Mark Scheme (Final) January 2019

NQF BTEC Level 1/Level 2 First Award Construction and the Built Environment

(21492E)

Unit 1: Construction Technology

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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 judgement 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: Strength- Use of stress graded structural timber Sustainability- Minimising construction waste	(2)

Question Number	Answer	Mark
1(b)	1 mark for each location named: • cavity • wall • roof/loft/ceiling/attic • floor • door • draught strips • window/double/triple glazing • hot water storage cylinder • hot water pipework Up to a maximum of **two** marks. **Accept any other appropriate answers.**	(2)

Question Number	Answer	Mark
1(c)	**C-** Plasterboard layers **D-** Flooring mats	(2)

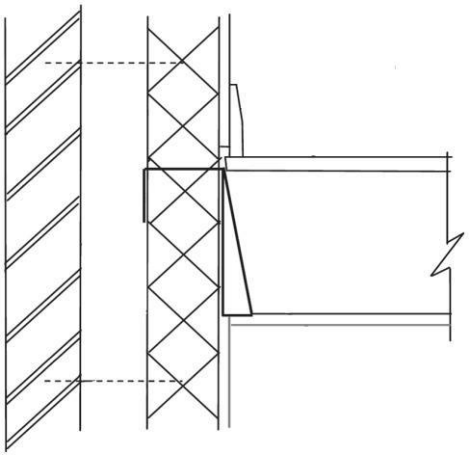
Question Number	Answer	Mark
1(d)	**A** - Dead **E -** Dynamic	(2)

Question Number	Answer	Mark
2	• Associated Risk - Flooding, drowning, death, trench sides collapse • Control Measure - Pump out excess water, shore up sides of trench	(2)

Question Number	Answer	Mark
3	**B -**Temporary lighting **D-** Site accommodation	(2)

Question Number	Answer	Mark
4(a)	**A -** It is often used in house construction	(1)

Question Number	Answer	Mark
4(b)	1 mark for each correct label: (i) brickwork (ii) DPC (iii) ground level (iv) concrete/ground beam/edge beam/beam (v) pile Up to a maximum of **five** marks.	(5)

Question Number	Answer	Mark
5	Marks should be awarded for appropriate placing of the components of the diagram. **One** mark awarded for each label or fill pattern. Up to a maximum of **four** marks. Wall and timber floor section:  1 mark for brickwork 1 mark for wall tie 1 mark for insulation 1 mark for blockwork 1 mark for joist 1 mark for joist hanger 1 mark for cavity indicated (0 marks awarded if cavity has not been labelled) 1 mark for flooring/floorboard 1 mark for skirting 1 mark for plaster 1 mark for ceiling **Accept similar valid alternative sketches.**	(4)

Question Number	Answer	Mark
6	1 mark for each method named: • Prefabrication of elements • Recycling • Building orientation • Reduction in use of greenfield sites • Use of brownfield sites • Use of low embodied energy materials • Use of green natural materials • Use of local supplies • Re-use/re-claim Up to a maximum of **two** marks **Accept any other appropriate answers.**	(2)

Question Number	Answer	Mark
7	**Two** marks for any of the following explanations of advantages of a raft foundation. **One** mark for identification and **one** mark for a linked explanation, up to **two** marks per explanation. Up to a maximum of **four** marks. • Provides a good foundation where soil conditions are poor/variable (1) reducing differential settlement (1) • Shallow form of construction (1) which avoids the need for trench support /de-watering (1) • A separate floor slab is not required (1) providing cost savings when a raft foundation is required (1) • Provides a working platform (1) reducing the need for temporary hard surfaces/providing space for storage (1) **Accept any other appropriate answers.**	(4)

Question Number	Answer	Mark
8	**Two** marks for any of the following explanations of benefits to the community of building on a brownfield site. **One** mark for identification and **one** mark for a linked explanation, up to **two** marks per explanation. Up to a maximum of **four** marks. • Environmental benefits (1) as the site will be cleaned up and the contaminants will be removed. (1) • Regeneration of the disused site (1) because the derelict site will be developed/ may provide community buildings/green space/employment opportunities (1). • Improved natural environment (1) by allowing eco-system/habitat to improve/return (1) • Less greenfield sites used (1) resulting in the retention/protection of the natural environment (1) • Improved visual amenity (1) increases property values for existing residents (1) • Less attractive to vandals, rough sleepers and drug users (1) resulting in crime reduction (1) **Accept any other appropriate answers.**	(4)

Question Number	Answer	Mark

9	**Two** marks for any of the following explanations of an advantage of a flat roof compared to a pitched roof. **One** mark for identification and **one** mark for a linked explanation, up to **two** marks per explanation. Up to a maximum of **four** marks. • Speed of erection (1) less skill required with the construction process (1) • Terrace/roof garden that can be used for outdoor activities could be added in the future/ Aesthetic form of construction seen by some/Ease of maintenance (1) may be seen as a selling point to prospective buyers (1) • Less materials used in a flat roof (1) so costs/initial costs are reduced (1) • No wasted space (1) efficient and therefore quicker form of construction (1) • Less height of construction (1) so developer may find favour with planners where there is a height restriction/local residents as a result of potential visual intrusion (1). **Accept any other appropriate answers.**	(4)

Question Number	Answer	Mark
10	**Two** marks for any of the following explanations of why a traditional cavity wall is a less sustainable form of construction. **One** mark for identification and **one** mark for a linked explanation. Up to a maximum of **two** marks. • Use of high embodied energy materials (1) increased pollution/emissions in their production/reduction of finite natural resources (1) • Increased site wastage (1) as construction is on site as opposed to the use of quality controlled prefabricated components/units (1) • Impact on the local natural environment/animal habitats/community (1) due to increased time on site (1) **Accept any other appropriate answers.**	(2)

Question Number	Answer	Mark
11	**Two** marks for any of the following explanations of disadvantages to a developer of using a prefabricated concrete cross-wall form of construction. **One** mark for identification and **one** mark for a linked explanation, up to **two** marks per explanation. Up to a maximum of **four** marks. • Can be unattractive to buyers (1) because of the repetition of layout (1) • Specialist plant equipment required to erect the frame (1) may increase cost to the project/weight of components (1) • Increased lead time (1) as the units need to be designed and manufactured prior to delivery to site (1) • requires accurate dimensions when ordering manufacturing/constructing (1) as any errors would be costly to rectify/delay completion (1) **Accept any other appropriate answers.**	(4)

Question Number	Indicative content	Mark
12	Traditional cavity wall Advantages: • Public confidence in traditional construction • Aesthetically pleasing/traditional form of construction i.e. facing brickwork • Good restriction of moisture passing through the wall • Good thermal insulation properties via the air gap and use of inner leaf thermally efficient concrete blocks • Cavity can be filled with insulation to reduce heat loss. • More flexible form of construction compared to SIPs Disadvantages: • At times of high demand bricks are on extended delivery schedules • Bricklayers are more difficult to obtain during periods of high demand • Speed of construction can be slower • Requirement to have more skilled operatives involved in the development • Less sustainable form of construction (more waste etc.) • Construction time prone to weather delays • Limitations on progress due to curing/drying times Structural insulated panel (SIPs) Advantages: • Faster construction form on site • Due to speed of construction this can reduce the overall contract period • Reduced site labour required to install therefore saving money • High strength to weight ratio so shallower foundations/less materials required and to be disposed of • Lighter, resulting in less concrete needed for foundations • Pre-insulated, no need to cut/fit insulation • A variety of finishes can be applied facilitating contemporary/variety of design may make this an appealing form of construction • SIPs can provide high levels of air-tightness and insulation • Less on site waste	(8)

	Disadvantages: • Less public confidence in this structural form • SIPs can be damaged by moisture, and should be carefully protected • Pest infestation is a possibility • Many builders – and their workforce - are not familiar with SIP construction • Modifications to the initial project can be difficult and costly to accommodate • SIPs will need to be protected during construction • Less fire-resistant. Requires fire protection	

Level	Mark	Descriptor
0	0 marks	No rewardable material
1	1-3 marks	Basic arguments for both forms identified, **or** only one form considered. The answer could be in the form of a list. Points made will be superficial/generic and not applied/directly linked to the situation in the question. The learner demonstrates a basic understanding of cavity wall and SIPS construction.
2	4-6 marks	Arguments for and against are described, but there will be more emphasis on one side than the other. The answer will be unbalanced. Most points made will be relevant to the situation in the question, but the link will not always be clear. The learner demonstrates a good understanding of cavity wall and SIPS construction.
3	7-8 marks	Balanced explanation of both sides for and against. The majority of points made will be relevant and there will be a clear link to the situation in the question. The learner demonstrates a developed understanding of cavity wall and SIPS construction.