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Examiners' Report/

Lead Examiner Feedback

Summer 2017

NQF BTEC Level 1/Level 2 Firsts in
Construction

Unit 1: Construction Technology (21492E)

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Grade Boundaries

Introducing external assessment

The new suite of 'next generation' NQF BTECs now include an element of external assessment. The external assessments for NQF BTEC Construction are timetabled paper-based examinations.

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 is conducted to ensure learners achieve the grade they deserve to achieve, irrespective of variation in the external assessment.

Variations in external assessments

Each test 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 for each test, because then it wouldn't take into account that a test might be slightly easier or more difficult than any other.

Grade boundaries

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	8	19	30	41

Introduction

This report has been written by the Lead Examiner for BTEC Construction and the Built Environment Unit 1 – Construction Technology. 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 example learner responses at Level 2 Pass, Merit and Distinction. We hope this will help you to prepare your learners for future examination series.

Introduction to the Overall Performance of the Unit

This was the sixth time that this paper has been sat and, overall, the paper produced a suitable range of responses. Lower ability learners often gave inaccurate or simplistic responses to questions and therefore gained limited marks. The more demanding questions provided learners with an opportunity to apply their knowledge in relation to construction scenarios and it was pleasing to see some extended answers that focused on the vocational context. In some cases, learners continued to provide responses which repeated information from the question stem or from previous question stems. In a number of other cases, candidates gave answers that appeared to reflect general knowledge rather than any detailed understanding of construction components or methods under consideration.

In preparation for future series, centres should focus on the analysis of the SAM (Sample Assessment Material) for this unit together with using this exam and its mark scheme as the basis for identifying and applying relevant, more expansive solutions to the questions set. Learners should also be familiar with the full range of content from the unit specification and ought to be able to examine the application of these concepts in different scenarios. Learners should be able to sketch and label elements of construction as identified in the unit specification.

The ability to recognise the demands of a question is also important. Candidates should understand the different responses required for different command words, for example, identify, explain or discuss.

Question 1

This question was aimed at the understanding of the performance requirements required in buildings.

Targeted Specification Area: Learning Aim A.1

Q1(a)

Most learners correctly identified the correct answer of:

Fire protection-Use of a sprinkler system.

However, many learners were unable to link weather resistance to the use of falls. Often learners incorrectly stated that weather resistance was linked to the installation of acoustic ceilings.

Q1(b)

Learners were required to name two tests used to measure the properties of concrete. The two correct answers were:

- Slump
- Compressive or cube test

Most learners were able to identify one test correctly with more able learners able to correctly identify both tests. Learners also achieved 1 mark by identifying one of the tests as:

- Pressure test
- Strength test

2 mark response example:

(b) Name **two** tests used to measure the properties of concrete.

(2)

- 1 A Slump test, to test how solid the concrete is.
- 2 compression test, to test if it is solid enough to be used.

The first response is acceptable for 1 mark; please refer to bullet point 1 in the marking scheme.

The second response of compression testing is an acceptable answer; please refer to bullet point 2 in the marking scheme.

Q1(c)

Learners were required to name one method used to stress grade structural timber.

Two correct answers were:

- Visual
- Machine

With the exception of L2 Pass or above learners, many learners were unable to identify a suitable method. Learners also achieved 1 mark by identifying one of the methods as:

- Pressure test
- Strength test
- Compressive test

1 mark response example:

(c) Name **one** method used to stress grade structural timber.

(1)

Pressure test

(Total for Question 1 = 5 marks)

1 mark given for an acceptable correct response.

Question 2

This question was aimed at the preconstruction phase of a construction project.

Targeted Specification Area: Learning Aim B.1

Learners were required to give two types of site-based preconstruction clearance activities. With the exception of L2 Pass or above learners, many learners often incorrectly stated two site set-up activities. Correct answers are stated in the marking scheme.

2 mark response example:

2 Give **two** types of site-based preconstruction clearance activity.

1 excavation of ground for foundation

2 clearance of trees and buildings

The first response 'excavation of ground for foundation' is insufficient for the award of any marks.

The second response includes reference to the clearance of trees and buildings. Two marks are given; please refer to bullet points 1 and 3 in the marking scheme.

0 mark response example:

2 Give **two** types of site-based preconstruction clearance activity.

1 Fencing

2 temporary lighting

Both responses are related to site set-up activities and not site-based clearance activities.

Question 3

This question was aimed at the superstructure of floors.

Targeted Specification Area: Learning Aim C.2

Q3(a)

Learners were required to identify two functions of a floor. The two correct answers were:

- B- To provide accommodation of services
- D-To provide a level surface

Most learners were able to identify one function correctly with more able learners able to correctly identify both functions.

Q3(b)

Learners were required to identify two types of floor finish. The two correct answers were:

- A- Screed
- C-Chipboard

Most learners were able to correctly identify the floor finish of chipboard. More able learners were also able to correctly identify that screed was also a floor finish.

Question 4

This question was aimed at the superstructure of walls.

Targeted Specification Area: Learning Aim C.1

Learners were required to identify two types of pointing used in facing brickwork. This was satisfactorily attempted by most learners with many achieving at least one mark. The two correct responses were:

A- Recessed

C-Flush

Question 5

This question was aimed at the substructure of ground floors.

Targeted Specification Area: Learning Aim B.2

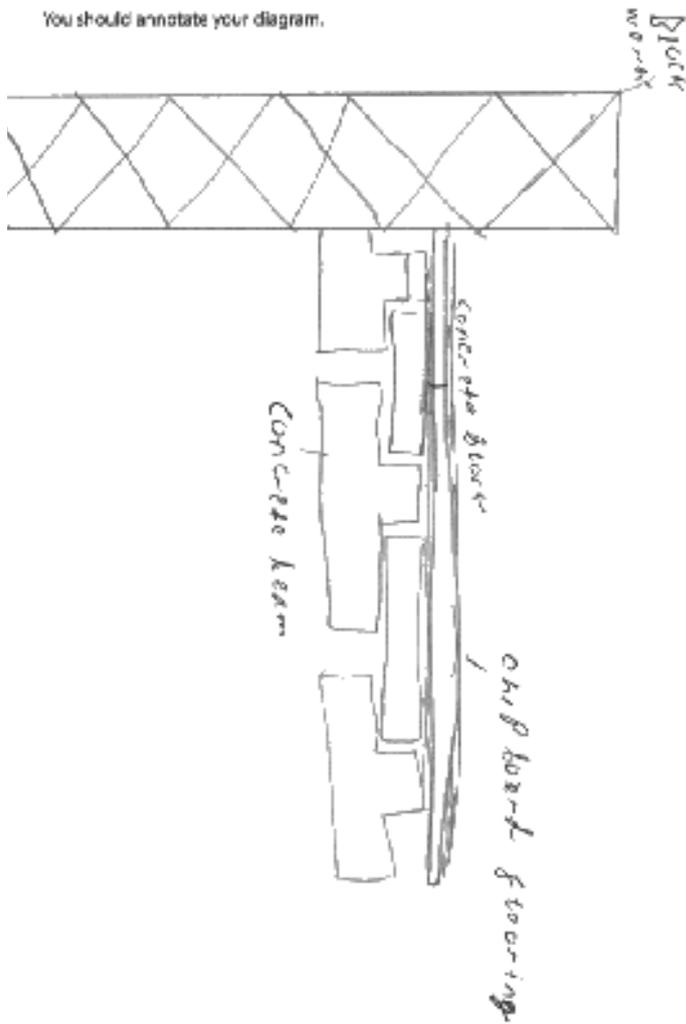
Learners were required to sketch a cross-section through a beam and block ground floor.

In recent exam series, learner responses to sketch type questions had improved, however in this examination, responses were often weak. Learners often either did not attempt a response or focused incorrectly on a past exam series detail such as that of a flat roof or strip foundation.

Centres should consult with the mark scheme to consider the detail required for a sketch question of this type. Centres also need to understand that this type of question will continue to be included in future examinations.

4 mark response example:

- 5 Sketch a diagram of a cross-section through a beam and block ground floor.
You should annotate your diagram.

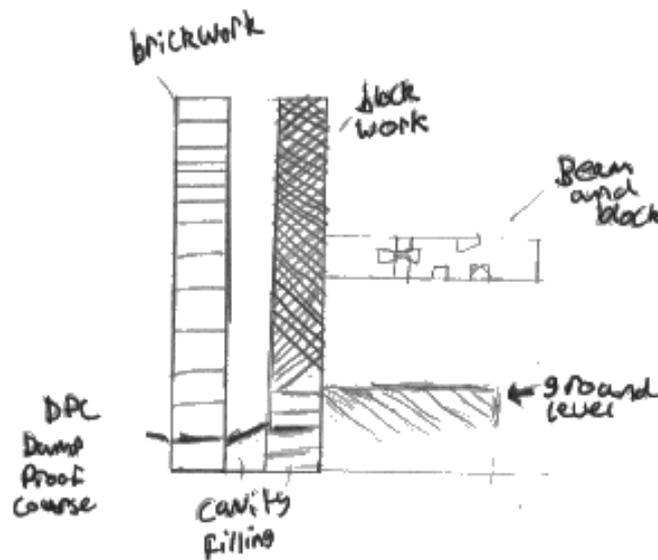


4 marks achieved as four components have been clearly labelled.

4 mark response example:

5 Sketch a diagram of a cross-section through a beam and block ground floor.

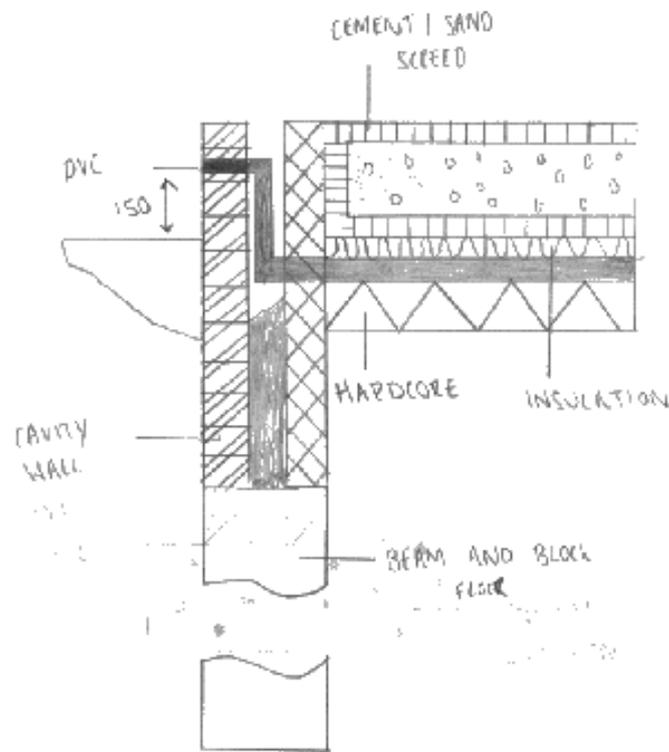
You should annotate your diagram.



The candidate has correctly identified four components of the floor section shown.

0 mark response example:

- 5 Sketch a diagram of a cross-section through a beam and block ground floor.
You should annotate your diagram.



As the cross section is not a beam and block floor.

Question 6

This question was aimed at the superstructure of walls .

Targeted Specification Area: Learning Aim C.1

Learners were required to identify five components of a timber frame wall. This was satisfactorily attempted by most learners with many achieving 2 marks for (ii) wall ties and (iv) insulation. More able learners were often able to name 4 components/materials correctly. The component of the cross-section which most learners struggled to identify correctly was part (i) the breather membrane.

Question 7

This question was aimed at aspects of common structural forms for low-rise construction.

Targeted Specification Area: Learning Aim A.1

Learners were required to explain two sustainability related advantages of structural insulated panels (SIPs). The command verb used for this question is explain, therefore 1 mark was allocated to the identification of an advantage and 1 mark for a linked explanation of the stated advantage.

Learners were able to achieve 1 mark for the identification of an advantage but then often failed to understand the need to develop a linked explanation from it. More able learners were often able to achieve 2 or 3 marks. Suitable linked correct responses may be seen in the marking scheme.

Acceptable 1 mark advantage responses included:

- Quick to put up/faster to erect
- They are good insulators
- They can be recycled
- Good for the environment
- Less energy is required in the manufacturing of SIPs

2 mark response example:

7 An architect is designing a series of low-rise apartment blocks. The architect is keen to adopt sustainable methods wherever possible.

Explain **two** sustainability-related advantages of structural insulated panels (SIPs)

1 They are sustainable which means they are strong

2 The panels are also insulated which means they keep in heat.

The first response is not a sustainability-related advantage and therefore no marks are achieved.

The second response is acceptable for 2 marks, please refer to bullet point 5 in the marking scheme. The link to 'keep in heat' is accepted as a response to reduce energy use.

0 mark response example:

7 An architect is designing a series of low-rise apartment blocks. The architect is keen to adopt sustainable methods wherever possible.

Explain **two** sustainability-related advantages of structural insulated panels (SIPs)

1 ~~They are not lighter~~
They are really light.

2
Don't need skills workers to do them.

Both responses are not linked to sustainability-related advantages and therefore no marks are achieved.

Question 8

This question was aimed at aspects of common structural forms for low-rise construction.

Targeted Specification Area: Learning Aim A.1

Learners were required to explain two economic advantages to a fast food company of using a prefabricated structural form to build a restaurant. The command verb used for this question is explain, therefore 1 mark was allocated to the identification of an advantage and 1 mark for a linked explanation of the stated advantage.

Learners were again often able to achieve 1 mark for the identification of an advantage but then often failed to understand the need to develop a linked explanation from it. More able learners were often able to achieve 2 or 3 marks. Suitable linked correct responses may be seen in the marking scheme.

Acceptable 1 mark advantage responses included:

- Quick/quicker speed of construction
- It is more economic/cheaper/cheaper to build
- It produces less waste

2 mark response example:

8 A fast food company intends to build a number of new restaurants.

The restaurants will be of a prefabricated structural form and delivered to site ready for erection.

Explain **two** economic advantages for the fast food company of using a prefabricated structural form to build the restaurants.

1 The prefabricated structures can be installed quickly meaning the business opens sooner

2 The restaurants will be very strong meaning low maintenance.

The first response is acceptable for 2 marks and indicates a suitable linked response. Please refer to bullet point 2 in the marking scheme.

The second response is not an economic advantage for the fast food company and is therefore worth no marks.

3 mark response example:

8 A fast food company intends to build a number of new restaurants.

The restaurants will be of a prefabricated structural form and delivered to site ready for erection.

Explain **two** economic advantages for the fast food company of using a prefabricated structural form to build the restaurants.

- 1 So then they can get the business up and running quicker so they can then start making money.
- 2 Also a cheaper for the company, and well insulated for customers.

The first response is acceptable for 2 marks and indicates a suitable linked response. Please refer to bullet point 2 in the marking scheme.

The second response is worth 1 mark for cheaper as it stems from lower tender prices for the client.

3 mark response example:

8 A fast food company intends to build a number of new restaurants.

The restaurants will be of a prefabricated structural form and delivered to site ready for erection.

Explain **two** economic advantages for the fast food company of using a prefabricated structural form to build the restaurants.

1. prefabricated structural forms are ^{and} quicker and ^{and} easier advantage because they are easier to put up onsite than building a brick ^{cavity} wall
2. Another advantage would be that less employees are needed to put up the structure because also because they come pre built. This saves

(Total for Question 8 = 4 marks)

money for the shop owner.

The first response is acceptable for 1 mark and is linked to speed of erection. No linked response has been clearly given.

The second response is acceptable for 2 marks and indicates a suitable linked response.

Question 9

This question was aimed at the superstructure of roofs.

Targeted Specification Area: Learning Aim C.3

Q9(a)

Learners were required to identify two types of roof construction. The two correct answers were:

B- Double pitch

D-Lean-to

Most learners were able to identify one type of roof construction correctly with more able learners able to correctly identify both types.

9b) Learners were required to explain one benefit of a hipped roof compared to a flat roof for a garage extension. The command verb used for this question is explain, therefore 1 mark was allocated to the identification of a benefit and 1 mark for a linked explanation of the stated benefit.

This question was satisfactorily attempted by learners. Some learners were able to achieve 1 mark for the identification of a benefit but then often failed to understand the need to develop a linked explanation from it.

The most common identification mark achieved by learners was to identify that pitch roofs were better for drainage.

Suitable linked correct responses may be seen in the marking scheme.

2 mark response example:

(b) A homeowner wants to have a detached double garage built and is considering different options for the roof.

Explain **one** maintenance benefit of a hipped roof compared to a flat roof for the garage.

(2)

It will require less maintenance because instead of a flat roof where the water has a chance to pool and create leaks in the roof, a hipped roof the water runs off the roof straight away. So there's no need to clean it.

The response is acceptable for 2 marks and indicates a suitable linked response. Please refer to bullet point 1 in the marking scheme.

1 mark response example:

(b) A homeowner wants to have a detached double garage built and is considering different options for the roof.

Explain **one** maintenance benefit of a hipped roof compared to a flat roof for the garage.

(2)

~~This one is~~ The flat roof will be easier to maintain and the other one is more harder to maintain. But the hipped roof is a better for water to fall off than the flat roof

The response is acceptable for 1 mark and is linked bullet point 1 in the marking scheme. No linked response has been clearly given.

Question 10

This question was aimed at the sub-structure of foundations.

Targeted Specification Area: Learning Aim B.2

Q10(a)

Learners were required to explain two reasons why a builder is unlikely to use a raft foundation for a house on sloping ground. The command verb used for this question is explain, therefore 1 mark was allocated to the identification of a reason and 1 mark for a linked explanation of the stated reason.

This question was poorly attempted by learners. Some learners were able to achieve 1 mark for the identification of a reason but then often failed to understand the need to develop a linked explanation from it.

Acceptable 1 mark advantage responses included:

- There is a need to level the site
- It is not suitable due to the slope
- Rafts are designed for unstable ground not sloping
- More materials are generally required

Suitable linked correct responses may be seen in the marking scheme.

2 mark response example:

10 Ground conditions can affect the choice of foundation for a building.

(a) Explain **two** reasons why a builder is unlikely to use a raft foundation for a house on sloping ground.

1 Because you would need to make ⁽⁴⁾ the ground a level so it would be a harder process

2 You would need more materials and you would need to make it level so ~~it~~ exactly flat.

The first response is acceptable for 1 mark as there is a link to the ground needed to be levelled out. Please refer to bullet point 1 in the marking scheme. A relevant linked response has not been given.

The second response is acceptable for 1 mark and is linked to bullet point 3 in the marking scheme. A clear relevant linked response has not been given.

0 mark response example:

10 Ground conditions can affect the choice of foundation for a building.

(a) Explain **two** reasons why a builder is unlikely to use a raft foundation for a house on sloping ground.

(4)

1 The builder is unlikely to use a raft foundation because if the house is on a sloping ground this foundation will not support the house.

2 Another reason is using a raft foundation would only mean that the house is less supportive than it was already.

Both responses are not reasons why a builder is unlikely to use a raft foundation for a house on sloping ground.

Q10(b)

Learners were required to explain two reasons why a pile foundation would be more suitable than a strip foundation on low bearing capacity soil. The command verb used for this question is explain, therefore 1 mark was allocated to the identification of a reason and 1 mark for a linked explanation of the stated reason.

This question was poorly attempted by learners. Some learners were able to achieve 1 mark for the identification of a reason but then often failed to understand the need to develop a linked explanation from it.

Acceptable 1 mark advantage responses included:

- A pile is cheaper than a strip foundation/strip is expensive/piles are a cheaper option/cost effective
- More stable/greater stability/sturdy to build on
- Pile foundations are better with soil of a poor quality

Suitable linked correct responses may be seen in the marking scheme.

2 mark response example:

(b) An architect is designing a low-rise office building. A site investigation has indicated that the ground conditions consist of low bearing capacity soil.

Explain **two** reasons why a pile foundation would be more suitable than a strip foundation on low bearing capacity soil.

(4)

1 because it would last ~~longer~~ longer

2 It would be more stable and more economical

The first response is not a reason why a pile foundation would be more suitable than a strip foundation on low bearing capacity soil and is therefore worth no marks.

The second response is acceptable for 2 marks as there is a link to stability. There is also included a second identification mark as the learner has stated it is more economical. Relevant linked responses have not been given.

1 mark response example:

(b) An architect is designing a low-rise office building. A site investigation has indicated that the ground conditions consist of low bearing capacity soil.

Explain **two** reasons why a pile foundation would be more suitable than a strip foundation on low bearing capacity soil.

(4)

1 The ground would be more stable and
wouldn't ruin the office building.

2 The building would be very compact in
its current position.

The first response is acceptable for 1 mark. Please refer to bullet point 5 in the marking scheme. A relevant linked response has not been given.

The second response is not a reason why a pile foundation would be more suitable than a strip foundation on low bearing capacity soil and is therefore worth no marks.

Question 11

This question was aimed at common structural forms for low-rise construction.

Targeted Specification Area: Learning Aim A.1

Learners were required to discuss the advantages and disadvantages of two types of external wall cladding options.

Learners should identify the issue/situation that is being assessed within the question. Marks were given dependent on the detail of points identified and described and as to whether the learner had made a balanced explanation of the cladding options.

Most learners attempted this question. Many achieved some marks. Learner marks were mostly in mark band 1 or at the lower end of mark band 2. Some high mark band 2 and occasional mark band 3 learner work was also seen.

The marking scheme gives a detailed list of the advantages and disadvantages of each cladding form. Learners generally identified a few key points from one or both forms. Few learners provided a balanced argument with sufficient detail to achieve marks beyond those in mark band 2. Some learners provided detailed responses and achieved mark band 2 criteria marks and the points made were linked to the development and its rural location.

The mark bands and level descriptors are included in the mark scheme for question 13.

3 mark example response:

11 An architect is considering alternative external wall cladding options for a timber framed housing development in a sustainable community project. The development is in a rural location with high rainfall and high wind speeds.

The external wall cladding options are:

- brickwork
- tiling

Discuss the advantages and disadvantages of each external wall cladding option

(8)

Brickwork

advantages: Brickwork is very good at keeping out the weather as bricks aren't very porous. This is good for the location because also they are very strong and can withstand high wind speeds, they are also cemented down so they can't move. Also you can put insulation between the cavity of the bricks and the timber frame, this will help against the cold winds and poor weather.

Disadvantages: Brickwork can be affected by the weather in the sense that bricks can only be put down if it's not raining, this is so the mortar can dry and doesn't get wet. This is bad because the area has high rainfall. ~~Let~~ With the high winds it is also more dangerous for the bricklayers to work up high.

Tiling

advantages: This can be done in poor weather

conditions, so the build won't be halted by this. Also this is a much quicker method as you don't do lots of labour. They are also very cheap and if one breaks they are cheap to replace. Also are good at keeping rain out as it runs off.

Disadvantages: Tiling is not a good option because if the area is subjected to high rainfall it is very likely that the tiles can be blown off and broken. This will let the rain in and damage the building.

Conclusions:

I would choose the brickwork method as it is much more weather resistant and can stand high wind and rain.

A few points have been discussed in limited detail. The learner shows a basic understanding of cladding systems. The learner has attempted to link their response to the scenario eg high winds and high rainfall however, the links are not always correct.

2 mark example response:

71 An architect is considering alternative external wall cladding options for a timber framed housing development in a sustainable community project. The development is in a rural location with high rainfall and high wind speeds.

The external wall cladding options are:

- brickwork
- tiling

Discuss the advantages and disadvantages of each external wall cladding option.

brickwork would resist the rain and wind. ^{it} it is cheaper than tiling the bricks can be locally sourced or can be reused. you would need a bricklayer to come and to be adding bricks. are not ~~pre~~ aesthetically pleasing and are not sustainable.

tiling is more expensive than brickwork but is more aesthetically pleasing and will not take as much weather as brickwork. tiles can not be locally sourced and can be blown off in high winds. bricks would maintain stability in high winds.

A few points have been discussed in limited detail. The learner shows a basic understanding of cladding systems.

2 mark example response:

11 An architect is considering alternative external wall cladding options for a timber framed housing development in a sustainable community project. The development is in a rural location with high rainfall and high wind speeds.

The external wall cladding options are:

- brickwork
- tiling

Discuss the advantages and disadvantages of each external wall cladding option.

(8)

brickwork would be better in high
wind speeds because it is stronger
but they are more expensive
than tiles they are also good
for high rainfall
Tiles are also good for high rainfall
but they might not be as
good in high wind speeds
however wood tiles would be
cheaper

A few points have been discussed in superficial detail. The learner shows a basic understanding of cladding systems.

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.

