6720-042 and 542 March 2018

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

6720-37 Level 3 Advanced Technical Extended Diploma in Constructing the Built Environment (1080)

Q	Acceptable answer(s)	Guidance	Max marks
1	Any **two** of the following at **one** mark each. • Dense monolithic concrete walls and floors. • Tanking (Bitumen). • Drained cavity systems.	Do **not** accept DPM, DPC or techniques for dewatering the site, e.g. pumps.	**2**
2	Any **two** of the following at **one** mark for identification and **one** mark for a brief description as shown. • Tiles (ordinary roofing tiles, fitted as they would be to a sloping roof). • Timber boards (match boarding or shiplap fixed to horizontal or vertical battens). • Plastic board sections (proprietary, fixed in same way as timber boards). • Masonry (brickwork/blockwork/rendered). All other suitable answers.	**n/a**	**4**
3	Any **three** of the following at **one** mark each. • Higher quality product. • Controlled production costs. • Reduced build time on site. • Reduced labour requirement. • Better thermal insulation. • Better sound insulation. • Better airtightness. • Increases efficiency.	Do **not** accept formulaic responses like 'time', 'cost' and 'quality' unless further developed. Reference to economy of scales will be accepted for 1 mark.	**3**
4	Marks as shown to a maximum of **three**. • The choice of foundation is not dependent on the bearing capacity of the ground here (1). • The deep strip would be preferred because fewer man-hours are required to create it (1). • Less-skilled trades are required or more cost effective (either for max 1 mark). • The use of ready-mix concrete is cleaner and easier to manage (1). • To aid future conversion (1).	**n/a**	**3**

	• No foundation blocks needed (1) Or any other suitable answer.		
5	A linked explanation of the steps taken to address the relevant issues, up to **four** marks as shown. • Access for construction plant and cranes (1) (use mini-hoists, work at night and on Sundays) (1). • Accommodating modular construction into non-modular buildings (1) (use bespoke modules) (1). • Replacing traditional materials with modern materials (1) (sympathetic materials matching) (1). • Use of Site Waste Management Plans or SWMP (1). All other suitable answers.	Do **not** accept conservation areas or similar. The answer **must** relate to modern methods of construction.	**4**
6	A linked summary of the steps taken to address the relevant issues, up to **four** marks as shown. • Fire detection systems linked to positive actions: smoke alarms linked to sprinklers or closing doors (1). • Compartmentation (1) Fire doors and components (1): Confinement/slowdown of fire/resist for a certain time. • Material specification: choose low flammability materials (1) or treat flammable materials (1). All other suitable answers.	**n/a**	**4**
7	Any **two** of the following at **one** mark each. • Local roads. • Existing structures. • Existing services. • Trees or wildlife (either for max 1 mark) All other suitable answers.	**n/a**	**2**
8a)	Deep basements, underground stations, tunnel approaches, pumping stations (any 1).	**n/a**	**1**
8b)	Because the excavation is very deep and battered slopes are prohibitive (1).	**n/a**	**1**
9	Any **two** of the following at **one** mark for identification and **one** mark for a descriptive statement, to a maximum of **two** marks per method. • Bolts (1): fitted into pre-drilled or punched holes (1), fitted to end plates or flanges (1), on-site (1). • Rivets (1): fitted into pre-drilled or punched holes (1), still seen but no longer used (1), on-site (1). • Welds (1): stronger (1), neater (1), high level of skill required (1), off-site (1).	**n/a**	**4**

10	A coherent justification that includes **three** of the following arguments. • Primary schools = children, children eat soil (pica), which must therefore be uncontaminated/ particular susceptibility of young children (1). • Those working on the site should not be exposed to dangerous chemicals in contaminated land (1). • Working on contaminated land may release leachates into water table (1). • Dusts or vapours released during construction can be dangerous both then and afterwards (1). • Low availability of land means brownfield sites need to be remediated (1). Or any other suitable answer.	**n/a**	**3**
11	A coherent explanation that includes **three** of the following points. • Glulam is more sustainable than steel. • Glulam has lower embedded energy than steel. • Glulam is more aesthetically pleasing than steel. • Glulam can more easily be formed in a curved shape. • Glulam does not corrode, but steel does. • Glulam can be treated to behave better in fire than steel will. • Glulam is an electrical insulator, no need for bonding.	**n/a**	**3**
12a)	A coherent explanation of the following. Marks as shown to a maximum of **three** marks in total. A DPM below the concrete protects the concrete bed (1) from the ingress of moisture (1) and harmful salts (1) whereas placing the DPM above the concrete is simpler (1).	**n/a**	**3**
12b)	A coherent explanation of the following. Marks as shown to a maximum of **three** marks in total. There is a risk of damage (1) to the DPM during placement of the concrete (1) whereas if the DPM is placed above this will not happen (1) but concrete is at risk from moisture and salts (1).	**n/a**	**3**
13a)	Any **two** of following at **one** mark each. • High winds • Heavy rain • Low temperatures, e.g. snow/ice (max 1 mark) • High air temperatures • Excessive sunshine • Fog (poor visibility).	**n/a**	**2**
13b)	Any **one** of following at **one** mark.	**n/a**	**1**

	• Noxious fumes • Reduced oxygen levels • Fire • Flooding/drowning • Asphyxiation due to dust, grain or other contaminants.		
14a)	Any **one** of the following at **one** mark for identification. • Concrete breakers and pokers (used to break-up concrete and to compact fresh concrete). • Sanders, grinders, disc cutters (used to smooth off surfaces or remove irregularities). • Hammer drills (used to drive items into solids and to create holes). • Chainsaws (used to reduce the size of large pieces of timber and similar). • Scabblers, needle guns (used to roughen the surface of concrete). • Wacker plate	Do **not** accept drill or electrical drill.	**1**
14b)	Any **two** of the following for **one** mark. • Special low-vibration tools. • Anti-vibration gloves. • Limit daily exposure. • Regular monitoring of workers. Any other suitable answer.	**n/a**	**2**
15	A coherent explanation of the following. Marks as shown to a maximum of **four** marks in total. They will be complying with the law (1), they can see where they are doing well and where they are doing less well (1), they will be able to correlate activities with incidents (1), they will have information to support changes in working practices (1), they will be able to monitor the changed working practices (1) and they will have the data needed by the HSE in case of an investigation (1).	Accept: Improving the firm's image (1) Reducing insurance costs (1) Training (1)	**4**
16	A coherent explanation of the following. Marks as shown to a maximum of **four** marks in total. The construction process involves the use of many materials which are hazardous to health (1). The responsible people must find out what the health hazards are (1), assess the risks involved (1), provide control measures to reduce harm to health (1), and make sure that they are used (1) or they may be legally liable (1).	**n/a**	**4**
17a)	Marks as shown below up to a maximum of **two**. Bags of cement should be stored under cover (1), in a ventilated store (1), off the ground (1) and in such an order that stock rotation is easy and obvious (1).	**n/a**	**2**

17b)	Marks as shown below up to a maximum of **two**. Common clay bricks should be stacked on clean firm ground (1), near the work to be done (1), in separate piles according to type (1) and stacked no more than 10 bricks high (1).	Accept that bricks are stored outside so long as they are covered. Also accept that bricks must be stored in a way to prevent risk of failing.	**2**
18a)	Both of the following at **one** mark each. • Purchase • Hire	**n/a**	**2**
18b)	Marks as shown to a maximum of **two** marks. Supervisor identifies previously unidentified or emergency requirement (1) in terms of what is needed/when it is needed/how long it is needed for (any 1). Supervisor contacts buyer at head office who then researches possible suppliers (1). Supervisor to check condition of plant on delivery (1). Or any other suitable answer.	**n/a**	**2**
19	A coherent explanation of the following. Marks as shown to a maximum of **five** marks in total. They should do all they can to reduce the impact of construction activities on anyone affected by their work (1) and should aim to leave a positive impression on their neighbours (1) by reducing noise, dust and dirt (any 1). They should provide clean and appropriate facilities (1) for all those who work for them, treat every employee with respect (1) and follow the company health and safety policy at all times (1). They should do all they can to reduce any negative impact they may have on the environment (1), and should work in an environmentally-conscious and sustainable manner (1).	**n/a**	**5**
20	A coherent explanation of the following. Marks as shown to a maximum of **five** marks in total. **Template 1** is for a risk assessment (1) and The site supervisor may complete risk assessments (1) on occasion but will always be required to comply with risk assessments written by others (1). **Max 3** **Template 2** is a title block from a working drawing or anything similar (1). The site supervisor will not create the working drawings (1) but will use them to direct the construction phase of the project (1) to produce the buildings depicted in the drawings (1). **Max 2**	Template 2 – drawing document or archive note is an acceptable answer.	**5**
21a)	A clear evaluation of any **three** of the following as they apply to the project in question: health and safety training, quality control, materials management, day-to-day management, liaison with the construction team and external bodies (3).	Also acceptable is issues associated with first time undertaking a job like this or learning on the job.	**3**

21b)	Either raft or pile foundations could be used (1). Other foundations are unsuitable with soil of variable strength (1). A raft foundation is more appropriate as it is easier and less costly (1).	**n/a**	**3**
22c)	**Intention:** **The aim of this question is to allow candidates an opportunity to demonstrate knowledge and understanding of the sustainable methods and techniques used to construct a new build commercial building, including the selection of appropriate foundations, and convert an existing domestic building to provide access, both to and within that building, for elderly and disabled persons, using good health and safety practices. There should be consideration of the challenges presented by the above to the construction staff used to supervise the construction project.** **Band 1 (1 – 4 marks)** The learner identifies a limited number of construction methods to be used, but there is little in the way of description. The learner's response lacks detail and is not clearly linked to the scenario. To access higher marks in this band, learners must present the methods to be used in the correct chronological order **Band 2 (5 – 8 marks)** The learner identifies a wide range of construction methods to be used and supports this with brief descriptions. The learner's response is detailed but incomplete and has clear links to the scenario in most cases. To access higher marks in this band, learners must describe the good health and safety practices associated with each of the specified methods. **Band 3 (9 – 12 marks)** The learner identifies a comprehensive range of construction methods to be used and supports this with in-depth descriptions. The learner's response is detailed and complete and has clear and accurate links to the scenario. To access higher marks in this band, learners must provide evidence of having considered the relative cost and efficacy of each of the specified methods.	**Indicative content:** sub and superstructure forms, primary and secondary elements, components and materials, performance expectations, environmental issues, access and disability issues, renewable energy, sustainable construction techniques, types and uses of foundations, practical implementation of health and safety regulations. ***For no awardable content, award 0 marks.***	**12**