



# Examiners' Report/ Lead Examiner Feedback

June 2015

NQF BTEC Level 1/Level 2 Firsts in  
Construction

Unit 1: Construction Technology  
(21492E)

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## Grade Boundaries

### 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	11	21	31	42

## **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 third time that this paper has been sat and, overall, the paper produced a good 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 focussed on the vocational context. In some cases, learners simply provided 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 this exam and mark scheme as the basis for identifying and applying more expansive responses 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. Learners should understand the different responses required for different command words, for example, identify, explain or discuss.

## Question 1

This question was aimed at aspects of preconstruction site set-up work necessary for low-rise construction.

Targeted Specification Area: Learning Aim B.1

Most learners correctly identified the two preconstruction site set-up activities:

- B - Installation of site accommodation
- C - Gates and security of site

A number of learners incorrectly identified the permanent control of sub-soil water as a preconstruction site set-up activity when this is in fact part of the sub-structure groundworks phase of a construction project.

## Question 2

This question was aimed at a range of aspects relating to the structural performance required for low-rise construction.

Targeted Specification Area: Learning Aim A.1

**2a)** Learners were required to identify two purposes of thermal insulation in a building. This was only satisfactorily attempted by learners with many achieving 1 mark only. Most incorrect responses stated that the purpose of thermal insulation was to improve sound insulation, which is incorrect. The purpose(s) of thermal insulation are clearly stated within the unit specification and are also included within the mark scheme which centres should refer to.

2 mark response example:

2 (a) Identify **two** purposes of thermal insulation in a building.

(2)

1. to keep the building warm

2. to lower the cost of the heating bill

2 marks awarded for 2 correct responses given.

1 mark response example:

2 (a) Identify **two** purposes of thermal insulation in a building. (2)

1 To keep heat in the building

2 Stop heat from escaping.

1 mark awarded only as both responses relate to heat loss of a building.

**2b)** Learners were required to identify two locations where sound insulation may be installed in a building. This was well attempted by learners. Most learners identified a wall, floor, ceiling, attic loft, door, window etc which were all considered to be acceptable answers. Specific geographic locations e.g. airports, London, or regular rooms within a domestic property, were not acceptable answers.

2 mark response example:

(b) Identify **two** locations where sound insulation may be installed in a building. (2)

1 walls to keep sound out

2 ground roof because of aircraft noises

2 marks awarded for 2 correct responses given of a wall and roof.

**2c)** Learners were required to identify two materials that are used to achieve weather resistance in a building. The majority of learners correctly identified the two correct materials:

D - Flashings

E - Double Glazing

The question was well understood by many learners.

**2d)** Learners were required to give two design features that will reduce the spread of fire in a building. This was mostly well answered by students with many achieving a minimum of 1 mark.

Acceptable responses can be found in the mark scheme.

In addition learners were awarded marks for shortened versions of their responses e.g. compartments, barriers etc.

2 mark response example:

(d) Give **two** design features that will reduce the spread of fire in a building. (2)

1 plaster board to slow down the spread of flames

2 fire doors to keep flames behind a certain point.

2 marks awarded for 2 correct responses given.

1 mark response example:

(d) Give **two** design features that will reduce the spread of fire in a building. (2)

1 Fire alarm

2 ~~Sprinkler~~ Sprinkler ~~Systeme~~ Systeme

1 mark awarded for the design feature of a sprinkler system. No mark is awarded for the first response as fire alarms do not reduce the spread of fire.

**2e)** Learners were required to identify two types of load that buildings are designed to resist. This was mostly well answered by students with many achieving 2 marks and most achieving at least 1 mark. The correct responses were:

- A - Snow
- D - Self-weight

Some students failed to identify that the self-weight of a building is a type of load buildings are designed to resist.

### Question 3

This question was aimed at a range of aspects relating to the sub-structure groundworks necessary for low-rise construction.

Targeted Specification Area: Learning Aim B.2
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**3a)** Learners were required to name the three types of foundation shown. In general this question was poorly answered by many learners. The correct acceptable answers for each foundation detail were:

- (i) Raft
- (ii) Pile
- (iii) Strip

Many students did not give a response or included inaccurate terms such as trench/mass fill (assumed to be taken from Q3b), concrete or pillar foundation.

The identification of the three basic foundation types is an important part of this unit yet students had limited understanding of which foundation type was detailed.

**3b)** Learners were required to explain one advantage and one disadvantage of a trench/mass fill concrete foundation. The command verb used for this question is explain, therefore 1 mark was allocated to the identification of an advantage or disadvantage and 1 mark for a linked explanation of the stated advantage/disadvantage. Learners were often able to achieve 1 mark for the identification of an advantage/disadvantage 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/disadvantage.

Many learners achieved 1 mark by identifying that an advantage of a trench/mass fill concrete foundation is:

- It is a quicker form of construction
- It is easy to construct
- It reduces the need for skilled labour

Some students did not interpret the question well and gave a range of inaccurate responses which did not relate to the advantages or disadvantages of a trench/mass fill concrete foundation. Incorrect responses included:

- It is a greater load bearing foundation
- It has greater stability
- It is more durable
- It is cheap (it is not always the cheaper option)

2 mark response examples:

(b) Explain **one** advantage and **one** disadvantage of a trench/mass fill concrete foundation. (4)

Advantage  
quick and easy to install  
create.

Disadvantage  
not suitable for all  
ground types.

(Total for Question 3 = 7 marks)

2 marks awarded. The first response has identified that trench/mass fill concrete foundations are quick and easy to install (1), but without a linked explanation this response is not awarded the second mark.

The second response has identified that trench/mass fill concrete foundations are not suitable for all ground types (1), but without a linked explanation this response is not awarded the second mark.

(b) Explain **one** advantage and **one** disadvantage of a trench/mass fill concrete foundation.

(4)

Advantage

Easy to construct, leading to quicker construction time and less labour costs.

Disadvantage

Concrete has to be left for 28 days to set before it can be used, therefore limiting construction progress during that period.

2 marks awarded. The first response has identified that trench/mass fill concrete foundations are easy to construct (1), with the linked explanation of reduced construction time (1) i.e. cost effective.

The second response is a disadvantage of many types of foundation, and is not specific to trench/mass fill foundations.

#### Question 4

This question was aimed at the identification of the components of a window head detail included in the superstructures-walls aspect of the unit specification.

Targeted Specification Area: Learning Aim C.1

Learners were required to label five components of a window head detail. In general this question was poorly answered by many learners. The correct acceptable answers for each component were:

- (i) weephole/cavity vent/cavity drain
- (ii) window or glass
- (iii) wall tie
- (iv) cavity tray/cavity gutter/DPC
- (v) lintel

Many students did not give a response or included inaccurate terms such as wall plate, insulation or brickwork.

The labelling of the components of elements of a structure is an important part of this unit and centres need to understand that this type of question will be included in future examinations.

3 mark response example:

4 Diagram 1 shows a window head detail.  
Label the components of the window head detail.

Diagram 1

(Total for Question 4 = 5 marks)

3 marks awarded for the following:

- (ii) window
- (iii) wall tie
- (iv) DPM

No marks are awarded for the other responses as they are incorrect.

### Question 5

This question was aimed at the sketching of a cross-section through an external wall of a timber-framed building. It targeted the understanding of how walls are detailed in the superstructure-walls aspect of the unit.

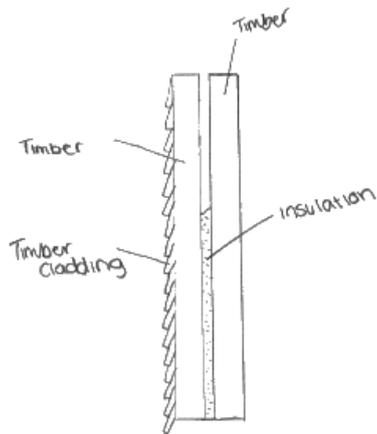
Targeted Specification Area: Learning Aim C.1

Learners were required to sketch a cross section through an external wall of a timber-framed building. This question requires learners to be able to demonstrate the use of sketching techniques as per the requirements of Topic C.1-superstructure- walls section. This was poorly attempted by many students. Many either did not attempt a response or focussed incorrectly on a traditional cavity masonry wall. Some learners also sketched details of a solid ground floor or flat roof construction form, which had been included in

previous exam papers, rather than the specific cross section requirements of an external wall of timber-framed building, as indicated in the question. Some learners also included details with components in an incorrect order. 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:

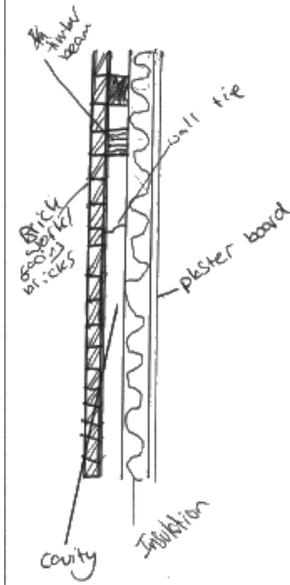
5 Sketch a cross-section through an external wall of a timber-framed building.  
You should annotate your diagram.



4 marks awarded for four correctly labelled components. Although the hatching for insulation is incorrect, it is correctly placed and labelled. 1 mark is awarded for each timber frame component. The fourth mark is awarded for the cladding.

5 mark response example:

- 5 Sketch a cross-section through an external wall of a timber-framed building.  
You should annotate your diagram.



5 marks awarded for a correct sketch detail with 5 components correctly labelled.

### Question 6

This question was aimed at a range of aspects relating to the superstructures of roofs.

Targeted Specification Area: Learning Aim C.3

**6a)** Learners were required to state one function of a roof. This was well answered by students.

The mark scheme identifies a wide range of acceptable responses. Additional learner responses were accepted including:

- keep the weather out
- insulation
- stops the rain from coming in
- allows rainwater to run off the building

1 mark response example:

6 (a) State <b>one</b> function of a roof.	(1)
resist weather	
keep walls together.	

1 mark awarded for correctly identifying waterproofing the structure. The second response is also valid, however only one mark can be awarded for this question.

**6b)** Learners were required to identify two components used in the construction of roofs. This was only satisfactorily attempted by learners with many achieving 1 mark only.

The correct responses were:

- B - Wall plate
- E - Jack rafter

Most learners identified that either a wall plate or jack rafter as a correct component, but often learners identified a cavity tray or aluminium walling as an answer which are both incorrect. The components of a roof are clearly stated within the unit specification and included within the mark scheme which centres should refer to.

## Question 7

This question was aimed at aspects of sub-structure ground works.

Targeted Specification Area: Learning Aim B.2

Learners were required to explain two advantages of using a solid ground floor instead of a suspended timber ground floor in a house. The command verb used for this question is explain, therefore 1 mark was awarded to the identification of an advantage and 1 mark for a linked explanation. Learners were often able to achieve 1 mark for the identification of an advantage but then did not provide a linked explanation.

Identification marks were awarded for:

- stronger/can take a greater weight/can hold more weight/sturdy
- stable
- fire resistant/proof
- quicker to construct

Marks for linked responses were achieved in some instances, some typical examples included:

- it is more cost effective (1) as it needs less skilled labour to construct (1)
- it has better fire resistance (1) because there is no combustible material (1)
- it is not prone to fungal attack (1) so is more durable and lasts longer (1)

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

2 mark response example:

7 Explain **two** advantages of using a solid ground floor instead of a suspended timber ground floor in a house.

1 A solid ground floor is stronger and will take more ~~load~~ heavier loads than timber ground floor.

2 A solid ground floor will last longer.

2 marks awarded for correctly identifying that a solid ground floor can take heavier loads (1) and it will last longer (1)

As this learner has not provided linked responses, the additional 2 marks cannot be awarded.

1 mark response example:

7 Explain **two** advantages of using a solid ground floor instead of a suspended timber ground floor in a house.

1 A solid ground floor will not rot because it's not made out of wood.

2 <sup>solid ground floor</sup> it's easier to make.

1 mark awarded for correctly identifying that timber can rot.

No marks are awarded to 'it is easier to make' as this is not necessarily so.

## Question 8

This question was aimed at aspects of sustainability.

Targeted Specification Area: Learning Aim A.1

Learners were required to explain one way in which onsite construction wastage can be reduced. The command verb used for this question is explain, therefore 1 mark was awarded to the identification of a way onsite construction wastage and 1 mark for a linked explanation. Learners were often able to achieve 1 mark for the identification of a way to reduce onsite construction wastage but then did not understand the need to provide a linked explanation.

Identification marks were awarded for:

- order the right amount of material
- order as it is needed
- erect appropriate signage to ensure awareness

Marks for linked responses were achieved in some instances, a typical example included:

- Prefabricated components are made to measure (1) this will reduce the cutting of materials on site (1)

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

1 mark response example:

8 Explain **one** way in which on-site construction wastage can be reduced.

One way in which on-site construction wastage can be reduced is cutting or ordering the material to the right dimensions, reducing the on-site construction wastage.

(Total for Question 8 = 2 marks)

1 mark awarded for correctly identifying the need to cut or order material to the right dimensions. There is no linked response, so 1 mark is awarded for identification only.

## 2 mark response example:

8 Explain **one** way in which on-site construction wastage can be reduced.

Ordering the correct amount of a material  
so there is less waste from offcuts.

(Total for Question 8 = 2 marks)

2 marks awarded as the learner has provided a correct linked response.

## Question 9

This question was aimed at aspects of superstructures- walls.

Targeted Specification Area: Learning Aim C.1

Learners were required to explain two reasons why internal partitions are often constructed using softwood. The command verb used for this question is explain, therefore 1 mark was awarded to the identification of a reason why softwood is used in the construction of internal partitions and 1 mark for a linked explanation. Learners were often able to achieve 1 mark for the identification of a reason why internal partitions are made from softwood but then failed to understand the need to expand their identified reason.

Identification marks were awarded for:

- Cheaper than hardwood
- Speed of erection
- Quick to assemble/construct
- Lighter than other types of wood

Identification marks were not awarded for cheaper to install or quicker to assemble without a comparator.

Marks for linked responses were achieved in some instances, typical examples included:

- Lightweight (1) reduces the load on the structure (1)
- Softwood is light (1) so is easy to move (1)

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

2 mark response example:

9 Explain **two** reasons why internal partition walls are often constructed using softwood.

1 They are easy to take down if needed.

2 quicker to put up than brick.

(Total for Question 9 = 4 marks)

2 marks awarded. The first response indicates that softwood partitions may be easily modified.

The second response is accepted as being quicker to install.

Both responses lack a linked explanation and therefore 2 identification marks are awarded.

Further 2 mark response example:

9 Explain **two** reasons why internal partition walls are often constructed using softwood.

1 because it is lighter than other types of wood but it is still as durable.

2 Cheap and a renewable source.

(Total for Question 9 = 4 marks)

2 marks awarded. Both responses lack a linked explanation and therefore 2 identification marks are awarded. The learner has indicated that softwood is lighter than other types of wood and indicated that softwood is from a renewable source. The maximum number of marks that can be awarded for identification is 2.

## Question 10

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

Targeted Specification Area: Learning Aim A.2
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Learners were required to discuss the benefits of two structural forms which could be used to create accommodation for university students. The command verb used for this question is discuss. A discussion question requires learners to investigate a theme or topic by reasoning or argument. 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 comparison between the benefits of the two options and linked their responses to the creation of residential accommodation for university students.

Most learners attempted this question, with many achieved some marks. Learner marks were mostly in mark band 1 or at the lower end of mark band 2. Some learners scored marks at the top of mark band 2.

Typical benefits of pre-fabricated concrete cross-wall construction form included:

- Quicker build process
- Reduced need for skilled labour
- Can be aesthetically pleasing

Typical benefits of traditional brick cavity wall construction form included:

- Good resistance to moisture penetration
- Can be aesthetically pleasing
- Cavity promoted good thermal insulation properties
- Has fire resistance properties

Learners generally identified a few key points from one or both structural 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 3 criteria marks. These responses were well balanced and included detailed explanations, and the points made were linked to the creation of accommodation to meet university student needs.

The mark bands and level descriptors are also included in the mark scheme to identify how learners can move from mark band 1 to mark band 2 or mark band 2 to mark band 3.

2 mark response example:

10 A university wishes to develop an area of land to create residential accommodation for students. Two structural forms are being considered.

1. Prefabricated concrete cross-wall
2. Traditional brick cavity wall

Discuss the benefits of each structural form of construction.

advantages to a pre fabricated concrete cross wall is that  
it's cheap. then a house can be built in 3 days but  
a dis advantage is that it isn't as strong as a traditional  
brick cavity wall

A traditional brick cavity wall is stronger than a  
pre fabricated concrete cross wall. the public eye thinks  
they look a lot nicer but the disadvantage to it is  
that it takes a long time to build and doesn't  
come pre built.

2 marks awarded. This response falls in the middle of mark band 1 as the learner has identified some key features with limited linked descriptions. Both forms of construction are discussed, however the response is superficial/generic and in places is incorrect.

6 mark response example:

for students. Two structural forms are being considered.

1. Prefabricated concrete cross-wall
2. Traditional brick cavity wall

Discuss the benefits of each structural form of construction.

One advantage for Prefabricated cross-wall construction is that it is mostly made off site and just brought on site to be assembled so this ~~make~~ ~~make~~ make it quicker to build. Also it is easier to build because the front and back walls are non load bearing walls so they don't need to provide as much strength. Another ~~good~~ advantage is that it is good for flats and industrial buildings because it ~~allows~~ allows all the levels to be the same inside the building. ~~Also~~ ~~this~~ furthermore the foundations ~~are~~ are the most load bearing part of the building by being connected to all four walls and providing lateral resistance giving the building its strength.

One advantage about cavity wall construction is that it protects the house from damp better because it ~~has~~ has two skins the water can't penetrate as easily. Also there is space in between the cavity for insulation which ~~will~~ will keep the heat in. Another advantage is that you can apply sound insulating plasterboard to the inside of the building. Also in side the two skins there are wall ties which provide strength and ~~get~~ (Total for Question 10 = 8 marks)

TOTAL FOR PAPER = 50 MARKS

6 marks awarded. This response falls at the top of mark band 2 as while the learner shows developed knowledge of the subject matter, for example the use of cross wall construction for flats, the response is not linked to the scenario given in the question stem.

In order to move into mark band 3, the response needs to be linked more closely to the scenario and there is the potential to further develop the commentary in relation to traditional brick cavity wall.



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