or two aims of the scheme and in some cases were also able to provide a linked response of how this reduced the impact of the project on the local community. There are five aims of the Considerate Constructors Scheme and learners could have responded by explaining any two of these. They are all given in the marking scheme. The most frequent response given was 'respecting the community' with the linked response of 'providing information/not working unsociable hours'.

4 mark response:



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

1 [redacted]y by not working late and keep people up at night.

2 and by not leaving rubbish about and keep the coommuty clean and tidy.

Question 19

This question was scenario-based and required learners to demonstrate an understanding of social and economic sustainability.

Targeted Specification Area: Learning Aim A1, A2, A3, A4 & B1

Learners were required to discuss the benefits and drawbacks of Building 2, a shopping centre with a range of other facilities, in terms of the social and economic sustainability of the town.

Most learners provided a response to this question and were able to draw out some relevant points from the scenario and identify if this was a benefit or drawback.

The mark scheme provides a range of points that could have been considered in the discussion of the benefits and drawbacks of Building 2 in terms of social and economic sustainability of the town.

The mark scheme also provides three descriptor mark bands by which the responses are assessed and given marks. The learner's application of understanding of social and economic sustainability in relation to the scenario is taken into consideration.

Learners should only use material that can be gained from the scenario and should not make assumptions where the scenario provides no basis for these.

Lower mark band learners are expected to identify a few benefits and drawbacks, with superficial/generic explanation, and show basic understanding of social and economic sustainability.

For the mid mark band learners will provide some further discussion of the benefits and drawbacks relating them to Building 2 in the scenario. The response will show a good understanding of social and economic sustainability. Many learners provided some discussion on the social and economic issues and this included the issues of local shops losing trade and leading them to close, and local pollution and delays caused by the traffic congestion.

For the higher mark band learners will provide a detailed discussion of the benefits and drawbacks relating to Building 2 in the scenario. The response will show a developed understanding of social economic sustainability. Learner responses were well balanced and covered a wide range of benefits and drawbacks.

The descriptors for the mark bands can be found at the end of the mark scheme.

Middle of Band 1 Descriptor Example (2 Marks)

19 Discuss the benefits and drawbacks of Building 2 in terms of the social and economic sustainability of the town. People ← (8) → Mon

Building 2 is very good if you work there, you get loads of customers, a fair amount of money so you can spend on expanding the building and ~~Seeing~~ coming up with new sustainable ways to keep the shop running.

One drawback is that all the other shops that were there could get shut down because everyone would want to go and see all shops and ~~text that~~ variety inside building 2 this is not sustainable because all the other shops arent getting many customers meaning this has a bad impact on the sustainability of the economy.

Some social benifits are that there are loads more jobs opportunities meaning more money for the people and more money for the economy meaning more sustainability.

One other sustainable factor is that you could get regular ~~to from customers~~ customers meaning regular ~~in~~ sustainable income for the economy of the town and the income sustainability for the shopping centre itself.

With this regular income for the town, the town could expand and make new sustainable developments that are needed for the town.

You could also build a sustainable road so the traffic is constenly flowing rather than stop start, stop start all the time which then means that the people can places quicker and much easier.

The only drawback from that would be you are spending quite a bit of money.

Mid Band 2 Descriptor Example (5 Marks)

19 Discuss the benefits and drawbacks of Building 2 in terms of the social and economic sustainability of the town. (8)

One social benefit of building 2 is that it provides a community area for the locals to meet. This is going to mean the community is much happier as well as more willing to spend their money.

However a negative social impact is that building 2 causes a large amount of congestion on the roads. This is going to aggravate and annoy the locals which could make them less likely to travel or return to the area.

There are however lots of economic benefits one being it attracts custom meaning large amounts of money is spent in the area's then fed into the community. This can lead to the council or local authority spending money and improving the community. This then has a positive effect on the community.

A negative economic impact is it is slowly removing small local businesses which makes the centre of town look more run down and neglected. This means large amounts of money need to be spent on renovating the local area.

Another social benefit is that it provides lots of extra services meaning the community does not need to travel as far them.
A second is that it is built on a brown field sit. This means ~~the~~ the local green space has not been taken meaning the locals recive lots of services whilst still having their green space.

Finally an economic benefit is it ~~provides~~ can provide extra money for the bus service as the shopping centre is on route. This can also have a social impact because ~~if~~ if more people use the buses then will be less cars which will reduce the traffic in the area.

Band 3 Descriptor Example (7 Marks)

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

(8)

Benefits of Building 2:

- It is on the edge of a large town and on an important road junction. This means that there is always passing trade and convenient for people to visit if they are going to or from another place. The junction provides access to the large town and suburbs which also means that while people can stop during a journey, there are easy links to people who are further out which more money being spent at the shopping centre and it is attracting people from further away which may also create revenue for smaller or other businesses in the area. It has been built on a brownfield site which means that the area has been re-generated and not just left to attract anti-social behaviour or be an eyesore for residents. There are a lot of leisure facilities too, and a doctors surgery etc which provide a lot of jobs for locals and a place where people can also enjoy themselves which is convenient.

People who are visiting the dentist may also stop for lunch or go to the shops which increases spending at the shopping centre and increases revenue for the local economy. The centre is on local bus routes which again opens more opportunity for people further away to either work here or spend money here.

Drawbacks of building 2:

The success of the shopping centre has attracted more people there than to the local shops, which means local & independant companies would have to close due to not being able to compete with larger stores. Congestion and traffic is now a problem and this can cause accidents and road rage and people in general just not wanting to visit the shopping centre due to the amount of disruption it has caused to the local community The fear that other places may become run down and neglected because the shopping centre is so successful could happen, which

would then attract anti-social behaviour and possibly crime to the community. The local bus routes and larger roads that go via the shopping centre are in effect taking people away from the local shops, and if the shops close, people will lose jobs and businesses etc.
Because of the traffic, people may have started to use smaller roads ~~which~~ through villages which may not be prepared to accomodate such a high level of traffic, which may result in local residents being angry or annoyed.

Summary

Based on their performance on this paper, learners should:

- Prepare for exams using all available material, including Past Papers and Sample Assessment Materials.
- Carefully read the questions before answering,
- Ensure that they have covered all aspects of the specification.

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