



# Mark Scheme (Results)

June 2014

NQF BTEC Level 1/Level 2 Firsts in  
Construction and the Built Environment

Unit 1: Construction Technology  
(21492E)

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## General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- All marks on the mark scheme should be used appropriately.
- All marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if a candidate's response is not worthy of credit according to the mark scheme.
- Where some judgment is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt about applying the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed-out work should be marked UNLESS the candidate has replaced it with an alternative response.

Question Number	Answer	Mark
1(a)	1 mark for each of:  Flashings — Weather resistance Sheep's wool — Thermal insulation	(2)

Question Number	Answer	Mark
1(b)	B — concrete	(1)

Question Number	Answer	Mark
1(c)	D — timber	(1)

Question Number	Answer	Mark
1(d)	1 mark for each purpose of sound insulation for a building identified, up to a maximum of two marks: <ul style="list-style-type: none"> <li>• Preventing nuisance and noise disturbance of/to adjacent neighbours (1)</li> <li>• Reduce external infrastructure noise (1)</li> <li>• Reduce aircraft noise (1)</li> <li>• Provide confidentiality (1)</li> <li>• The sound insulation could double up as thermal insulation (1)</li> </ul> <p>Accept any other appropriate answers, including examples of outside noises such as cars/lorries/animals, etc.</p> <p>Do <b>not</b> accept sound in and/or sound out in isolation as it is passage of sound.</p>	(2)

Question Number	Answer	Mark
1(e)	1 mark for identification of a benefit, and 1 mark for expansion of that benefit, up to a maximum of two marks. 2 marks for any one of the following description of a benefit: <ul style="list-style-type: none"> <li>• requires only a fraction of the energy to produce (1) as it is a natural material (1)</li> <li>• reduces the heat loss in a building/keeps the building warm (1) thus saving money on heating bills/maintaining a comfortable internal environment (1)</li> <li>• it is a sustainable material (1) as it is renewable (1)</li> <li>• cheaper than some other forms of insulation (1) thus lowering initial costs (1)</li> </ul> <p>Do <b>not</b> accept cheaper or cheap without relative comparison. Accept any other appropriate answers.</p>	(2)

Question Number	Answer	Mark
2(a)	1 mark for each of:  C — Timbering D — Steel trench sheets	(2)

Question Number	Answer	Mark
2(b)	1 mark for any one of the following:  <ul style="list-style-type: none"> <li>• simple sump pump/pumping</li> <li>• sump pump/pumping</li> <li>• pump/pumping.</li> </ul> <p>Do <b>not</b> accept steel sheeting as this prevents the ingress of groundwater, not surface water. Do not accept covering the trench.</p>	(1)

Question Number	Answer	Mark
3	1 mark for each of:  Desk-based preconstruction — Scaled site layout plan Site-based preconstruction — Gates and security of the site  If there are multiple lines coming out of the same box, apply zero marks for that response, even if one of the lines connects to the correct answer.	(2)

Question Number	Answer	Mark
4(a)	1 mark for any two from the following functions of a wall, up to a maximum of two marks:  <ul style="list-style-type: none"> <li>• to resist heat transfer/provide insulation (not sound)</li> <li>• to transfer loads to foundations</li> <li>• to provide shelter/weather resistance/protection from the weather</li> <li>• to provide security/privacy</li> <li>• structural stability</li> <li>• aesthetics of the building</li> <li>• to compartmentalise the building/external areas</li> <li>• to provide fire resistance</li> <li>• to accommodate services</li> </ul> <p>Accept any other appropriate answers. Do <b>not</b> accept any reference to sound/noise.</p>	(2)

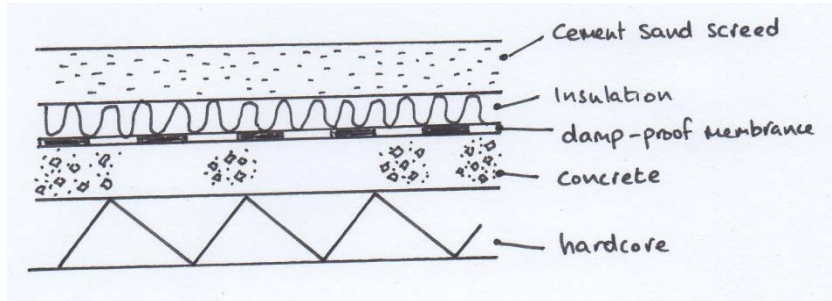
Question Number	Answer	Mark
4(b)	<ul style="list-style-type: none"> <li>To support the materials/wall above the opening</li> <li>Aesthetically pleasing/decorative eg. stone/timber</li> </ul> <p>Do <b>not</b> accept any other answers.</p>	(1)

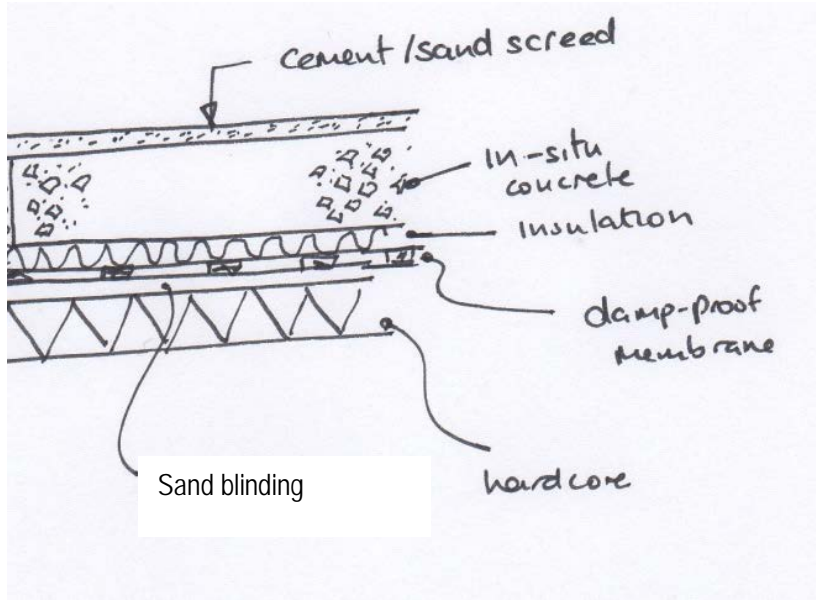
Question Number	Answer	Mark
4(c)	<p>1 mark for each of:</p> <p>B — Rendered blockwork</p> <p>D — Facing brickwork</p>	(2)

Question Number	Answer	Mark
5	<p>Any two from the following explanations of a measure that could have been taken. 1 mark for identification of a measure, and 1 mark for an explanation of the benefit, up to a maximum of 2 marks per explanation and up to a maximum of four marks:</p> <ul style="list-style-type: none"> <li>employ trained operatives who have undergone health and safety training (1) to safeguard against accidents occurring(1)</li> <li>site manager to make contact with service providers/utilise local knowledge (1) to ensure, where possible, services are accurately located (1)</li> <li>ensure all service drawings are available (1) to locate services on site (1)</li> <li>use a cable avoidance tool (CAT)/conduct a survey of the site (1) to find the exact location of the service (1)</li> <li>use trial-holes (1) to locate the exact depth of the service (1)</li> <li>carefully hand excavate around the cable duct (no mark awarded if learner states different method of excavation, without stating hand digging) (1) to accurately locate and expose (1)</li> <li>relocating/diverting cables (1) to avoid the vicinity of groundworks (1)</li> <li>mark position of services on ground (1) to warn operatives to avoid/be careful when excavating (1)</li> </ul> <p>Accept any other appropriate answers.</p>	(4)

Question Number	Answer	Mark
6(a)	<p>One mark for each correct label:</p> <p>Label i) — valley/valley board/valley rafter/lead valley/GRP valley</p> <p>Label ii) — ridge/ridgeboard</p> <p>Label iii) — jack/jack rafter</p> <p>Label iv) — hip/hip rafter</p> <p>Do <b>not</b> accept rafter or board on its own</p>	(4)

Question Number	Answer	Mark
6(b)	B — Softwood	(1)

Question Number	Answer	Mark
7	<p>Marks should be awarded for appropriate placing of the components of the diagram.</p> <p>Accept fill patterns in place of annotation.</p> <p>1 mark for each label or fill pattern, up to a maximum of 5 marks:</p> <p>1 mark for compacted earth/sub-soil labelled/fill pattern</p> <p>1 mark for hardcore labelled/fill pattern</p> <p>1 mark for concrete labelled/fill pattern</p> <p>1 mark for damp-proof membrane labelled/fill pattern</p> <p>1 mark for thermal insulation labelled/fill pattern</p> <p>1 mark for cement/sand screed labelled/fill pattern (or any appropriate finish)</p> <p>Examples of acceptable sketches with appropriate labelling and fill patterns.</p> <p><b>Example 1</b></p> 	(5)

	<p><b>Example 2</b></p>  <p>Accept similar valid alternative sketches.</p>	
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Question Number	Answer	Mark
8	<p>1 mark per advantage identified, and 1 mark for a linked explanation, up to 2 marks per explanation, up to a maximum of four marks. Any two from the following explanations of the advantages of a solid ground floor:</p> <ul style="list-style-type: none"> <li>• ground bearing slab (1) therefore able to carry loads without deflection (1)</li> <li>• simple construction form (1) therefore can be cost-effective (cheap) (1)</li> <li>• quicker to construct (1) therefore can be cost effective (cheap) (1)</li> <li>• semi-skilled labour is required (1) therefore labour costs kept to a minimum (1)</li> <li>• can be thickened to support load bearing walls (1) therefore can support increased loading (1)</li> <li>• no need to ventilate the solid floor (1) because a solid floor will not rot/is more durable (1)</li> <li>• floor/screed can be self-finished eg. power float (1) reducing the need for costly secondary finishes (1)</li> </ul> <p>Accept any other appropriate answers.</p> <p>Do <b>not</b> accept faster/quicker/cheaper in isolation.</p>	(4)



Question Number	Answer	Mark
9	<p>1 mark per benefit identified, and 1 mark for a linked explanation, up to 2 marks per explanation, up to a maximum of four marks. Any two from the following explanations of the benefits of using engineered timber joists:</p> <ul style="list-style-type: none"> <li>• reduce wastage on site (1) because joists are made to measure (1)</li> <li>• lower total installation costs (1) because it is easy to handle/quick to install (1)</li> <li>• efficient/sustainable use of material (1) as section is more efficient structurally/lighter (1)</li> <li>• timber is a sustainable/renewable material (1) because it is grown in managed forests (1)</li> <li>• long spans are possible (1) as a result of greater depths of sections possible (1)</li> <li>• they are structurally strong (1) allowing a lightweight floor structure (1)</li> </ul> <p>Accept any other appropriate answers.</p>	(4)

Question Number	Answer	Mark
10	<p>2 marks for any one of the following explanations. Award 1 mark for identification of how it is sustainable and 1 mark for appropriate explanation, up to a maximum of two marks:</p> <ul style="list-style-type: none"> <li>• it is a renewable resource (1) because it uses timber from a managed forest (1)</li> <li>• it reduces carbon footprint/is eco-friendly (1) because of a reduction in embodied energy/supports biodiversity (1)</li> <li>• reduces waste (1) because it is produced off-site (1)</li> <li>• fast form of construction/reduction in erection time (1) therefore reduces energy consumption during construction phase (1)</li> <li>• improves U value/reduces energy consumption (1) because it is easy to incorporate high levels of insulation within the structure (1).</li> </ul> <p>Do <b>not</b> accept sustainable on its own.</p> <p>Accept any other appropriate answers.</p>	(2)

Question Number	Indicative content	Mark
11	<p>Advantages of brownfield site:</p> <ul style="list-style-type: none"> <li>• Environmental concerns likely to be less than for greenfield site.</li> <li>• Regeneration of brownfield sites – council more likely to grant the property developer planning permission.</li> <li>• Existing infrastructure may be in place.</li> <li>• Structures and services can be utilised without major upgrades (i.e. electrical, drainage).</li> <li>• Access road and transport systems may already be in place.</li> <li>• The housing development may bring more green areas into the locale, increasing the presence of flora and fauna.</li> <li>• Potential regeneration of the area with improved social benefits.</li> <li>• Attracts buyers who would like to live on a brownfield site/proximity to urban areas</li> </ul> <p>Disadvantages of brownfield sites:</p> <ul style="list-style-type: none"> <li>• Design options may be compromised to suit existing constraints.</li> <li>• Site location is inner city and therefore may pose operating difficulties in terms of traffic congestion and noise.</li> <li>• Existing structures and services issues.</li> <li>• Contingency costs could be high due to unforeseen situations, e.g. foundations, basements, storage tanks, pipelines.</li> <li>• Contamination issues due to previous industrial use.</li> </ul> <p>Advantages of greenfield site:</p> <ul style="list-style-type: none"> <li>• Provides maximum design flexibility to meet project requirements.</li> <li>• Lower design costs for the property developer.</li> <li>• Reduce potential contingency costs as a result of existing service diversions.</li> <li>• Potential lower sub-structure costs.</li> <li>• Local authority can realise land assets by selling the parkland.</li> <li>• Attracts buyers who would like to live on a greenfield site.</li> </ul> <p>Disadvantages of greenfield site:</p> <ul style="list-style-type: none"> <li>• Damage to the natural environment.</li> <li>• Council approval timeframes may be longer for new sites.</li> <li>• Some sites are not fully developed and have additional development costs such as water and sewage infrastructure, e.g. sewage treatment plants, reservoirs and trunk mains.</li> </ul>	(8)

	<ul style="list-style-type: none"> <li>• Loss of amenity facilities to the public as the parkland is no longer in use</li> <li>• May have tree preservation orders</li> <li>• May be greenbelt land</li> </ul> <p>Accept any other valid response.</p>	
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Level	Descriptor
0 0 marks	No rewardable material
1 1–3 marks	A few key points identified, <b>or</b> one point described in some detail. The answer is likely to be in the form of a list. Only one viewpoint considered. Points made will be superficial/generic and not applied/directly linked to the situation in the question.
2 4–6 marks	Some points identified, <b>or</b> a few key points described. Consideration of more than one viewpoint but there will be more emphasis on one of them. The answer is unbalanced. Most points made will be relevant to the situation in the question, but the link will not always be clear.
3 7–8 marks	Range of points described, <b>or</b> key points explained in depth. All sides of the case are considered and the answer is well balanced, giving weight to all viewpoints. The majority of points made will be relevant and there will be a clear link to the situation in the question.