



General Certificate of Secondary Education  
2012

Centre Number

71

Candidate Number

## Construction and the Built Environment

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

[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

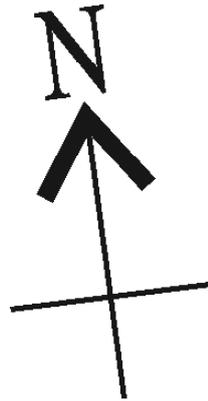
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**Section A**  
Answer **all** questions

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

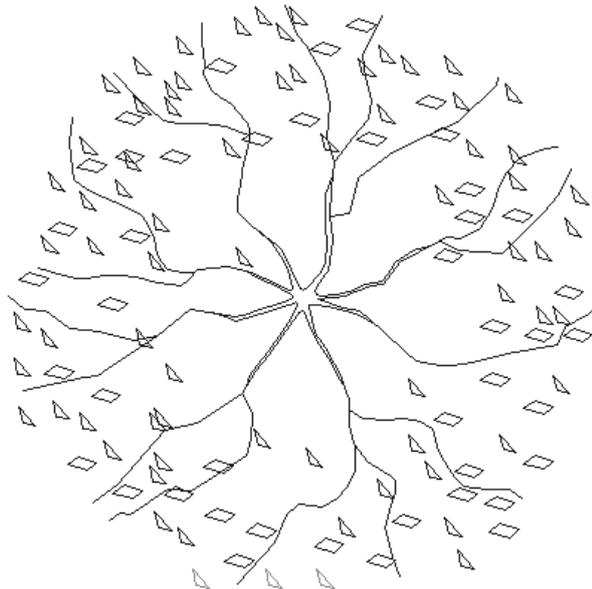
- 1 (a) The following symbols have been used on the Site Plan and Ground Floor Plan contained within the Pre-Release Material.

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



1. \_\_\_\_\_

[1]



2. \_\_\_\_\_

[1]

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.

- 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]

Examiner Only	
Marks	Remark



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

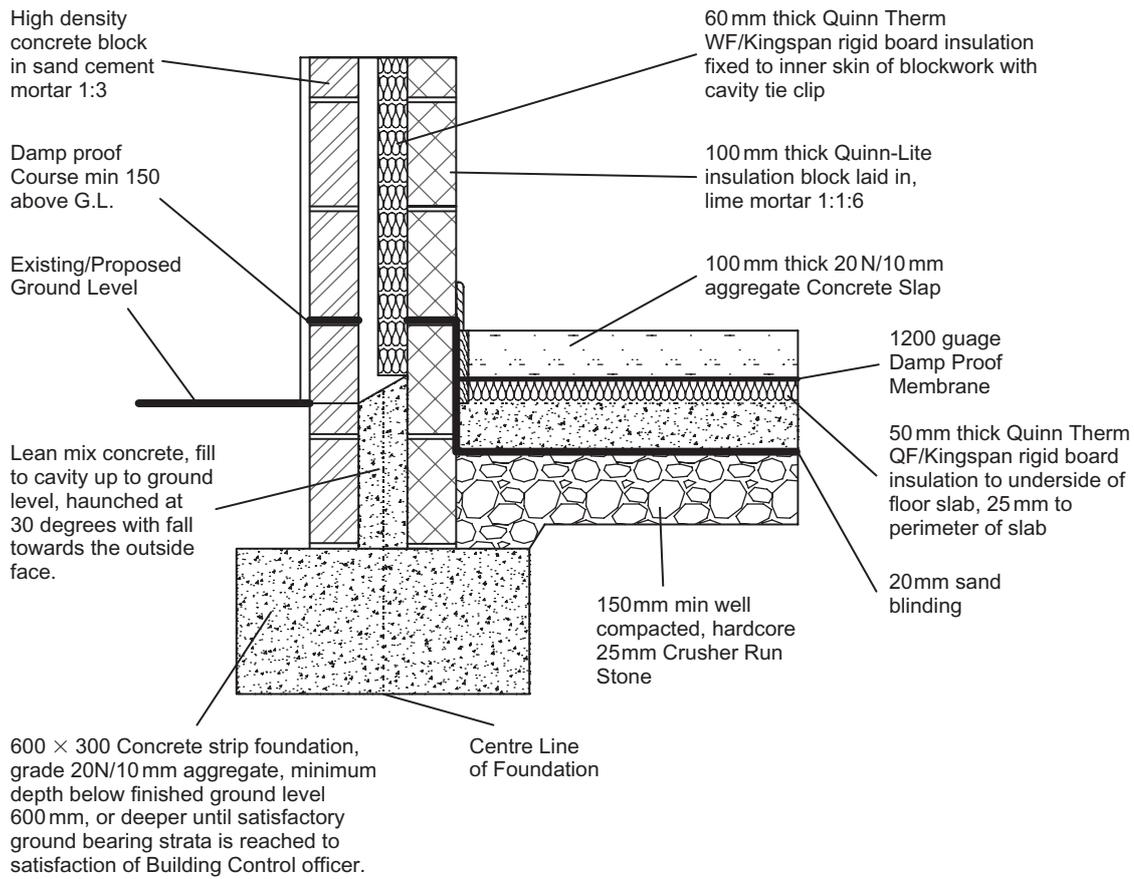


Fig. 2

(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**.

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[2]

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

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[2]

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

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[1]

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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?

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[2]

Examiner Only	
Marks	Remark

(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?

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[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?

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[2]

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]

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Marks	Remark

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



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

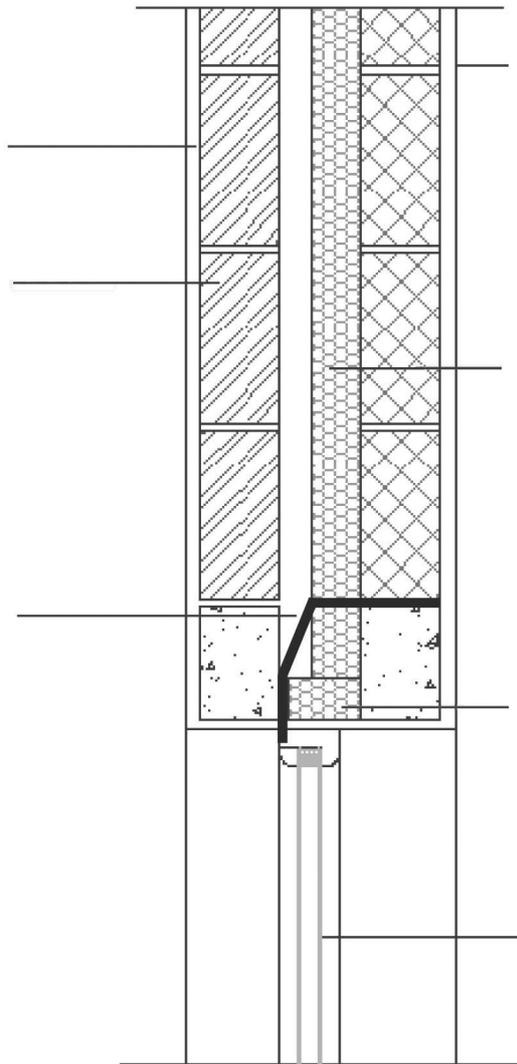


Fig. 8

[7]

Examiner Only	
Marks	Remark



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## **Construction and the Built Environment**

**Pre-Release Material**

Assessment Unit 1: The Construction  
Industry for the 21<sup>st</sup> Century

**[GCB11]**

**MONDAY 14 MAY, AFTERNOON**

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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 jamb 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

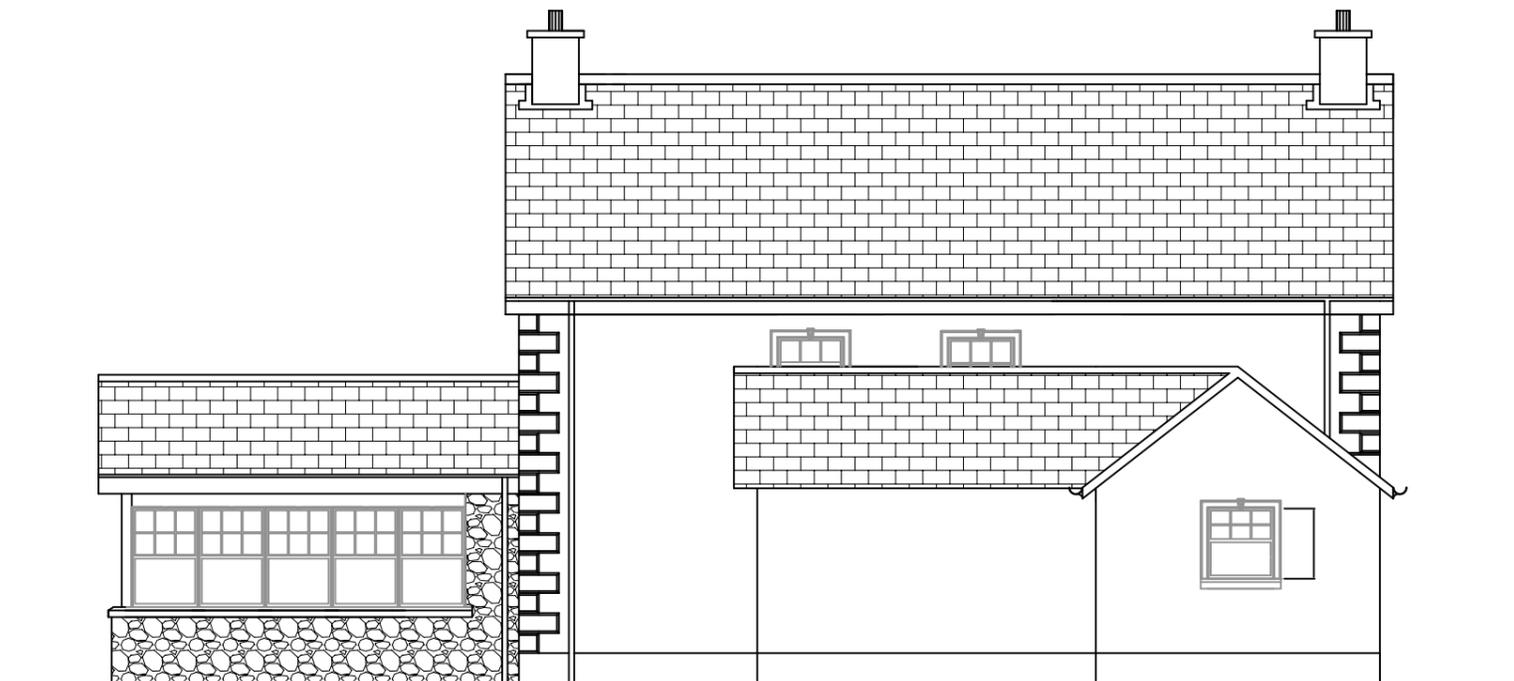
White PVC gutter and down pipe

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





Front Elevation



Back Elevation

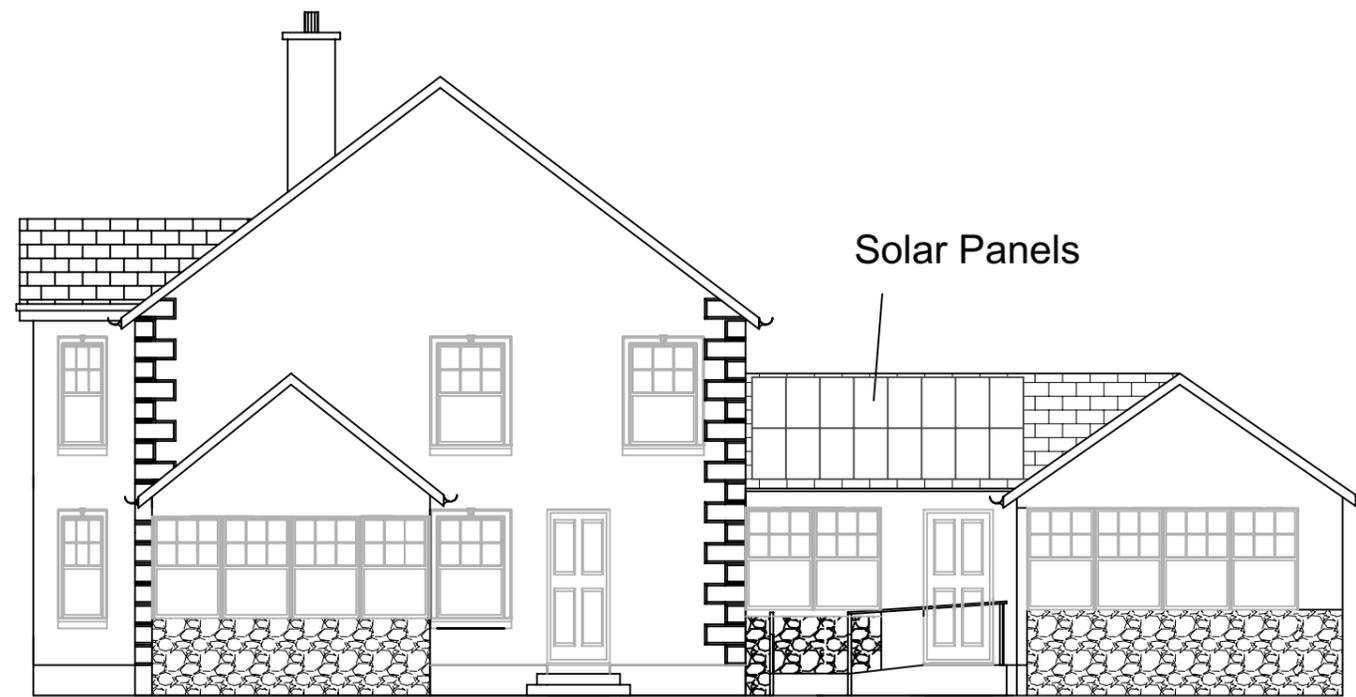
**GCSE Construction and the  
Built Environment**

**Front and Back Elevations**

**Unit 1**

***PRE-RELEASE MATERIALS***  
**Examination Series 2011 / 2012**

**SCALE: 1: 100**



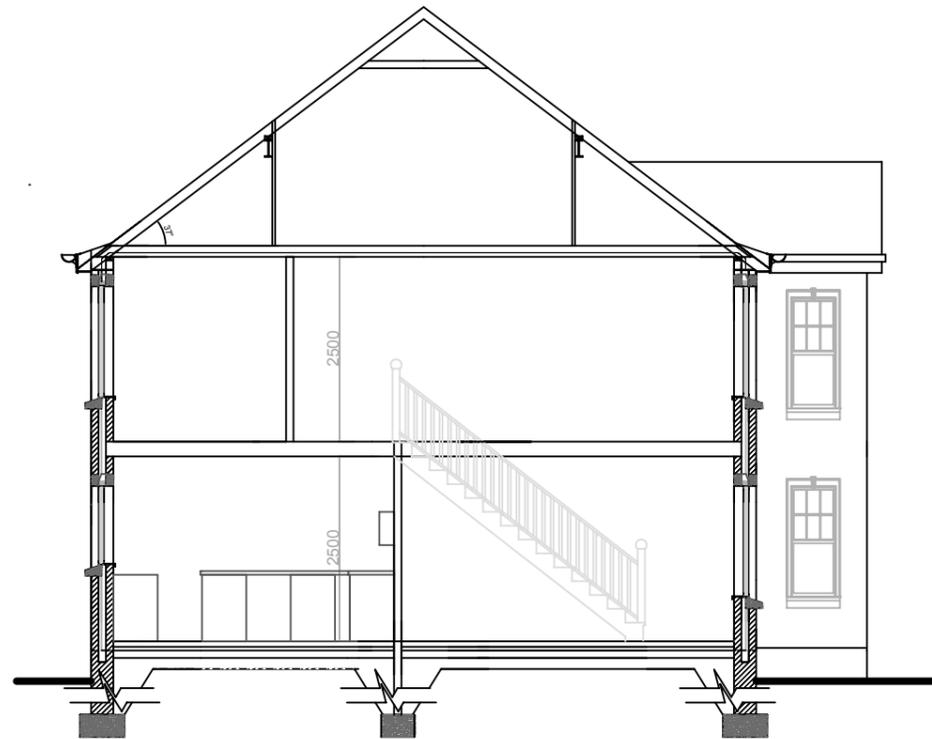
Side Elevation

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**Side Elevations**

**Unit 1**

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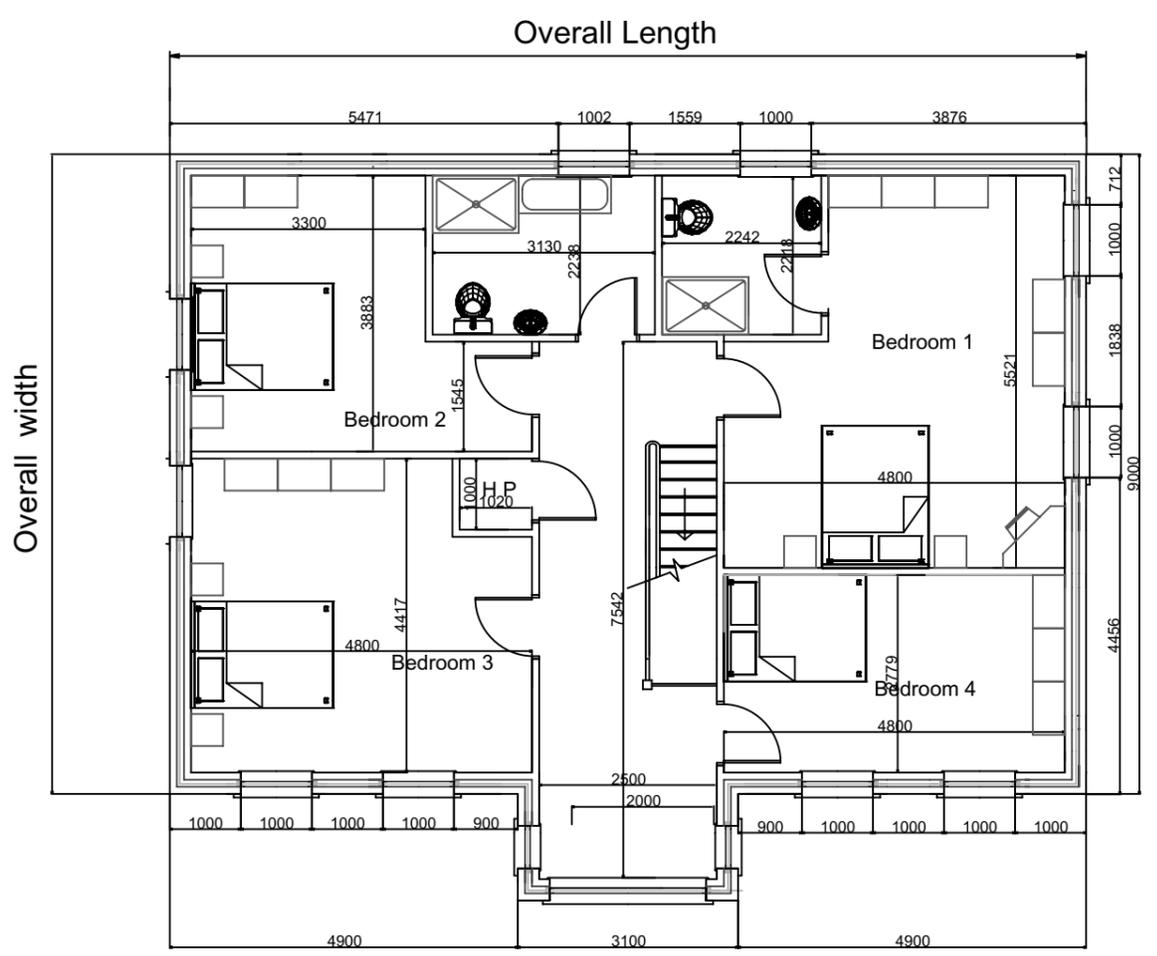
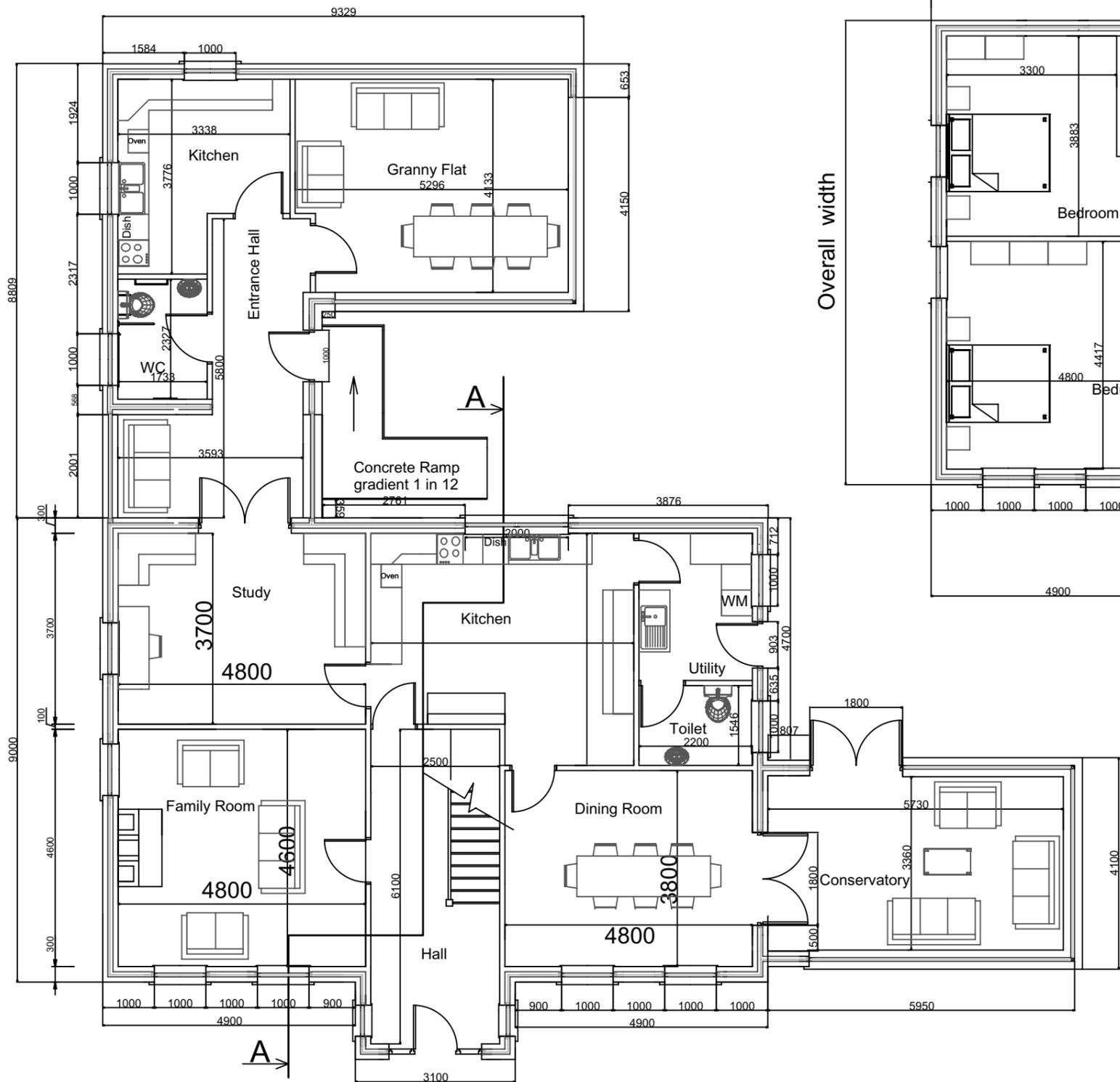
Section AA

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Built Environment**

**Sectional Detail**

**Unit 1**

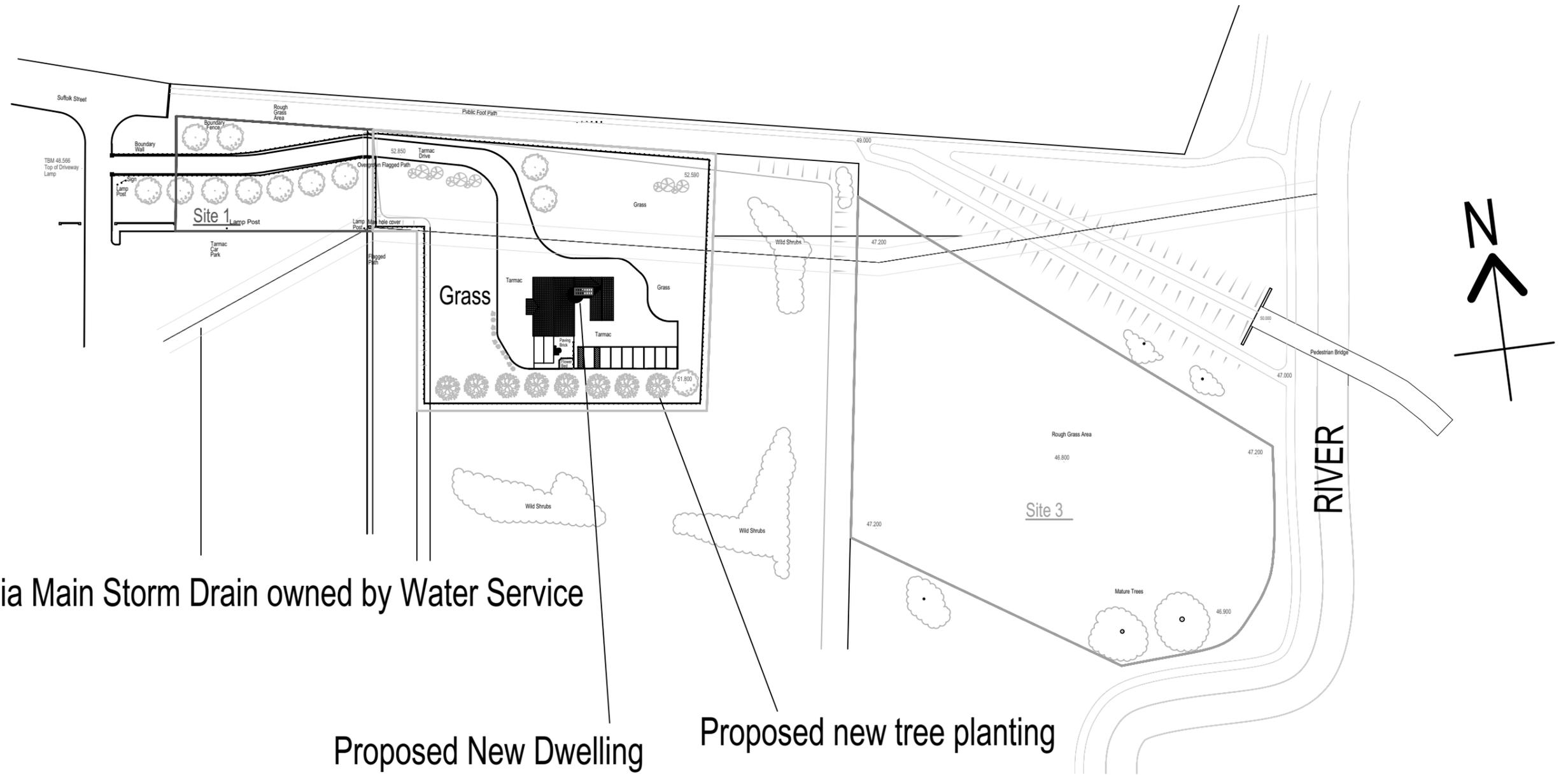
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**GCSE Construction and the Built Environment**

**Plan Details**

**Unit 1**  
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600 dia Main Storm Drain owned by Water Service

Proposed New Dwelling

Proposed new tree planting

**GCSE Construction and the Built Environment**

**Site Plan**

**Unit 1**

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NOT TO SCALE**