



2014 Building Construction

Higher

Finalised Marking Instructions

© Scottish Qualifications Authority 2014

The information in this publication may be reproduced to support SQA qualifications only on a non-commercial basis. If it is to be used for any other purposes written permission must be obtained from SQA's NQ Assessment team.

Where the publication includes materials from sources other than SQA (secondary copyright), this material should only be reproduced for the purposes of examination or assessment. If it needs to be reproduced for any other purpose it is the centre's responsibility to obtain the necessary copyright clearance. SQA's NQ Assessment team may be able to direct you to the secondary sources.

These Marking Instructions have been prepared by Examination Teams for use by SQA Appointed Markers when marking External Course Assessments. This publication must not be reproduced for commercial or trade purposes.

Part One: General Marking Principles for: Building Construction Higher

This information is provided to help you understand the general principles you must apply when marking candidate responses to questions in this Paper. These principles must be read in conjunction with the specific Marking Instructions for each question.

- (a) Marks for each candidate response must always be assigned in line with these general marking principles and the specific Marking Instructions for the relevant question. If a specific candidate response does not seem to be covered by either the principles or detailed Marking Instructions, and you are uncertain how to assess it, you must seek guidance from your Team Leader/Principal Assessor.
- (b) Marking should always be positive ie, marks should be awarded for what is correct and not deducted for errors or omissions.

GENERAL MARKING ADVICE: Building Construction Higher

The marking schemes are written to assist in determining the “minimal acceptable answer” rather than listing every possible correct and incorrect answer. The following notes are offered to support Markers in making judgements on candidates’ evidence, and apply to marking both end of unit assessments and course assessments.

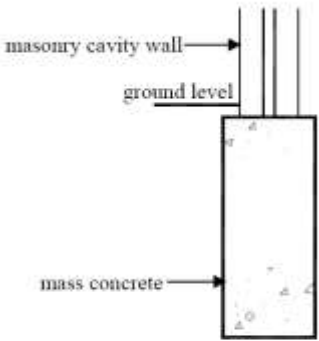
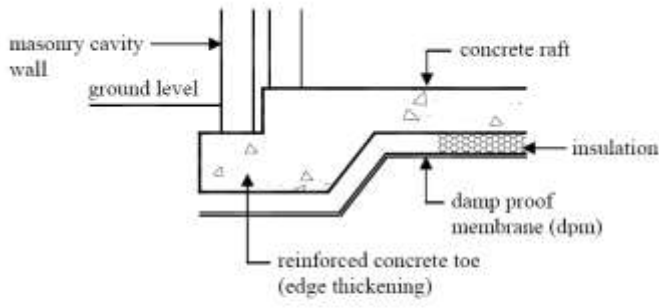
1. 100 marks are allocated to this paper
2. Attempt **all** questions in Section A (40 marks)
3. Attempt any **two** questions in Section B (30 marks each)
4. Worksheets are provided for Questions 6, 7(c), 8(a) and 8(c), Hand these in with your answer book.

Part Two: Marking Instructions for each Question

SECTION A

Attempt all questions in this Section (total 40 marks)

Question		Expected Answer(s)	Max Mark	Additional Guidance
1	(a)	<ul style="list-style-type: none"> • Geological maps • Historical Ordnance Survey maps • Aerial photographs • Mining records • Information from Local Authority such as services • Previous site investigation reports <p style="text-align: right;">(Any four)</p>	4	
1	(b)	<p>Dug by mechanical excavator (backhoe) approximately 1.2 metres wide x 3 metres deep. Earthwork support required if persons are to enter the excavation.</p> <p>Visual inspection of stratum possible for recording. (2 marks)</p> <p><u>Two items of information:</u> Soil samples may be taken for analysis. (1 mark)</p> <p><i>In-situ</i> testing may be carried out such as Shear vane test. (1 mark)</p>	4	

Question		Expected Answer(s)	Max Mark	Additional Guidance
2	(a)	<ul style="list-style-type: none"> • Top soil has very poor load bearing capacity, it is soft and compressible and readily retains moisture. • Top soil is organic and supports plant growth. Trees and shrubs may damage a foundation. • Major use is in landscaping and it is a valuable resource. <p style="text-align: right;">(Any two)</p>	2	
2	(b)	<ul style="list-style-type: none"> • The natural slope of the ground • Minimum depth set in current standards • Frost protection <p style="text-align: right;">(Any two)</p>	2	
2.	(c)	<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  <p>DEEP STRIP FOUNDATION (2)</p> </div> <div style="text-align: center;">  <p>RAFT FOUNDATION (2)</p> </div> </div> <p style="text-align: right;">(2 marks each)</p>	4	

Question			Expected Answer(s)	Max Mark	Additional Guidance
3	(a)	(i)	1. flooring material such as tongued & grooved chipboard 2. insulation 3. concrete blocks 4. horizontal restraint strap. (1 mark each)	4	
3	(a)	(ii)	These straps, manufactured from galvanised steel or stainless steel, provide the floor with horizontal lateral restraint to an external wall where the floor joists run parallel with the wall.	2	

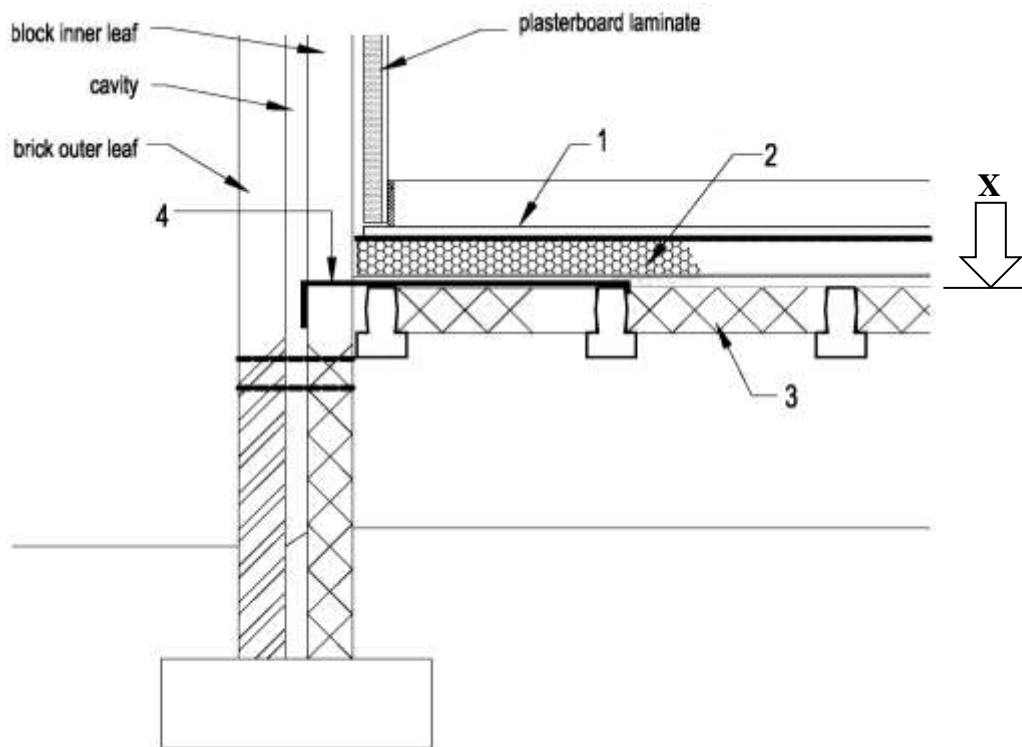
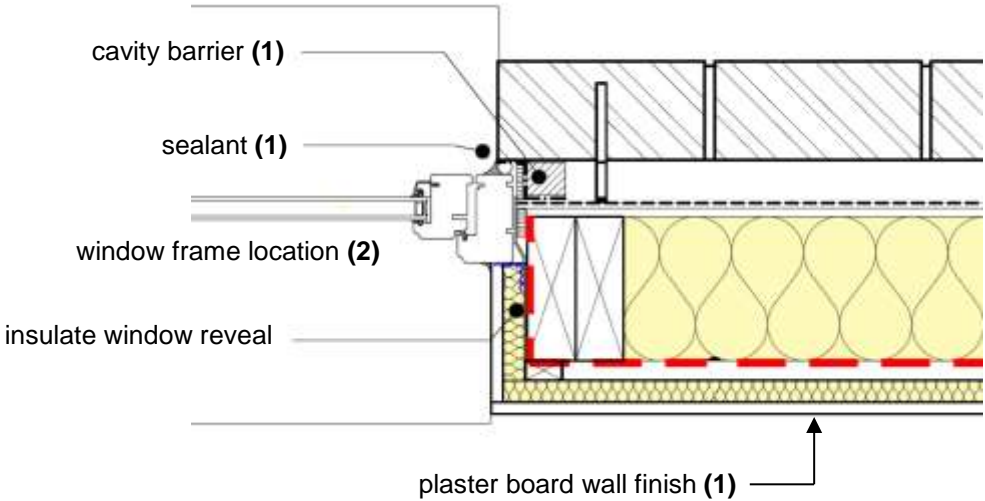
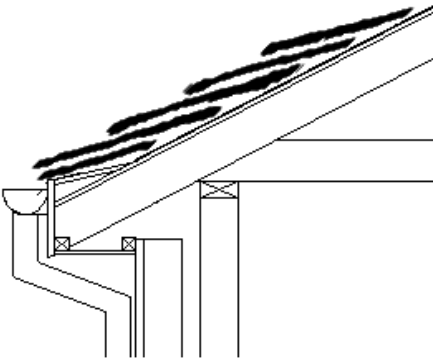
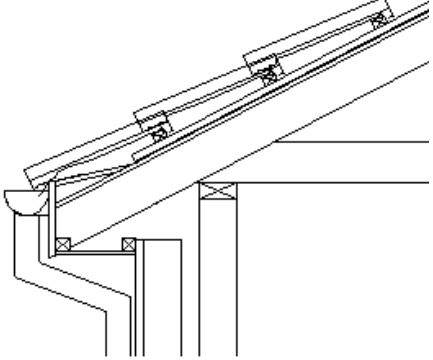


Figure Q3

Question		Expected Answer(s)	Max Mark	Additional Guidance
3	(b)	A sand/cement screed could be laid over the concrete suspended floor to provide a level surface finish. Timber battens/insulation and flooring could be laid on top of the screed.	3	
4	(a)	Tilt turn windows rely on hardware controlled by a single lever that allows the window to either swing in like a door hinged at the sides or tilt in at the top like a hopper.	4	
4.	(b)	 <p>The diagram shows a cross-section of a window jamb. On the left, a window frame is shown with a handle. The frame is set into a wall. Labels with leader lines point to various parts: 'cavity barrier (1)' points to a vertical barrier in the gap between the frame and the wall; 'sealant (1)' points to a black sealant bead at the top of the frame; 'window frame location (2)' points to the frame itself; 'insulate window reveal' points to a yellow insulation material in the gap; and 'plaster board wall finish (1)' points to the wall surface with an upward arrow. Below the diagram, the text 'WINDOW JAMB' is written in bold.</p> <p>WINDOW JAMB</p>	5	

Question	Expected Answer(s)	Max Mark	Additional Guidance
5.	<p>Slates laid with a double lap directly onto breathable underlay.</p>  <p>SLATE ROOF (3 marks)</p>	6	<p>Tiles clipped over timber battens which are secured to counter battens nailed to breathable underlayer.</p>  <p>CONCRETE INTERLOCKING TILES (3 marks)</p>
		(40)	

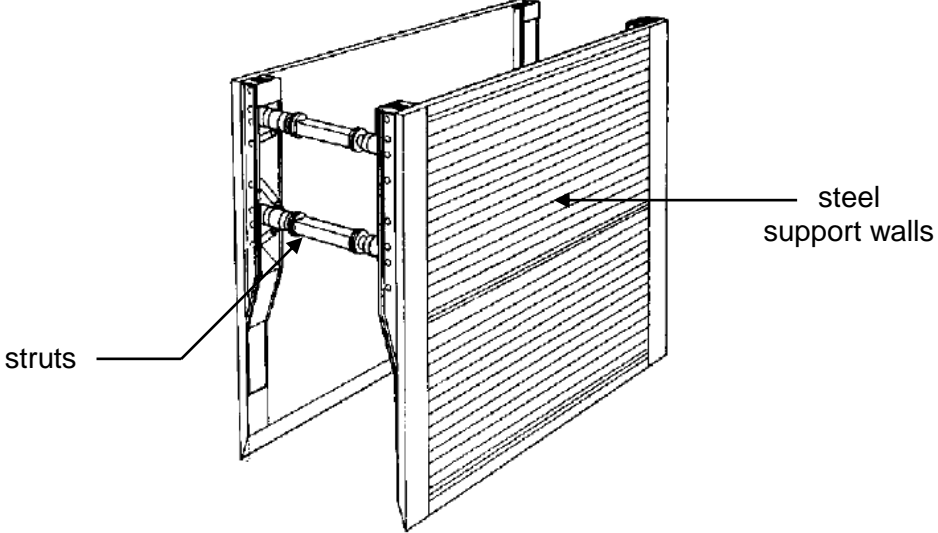
[END OF SECTION A]

SECTION B

Attempt any TWO questions in this Section (total 60 marks)

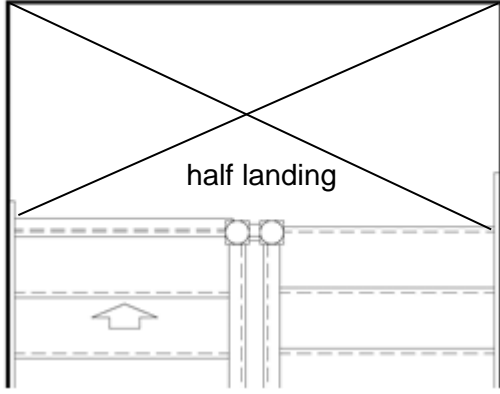
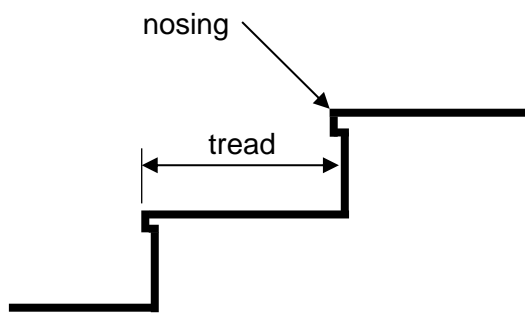
Question		Expected Answer(s)	Max Mark	Additional Guidance
6	(a)	<p><u>Site Access</u></p> <ul style="list-style-type: none"> • Traffic safety • Access for large vehicles delivering materials • Adequate width of access. <p>(Any two for 2 marks)</p> <p><u>Storage of materials</u></p> <ul style="list-style-type: none"> • Sited near temporary road for easy access • Sited in reach of any onsite cranes • Avoid double handling • Not too far from work area • Secure area. <p>(Any two for 2 marks)</p> <p><u>Temporary Accommodation</u></p> <ul style="list-style-type: none"> • Not too far from the building under construction • Located away from noisy activities • Good visibility of site from the cabins. • Easy quick access for visitors. <p>(Any two for 2 marks)</p>	6	
6	(b)	Solution on worksheet.	3	

Question		Expected Answer(s)	Max Mark	Additional Guidance
6	(c)	<p><u>Trussed rafters</u> Must be stored either horizontally or vertically, off the ground, fully supported by battens below all joints to avoid damage to the joints by distortion. Must be protected from rain with waterproof sheet secured all round. (2 marks)</p> <p><u>Concrete blocks</u> May be delivered on pallets or banded. Off-loaded units should be stacked carefully on a prepared, clean, level, firm area to minimise soiling, chipping and breakage. Stacks should be protected from inclement weather and from soiling from the ground and passing traffic. Whenever possible air should be allowed to circulate around and through the stacks. (2 marks)</p> <p><u>uPVC windows</u> Should be stored vertical on a level surface. Care must be taken to ensure they do not distort. Should also be stored indoors or undercover in a secure location. (2 marks)</p>	6	
6	(d)	<p>1. Proprietary metal fencing systems - comprising a tubular steel frame and anti-climb wire mesh panels fixed at ground level with concrete or plastic foot blocks. Each panel locked together with bolted clamps. (2 marks)</p> <p>2. Timber hoarding – comprising timber posts set into the ground in concrete, timber rails and plywood face. (2 marks)</p>	4	

Question			Expected Answer(s)	Max Mark	Additional Guidance
6	(e)		<p>Candidate's may choose either: Proprietary shoring systems lifted into place by mechanical plant or traditional timbering of the trench. The sketch below indicates a proprietary box system which is modular and has strutted support. It acts as a safety box to protect workmen. Boxes of this type can be extended in width and height.</p>	4	
					
6	(f)	(i)	A supply of concrete would be obtained from a ready-mixed concrete batching plant and delivered to site by truck mixer.	3	
6	(f)	(ii)	In housing projects, excavators and dumpers are common for placing ready-mixed concrete. An alternative would be concrete pump.	3	
6	(g)		Fabric reinforcement.	1	
				(30)	

Question		Expected Answer(s)	Max Mark	Additional Guidance
7	(a)	<p>The light-cable percussion boring method uses a mobile rig with a winch driven by a diesel engine and a tripod derrick of about 7m height. The derrick folds down so that the rig can be towed by a 4 x 4 vehicle. A borehole is formed by raising and lowering either a 'clay cutter' for cohesive soils or a 'shell' (or bailer) for non-cohesive materials. A chiselling tool can be used to penetrate very hard ground conditions or obstructions. The sides of the borehole are supported using steel casing which is hammered into the ground as the boring proceeds. The material recovered from the borehole is representative to determine the depth and description of the geological strata.</p>	6	
7	(b)	<p>State one from:</p> <ul style="list-style-type: none"> • Unconfined compression tests • Triaxial compression • Chemical analysis • Particle size distribution <p style="text-align: right;">(Any one)</p>	2	
7	(c)	Solution on the worksheet.	10	

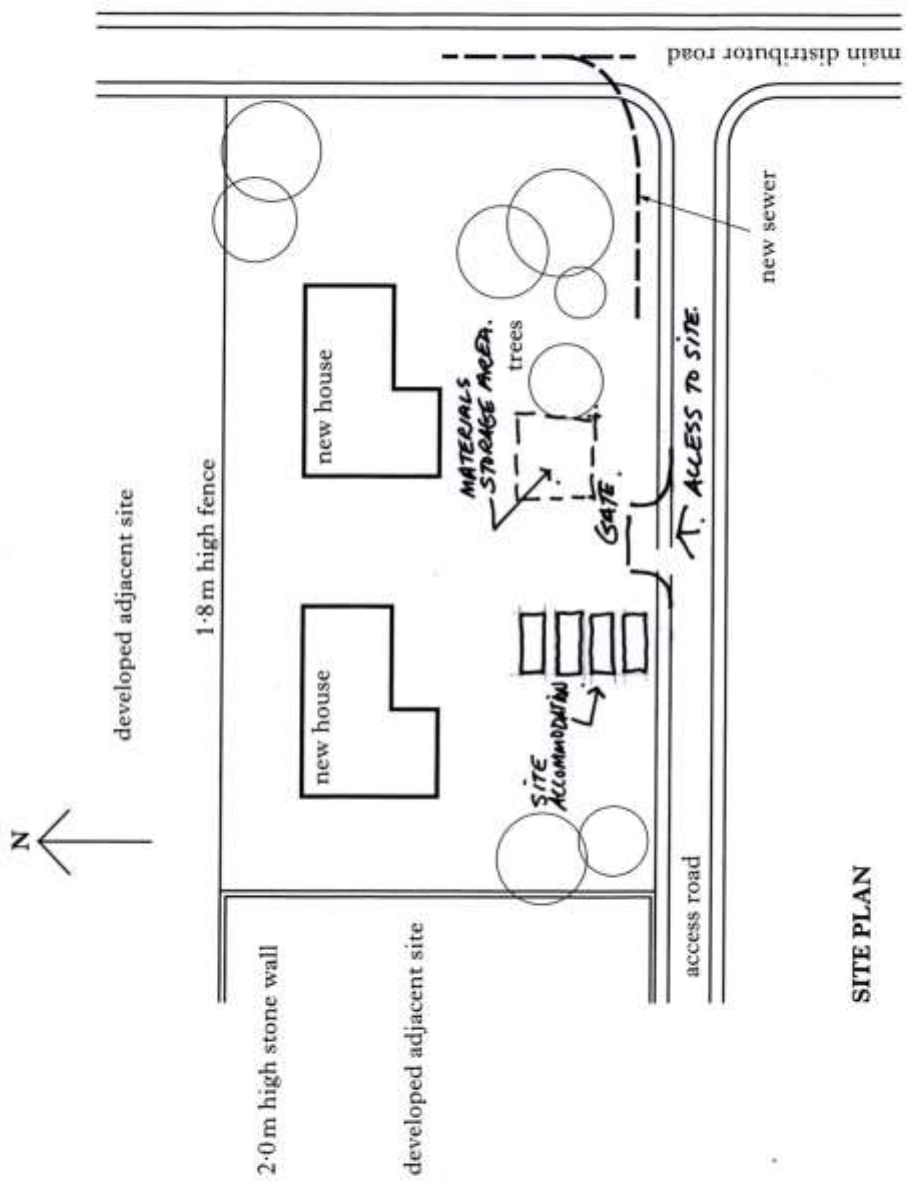
Question		Expected Answer(s)	Max Mark	Additional Guidance
7	(d)	<p><u>Laminated floor</u> Preparation is important. Base must be dry and level. If not level a self-levelling screed may be used. Lay out a proprietary cushion underlay over the area to be floored. Lay laminate boards on top of underlay ensuring they are a tight fit at all edges. Allow a 10 mm gap round the perimeter of the room for movement of the floor. Fix perimeter beading to match floor.</p> <p style="text-align: right;">(3 marks)</p> <p><u>Sheet vinyl</u> Preparation is important. Base must be dry and level. If not level a self-levelling screed may be used. Prepare a template for the shape of the room to be covered. Cut vinyl to the required shape. Prepare adhesive and spread over the floor area using a notched trowel. Role the vinyl out over the adhesive, working from the centre out. Clean up excess adhesive immediately.</p> <p style="text-align: right;">(3 marks)</p>	6	
7	(e)	<p>Choose two from:</p> <ul style="list-style-type: none"> • Timber framing securely fixed to blockwork with the plasterboard fixed to the framing with screws. • Plaster dabs – proprietary plasterboard adhesive dabs applied to the blockwork and the boards secured to the dabs with firm pressure. • Proprietary metal frame system attached to blockwork. Plasterboard attached to frame with screws. <p style="text-align: right;">(3 marks each)</p>	6	
			(30)	

Question			Expected Answer(s)	Max Mark	Additional Guidance
8	(a)		Solution on worksheet.	10	
8.	(b)		<p>(i) half landing;</p>  <p>half landing</p> <p>PLAN OF STAIR SHOWING HALF LANDING (1 mark)</p>	2	<p>(ii) tread.</p>  <p>nosing</p> <p>tread</p> <p>SECTION THROUGH STAIR SHOWING TREAD. (1 mark)</p>
8	(c)	(i)	Solution on worksheet Q8(c)	6	
8	(c)	(ii)	<p>Height of handrail – 840 mm (1)</p> <p>Going at point X – 50 mm } (1)</p> <p>Going at point Y – 225 mm }</p> <p>Width of stair – 800 mm (1)</p>	3	

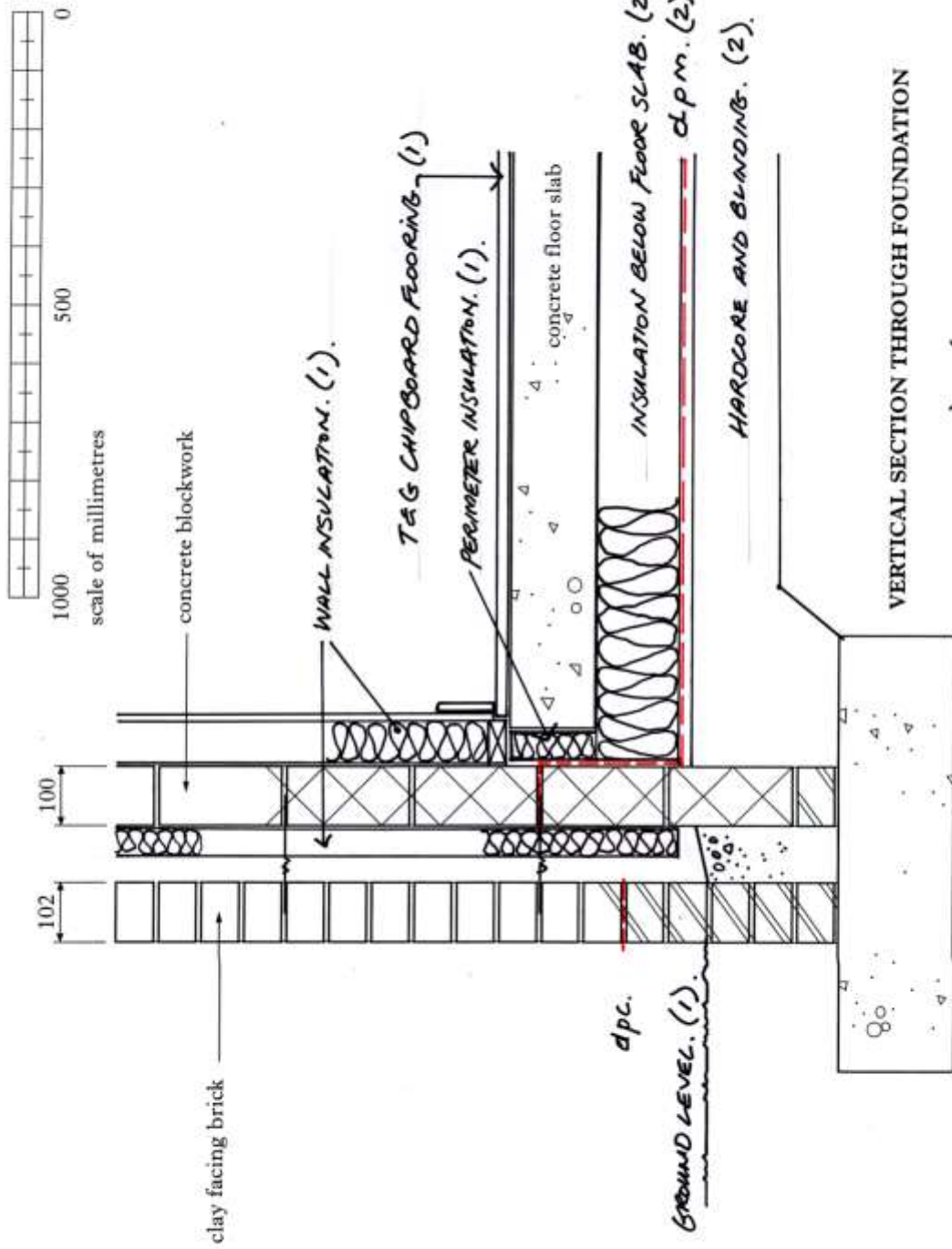
Question			Expected Answer(s)	Max Mark	Additional Guidance
8	(c)	(iii)	<p>From the worksheet the going is $1175 \div 5 = 235\text{mm}$ (1 mark)</p> <p>From the worksheet the rise is $1470 \div 7 = 210\text{ mm}$ (1 mark)</p> <p>Carry out checks: Twice rise plus going to be between 550 mm and 700 mm Therefore: $(2 \times 210) + 235 = 655\text{ mm}$ therefore that is fine.</p> <p>Check pitch: $\tan\theta = 210 \div 235 = 0.8936$ therefore $\theta = \text{inverse tan } 0.8936$ = 41.78 degrees (2 marks)</p> <p>Since the maximum rise permitted under current standards is 42 degrees, this stair complies. (1 mark)</p>	5	
8	(d)		<p>Brief explanation of the preparation and application of ceramic wall tiles. Sketches required.</p>	4	
				(30)	

[END OF SECTION B]

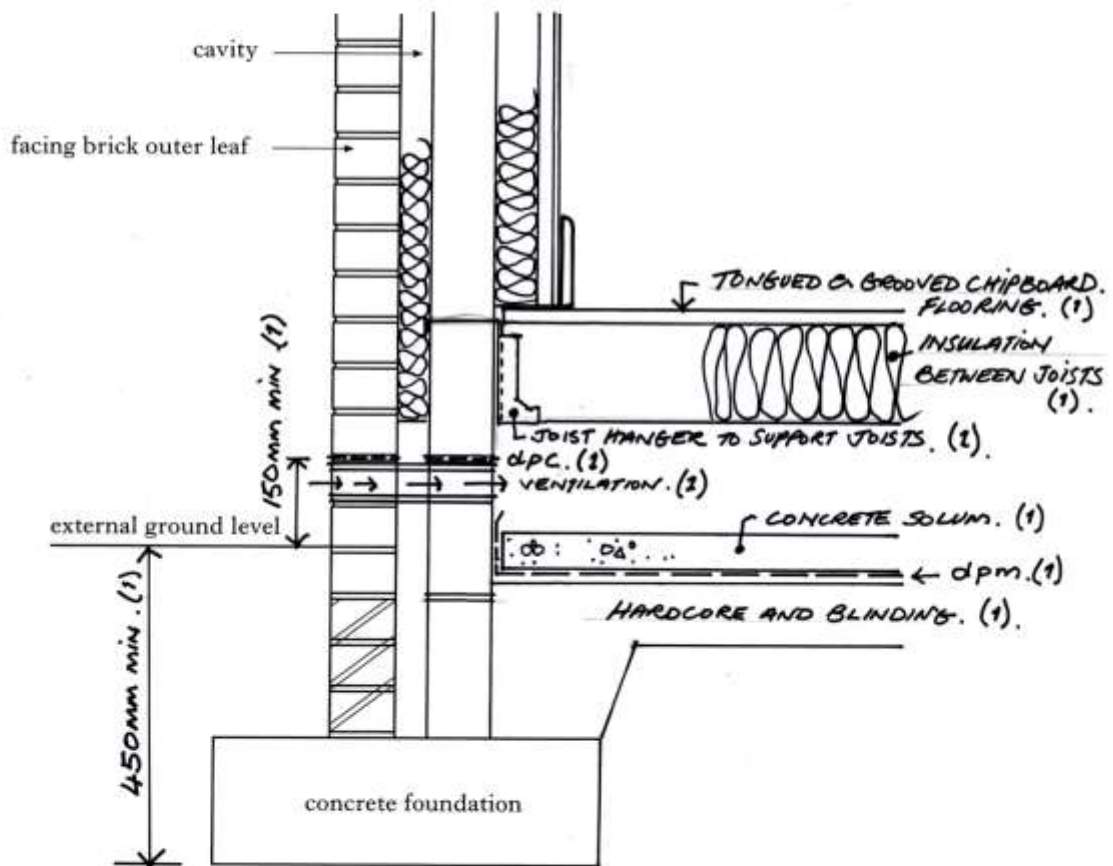
WORKSHEET Q6



WORKSHEET Q7(c)



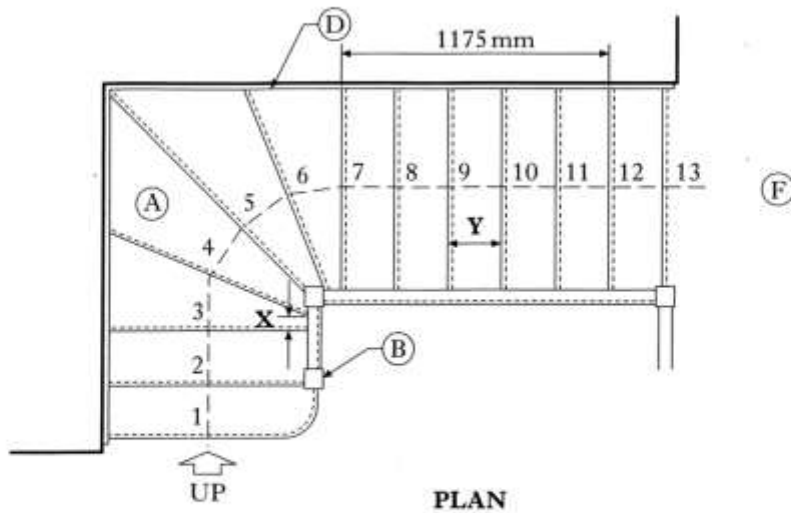
WORKSHEET Q8(a)



VERTICAL SECTION THROUGH FOUNDATION

MARK ALLOCATION IN BRACKETS. TOTAL 10 MARKS.

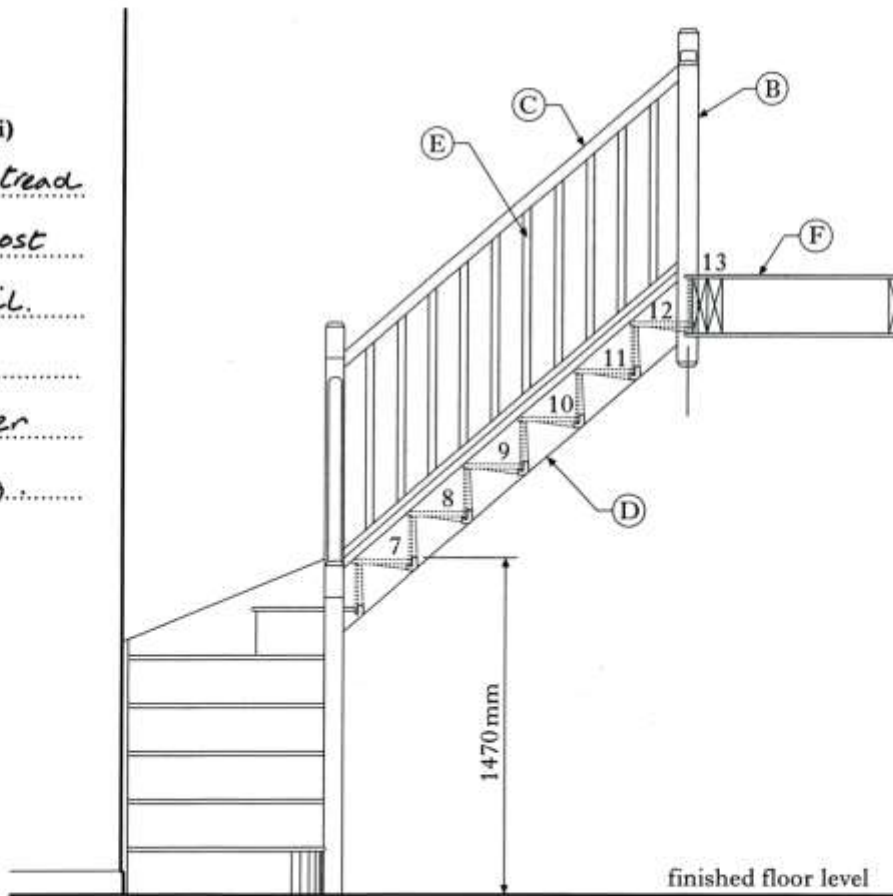
WORKSHEET Q8(c)



PLAN

Question 8(c)(i)

- A *tapered tread*
- B *newel post*
- C *handrail*
- D *string*
- E *baluster*
- F *landing*



ELEVATION

[END OF MARKING INSTRUCTIONS]