



Examiners' Report/ Lead Examiner Feedback

January 2015

NQF BTEC Level 1/Level 2 Firsts in
Construction

Unit 1: Construction Technology
(21492E)

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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 second examination for this unit and overall, the paper produced a reasonable range of responses.

Lower ability learners were often able to answer multiple choice questions well where simple recall from the unit specification was required. However, the ability to label construction diagrams, sketch details or answer contextualised questions was not demonstrated.

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 exam series, centres should focus on the analysis of the SAM (Sample Assessment Material), previous question papers, mark schemes and the associated Lead Examiners reports as the basis for identifying and applying relevant and 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 apply these concepts to different scenarios. Learners should be able to sketch and label elements of construction as identified in the unit specification.

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

Question 1

This question required learners to identify two preconstruction stage legal requirements.

Targeted Specification Area: Learning Aim B.1

The majority of learners answered this correctly.

Question 2

This question required learners to identify two site set-up preconstruction activities, other than the installation of site accommodation.

Targeted Specification Area: Learning Aim B.1

This was satisfactorily attempted by learners. Most incorrect responses related to the desk-based preconstruction activities of informing the Health and Safety Executive (HSE) or in the conducting of risk assessments. Offices and site storage were deemed site accommodation and were awarded no marks. For acceptable responses, please see the mark scheme.

Please note, if a candidate had two responses relating to site facilities, e.g. toilet and canteen, this was awarded 1 mark only.

2 mark example:

2 The installation of site accommodation is a site-based preconstruction activity carried out at the set-up stage.

Name **two** other site set-up activities required before construction work begins.

1 *Street lighting and gates.*

2 *Signs.*

(Total for Question 2 = 2 marks)

Question 3

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/A.2

3a) Learners were required to identify two fire-resistant materials. Most learners were able to identify either plasterboard or blockwork as a fire resistant material. A number of learners incorrectly identified bitumen as a fire resistant material.

3b) Learners were required to identify two locations where thermal insulation may be installed in a building. This was mostly well answered by learners. Typical correct responses included floor, wall, ceiling, loft, roof or attic.

2 mark example:

(b) Buildings are insulated in order to reduce heat loss.
Identify **two** locations where thermal insulation may be installed. (2)

1 In your walls (external generally)

2 In your loft area - between roof and ceiling

3c) Learners were required to identify the structural form from a given detail. The majority of learners correctly identified the structural form as D, cross-wall.

Question 4

This question was aimed at types of superstructure wall finish.

Targeted Specification Area: Learning Aim C.1

A high number of learners were unable to name two types of pointing, despite the correct answers being given in the unit specification.

2 mark example:

4 Name **two** types of pointing used in facing brickwork. 2 Q04

1 Bucket handle pointing. The ~~to~~ handle of the trowel is used to round off the joint. []

2 Flush Joint. Mortar is made flush with the brick. []

Question 5

These questions were aimed at aspects of how sub-structures are constructed.

Targeted Specification Area: Learning Aims B.1/B.2

5a) Learners were required to identify two hazards, other than the damaging of existing underground services, associated with sub-structure groundworks. Learners found this question challenging, although many learners were able to provide one other hazard associated with sub-structure groundworks. Some students did not read the question stem correctly and stated that existing services such as electric, gas or water could be hit and damaged.

2 mark example:

5 There are many hazards associated with sub-structure groundwork activities, such as damaging existing underground services.

(a) Identify **two** other hazards associated with sub-structure groundworks. (2)

1 The ground could collapse below because of too much weight.

2

1 mark was awarded for 'the ground could collapse'. The second mark was awarded for 'too much weight' which is interpreted as overburden. Both marks are in the learner's first and only response.

5b) Learners were required to explain two ways to locate existing underground electric cables. Learners found this question challenging. The command verb used for this question is explain, therefore 1 mark was awarded to the identification of a measure and 1 mark for the linked explanation of the measure identified. Many learners were able to identify at least one way to locate existing underground electric cables. However, responses including a linked explanation were not often seen. Learner identification responses were often simplistic in nature and included check plans, hand dig, use a detector etc.

4 mark example:

<p>To enable construction work to start, existing services need to be located and protected.</p> <p>(b) Explain two ways to locate existing underground electric cables. (4)</p> <p>1. Ring a electric company and ask them to locate the cables underground.</p> <p>2. Find the plans of the site your working on and find the electric cables.</p>

The first response identifies consulting with a utility company (1), with a linked explanation of asking them to locate cables (1). The second response identifies the use of plans (1) with the linked explanation to find the electric cables (1).

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

5c) Learners were required to identify one method for the permanent control of sub-soil water. The correct answer was land drainage, which is explicitly stated in the unit specification. A range of variations on this method including drainage, channel, piping, pipes and pumping were also accepted. Learner responses were weak.

1 mark example:

<p>(c) Name one method used to permanently control sub-soil water. (1)</p> <p>a drainage System wich will pump out all the water.</p> <p>(Total for Question 5 = 7 marks)</p>
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Question 6

This question was aimed at the identification of the components of a suspended timber ground floor.

Targeted Specification Area: Learning Aim B.2

Responses for this question were poor. The correct acceptable answers for each component were:

- (i) Insulation
- (ii) Wall plate/timber wall plate
- (iii) Damp-proof course/DPC
- (iv) Sleeper wall/honeycomb sleeper wall/brick wall and brick on its own was also accepted.

Only a small proportion of candidates achieved marks for this question. The most common correct components to be labelled were parts (i) insulation and (iv) brick.

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

Question 7

This question was aimed at the sketching of a cross-section through a timber flat roof construction form.

Targeted Specification Area: Learning Aim C.3

Learners were required to sketch a diagram of a cross-section through a timber flat roof. Responses for this question were poor. Many learners left this question blank or included very poor or irrelevant details of a solid ground floor or wall rather than the components of a timber roof construction form. The components/materials most commonly identified by learners who attempted this question were insulation or felt. Some learners also included details with components in an incorrect order.

Centres should consult the mark scheme to consider the detail required for a sketch question of this type. Centres also need to understand that sketching details is fundamental to construction technology and is featured in the sample assessment materials. Learners therefore need to be prepared for questions where they are required to sketch construction details or cross sections of key construction elements.

Question 8

These questions relate to aspects of sustainability which are included in topic A.1 of the unit specification.

Targeted Specification Area: Learning Aim A.1

8a) Learners were required to explain one benefit to the environment of recycling the bricks from a brownfield site as hardcore for a new low-rise building project. 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 of the identified advantage. Learners found this question challenging and responses were varied.

The mark scheme shows examples of linked responses which would be awarded two marks.

Many learners did not read the question stem correctly and answered incorrectly on the environmental effects of producing new bricks for hardcore rather than the benefits to the environment of recycling bricks from the existing site. Some learners also thought that not as many bricks would have to be manufactured for use as bricks. These learners had misread the question and didn't realise that the old bricks were being used as hardcore.

2 mark example:

8 A low-rise building project is taking place on a brownfield site.

(a) Explain **one** benefit to the environment of recycling the bricks from the brownfield site as hardcore for the new building. (2)

this means that there wont be any lorries polluting the environment driving to the site with the hardcore

The learner has provided a linked response to indicate that there will be reduced pollutants from lorries (1) who will not have to drive to the site (1).

8b) Learners were required to define the term embodied energy. Responses for this question were weak. Many learners were unable to define the term embodied energy. Acceptable answers are included in the mark scheme

1 mark example:

(b) Define the term embodied energy. (1)

Energy that is used to construct or make something

8c) Learners were required to explain one way each given method of sustainability could contribute towards a building's sustainability.

The command verb used for this question is explain, therefore 1 mark was awarded to the identification and 1 mark for a linked explanation of the identified way each method contributes towards a building's sustainability.

Learners found this question challenging, and responses were often weak. Many learners failed to read the question stem correctly and did not link their responses to a building's sustainability. Acceptable responses can be found in the mark scheme.

4 mark example:

(c) Explain **one** way in which each of the methods below can contribute towards a building's sustainability. (4) 4 Q08c

Building orientation

The building orientation will determine how much sunlight the building will get so ~~the~~ the more sunlight the building receives the less energy is needed to light and heat the building. In the UK the best orientation is south.

Prefabricated elements

The use of prefabricated elements means less time building the elements on site meaning less energy use - time use - and labour use.

The first response identifies orientation maximising solar gain (1) which will lead to reduced energy use (1).

In the second response the learner has identified that using prefabricated elements reduces building on-site (1) which in turn reduces energy use and labour use (1).

Question 9

This question required learners to explain two reasons why high-density blockwork is used in walls where sound insulation is required.

Targeted Specification Area: Learning Aim A.1

The command verb used for this question is explain, therefore 1 mark was awarded to the identification of a reason and 1 mark for a linked explanation of the identified reason. Learners found this question difficult. Only a small number of learners achieved marks for identifying that the mass (or it is heavy) of the blockwork improved sound insulation. Linked explanations were rarely seen.

1 mark example:

9 Explain **two** reasons why high-density blockwork is used in walls where sound insulation is required.

1. Because the blockwork is good for that as density means its heavy and it wont let sound get through it as easy as other bricks would.
2. Good for sound insulation.

(Total for Question 9 = 4 marks)

1 mark awarded. The learner mentions 'heavy' in the first response, please see bullet point 1 in the mark scheme. The linked explanation is irrelevant.

The second response is also irrelevant.

Question 10

Learners were required to explain two reasons why metal studs are a suitable form of internal partition for a new office block.

Targeted Specification Area: Learning Aim C.1

The command verb used for this question is explain, therefore 1 mark was awarded for the identification of a reason why metal studs would be a suitable form of construction with the second mark being awarded for a linked explanation. Learners found this question challenging. A small proportion of learners achieved marks for commenting that metal studs were a quicker form of construction or that it was easy to be moved. Linked responses were rarely seen.

2 mark example:

10 Sections of a new build office building will be rented to different businesses.

The internal partitions will be constructed using metal studs.

Explain **two** reasons why metal studs are suitable for this office building.

1 They are stronger than timber studs so they can take the weight easier.

2 They are quicker to be installed so business will be able to use the building quicker.

(Total for Question 10 = 4 marks)

2 marks awarded. 1 mark awarded for the identification of speed of installation (1) and the second mark awarded for the linked explanation that the building will in use earlier (1). The first response is irrelevant.

Question 11

Learners were required to evaluate whether ABC Housing Developments should change from using a traditional brick cavity wall to a timber frame structural form in order to meet an increase in demand for its homes.

Targeted Specification Area: Learning Aim A.2 Common Structural Forms

The command verb used for this question is evaluate. An evaluation question requires learners to consider both types of structural form available and then produce a conclusion which is justified and clearly linked to the consideration of arguments for and against their recommended or preferred structural form and the need for the development company to meet the increase in demand for ABC Housing Developments quickly.

This question is marked using the mark bands found at the end of the mark scheme. Marks were awarded dependent on the detail of the evaluation and whether the learner had made a comparison between the two structural forms and linked their responses to the scenario.

A fundamental error here was that most learners produced a generic essay about the advantages and disadvantages of both construction types but failed to pick up on the focus of the question i.e. 'the best way for ABC Housing Developments to meet the increase in demand quickly'.

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 or 3 scoring learner work was also seen.

Typical advantages of timber frame centred on:

- Can use off-the-shelf designs
- Quicker overall completion time
- Can be more cost effective

Disadvantages discussed included:

- Less public confidence in this structural form
- May not have experienced staff to build this structural form

Typical advantages of the brick cavity wall form included:

- Greater public confidence in this form of construction
- Good thermal insulation properties

Disadvantages discussed included:

- Speed of construction is slower
- May struggle to get bricklayers in period of high demand

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. For learner work in mark bands 2 and 3 responses were well balanced, included a conclusion and responses were linked to the context of the question.

Mark band 1 example:

11 ABC Housing Developments currently uses a traditional brick cavity wall structural form for all its housing projects. It is experiencing an increase in demand for its homes and would like to respond quickly. ABC Housing Developments is considering changing the structural form of its housing to timber frame construction.

Evaluate whether this change of structural form is the best way for ABC Housing Developments to meet the increase in demand quickly.

Timber Frame construction is becoming more popular these days because they are cheaper to buy and easy to install. With a timber frame they can come ready made so the inside of houses is done before the outside. This means carpenters and decorators can work inside the house when ~~the~~ bricklayers work on the outside of the house. This would speed up construction very quickly and houses would be built twice as fast. So timber frame construction is a good change for ABC housing.

3 marks awarded. As the response is more structured than a list, this response falls at the top of mark band 1.

The learner has identified 'ready made' and that construction can be 'speeded up' and provides a quicker and cheaper form of construction.

Knowledge is inferred, e.g. 'carpenters and decorators can work inside the house...', but this reinforces the identification that timber frame construction is quicker than traditional brick/block cavity wall construction and confirms this is a good mark band 1 response.

This does not fall into mark band 2 as arguments for and against have not been described and the conclusion is a consequence of one side of the argument.

Mark band 3 example:

11 ABC Housing Developments currently uses a traditional brick cavity wall structural form for all its housing projects. It is experiencing an increase in demand for its homes and would like to respond quickly. ABC Housing Developments is considering changing the structural form of its housing to timber frame construction.

Evaluate whether this change of structural form is the best way for ABC Housing Developments to meet the increase in demand quickly.

Timber frame builds are quicker and require less skilled labour to put together as they can be put together in a factory and assembled on site. When building a timber frame house it's quicker because people can work inside the house doing first and possibly second fix's quickly as long as the floor is down, this speeds up the process. When the timber frame houses are finished they can have a facework brick cladding applied making them look like a normal house. A cavity wall house takes longer to build as no work can be done inside until the walls are built. Both buildings also have good insulation meaning energy bills are kept low for the homeowner.

If ABC constructions are needing lots of houses to be built quickly as the demand is high. Timber framed houses can be assembled quickly and aren't a lesser quality of house compared to cavity wall houses. So, yes, if ABC constructions need houses built quickly then timber framed buildings could be an option.

(Total for Question 11 = 8 marks)

A balanced explanation of both sides for and against has been given. A brief conclusion has been produced which is justified and linked to arguments discussed.

The majority of the points made are relevant and linked to the need for ABC Housing Developments to meet the increase in demand of its housing stock.

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	12	21	31	41

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