

**Published Mark Scheme for
GCSE Construction and the Built Environment
Summer 2010**

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**NORTHERN IRELAND GENERAL CERTIFICATE OF SECONDARY EDUCATION (GCSE)
AND NORTHERN IRELAND GENERAL CERTIFICATE OF EDUCATION (GCE)**

MARK SCHEMES (2010)

Foreword

Introduction

Mark Schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

The Purpose of Mark Schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of 16- and 18-year-old students in schools and colleges. The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes therefore are regarded as a part of an integral process which begins with the setting of questions and ends with the marking of the examination.

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all the markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

The Council hopes that the mark schemes will be viewed and used in a constructive way as a further support to the teaching and learning processes.

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New
Specification



Rewarding Learning

General Certificate of Secondary Education
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Construction and the Built Environment

Assessment Unit 1

assessing

The Construction Industry for the 21st Century

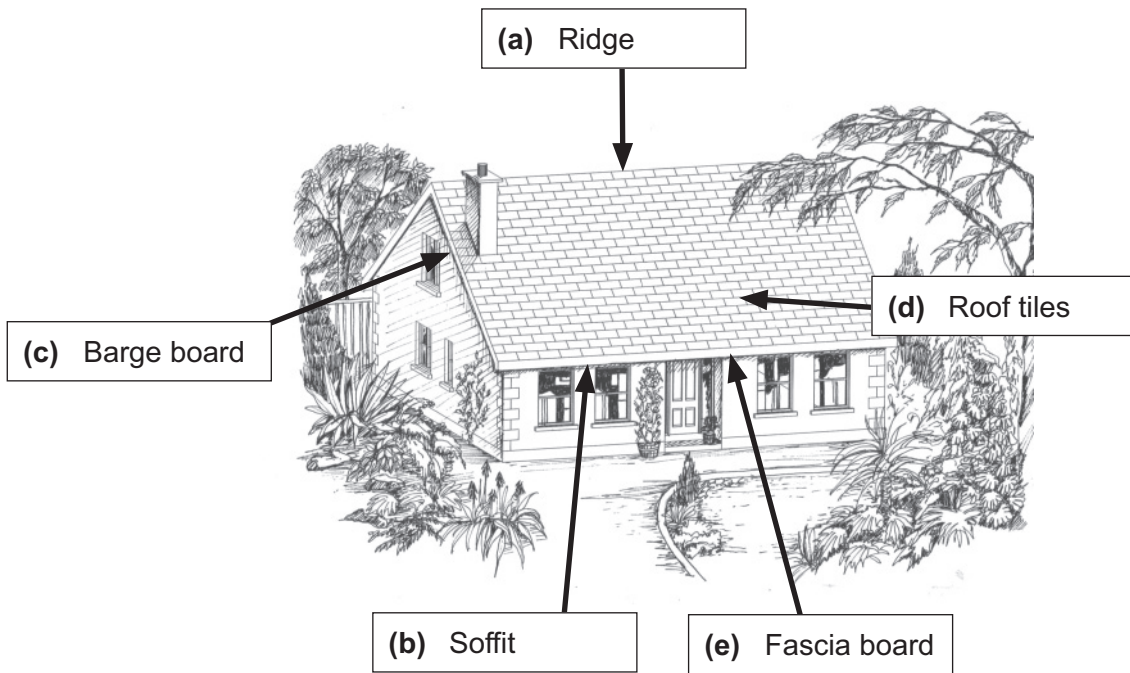
[GCB11]

MONDAY 17 MAY, AFTERNOON

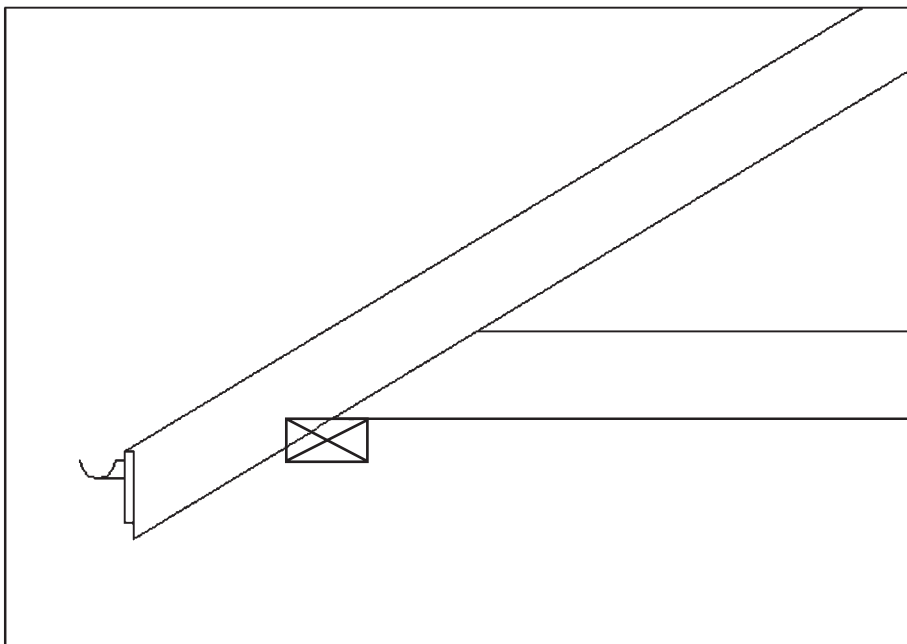
MARK SCHEME

Section A

- 1 (a) Ridge [1]
 (b) Fascia Board [1]
 (c) Barge Board [1]
 (d) Roof tiles [1]
 (e) Soffit [1]



(f)



| | | |
|--|-----|----|
| Correct sketch of rafter including ceiling joist and wall plate correctly proportioned | [9] | |
| Correct sketch of rafter including ceiling joist correctly proportioned | [6] | |
| Correct sketch of rafter or ceiling joist or wall plate correctly proportioned. | [3] | |
| Correct sketch of rafter including ceiling joist and wall plate not correctly proportioned | [3] | |
| Correct sketch of rafter including ceiling joist not correctly proportioned | [2] | |
| Correct sketch of rafter or ceiling joist or wall plate not correctly proportioned. | [1] | 14 |

2 Candidates should relate the following responses to the pre-release, including issues surrounding structural complexity of dwelling.

(a) Site Manager

Any **five** from the following or other appropriate response:

- Ensure that all aspects of site operations run smoothly
- Ensure health and safety on site.
- Represent the construction company on site and at site meetings with client and other members of the design and construction team.
- Organise plant, labour and resources on site.
- Ensure project is completed in the stipulated time frame.

[1] per principle role up to a maximum of [5]

(b) Architect

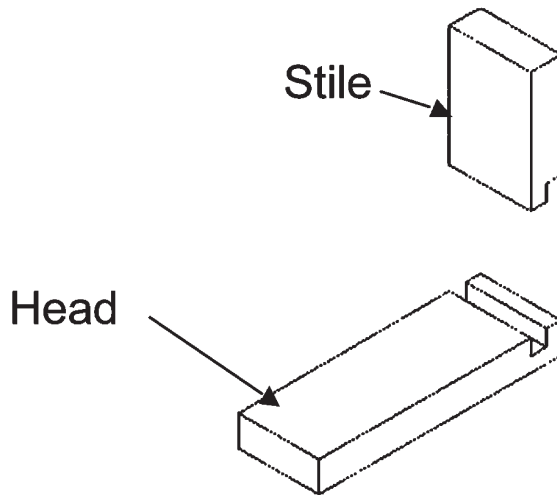
Any **five** from the following or other appropriate response:

- Plan site with regards to layout of houses
- Sketch proposals for the development.
- Design each house type
- Working drawings
- Making application for Planning and Building Control approval
- Supervise work on site
- Meet with client.

[1] per activity up to a maximum of [5]

4 (a) Housing joint or Rebated housing joint. [2]

(b)



[2]

Correct sketch of housing in head and rebate in stile correctly proportioned [4]

Correct sketch of housing in head and rebate in stile **not** correctly proportioned [2]

Correct sketch of housing in head **or** rebate in stile correctly proportioned [2]

Correct sketch of housing in head **or** rebate in stile not correctly proportioned [1]

Stile correctly labelled [1]

Head correctly labelled [1]

(c) Any **one** from the following or other appropriate response:

Door frames are squared by measuring the diagonals from head to points A & B as shown by the red line.

A & B are an equal distance from the head.

The two styles should be parallel.

3/4/5 option could also be used to square frame. (Pythagoras) [2]

(d) **Architrave**

The trim covering the joint between the frame and the wall. [2]

Hinges

Hinges are usually used in two or threes which are checked into the door and frame. The hinges allow the door to pivot. [2]

5 (a) Any **three** responses from:

- Terraced (or town) houses
- Semi detached
- Detached
- Single storey
- Two storey Dwellings
- Apartments
- Low rise buildings
- High rise buildings
- Bungalow

[1] per response up to a maximum of [3] or other appropriate response

(b) Any **three** responses from:

- Schools
- Hospitals
- Health Centres
- Community Centres
- Sport Centres.
- Concert halls
- Churches

[1] per response up to a maximum of [3] or other appropriate response

(c) Any **three** responses from:

- Shops
- Offices
- Banks
- Shopping Centres

[1] per response up to a maximum of [3] or other appropriate response

9

Section B

- 6 (a) [1] per response up to a maximum of [4] including other appropriate responses.
- Geothermal Ground Pumps
 - Hydro
 - Wind energy / power
 - Solar Energy
 - Biomass
- [4]

(b) Any **one** of the following up to a maximum of 6 marks.

Geothermal Ground Pumps

Ground source heat pumps are one of the most common types of heat pumps. Typically a cold fluid at about 5 degrees Celsius is circulated around a network of plastic pipes buried in the ground. As the fluid passes through the pipe it absorbs heat energy from the surrounding earth. The fluid returns to the heat pump slightly warmer than it left.

[3]

Application

The heat pump upgrades the heat to a higher level of 40 to 50 degrees Celsius to provide heating in the home. This water can then be circulated around radiators, under floor heating pipes or provide domestic hot water.

[3]

Wind power

Wind power is the conversion of wind energy into a useful form, such as electricity, using wind turbines.

[3]

Application

Small wind turbine on roof or large turbine for housing development or other suitable applications.

[3]

Solar Energy

Solar energy is the radiant light and heat from the Sun that has been harnessed using a range of solar technologies.

[3]

Application

Solar panels on the roof of the house or other suitable applications.

[3]

Biomass

Biomass is the harvesting of willow or other biological material to provide fuel.

[3]

Application

Fuel is used for a central heating burner, either for an individual house or for a complete development.

[3]

7

| | | |
|---|-------------------------------------|---|
| Waste materials | Traditional disposal | Improved methods of waste disposal. |
| Excavated earth to removed of site | Moved to land fill | Use in landscaping site or filling up a reduced level. |
| Broken brick or block | Moved to land fill | Used to provide hardcore for subfloors, drive ways and hard standing. |
| Waste timber | Moved to land fill | Timber will be removed in skips from site where it is removed off site for processing into Bio-fuel or chipboard manufacture or used as direct fuel. |
| Scrap metal | Sold to scrap metal merchant | Sold to scrap metal merchant. |
| Electrical cables | Moved to land fill | Copper core removed from electrical cables. |
| Other suitable uses to recycle construction materials. | | |

Level 1 ([1]-[4])

Candidates compare the two methods of waste disposal covering few of the attributes listed above (or have included other appropriate responses). Their level of accuracy for spelling, punctuation and grammar is limited. They compare both methods of waste disposal using a limited form and style of writing. Their comparison is not fully coherent or organized and there is little use of specialist terms.

Level 2 ([5]-[7])

Candidates compare the two methods of waste disposal covering some of the attributes listed above (or have included other appropriate responses). Their level of accuracy for spelling, punctuation and grammar is satisfactory. They compare both methods of waste disposal using a satisfactory form and style of writing. Their comparison is coherent or organized in most cases they use a range of specialist terms.

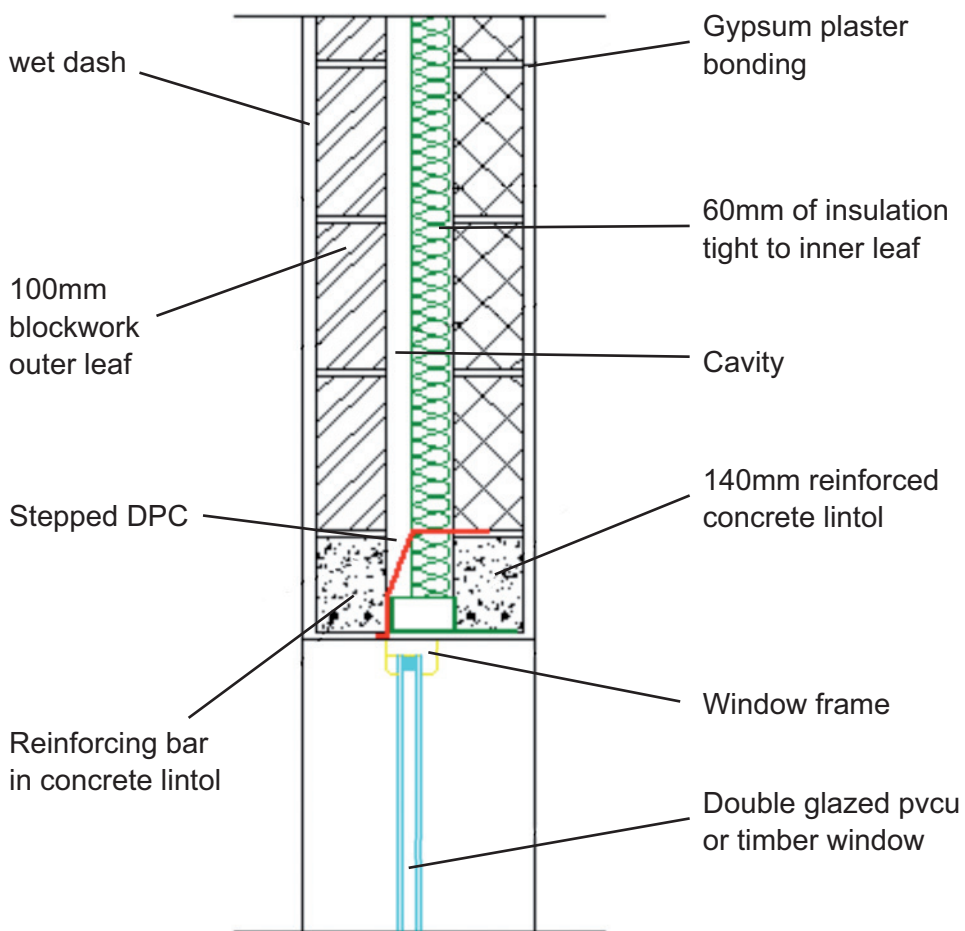
Level 3 ([8]-[10])

Candidates compare the two methods of waste disposal covering the majority of the attributes listed above (or have included other appropriate responses as well). Their level of accuracy for spelling, punctuation and grammar is excellent. They compare both methods of waste disposal using an excellent form and style of writing. Their comparison is coherent and very well organized and they use a wide range of specialist terms.

When a response is not worthy of credit a [0] mark should be awarded.
(AO1 [5], AO2 [5])

8 Drawing should be completed as shown with annotations. Allowance will be made for regional variations. Up to a maximum of [5]

- [1] Mark for completing the two heads correctly
- [1] Mark for the correct location of the window frame.
- [1] Mark for completing the DPC correctly
- [1] Mark for completing the double glazing
- [1] Mark for completing the window frame
- [1] Mark for completing the insulation correctly including above head [5]
- [1] for each correctly added annotation up to a maximum of 5 [5]



9 Reasons why cellular construction is more suitable for a domestic house than portal framed construction:

Cellular Construction

- The structure consists of walls each joined to its neighbour.
- The external walls form the boundaries of the building and the internal walls divide the building into cells (rooms) making the building Cellular
- Usually constructed from load bearing brick or block work.
- Easily adjusted for one off designs
- The total load of the roof and intermediate floors are transferred to the foundations by the external walls.
- The internal walls may also carry some of the load.

[1] per response up to a maximum of [5] including other appropriate responses.

Portal Framed Construction

- Portal frames are made in a variety of shapes and sizes.
- They are usually made from steel, but can also be made from concrete or timber.
- The portal structure is designed in such a way that it has no intermediate columns, as a result large open areas can easily be created within the structure.
- Portal Frames are generally used for single storey construction which require a large unobstructed floor space.
- Connected together in factories by welding.
- Site connections should be bolted.

[1] per response up to a maximum of [5] including other appropriate responses.

Evaluation of why Cellular Construction is more suited to domestic construction

Level 1 ([1]-[4])

Candidates compare the two methods of construction covering few of the attributes listed above (or have included other appropriate responses). Their level of accuracy for spelling, punctuation and grammar is limited. They compare both methods of construction using a limited form and style of writing. Their comparison is not fully coherent or organized and there is little use of specialist terms.

Level 2 ([5]-[7])

Candidates compare the two methods of construction covering some of the attributes listed above (or have included other appropriate responses). Their level of accuracy for spelling, punctuation and grammar is satisfactory. They compare both methods of construction using a satisfactory form and style of writing. Their comparison is coherent or organized in most cases they use a range of specialist terms.

Level 3 ([8]-[10])

Candidates compare the two methods of construction covering the majority of the attributes listed above (or have included other appropriate responses as well). Their level of accuracy for spelling, punctuation and grammar is excellent. They compare both methods of construction using an excellent form and style of writing. Their comparison is coherent and very well organized and they use a wide range of specialist terms.

When a response is not worthy of credit a [0] mark should be awarded. (AO3 [10])

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