

6720-044 and 544 June 2018

6720-35 Level 3 Advanced Technical Diploma in Constructing the Built Environment (Design and Planning) (540)

1	Name two secondary building elements commonly found in domestic properties.		
	Acceptable answer(s)	Guidance	Max marks
	Any two of the following at one mark each. <ul style="list-style-type: none"> • Doors • Windows • Partitions • Staircases • Fixtures/fittings (max one mark) 	n/a	2
2	Describe what is meant by the term 'security' in terms of the performance requirement of buildings.		
	Acceptable answer(s)	Guidance	Max mks
	Marks as shown up to a maximum of two marks. Security means ensuring that only those people who should be able to access a building do so (1) and to deter individuals from attempting entry (1). Damage to property (1) Securing of building (1)	Accept a suitable example if correct.	2
3	Name two components of a suspended ceiling.		
	Acceptable answer(s)	Guidance	Max mks
	Any two of the following at one mark each: <ul style="list-style-type: none"> • Concealed Tee-section hangers in metal or plastic. • Exposed Tee-section hangers in metal or plastic. • Tiles, trays, boards or strips for panels. • Panels made from fibreboard, plasterboard, fire-retardant plastic. 	Accept brackets. Do not accept joists.	2
4	Name the type of foundation that is a large concrete slab which covers all of the ground under a building.		
	Acceptable answer(s)	Guidance	Max mks

	Raft/Mat.	n/a	1
5	State two disadvantages of traditional methods of construction.		
	Acceptable answer(s)	Guidance	Max mks
	Any two of the following at one mark each. <ul style="list-style-type: none"> • Labour intensive. • Longer build times. • More waste generated. • Low levels of mechanisation. • Weather dependent. • Generally more expensive. • Less sustainable • Less prefabricated components 	n/a	2
6	Explain how Energy Performance Certificates (EPCs) are used to support improvements to the energy performance of domestic buildings in the UK.		
	Acceptable answer(s)	Guidance	Max mks
	A coherent and linked explanation to include some or all of the points made below. Marks as shown to a maximum of six marks. All domestic and commercial buildings in the UK available to buy or rent must have an Energy Performance Certificate (EPC). (1) You must order an EPC for potential buyers and tenants before you market your property to sell or rent.(1) If you own a home, getting an energy performance survey done could help you identify ways to save money on your energy bills (1) and improve the comfort of your home. (1) An EPC contains: information about a property's energy use and typical energy costs (1) and recommendations about how to reduce energy use and save money. (1) Supports comparisons with other buildings (1)	An example of how a building can be improved can be accepted as an answer for 1 mark per example (e.g. boiler, sustainability/reducing the usage of infinite resources/reduce carbon footprint).	6
7	Explain why 'thin joint' construction techniques may be specified for masonry walls.		
	Acceptable answer(s)	Guidance	Max mks
	Max of two marks: Thin joint construction is a masonry wall construction technique which replaces conventional 10mm mortar joints (1) with 2 - 3mm joints (1) using a special adhesive mortar (1). Max of three marks: This technique of 'gluing' blocks together results in a significantly faster build time (1), less waste (1), less materials	Do not accept less skill needed.	5

	and plant required on site (1) and improved energy efficiency (eg walls with improved U values and air-tightness) (1).		
8a)	What is the term for concrete that is moulded, formed and cured in a controlled environment, transported to site and lifted into place?		
	Acceptable answer(s)	Guidance	Max mks
	Precast.	n/a	1
8b)	What is the term for concrete that is poured into formwork on site, where it sets and hardens?		
	Acceptable answer(s)	Guidance	Max mks
	In situ.	n/a	1
9	Define the following terms as they apply to ground improvement techniques.		
9a)	Consolidation.		
	Acceptable answer(s)	Guidance	Max mks
	Consolidation expels water from soil.	n/a	1
9b)	Compaction.		
	Acceptable answer(s)	Guidance	Max mks
	Compaction expels air from soil (1) OR Soil being pushed to reduce space (1)	n/a	1
10	Describe one advantage of a green roof.		
	Acceptable answer(s)	Guidance	Max mks
	Any one of the following at one mark for identification and one mark for a brief description. <ul style="list-style-type: none"> Reduces heat losses through the roof in winter (1): leads to both energy and cost savings (1). Reduces solar gain in summer (1): reduces cost of cooling and air conditioning (1). 	Also accept sustainable method (1) plus a brief description (1).	2

	<ul style="list-style-type: none"> • Improved energy efficiency (1): less greenhouse gas emission and, once again, lower costs (1). • Plants pick up airborne pollutants (1): improves air quality in big cities (1). • Absorbs rainfall (1): reduces flow of water into surface water system (1). • Aesthetic values (1): looks nice and offers a pleasant environment (1). • Additional space of a different kind (1): provides a relaxing recreational space (1). • Wildlife (1): supports biodiversity (1), wildlife habitat (1) 		
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11a) Identify the type of floor shown in Figure 1.



Figure 1

Acceptable answer(s)

Guidance

Max mks

Beam and block floor.

n/a

1

11b) Identify **one** advantage of this type of floor compared to a timber floor.

Acceptable answer(s)

Guidance

Max mks

Any **one** of the following at **one** mark:

- Rigid construction.
- Better sound insulation.
- Quicker installation.
- Safe working platform.
- Generally less expensive.
- Ability to support greater imposed loads
- Maintenance
- Easier to slot together.
- High compressive strength.

Do **not** accept strength on its own.

1

12	Explain why laminated timber may be specified for a portal framed beam.		
	Acceptable answer(s)	Guidance	Max mks
	<p>Marks as shown below to a maximum of four.</p> <p>A linked and coherent explanation that includes any of the following at one mark each.</p> <ul style="list-style-type: none"> • Environmentally sustainable • Flexibility of shape and size • Good aesthetic appearance • Excellent strength to weight ratio • Durability • Consistency of performance • Good fire resistance • High strength and dimensional stability • Environmental performance • Less labour intensive because it is pre-fabricated, (quick to assemble/ease of erection) • Less waste • Improved quality assurance. 	Do not accept high strength on its own, strength to weight ratio needs to be stated.	4
13	Explain one benefit of using a deep strip foundation for an industrial building in good ground.		
	Acceptable answer(s)	Guidance	Max mks
	<p>For either of the following, one mark for identifying a benefit and one mark for the explanation of how it's beneficial.</p> <ul style="list-style-type: none"> • Cheaper (1): either none of the costs associated with setting out rafts, ring and beam or piled foundations (1) or less plant and labour required. (1) • Quick and easy (1): only need to excavate trench and pour concrete to required depth (1). 	n/a	2
14	Explain why a monitor roof might be preferred to a traditional flat roof for a wide-span building.		
	Acceptable answer(s)	Guidance	Max mks
	<p>Marks as shown to a maximum of six marks.</p> <p>A monitor roof is either a raised structure along the ridge of a double-pitched roof (1), with a second roof running parallel to the main roof containing windows or louvres (1). Or a roof with a series of raised structures with glazing on one elevation across the roof (1).</p> <p>Wide-span buildings lack natural light in the middle (1). The structure of a monitor roof provides natural light (1), ventilation (1) and space for services (1), all of which are</p>	n/a	6

	valuable in wide-span buildings, none of which is provided by a flat roof (1). All other suitable answers.		
15	Name two groups of people, classified in a risk assessment, who could be placed at risk because of construction works.		
	Acceptable answer(s)	Guidance	Max mks
	Any two of the following at one mark each. <ul style="list-style-type: none"> • Employees. • Employers. • Visitors. • General public. 	n/a	2
16	Identify the term used to denote 'an unplanned event or occurrence, resulting in injury or damage'.		
	Acceptable answer(s)	Guidance	Max mks
	Accident.	n/a	1
17	Describe the purpose of an on-site health and safety induction.		
	Acceptable answer(s)	Guidance	Max mks
	Marks as follows to a maximum of three marks. An on-site health and safety induction is given to employees new to the industry or company to explain the company policies and/or procedures on health and safety (1) and to prepare the new employees for work in a hazardous environment. (1) An induction may also be given to experienced employees who will be working on a new site for the first time (1) on the grounds that all sites are different and will present different hazards (1).	Also accept: hazards and risks associated with the sites (1) Welfare facilities (1) Reporting of accidents (1) Legal requirements (1)	3
18	Explain why an experienced and qualified construction worker, who has a CSCS card, still needs to obtain a 'permit to work' for particular tasks on site.		
	Acceptable answer(s)	Guidance	Max mks
	Marks as shown to a maximum of four marks. CSCS cards are proof that a construction worker has the necessary accreditation/qualifications to do their job (1). They also require the successful completion of a health and safety test. (1)	n/a	4

	Permits to work are formal procedures (1) used to control high-risk activities (1). They allow only authorised personnel (1) to perform those activities at specified times (1) and in specified ways (1).		
19	Explain why weather conditions should be taken into account when performing risk assessments for on-site tasks.		
	Acceptable answer(s)	Guidance	Max mks
	A linked explanation to include some of the points made below, up to a maximum of four marks. <ul style="list-style-type: none"> • High winds (1) can bring down scaffolding and cranes, carry sheet materials away, create dust, blow workers off ladders and make work at height very dangerous (1 mark for any example). • Extreme temperatures (too hot or too cold) can affect the dexterity with which workers operate (1) and can cause sunstroke if too hot and frostbite if too cold. (1 mark for any example). • Lightning causing explosions, electrocution and fires. (1) Especially dangerous in cranes and on scaffolding (1 mark for any example). (1) • Heavy rain reduces visibility and creates mud making working and site traffic dangerous. (1) • Fog reduces visibility, and is especially hazardous for site traffic. Limits work that can be undertaken. (1) 	n/a	4
20	Describe how the CDM regulations impact on the design considerations for a building.		
	Acceptable answer(s)	Guidance	Max mks
	A description that the design must be able to be constructed (1), used safely (1) and managed and maintained (1) safely. Max two marks.	n/a	2
21	State four design measures a designer can implement to assist in reducing the embodied energy of a building.		
	Acceptable answer(s)	Guidance	Max mks
	Any four from the list below at one mark each: <ul style="list-style-type: none"> • Specify locally produced materials (1) • Reuse materials from other projects (1) • Specify materials with low embodied energy (1) 	n/a	4

	<ul style="list-style-type: none"> • Use renewable energy sources to power the building (1) • Specify the use of grey water systems (1) • Use SUDS systems on the site (1) 		
22	Describe how aesthetical considerations can impact on the design of a building.		
	Acceptable answer(s)	Guidance	Max mks
	<p>Maximum of two marks.</p> <p>A coherent linked description that considers the implications on the design of a building due to the aesthetical considerations. Candidate may consider issues such as the local 'look' and style (1) and the need for a building to 'fit in' (1), this may include the need to change how the building looks from the outside (1), change the layouts or orientation (1) to satisfy the requirements of the planners (1).</p>	n/a	2
23	Explain how local authorities develop planning policies for their local area.		
	Acceptable answer(s)	Guidance	Max mks
	<p>A coherent linked explanation:</p> <p>To develop the Local (Development) Plan (1) the local authority will consult with all relevant stake holders (1) and consult with national planning polices (1) and planning frameworks (1). The LA will produce a draft local plan (1) that will go through consultation and approval before being fully adopted (1).</p> <p>Max two marks from the below (if stated):</p> <p>The typical areas for consideration include; Housing (1), retail (1), infrastructure (1), education (1), health (1) law enforcement (1), energy (1), the historic environment (1), the natural environment (1), and flooding (1).</p>	n/a	6
24	Explain the contractual relationship between client, contractor and contract administrator.		
	Acceptable answer(s)	Guidance	Max mks
	<p>A coherent linked explanation.</p> <p>Max two marks from the following:</p> <p>The contractual links are between the client and contractor (1), client and contract administrator (1). There is usually no direct contractual link between the contract administrator and the contractor (1).</p> <p>Max two marks from the following:</p>	n/a	4

	The client employs the contractor and they both sign a contract (1) this contract is then managed by the contract administrator (1). All three parties are named within the contract (1) however, breach of contract can only be by the main parties to the contract (1) and failure to perform by the contract administrator would be dealt with by a spate agreement for the employment of the CA by the client (1).		
25	<p>A construction company has purchased a large plot of land that was previously used for agricultural purposes. The intention is to construct a housing estate with a range of properties from single-bed starter homes up to larger four-bed family homes, and a low-rise discount supermarket, on the site.</p> <p>The local authority has indicated that it will only approve projects that serve the local community and are aesthetically acceptable, sustainable, of low environmental impact, use modern methods of construction, and seek to reduce or eliminate accidents during the construction process.</p>		
25a)	Explain how the local authority can make decisions on the aesthetics of the project.		
	Acceptable answer(s)	Guidance	Max mks
	By consulting drawings, materials specifications and models of the proposed development and photographs/images of similar existing developments (any three at one mark each).	n/a	3
25b)	Summarise the documents used to help reduce risk on the site during construction.		
	Acceptable answer(s)	Guidance	Max mks
	A linked comparison of the purpose and use of risk assessments (1), method statements (1) and COSHH information sheets (1).	n/a	3
25c)	Discuss how the construction company will meet the requirements of the local authority.		
	Acceptable answer(s)	Guidance	Max mks

<p>Intention: <i>The aim of this question is to allow candidates an opportunity to demonstrate their knowledge and understanding of the construction of a new housing estate with commercial aspects underpinned with a clear coherent understanding of the local authority planning department, sustainability and health and safety.</i></p> <p>Band 1 (1-4 marks) The learner provides limited responses to be presented to the local authority, and there is little in the way of description with several inaccuracies. There is some limited reference to construction methods but the learner’s response lacks detail and is not clearly linked to the scenario. At the upper end of this band, answers will make some reference to the scenario and show an understanding of the links between good practice and health and safety and the requirements of the local authority planners.</p> <p>Band 2 (5-8 marks) The learner provides a wide range of responses to be presented to the local authority, with reference to different options for the construction of the properties (both residential and commercial), and supports this with brief descriptions. The learner’s response is detailed but incomplete and has clear links to the scenario in most cases. At the upper end of this band, answers will show an understanding of the links between methods of construction, health and safety and sustainability and will detail how the needs of the local authority could be met.</p> <p>Band 3 (9-12 marks) The learner identifies a comprehensive range of responses to be presented to the local authority, including a broad range of methods of construction for the residential and commercial properties, and supports this with in-depth descriptions and comparisons. The learner’s response is detailed, complete and technically accurate, with clear and accurate links to the scenario. The learner will show and accurate understanding of how construction methods contribute to improve health and safety and sustainability and the aesthetics impact on the area. At the upper end of this band, answers will consider the implications and impact of the different methods in terms of aesthetics, sustainability and health and safety.</p>	<p>Indicative Content</p> <p>Modern pre-fabricated methods of constructing domestic properties and commercial buildings. Sustainable techniques that reduce waste, use of locally-sourced materials and components, outcomes of site investigations and their effects on construction practices and the health and safety practices and procedures used to reduce incidents on site during construction, methods of presenting design information in order to gain planning approval.</p> <p><i>For no awardable content, award 0 marks.</i></p>	<p>12</p>
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