

SAMPLE ASSIGNMENT BRIEF

UNIT 2 - DESIGN THE BUILT ENVIRONMENT: MATERIALS AND STRUCTURES



Construction and the Built Environment Higher (Level 2) Unit 2 Design the built environment: materials and structures (CBE2U2)

Sample Assignment Brief (Approximately eighteen hours under controlled conditions)

Introduction

The purpose of this unit is to give you an understanding of the properties and uses of construction materials. It explores the influence of sustainable materials on the design process, as well as examining common structural forms and building elements. This unit, alongside the others within the Higher (Level 2) Diploma in Principal Learning in Construction and the Built Environment, has been designed to allow you the opportunity to develop a good range of Personal, Learning and Thinking Skills (PLTS), and to demonstrate these on more than one occasion. This approach will allow you to build towards a full range of PLTS.

Learning Outcomes:

1. to know about different construction materials and their properties, including sustainable materials
2. to be able to test construction materials to establish their suitability for a particular job
3. to understand structural forms and building elements
4. to know about traditional and modern methods of construction.

Assignment brief

You will be expected to spend about **18 hours** on this internally assessed assignment.

Marking of the assessment will be determined by the criteria set out on the assessment grid. The unit is assessed through this centre set and marked assignment. Internal assessments are subject to moderation by our awarding body which is: AQA-City & Guilds.

Your assignment report should be a word processed A4 document and will be included in your portfolio. Photographs and other images to support your work may be included in your assignment report. Any drawings or sketches you wish to include should be no larger than A3 sheets. You may use the opinions and judgements of construction professionals, to support your work.

Each page of your portfolio should be numbered and include the following information;

- candidate name; candidate number; centre name and centre number.

You should concentrate your efforts on these requirements in order to help maximise your final marks for this unit. When you work in teams you should clearly identify your own contributions.

Assignment Task:

The assignment task is in two parts and further guidance is given under the sections entitled:

Evidence requirements (page 3)

and

Suggested assignment structure (pages 4 & 5)

Part A

1. Construction materials and their properties
2. Testing construction materials

Within the group each to select **three common building** materials from the list below and prepare a report to cover the following aspects:

timber based products
cements and concrete
metals
bricks
plastics
plasters
paints
glass

- identify and describe the methods of extraction, harvesting and manufacture of the selected materials
- describe the properties, use and typical failures of your selected materials
- undertake and report upon detailed tests of the materials and provide clear interpretation of your results

Part A of this assignment is based upon knowledge and understanding of the properties and uses of construction materials (and sustainable materials in particular) and the skills needed to perform simple tests on construction materials and the correct interpretation of results.

Part B

3. Structural forms and building elements
4. Traditional and modern methods of construction

Prepare an illustrated report that compares and contrasts the three structural forms of:

- traditional;
- crosswall;
- framed design.

Produce annotated sketches, drawings, schedules and specifications of **three** different building elements (eg walls, floors, roof, etc.) and identify their locations in different buildings and structures.

Compare and contrast a variety of traditional and modern methods of construction exploring on-site and off-site construction techniques explaining the advantages and disadvantages of each.

Evidence requirements

You should produce evidence of achievement of the assessment criteria. In this assignment, you will:

Part A

- 1 produce a written report on the properties and uses of construction materials and, in particular, the contribution each makes to sustainability
- 2 perform simple tests on construction materials as part of a team. This can be evidenced using witness statements
- 3 present results of the tests and demonstrate an interpretation of the results
- 4 produce descriptions and illustrations of at least **four** construction materials based on their properties in use.

Part B

- 5 produce a report on structural forms and building elements supported by annotated sketches, drawings, schedules and specifications as appropriate
- 6 differentiate between traditional and modern methods of construction, and comment upon the advantages and disadvantages of each. Comment on the opportunities for on and off site construction.

In order to attain a high mark in this unit, you should address all of the above. It may, however, be possible to achieve a pass mark without producing every one of the evidence requirements. A table showing how the assessment topics are weighted is included below, and you should understand this in order to understand how the final mark will be determined.

Weighting of assessment criteria topics

Assessment criteria topic	Weighting	Marks
1 Construction materials and their properties	25%	12
2 Testing construction materials	25%	12
3 Structural forms and building elements	25%	12
4 Traditional and modern methods of construction	25%	12
Total	100%	48

Assignment structure

A suggested assignment structure, which will allow you to meet the evidence requirements, may include the following steps:

Part A

- Identify and describe the properties of materials specified for a given building or structure.
- Track what happens to your **three** selected material types from the extraction of their raw materials, through any manufacturing processes, to the specification based on their predicted properties-in-use, to their short and/or long term sustainability, to any anticipated modes of failure, through to the techniques used to prevent and/or remedy such failures.

You will perform some of these tasks as part of a team, where appropriate, and undertake simple tests for any **four** properties of all **three** of the materials in your brief, interpret the results, and explain how their properties influenced their specification. You could tabulate the results of the tests and present their interpretation using calculations and graphs as appropriate.

Part B

- Identify the elements used in the construction of a building and their overall structural form. Compare the building elements used in buildings with those used in another type of building or structure which has a different structural form. Annotated sketches, drawings, schedules and specifications should be included wherever appropriate.
- Using a local iconic building as your example, decide whether the structure was built using traditional and/or modern methods of construction. Compare the methods and techniques with another building or structure under construction using different methods and techniques. Compare and contrast traditional and modern methods of construction in terms of the technical information required for each, the important differences between the two methods, and the perceived advantages and disadvantages of each.

You should produce a report covering the above tasks using annotated drawings, photographs and other images to support your work on this assignment. It is acceptable for you to use opinions gained from team discussions with other learners and construction professionals, to support your work.

You should plan and action your reports and formulate your own initial findings. Revisit these initial findings after discussions with other learners and construction professionals, and review them in light of the outcomes of such discussions.

A suitable period of reflection should follow upon completion of the assessment for this unit. You should evaluate what you have done, what went well, what went less well and how you would do things differently if you were to do the assessment again. The learning and assessment that comprise this unit can then be used to support study at a higher level.

You will be required to make a presentation to your class on your findings and make notes of the findings of other groups so that together you will have covered the full range of the Unit.

Assessment Grid

Assessment criteria topic	Band 1	Band 2	Band 3
	The learner has:		
1 Construction materials and their properties	<p>0 – 4 marks</p> <p>Demonstrated a basic knowledge and understanding of construction materials by identifying and briefly describing examples of the materials used in construction in terms of their manufacture, properties, specification, use, modes of failure, protection and associated sustainability issues.</p>	<p>5 – 8 marks</p> <p>Demonstrated a partial knowledge and understanding of construction materials by identifying and clearly describing all of the materials in general use in terms of their manufacture, properties, specification, use, modes of failure, protection and associated sustainability issues.</p>	<p>9 – 12 marks</p> <p>Demonstrated an in-depth knowledge and understanding of construction materials by identifying and fully describing a comprehensive range of available materials in terms of their manufacture, properties, specification, use, modes of failure, protection and associated sustainability issues.</p>
2 Testing construction materials	<p>0 – 4 marks</p> <p>Worked with others as part of a team to perform tests on a limited number of construction materials.</p> <p>Interpreted some of the test results correctly and made a tenuous link between properties and uses.</p>	<p>5 – 8 marks</p> <p>Worked with others as part of a team to perform tests on a wide range of the materials in common use.</p> <p>Effectively interpreted most of the test results correctly and made a sensible and logical link between properties and uses.</p>	<p>9 – 12 marks</p> <p>Worked with others as part of a team to perform tests on a comprehensive range of construction materials.</p> <p>Correctly interpreted all or nearly all of the test results and made a strong, clear and precise link between properties and uses.</p>
3 Structural forms and building elements	<p>0 – 4 marks</p> <p>Identified and described a limited range of building elements and structural forms, and briefly compared their use in different buildings or structures.</p>	<p>5 – 8 marks</p> <p>Identified and described a wide range of building elements and structural forms, and clearly and effectively compared their use in different buildings or structures.</p>	<p>9 – 12 marks</p> <p>Identified and described a comprehensive range of building elements and structural forms, and thoughtfully and precisely compared their use in different buildings or structures.</p>
4 Traditional and modern methods of construction	<p>0 – 4 marks</p> <p>Briefly compared and contrasted traditional and modern methods of construction in terms of a limited range of their differences, and some of the perceived advantages and disadvantages.</p>	<p>5 – 8 marks</p> <p>Effectively compared and contrasted traditional and modern methods of construction in terms of a broad range of their differences, and most of the perceived advantages and disadvantages.</p>	<p>9 – 12 marks</p> <p>Thoroughly and precisely compared and contrasted traditional and modern methods of construction in terms of a full range of their differences, and all or nearly all of the perceived advantages and disadvantages.</p>

Personal, Learning and Thinking Skills (PLTS)

The list below is indicative of the way this unit supports the development of PLTS, as opposed to the achievement of PLTS that are possible through the assessment. The unit supports the development of more PLTS than are covered through the assessment criteria alone. Alternative approaches might be selected.

The learner could develop PLTS by:

Independent enquirers

- planning and carrying out research into the factors that influence material specification
- analysing and evaluating information when considering results of tests on construction materials
- supporting conclusions, using reasoned arguments and evidence when specifying appropriate materials for given tasks

Creative thinkers

- connecting their ideas and experiences in making the link between the properties of construction materials and the uses to which they are put
- balancing the benefits of a given sustainable construction material against the energy cost associated with the manufacturing process used to make that material

Reflective learners

- setting themselves targets and goals in the production of any sketches, drawings, schedules and specifications associated with structural forms and building elements
- monitoring and reviewing their progress towards targets and goals in the production of any sketches, drawings, schedules and specifications associated with structural forms and building elements

Team workers

- working with others towards common goals when sharing information relating to performance of sustainable construction materials

Self-managers

- organising their time and resources to achieve targets and goals when completing the internally-set assignment

Effective participators

- proposing practical and manageable ways forward to a small group after feedback from the teacher on progress with the internal assignment
- identifying improvements to the practical methods used to test construction materials that either produce more accurate results, shorten the test period or reduce the risks associated with testing.