Mark Scheme (Results)

Summer 2017

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 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)	**One** mark for each of: Fire protection – Use of a sprinkler system Weather resistance – Use of falls	(2)

Question Number	Answer	Mark
1(b)	**One** mark for each of: • Slump • Compressive or cube test Up to a maximum of **two** marks. Accept any other appropriate answers.	(2)

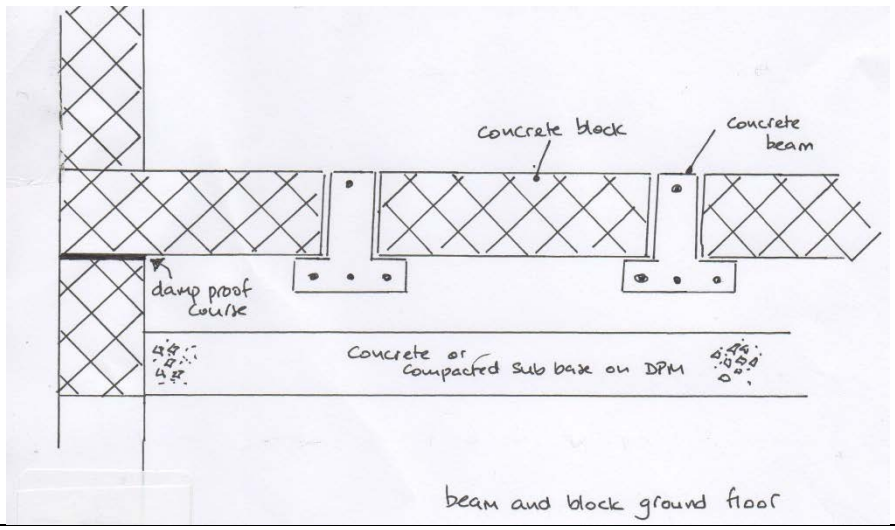
Question Number	Answer	Mark
1(c)	**One** mark for either: • Visual • Machine Up to a maximum of **one** mark.	(1)

Question Number	Answer	Mark
2	**One** mark for each of: • Demolition of existing buildings • Removal of vegetation • Tree removal • Recycling of materials (on brownfield sites) • Specialist disposal of material e.g. asbestos • General disposal of rubbish e.g. fly tipping Accept any other appropriate answers. Up to a maximum of **two** marks.	(2)

Question Number	Answer	Mark
3(a)	**One** mark for each of: B – To provide accommodation of services D – To provide a level surface	(2)

Question Number	Answer	Mark
3(b)	**One** mark for each of: A – Screed C – Chipboard	(2)

Question Number	Answer	Mark
4	**One** mark for each of: A – Recessed E – Flush	(2)

Question Number	Answer	Mark
5	**One** mark for each component up to a maximum of **four** marks. Marks should be awarded for the appropriate placing of the components of the sketch. • Beam • Block • Concrete • DPM • Screed • Vapour barrier • Vent/Periscope vent • DPC • Hardcore • Floor finish • Insulation • Ground Level Example of an acceptable sketch with appropriate labelling:  	(4)

Question Number	Answer	Mark
6	**One** mark for each labelled component: (i) – Breather membrane/membrane (ii) –Tie/Wall tie (iii) - Plasterboard/alternative wall finish (iv) – Insulation (v) – Sole plate	(5)

Question Number	Answer	Mark
7	Any **two** from the following explanations of the sustainability advantages of structural insulated panels **One** mark per advantage identified, and **one** mark for a linked explanation, up to **two** marks per explanation. • Uses renewable material (1) as timber/green panels are sourced from managed forests (1) • Reduced waste (going to landfill) (1) due to fewer offcuts/better quality control/factory made, etc. (1) • High level of energy efficiency (1) due to the extent of insulation incorporated in panels (1) • Reduced impact on the local natural environment/animal habitats/community (1) due to reduced time on site (1) • Method produces an energy efficient building/lower energy usage (1) due to the thermal value of the panels, efficient form of construction, air tight structure, limited cold bridging (1) Up to a maximum of **four** marks. Accept any other appropriate answers.	(4)

Question Number	Answer	Mark
8	**One** mark per advantage identified, and **one** mark for a linked explanation, up to **two** marks per explanation. Up to a maximum of **four** marks. • Lower tender prices for the client (1) because of familiarity with the site assembly process (1) • Restaurant is ready to generate income quickly (1) due to the speed of erection (1) • Economies of scale for the restaurant layout (1) due to the repetition of design (1) • Brand image is easily incorporated into prefabricated design (1) through factory production processes/ease of incorporation of different material finishes (1) Accept any other appropriate answers.	(4)

Question Number	Answer	Mark
9(a)	**One** mark for each of: B– Double pitch D– Lean-to	(2)

Question Number	Answer	Mark
9(b)	**One** mark per maintenance benefit identified, and **one** mark for a linked explanation, up to a total of **two** marks. • Reduced risk of ponding/standing water leading to maintenance issues (1) because (all four sides are angled and) water runs off (1) • Typically a longer lifespan (1) and more durable than a typical flat roof (1) • Slate/tiles are unaffected by sunlight/heat e.g. blistering/rippling, etc. (1) therefore the roof does not require reapplication of solar coating (1) Up to a maximum of **two** marks. Accept any other appropriate answers.	(2)

Question Number	Answer	Mark
10(a)	**Four** marks for two reasons explained. **One** mark for each reason identified, and **one** mark for a linked explanation, up to **two** marks • Formation level may require extensive excavation (1) which leads to disproportionate costs on sloping ground/resulting in land fill and pollution issues (1) • May become uneconomical (1) due to complexity of formwork and aspects relating to the design (1) • May require a greater amount of concrete (1) which is not a sustainable form of construction (1) • Rafts are designed for unstable ground (1) and generally not used for sloping sites (1) Up to a maximum of **four** marks. Accept any other appropriate answers.	(4)

Question Number	Answer	Mark
10(b)	**One** mark per reason identified, and **one** mark for a linked explanation, up to **two** marks. • The low bearing capacity of the soil increases the required width of the strip foundation (1) therefore piling becomes a more economical solution (1) • Piles transfer loads to a greater depth (1) where soils with better bearing capacity are found (1) • Less excavation required (1) resulting in less off-site disposal of surplus material (1) • Minimal impact on the ground (1) reduces the risk of encountering further poor ground conditions(1) • Piling has a stabilising effect on ground conditions (1) as it penetrates various strata (1) Up to a maximum of **four** marks. Accept any other appropriate answers.	(4)

Question Number	Indicative content	Mark
11	Advantages of brickwork: • Aesthetically pleasing • Traditional form of construction, trusted by most homeowners • Durable • Low maintenance • Better fire protection than other materials • Further promotes sound/thermal insulation Disadvantages of brickwork: • Difficult to repair when damaged • Requires skilled workforce resulting in increased construction time/costs • High embodied energy to produce materials Advantages of tiling: • Easy to repair • Ability to insulate behind tiles • Decorative effect – aesthetically pleasing • Long service life Disadvantages of tiling: • Tiles themselves may be costly • Difficult to install at height • Easily damaged – prone to wind damage • If tiles fall off people can get injured • High embodied energy to manufacture • Requires special detailing around openings • Each tile has to be nailed – time consuming and can increase costs Accept any other valid response.	(8)

Level	Mark	Descriptor
	0	No material deserving of reward.
1	1–3	A few points identified. The answer is likely to be in the form of a list. Points made may be superficial/generic and may not be applied/directly linked to the situation in the question. The learner shows basic understanding of cladding.
2	4–6	Some points identified. The answer is unbalanced with a greater focus on one form of cladding. Most points made will be relevant to the situation in the question, but the link will not always be clear. The learner shows good understanding of cladding.
3	7–8	Range of points described, explained in depth. Both types of cladding are considered and the answer is well-balanced. The majority of points made will be relevant and there will be a clear link to the situation in the question. The learner shows well developed understanding of cladding.

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