

Examiners' Report/
Lead Examiner Feedback
June 2016

NQF BTEC Level 1/Level 2 Firsts in
Construction and the Built
Environment

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 fall back).

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	12	21	30	40

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.

General Comments

This was the fifth 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.

Section A

Question 1

This question was aimed at aspects associated with preconstruction work on a construction site.

Targeted Specification Area: Learning Aim B.1

Q1(a): Most learners correctly identified the correct answers of:

A – Fencing

C – Temporary lighting

Q1(b): Learners were required to name two services that may need to be protected before work can begin on a construction site.

This was satisfactorily attempted by learners. Many learners correctly identified the correct answers as stated in the marking scheme. However, some learners did not appear to understand what the term service meant and incorrectly identified other site set-up activities such as fencing or storage accommodation as their responses.

2 mark response example:

(b) Name **two** services that may need to be protected before work can begin on a construction site. (2)

1 ~~All the equipment~~ All the waterworks

2 All the gas mains

(Total for Question 1 = 4 marks)

2 marks awarded. Gas mains and waterworks, acceptable for water, are both relevant responses.

1 mark response example:

(b) Name **two** services that may need to be protected before work can begin on a construction site. (2)

1 ~~beams~~ Pipes

2 Drains

(Total for Question 1 = 4 marks)

1 mark awarded.

Drains are accepted for 1 mark. No mark is awarded for pipes as this is too similar to the service of drains.

Question 2

This question was aimed at aspects of structural performance requirements of low-rise construction.

Targeted Specification Area: Learning Aim A.1

Q2(a)(i): Learners were required to give one purpose of a concrete slump test. This was mostly well answered by learners. Acceptable correct answers are as stated in the marking scheme. A response also accepted was that it is a test for the strength of concrete as indirectly the test gives an indicator of the workability of a concrete mix which gives an indication of the strength of a mix.

1 mark response example:

2 (a) Give the purpose of:

(i) a concrete slump test (1)

To check the consistency of the mixture is correct & suitable

1 mark awarded for an acceptable correct response.

Q2(a)(ii): Learners were required to give one purpose of the compressive testing of concrete. The purpose of the compressive testing of concretes is to test the strength of it. This question was satisfactorily answered by learners.

1 mark response example

(ii) the compressive testing of concrete.

To find whether it can take the load of the ⁽¹⁾ buildings.

The response of 'to find whether it can take the load of the building' is an acceptable response linked to the strength of concrete.

1 mark response example:

be strong enough.
(ii) the compressive testing of concrete.
to see how strong and dense the ⁽¹⁾ concrete is.

1 mark awarded- The response of 'to see how strong the concrete is' is acceptable. The comment concerning how dense it is, is ignored.

Q2(b): Learners were required to identify two methods of stress grading structural timber. This was poorly attempted by learners despite similar worded questions being set in previous exam series. Most learners were able to identify visual as a correct solution. The two correct answers were:

C – Machine

E – Visual

Question 3

This question was aimed at the performance requirement of thermal insulation.

Targeted Specification Area: Learning Aim A.1

Learners were required to identify two types of thermal insulation. This question was well answered by many students with most achieving 2 marks. The two correct answers were:

A – Glass fibre

E – Foam

Question 4

This question was aimed at aspects of the superstructure of walls.

Targeted Specification Area: Learning Aim C.1

Q4(a): Learners were required to identify two types of external wall finish. This question was well answered by many students with most achieving 2 marks. The two correct answers were:

C – Facing brickwork

E – Rendered blockwork

Q4(b): Learners were required to name two types of internal wall partition.

This question was poorly answered by learners who were often unable to achieve a minimum of 1 mark, this despite the types of internal partition being clearly stated in the unit specification. Most correct responses indicated that timber or brickwork could be used as an internal wall partition. Some learners failed to understand the term partition and responded with answers of cavity wall or beam and block.

Acceptable responses can be found in the mark scheme.

2 mark example response:

(b) Name **two** types of internal wall partition. (2)

1 Timber stud walling

2 Single brick work wall

(Total for Question 4 = 4 marks)

2 marks awarded for two correct responses.

1 mark example response:

(b) Name **two** types of internal wall partition. (2)

1 Brick

2 Tiles.

(Total for Question 4 = 4 marks)

1 mark awarded for the first response. 0 marks awarded for the second response of tiles.

Question 5

This question was aimed at an aspect of the superstructure of floors.

Targeted Specification Area: Learning Aim C.2

Learners were required to name two types of internal floor finish. This question was well answered by most learners who were often able to achieve 2 marks. Acceptable responses can be found in the mark scheme.

2 mark example response:

5 Name **two** types of internal floor finish.

1 laminated wood flooring

2 carpeting

(Total for Question 5 = 2 marks)

2 marks are awarded for two the correct responses of laminate and carpeting.

Question 6

This question was aimed at the superstructures of roofs.

Targeted Specification Area: Learning Aim C.3

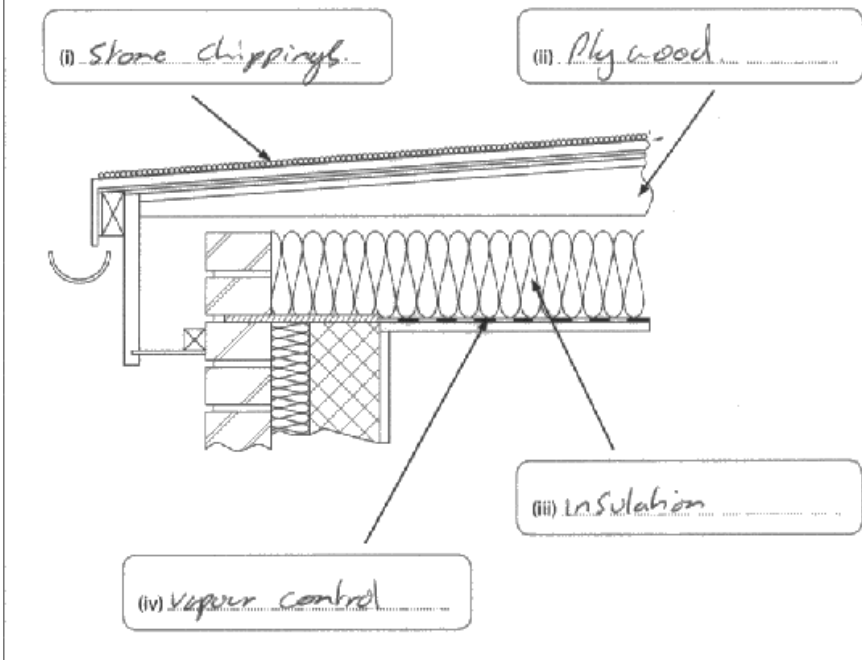
Learners were required to identify four parts of a flat roof diagram. This was poorly attempted by learners with many only achieving 1 mark for part (iii) insulation. In a previous examination series learners had been requested to sketch a flat roof construction form.

The correct parts were:

- (i) Stone chipping but felt was also accepted
- (ii) Furring
- (iii) Insulation
- (iv) Vapour layer/barrier

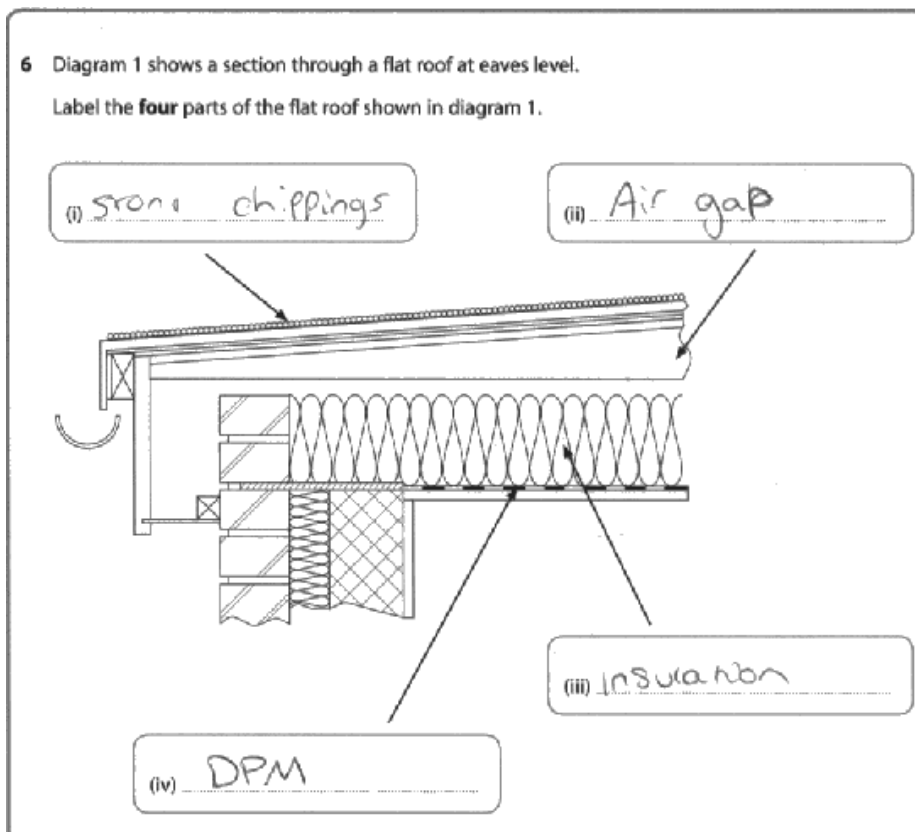
3 mark example response:

- 6 Diagram 1 shows a section through a flat roof at eaves level.
Label the **four** parts of the flat roof shown in diagram 1.



3 marks are awarded for the correct responses of stone chippings, insulation and vapour control. No marks are awarded for plywood.

2 mark example response:



2 marks are awarded for the correct responses of stone chippings and insulation. No marks awarded for air gap and DPM.

Question 7

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

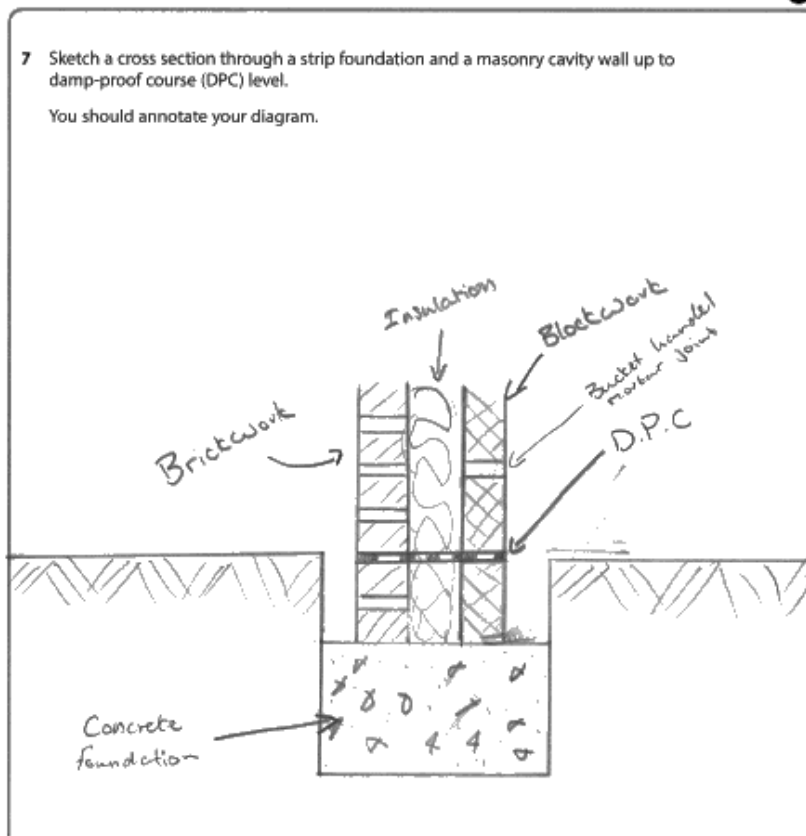
Targeted Specification Area: Learning Aim B.2

Learners were required to sketch a cross-section through a strip foundation and a masonry cavity wall up to damp-proof course (DPC) level. This question requires learners to be able to demonstrate the use of sketching techniques.

In this examination series a greater number of learners completed meaningful sketch details often achieving between 3 and 5 marks. However, some learners either did not attempt a response or focused incorrectly on a past exam series detail.

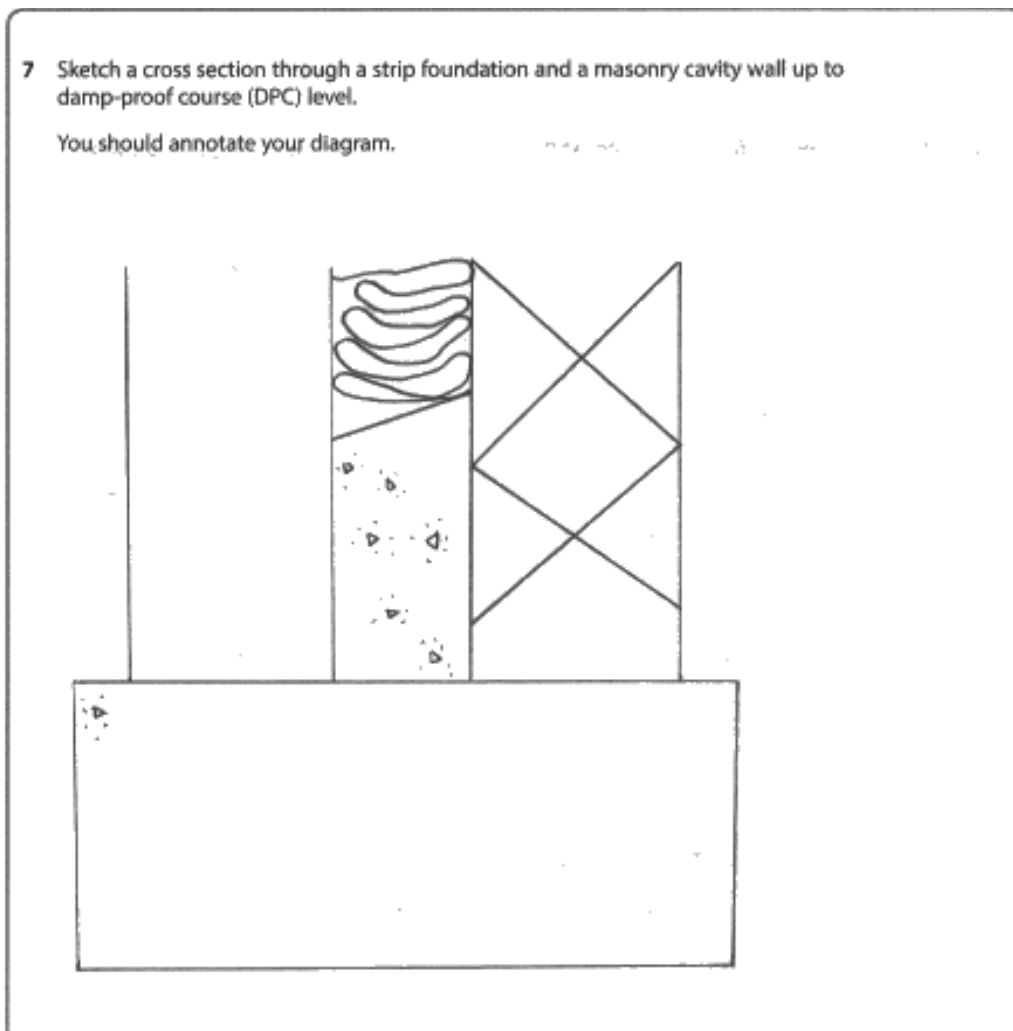
Centres should consult with the mark scheme to consider the detail required for a sketch question of this type. Centres also need to understand that this type of question will continue to be included in future examinations.

5 mark example response:



5 marks awarded as five components have been clearly labelled.

3 mark example response:



Although the candidate has not labelled the components of the concrete foundation, three components have been correctly detailed. The concrete foundation, cavity wall fill and internal blockwork are all awarded one mark each. No marks are awarded for the external brickwork as it has no fill pattern and has not been annotated.

Question 8

This question was aimed at the superstructure of floors.

Targeted Specification Area: Learning Aim C.2

Learners were required to explain two advantages of using eco-joists, instead of solid timber joist, as part of the upper floors of a building. 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 poorly attempted by learners. Some 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. Learners therefore often did not provide a complete description of their identified benefit.

Learners achieved 1 mark by identifying one advantage e.g.

- they are more stable
- they are more cost effective/economic
- easier to build

Some students did not interpret the question well and gave a range of inaccurate responses. The incorrect responses below cannot be clearly identified as an advantage of using eco-joists compared to solid timber joists

Responses awarded 0 marks included:

- it can be recycled
- lasts longer
- won't rot
- stronger
- doesn't harm the environment
- eco-friendly

2 mark example response:

8 Explain **two** advantages of using eco-joists, instead of solid timber joists, as part of the upper floors of a building.

1 eco joists are quicker to construct than solid timber joists which means you save more money because of less labour costs-

2 eco-joists are better at fire resistance than timber joists-

2 marks are awarded. The first response indicates eco joists are quicker to construct and is then linked to savings in labour costs. This is an acceptable 2 mark response- please refer to bullet point 4. The second response is awarded 0 marks.

1 mark example response:

8 Explain **two** advantages of using eco-joists, instead of solid timber joists, as part of the upper floors of a building.

1 It might be lighter to use and lift.

2 It might cheaper it wont cost as much as the solid timber.

1 mark was awarded. The first response indicates 'it might be easier lighter to use and fit'. Although this is a weak response 1 mark is awarded for stating lighter, see bullet point 4 in the mark scheme. The linked response has not been expanded upon sufficiently for the award of the second mark. No marks are awarded for the second response as eco joists are not necessarily cheaper than solid timber joists.

Question 9

This question was aimed at the superstructures of walls.

Targeted Specification Area: Learning Aim C.1

Learners were required to give two functions of a wall opening. This question was mostly well answered by learners who were often able to achieve a minimum of 1 mark. Acceptable responses can be found in the mark scheme.

2 mark example response:

9 Give **two** functions of a wall opening.

1 a function of a wall opening is so that a door can be fitted to get in and out

2 to get out if there is a fire.

egress and access

(Total for Question 9 = 2 marks)

2 marks awarded for the two correct responses of access and egress see bullet points 4 and 5 of the mark scheme.

1 mark example response:

9 Give **two** functions of a wall opening.

1 allows moisture to escape the wall

2 let fresh air in

(Total for Question 9 = 2 marks)

1 mark awarded as both responses relate to bullet point 1 in the mark scheme.

Question 10

This question was aimed at the performance requirement of strength and stability with respect to lateral and vertical restraint.

Targeted Specification Area: Learning Aim A.1

Learners were required to identify that the vertical restraint of roof is used to resist the uplift from wind loading. This question was satisfactorily answered.

The correct answer was:

D – Wind loading

Question 11

This question was aimed at the sub-structure groundwork aspect of ground floors.

Targeted Specification Area: Learning Aim B.2

Learners were required to explain one reason why a builder is unlikely to use a solid concrete floor for a house on a sloping site. 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 poorly attempted by learners. Some 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. Learners therefore often did not provide a complete description of their identified benefit.

Some learners achieved 1 mark by identifying one advantage e.g.

- it is less cost effective
- it is more expensive

Some students did not interpret the question well and gave a range of inaccurate poor or responses relating to concrete sliding down a hill.

1 mark example response:

11 Explain **one** reason why a builder is unlikely to use a solid concrete floor for a house on a sloping site.

Because it would be difficult to make the floor flat and would cost more to do so timber suspended floors are better

(Total for Question 11 = 2 marks)

1 mark awarded. The candidate has indicated 'it would be difficult to make the floor flat and it would cost more'. One mark awarded for cost effectiveness issue identified.

0 mark example response:

11 Explain **one** reason why a builder is unlikely to use a solid concrete floor for a house on a sloping site.

because the concrete would just keep falling to the sloped side leaving the building to be uneven and not very safe

(Total for Question 11 = 2 marks)

0 marks awarded. No relevant comment has been made worthy of a mark.

Question 12

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

Targeted Specification Area: Learning Aim B.2

Learners were required to explain two advantages of a raft foundation compared to a strip foundation in poor ground conditions. This question was poorly attempted by learners. Some 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. Learners therefore often did not provide a complete description of their identified advantage.

The mark scheme for this question is detailed and offers centre the opportunity to review how linked responses should be presented.

Learners achieved 1 mark by identifying one advantage e.g.

- distributes weight evenly
- good on variable soil
- cheaper in the long run (more cost effective)
- quicker to construct

Some students did not interpret the question well and gave a range of inaccurate responses. The incorrect responses below cannot be clearly identified as an advantage of using a raft foundation compared to a strip foundation in poor ground conditions.

Responses awarded 0 marks included:

- stronger
- stable
- prevents a building sinking
- it is easy to build

3 mark example response:

12 Explain **two** advantages of a raft foundation compared to a strip foundation in poor ground conditions.

- 1 it provides a better surface area over a area which has bad ground conditions this helps by allowing the soil with less stress over a large area.
- 2 it is quick to construct and can be erected on site this means that it

(Total for Question 12 = 4 marks)

2 marks awarded for the first response of 'it provides a better surface area (1)...allowing the soil with less stress over a large area (1)'. 1 mark awarded for the second response ' it is quick to construct'.

1 mark example response:

12 Explain **two** advantages of a raft foundation compared to a strip foundation in poor ground conditions.

- 1 one advantage of a raft foundation compared to a strip foundation is that the raft foundation is a stronger material.
- 2 Also the raft foundation is cheaper and easy to buy and apply.

(Total for Question 12 = 4 marks)

0 marks are awarded for stating a raft foundation is stronger than a strip foundation. 1 mark awarded for stating a raft foundation is cheaper (cost effective).

Question 13

This question was aimed at the cross-wall construction form.

Targeted Specification Area: Learning Aim A.2

Learners were required to explain one advantage and one disadvantage of using a prefabricated cross-wall construction form to build a new apartment block. Learners were often able to achieve 1 mark for the identification of an advantage but then failed to understand the need to expand their identified reason.

The mark scheme for this question is detailed and offers centres the opportunity to review how linked responses should be presented.

Learners achieved 1 mark by identifying one advantage e.g.

- less wastage
- sustainable/more environmentally friendly method
- able to recycle materials
- durability
- cheap/easy/quick to construct

Advantages awarded 0 marks included:

- stronger
- slows fire spread
- cheaper/easier/quicker on their own or without a comparator

For an acceptable explanation of a disadvantage, the mark scheme is detailed.

4 mark example response

13 Explain **one** advantage and **one** disadvantage of using a prefabricated concrete cross-wall construction form to build a new apartment block.

Advantage

Prefabricated structures are quick to put up meaning people can move in a lot quicker.

Disadvantage

The measurements ~~are~~ for the prefabrication could be wrong so either it is a waste of materials, ~~or~~ the layout has to be changed or another building has to be knocked down.

(Total for Question 13 = 4 marks)

The above includes two acceptable linked responses. The first response indicates that the apartment block is quick to build (1) which allows people to move in quicker (1). The second response indicates that if the measurements for prefabricated components are inaccurate (1) then this would lead to waste (1).

2 mark example response

13 Explain **one** advantage and **one** disadvantage of using a prefabricated concrete cross-wall construction form to build a new apartment block.

Advantage

The advantage would be that it is quicker to build an apartment block.

Disadvantage

It would cost a lot, because if you don't get the right size it will cost more.

(Total for Question 13 = 4 marks)

The first response is awarded 0 marks as no comparator is included. 1 mark would have been awarded had the learner provided a comparator e.g. quicker to build than an in-situ concrete frame (1). The second response is awarded 2 marks for an appropriate linked response. It identifies that if measurements or sizes are not correct (1) it will cost more (1).

1 mark example response

13 Explain **one** advantage and **one** disadvantage of using a prefabricated concrete cross-wall construction form to build a new apartment block.

Advantage

It's environmentally friendly as it is sustainable
therefore less greenhouse gas is produced

Disadvantage

It might not last long due to its strength
as it's pre made.

(Total for Question 13 = 4 marks)

1 mark awarded for 'environmentally friendly'. 0 marks awarded for the second response.

Question 14

This question was aimed at aspects of sustainability.

Targeted Specification Area: Learning Aim A.1

Learners were required to discuss the advantages and disadvantages of two sustainability methods to be used for a new housing development.

Learners should identify the issue/situation that is being assessed within the question using the mark bands provided in the mark scheme. Marks were awarded dependent on the detail of points identified and described and as to whether the learner had made a balanced explanation of the two sustainability methods linked to the project scenario.

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.

Typical advantages of green renewable materials stated by learners included:

- preserves the environment
- materials may be recyclable
- can be cost effective over time

Typical disadvantages of green renewable materials stated by learners included:

- materials may not be available
- materials could be more expensive

Typical advantages of locally supplied construction materials stated by learners included:

- less pollution
- boost to the local economy
- good public relations

Typical disadvantages of locally supplied construction materials stated by learners included:

- they can be more expensive
- suppliers may not be able to meet demand

Learners generally identified a few key points from one or both sustainability methods. 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 of a new housing scheme.

The mark bands and level descriptors are included in the mark scheme for question 14.

5 mark example response:

Discuss the advantages and disadvantages of these sustainable methods for the housing development. (8)

Advantages of "Green renewable materials"

- * It is renewable which means it would never run out (finish).
- * It is a sustainable material for construction.
- * It usually is already made and available for use to construct. (quick).
- * It has a low impact on the environment.
- * It is recyclable.
- * It improves sustainability.
- * It has low embodied energy.
- * It emits less or no carbon into the atmosphere.

Disadvantages of "Green renewable materials"

- * It is expensive to manufacture/buy.
- * Requires skilled labour to work with.
- * It had to find.

Advantages of "Locally Supplied Construction materials."

- * Easy to get / quick to construct with.
- * Readily available (wood)
- * It is sustainable
- * Commonly used (materials such as timber)
- * Low embodied energy
- * It is cheaper compared to green ^{renewable materials}
- * It is recyclable materials.

Disadvantages

- * Creates lots of waste product.
- * It's not renewable and can run out
- * Might not be strong enough.

- * ~~It is expensive to buy~~
- * Not everyone's good with the material (requires skilled labour)
- * Labour cost is high.

In conclusion, I think green renewable material is a better material to use compared to locally supplied materials because it is sustainable and renewable which mean it wouldn't run out and it is environmentally friendly. And it is also recyclable which means that new ones wouldn't be needed to be excavated regularly minimising emission into the atmosphere. And it also have a low embodied energy.

This response lies in the middle of mark band 2. Some points are identified and a few key points described. The learner has shown a good understanding of sustainable materials and methods.

3 mark example response:

14 A developer is planning to build a new sustainable housing development using:

- green renewable materials
- locally supplied construction materials.

Discuss the advantages and disadvantages of these sustainable methods for the housing development. (8)

A advantage of this is they are a renewable source however this will probably mean they are more expence. Also with is being locally supplied it will mean less miles to get to you and less pollution. Finally, my last disadvantage is due to the eco friendly way of building these houses it could increase the price of the proppite.

The candidate response lies at the top of mark band 1. The response provided is clearly linked to the scenario of a new housing development, thus giving it the potential to be awarded marks in band 2; however, the limited content and lack of descriptive qualities within the response has limited the mark to the top of band 1 in accordance with the principle of best fit.

2 mark example response:

Discuss the advantages and disadvantages of these sustainable methods for the housing development. ⁽⁸⁾

The advantages of using green renewable materials are they can be used over and over again and they won't run out like wood and Sheepwool for thermal insulation. However the disadvantages of using green renewable materials are that it's polluting air because you have to transport them from different places to get them. The advantages of using locally supplied construction materials are that it is cheaper because you don't have to travel far for them, another advantage is that it helps them economically and it will be good quality wood or any material. The disadvantage of using locally supplied construction materials is that they will soon run out if you use all of what they have.

The candidate response lies in the middle of mark band 1. Both key focus points within the question have been considered in equal measure. The learner has sufficient to be awarded 2 marks. The response is structured in a way that demonstrates a greater consideration of advantages than disadvantages of both sustainable methods; however, not every point made is completely relevant, e.g. pollution from transportation is not a disadvantage of using green renewable materials specifically as it applies to all materials.

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