Rewarding Learning

Centre Number
71

Candidate Number

General Certificate of Secondary Education
2012

Construction and the Built Environment

Unit 1: The Construction Industry for the 21st Century

[GCB11]

GCB11

MONDAY 14 MAY, AFTERNOON

TIME

1 hour 30 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all eleven** questions.
Questions **1**, **2**, **3**, **4**, **9**, **10** and **11** should be answered in relation to the enclosed house plans and specifications previously issued as Pre-Release Material. You should **not** bring any of the material previously issued into this examination.
You will be provided with a clean copy of the Pre-Release Material.

INFORMATION FOR CANDIDATES

The total mark for this paper is 120.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
Quality of written communication will be assessed in questions **7** and **9**.

A scale rule is required.

7299

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
Total Marks	

Section A

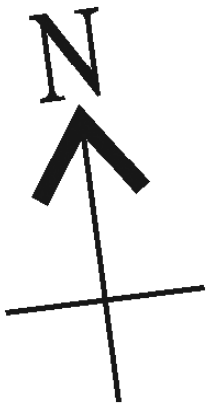
Answer **all** questions

Use the Pre-Release Material to assist with answering questions 1, 2, 3 and 4.

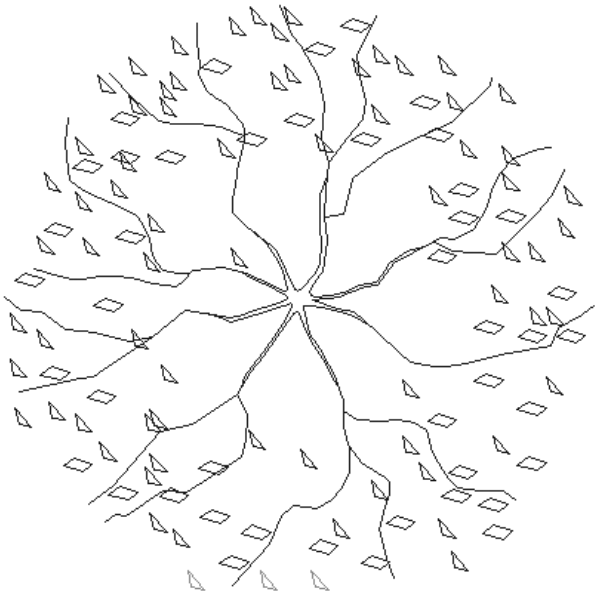
Examiner Only	
Marks	Remark

1 (a) The following symbols have been used on the Site Plan and Ground Floor Plan contained within the Pre-Release Material.

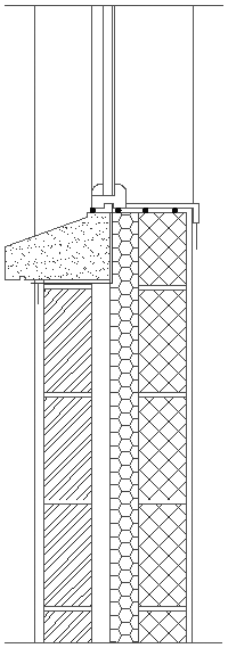
Identify what each of these BS1192 symbols or building elements represent:



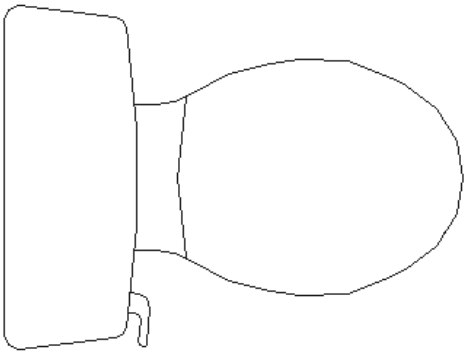
1. _____ [1]



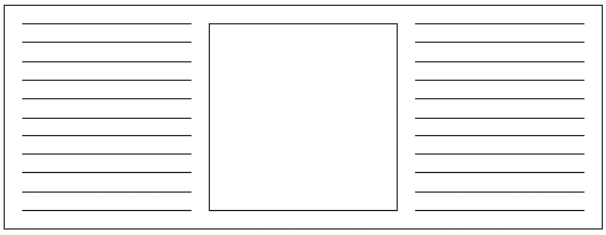
2. _____ [1]



3. _____ [1]



4. _____ [1]



5. _____ [1]

Examiner Only	
Marks	Remark

(b) The following building elements are found in the Pre-Release Material. Name **one** material that can be used to manufacture each element.

1. Front Windows _____

2. Damp Proof Membrane (DPM) _____

3. Roof Covering _____

4. Wall Ties _____

5. Rafters _____

6. Gutter _____

[6]

Examiner Only	
Marks	Remark

The following professionals and craft operatives are employed during the design and construction stages of the house shown in the Pre-Release Material.

Examiner Only	
Marks	Remark

2 **(a)** Identify **three** of the main roles that a Site Engineer would have in relation to this project.

Site Engineer

1. _____

_____

2. _____

_____

3. _____

_____ [3]

(b) Identify **three** of the main roles that the following craft operatives would have for the project shown in the Pre-Release Material.

Bricklayer

1. _____

_____

2. _____

_____

3. _____

_____ [3]

Joiner

1. _____

_____

2. _____

_____

3. _____

_____ [3]

3 Using the attached Pre-Release Material, give the following dimensions in millimetres. Some dimensions may need to be scaled.

Examiner Only	
Marks	Remark

(a) The length and width of the dining room.

Length _____ Width _____ [4]

(b) The overall width of the conservatory from the outside of the walls, at ground floor level, including sill projection.

Width _____ [2]

(c) The width and height of the family room window at the front of the house. Take this height at the highest point of the window.

Width _____ Height _____ [4]

(d) The total number of toilets within the complete building.

Total number of toilets _____ [2]

(e) The gradient of the ramp into the entrance hall.

Gradient _____ [2]

4 The drawing shown below is of a foundation detail, which will be used in the dwelling shown in the Pre-Release Material.

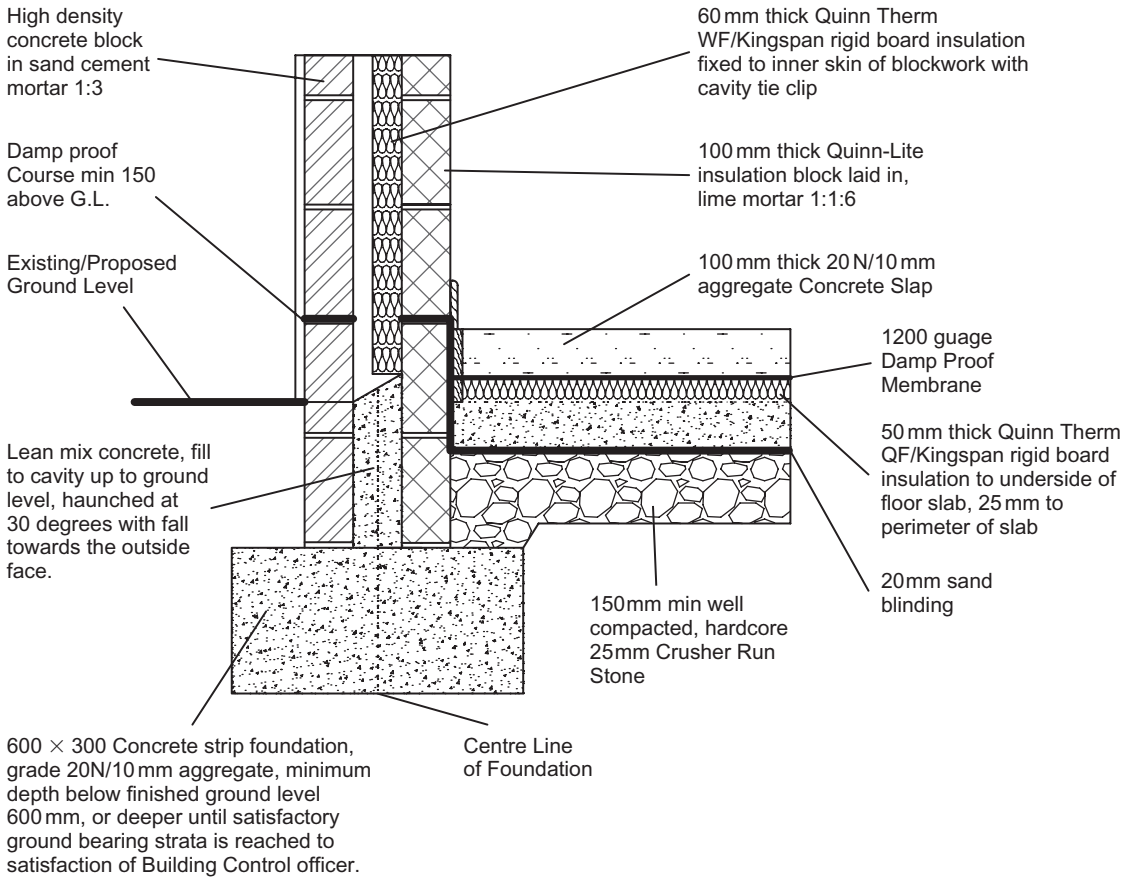


Fig. 2

(a) Name the type of foundation shown in **Fig. 2**.

_____ [2]

(b) Give **two** functions of the foundation shown above.

_____

_____

_____

_____ [2]

(c) Name the type of wall construction shown in **Fig. 2**.

_____ [2]

Examiner Only	
Marks	Remark

(d) List **two** functions of the wall construction shown in **Fig. 2**.

_____

_____

_____

_____ [2]

(e) What is the full name of the material represented by the letters DPM?

_____ [2]

(f) State **one** function of a DPM.

_____

_____ [1]

Examiner Only	
Marks	Remark

5 List different examples of work which could commonly be carried out under each of the following headings:

Building, **Civil Engineering** and **Building Services**.

(a) Building

List **five** different examples of work:

1. _____

2. _____

3. _____

4. _____

5. _____ [5]

(b) Civil Engineering

List **three** different examples of work:

1. _____

2. _____

3. _____ [3]

(c) Building Services

List **three** different examples of work:

1. _____

2. _____

3. _____ [3]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

6 A requirement of all modern construction is to incorporate services into a building.

(a) Clearly state how you would incorporate electrical services into a timber stud wall and secure a socket box in place. In your answer indicate what stage plastering should take place in this process.

_____

_____

_____

_____

_____ [4]

(b) Clearly state how you would incorporate electrical services into the inner leaf of a concrete block cavity wall and secure a socket box in place. In your answer indicate what stage plastering should take place in this process.

_____

_____

_____

_____

_____ [4]

Examiner Only	
Marks	Remark

7 State the main reason for having the following elements in a typical domestic house.

(a) The building element shown in **Fig. 3** is a foundation trench.

Fig. 3

What is the main reason for excavating the foundation trench?

_____

_____

_____ [2]

(b) The building elements shown in **Fig. 4** are floor joists.

Fig. 4

What are the **two** main reasons for having floor joists in a domestic house?

_____

_____

_____

_____ [2]

Examiner Only	
Marks	Remark

(c) The building element shown in **Fig. 5** is a window.

Fig. 5

What are the **two** main reasons for having a window within a domestic house?

_____

_____

_____

_____ [2]

Examiner Only

Marks	Remark

Section B

Answer **all** questions

Examiner Only	
Marks	Remark

8 Compare how a solid stone wall in traditional domestic construction is different from a modern cavity wall constructed from Brick or Block.

[10]

Examiner Only	
Marks	Remark

9 **Fig. 6** shows the early stages in the development of the Titanic Signature Building in Belfast which will be several storeys high.

Fig. 6

(a) List **five** operations which could be carried out by the Tower cranes shown on this site.

1. _____

2. _____

3. _____

4. _____

5. _____ [5]

The domestic site shown in the Pre-Release Material will use Telescopic Handlers such as the one shown in **Fig. 7**.

(b) List **five** operations which could be carried out by the Telescopic Handlers on the domestic building site.

Fig. 7

1. _____

2. _____

3. _____

4. _____

5. _____ [5]

(c) **(i)** Name the main plant item that would be used for lifting materials onto a new 7 storey office development site in a confined city centre location.

_____ [2]

(ii) Justify why you have chosen the item of plant you have listed above.

_____

_____

_____

_____ [3]

Examiner Only	
Marks	Remark

A Contractor organises his/her resources under three main headings:

Plant
Labour
Materials

(d) (i) What does the term “labour” refer to?

_____

_____ [2]

(ii) Provide **two** examples of this.

_____

_____ [2]

(e) (i) What does the term “materials” refer to?

_____

_____ [2]

(ii) Provide **two** examples of this.

_____

_____ [2]

Examiner Only	
Marks	Remark

10 **Fig. 8** below shows a head detail used in cavity wall construction for the dwelling shown in the Pre-Release Material.

Add the following labels to the drawing. Leader lines have been provided for your guidance.

Wet dash on a sand/cement render – total thickness is 19 mm
Cavity Insulation
Gypsum plaster bonding and finish coat – 13 mm
Stepped DPC
Double Glazed PVCu or Timber Window
100 mm blockwork outer leaf
Proprietary cavity closer

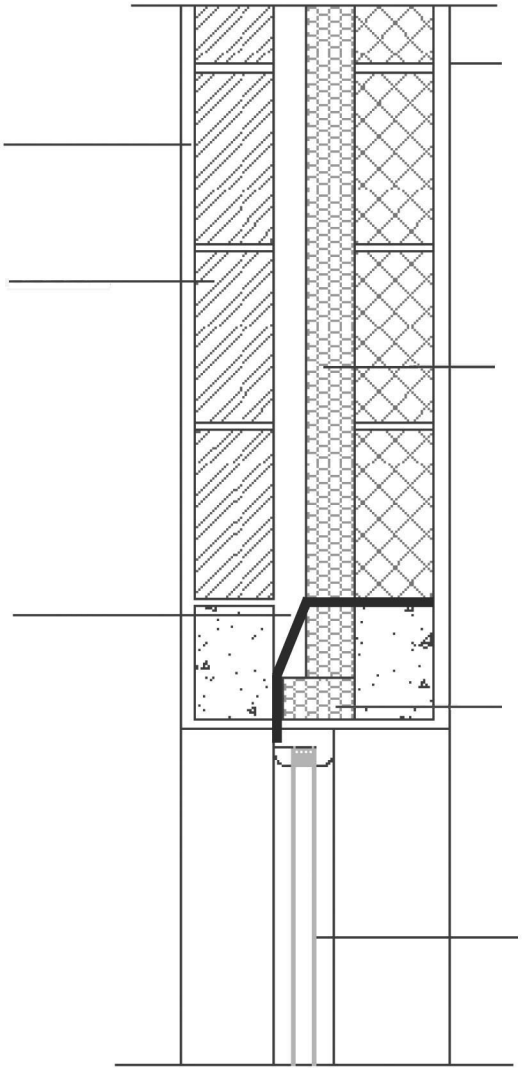


Fig. 8

[7]

Examiner Only	
Marks	Remark

11 Before the client gives their final approval for the attached pre-release drawing and specifications, he has asked you to identify ways in which he can reduce the use of fossil fuels in the day to day running costs of the house.

Evaluate how this can be achieved under the following headings:

The building structure
Renewable energy

[10]

Examiner Only	
Marks	Remark

THIS IS THE END OF THE QUESTION PAPER

Rewarding Learning

General Certificate of Secondary Education

2012

Construction and the Built Environment

Pre-Release Material

Assessment Unit 1: The Construction Industry for the 21st Century

[GCB11]

MONDAY 14 MAY, AFTERNOON

You must use **this** clean copy of the Pre-Release Material in the examination and **not** your own annotated copy.

Construction and the Built Environment

Introduction

A copy of the pre-release information for this examination is included in the following pages.

The materials contain drawings and specifications relating to a house and a Granny flat.

The drawings and specifications pertain to a house which has been constructed close to a river in a provincial town. The site is slightly elevated.

The client is a private client who has employed the following people to oversee the design of his development:

- Architect
- Site Engineer
- Quantity Surveyor

The contractor will be appointed on the basis of selective tendering. The contractor will employ the following team:

- Site Engineer/Manager
- Bricklayers
- Joiners
- Plasterers
- Plumber

Your client has asked the design team to look at the practicalities of using renewable energies where possible.

The contractor will have a telescopic handler on site.

Specification

Cavity wall construction

Outer leaf: 100 mm concrete block, 40 mm cavity, 60 mm “Jablite” EPS insulation held in position using stainless steel insulation retaining wall ties to BS1243.
Inner leaf: 100 mm concrete block work. Provide sand/cement plaster and carlite finish to inner face. Wall ties to be spaced at 900 mm horizontally and 450 mm vertically, and un-bonded jambs ties to be spaced 300 mm vertically.
25 mm “Jablite” insulation to all jambs between lintels and behind sills. DPC in front of “Jablite” in each case.
External walls finished in dry dash render.
Reinforced concrete heads over windows.

Solid floor construction

Seal all floors with two coats of penetrating liquid dust proofer, 75 mm fine aggregate screed, 40 mm of Jablite S.D. grade insulation, Visqueen 1200 grade DPM 100 mm concrete sub-floor. 150 mm consolidated hard-core.

Doors and windows

Brown plastic PVC windows and doors.

First floor construction
25 mm T & G Boarding, 225 mm × 38 mm. Joists at 400 mm centres. All joists built into inside skin of cavity walls to be beam filled and completely sealed between floor void and cavity. Provide one row herringbone bridging to each room, 12.5 mm plaster board and skim to ceilings. Provide 30 mm × 5 mm restraint straps to all timbers parallel to walls.

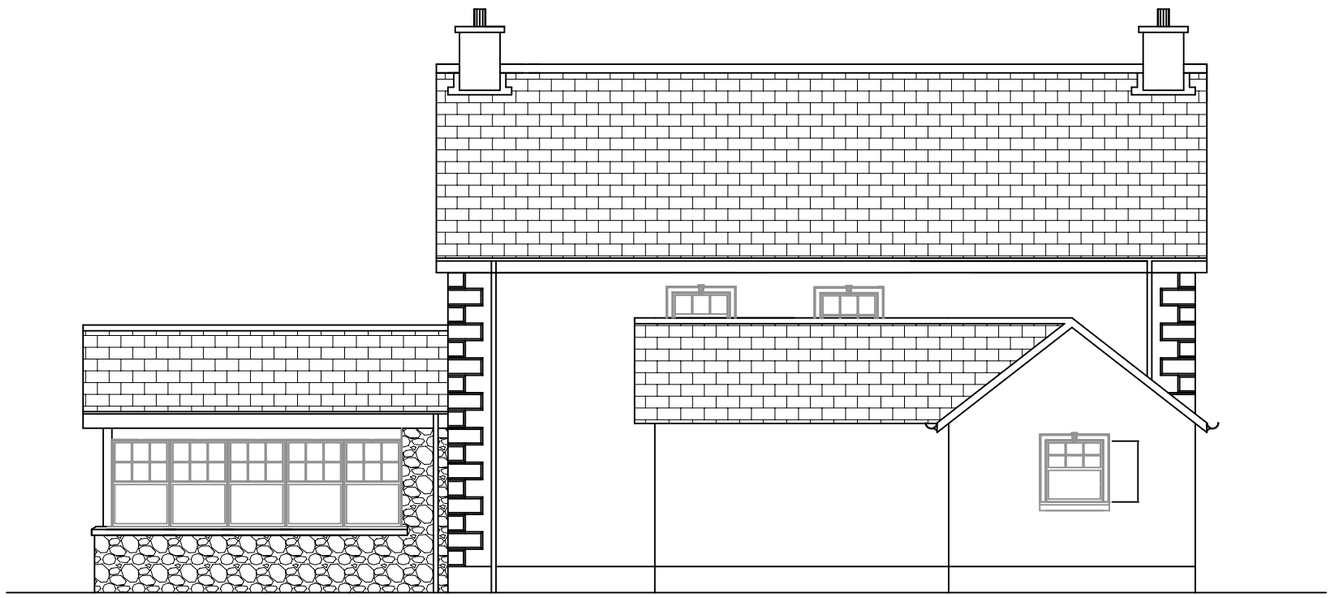
Damp proof courses
Vertical DPCs to all window and external door jambs, horizontal DPCs behind and under sills and stepped between lintels. Wall DPCs to external skin, laid at 150 mm minimum above finished ground levels.
DPCs to internal walls to overlap and be bonded to the floor DPM by a minimum of 215 mm.

Foundations
600 mm × 300 mm foundations to 300 mm walls.
450 mm × 300 mm foundations to 100 mm walls.
The above to be concrete strip foundations. The size and depth of foundations shown are the minimum required. Final sizes and bearing depths to be determined and agreed with building control when sub/soil bearing pressures are known.
Cavity fill to external walls to stop a minimum of 150 mm below the lowest DPC.

Roof construction
37 degree pitched roof construction
Bangor blue natural slate
150 × 38 softwood rafters
200 × 38 softwood ceiling joist
White PVC gutter and down pipe

NOTE Students will require the use of a scale ruler during the examination.

Front Elevation



Back Elevation

GCSE Construction and the Built Environment

Front and Back Elevations

Unit 1

PRE-RELEASE MATERIALS

Examination Series 2011 / 2012

SCALE: 1: 100

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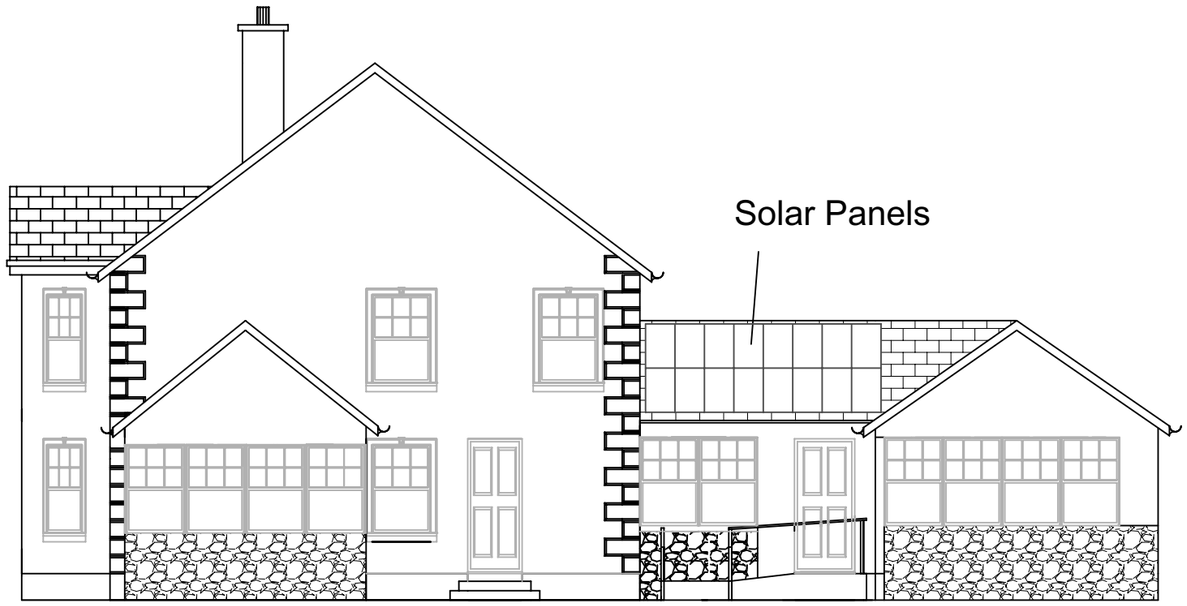

Side Elevation

GCSE Construction and the Built Environment

Side Elevations

Unit 1

PRE-RELEASE MATERIALS

Examination Series 2011 / 2012

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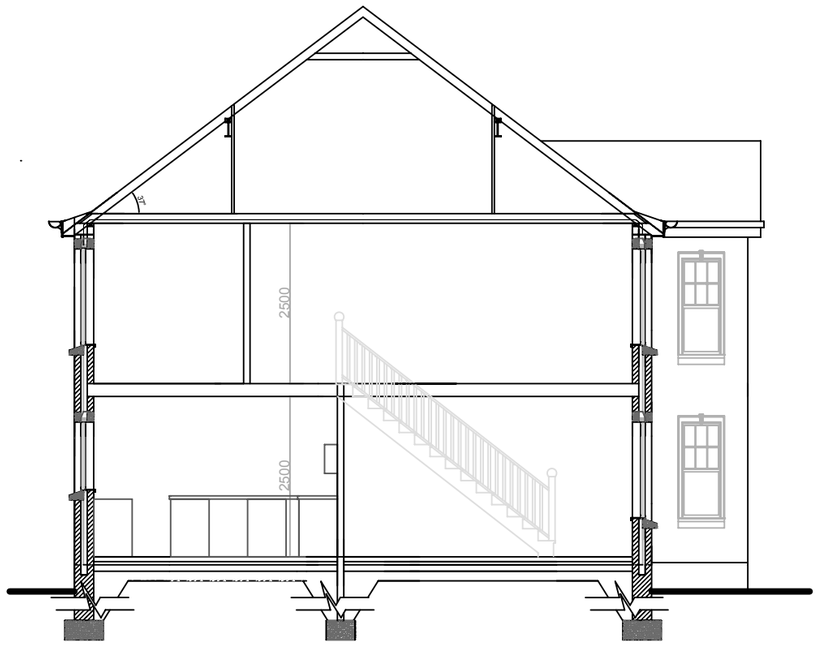

Section AA

GCSE Construction and the Built Environment

Sectional Detail

Unit 1
PRE-RELEASE MATERIALS
Examination Series 2011 / 2012
SCALE: 1: 100

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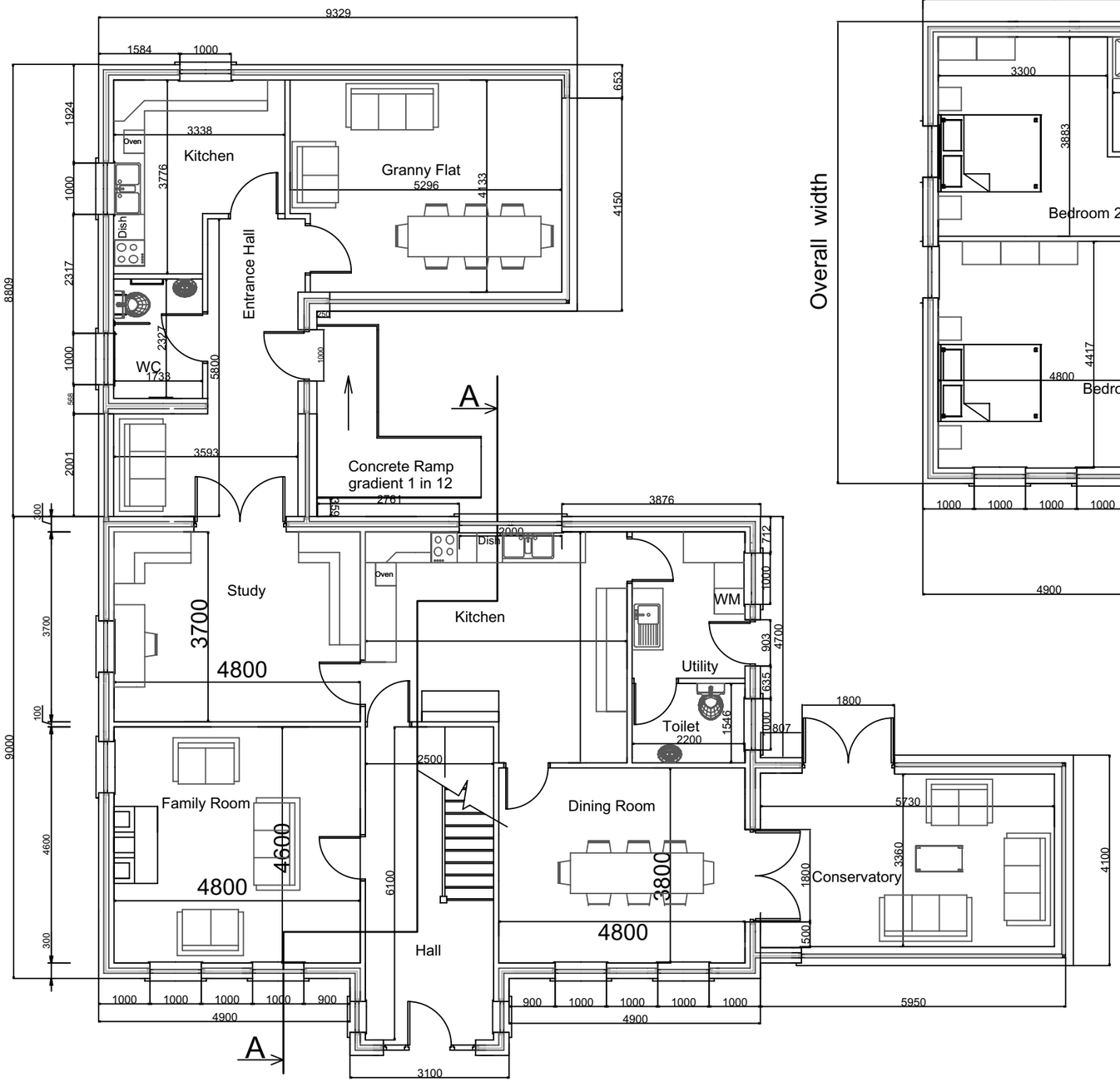
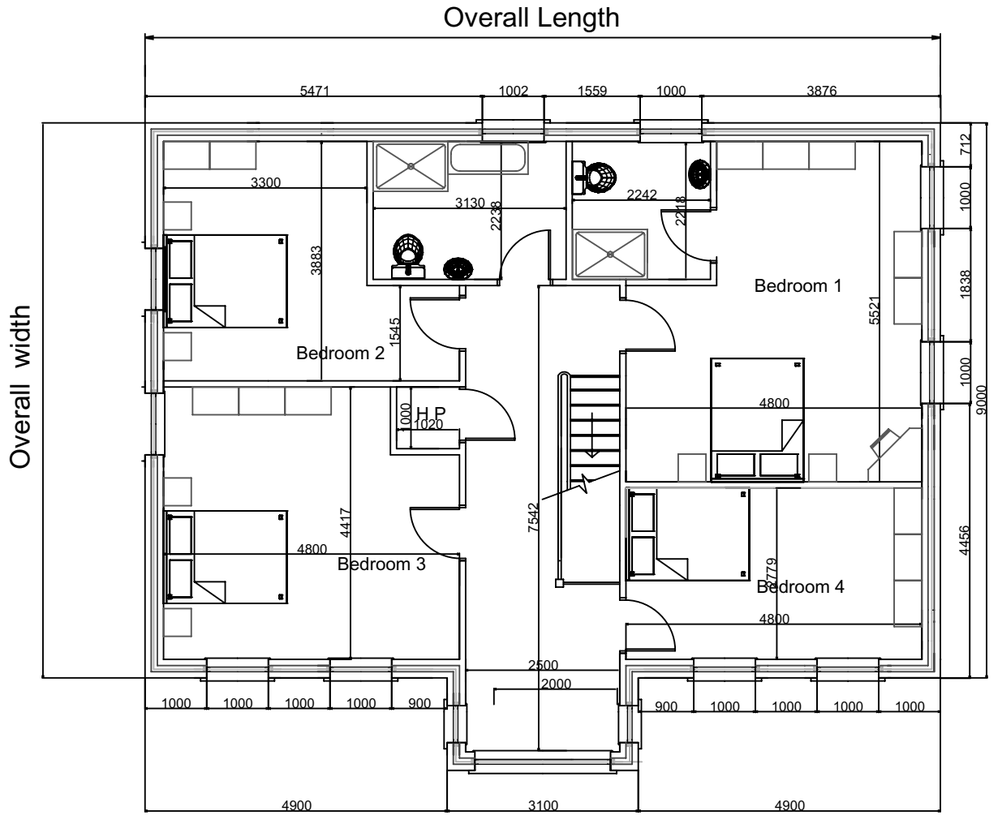


Ground Floor



First Floor

GCSE Construction and the Built Environment

Plan Details

Unit 1

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SCALE: 1: 100

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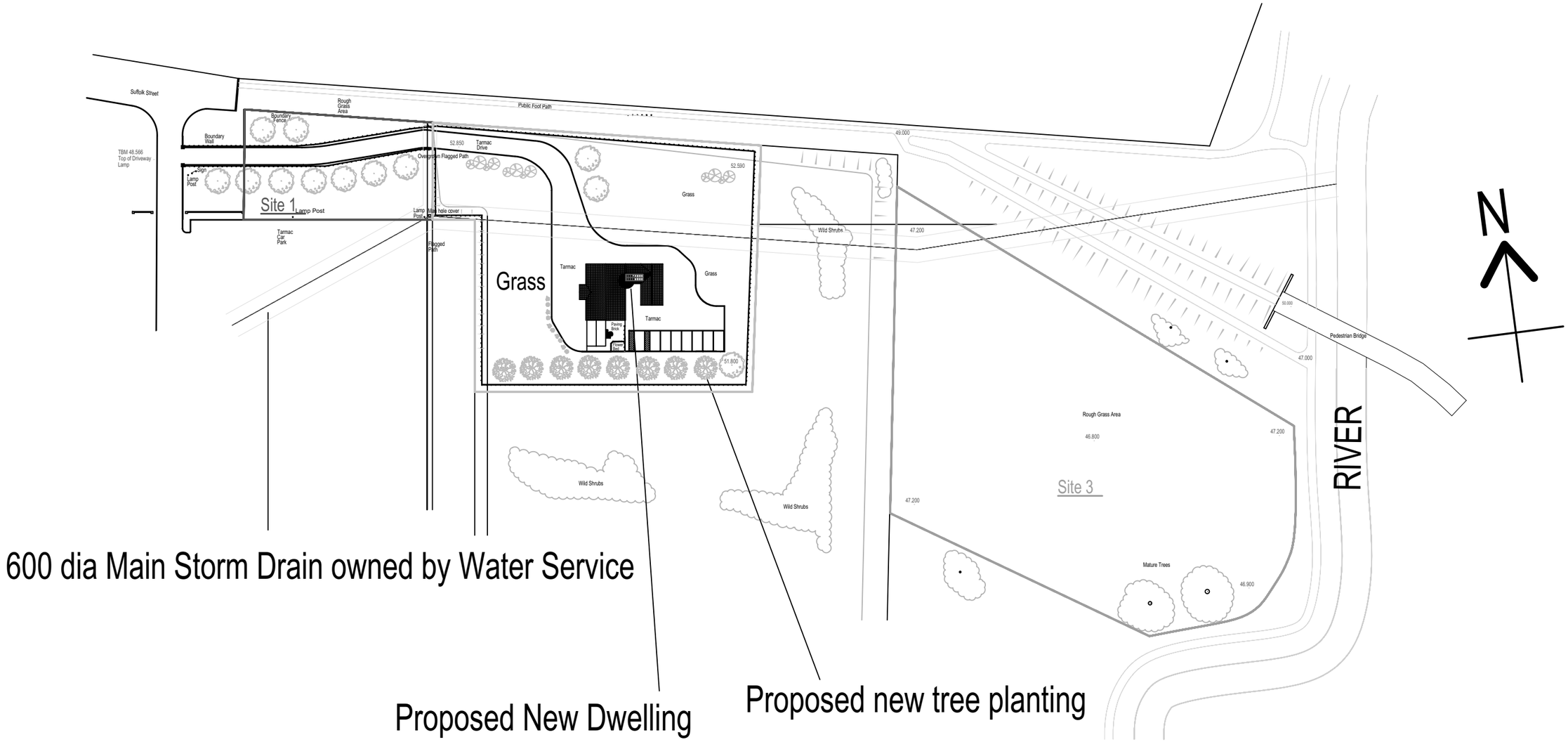

GCSE Construction and the Built Environment

Site Plan

Unit 1

PRE-RELEASE MATERIALS

Examination Series 2011 / 2012

NOT TO SCALE

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