





6720-544 MARCH 2018 Level 3 Advanced Technical Diploma in Constructing the Built Environment (540)

Level 3 Constructing the Built Environment – Theory Exam

| If provided, stick your candibarcode label here. | Thursday 2: 09:30 – 12:3 | 2 March 2018 30 | |
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| Candidate name (first, last) | | | |
| First | | | |
| Last | | | |
| Candidate enrolment number Assessment date (DDMMYYYY) | Date of birth (DDMMYYYY) Centre number | Gender (M/F) Candidate signature and declaration* | |
| If any additional answer sheets are used, enter the additional number of pages in this box. Please ensure that you staple additional answer sheets to the back of this answer booklet, clearly labelling them with your full name, enrolment number, centre number and qualification number in BLOCK CAPITALS. All candidates need to use a black/blue pen. Do not use a pencil or gel pen. If provided with source documents, these documents will not be returned to City & Guilds, and will be shredded. Do not write on the source documents. *I declare that I had no prior knowledge of the questions in this assessment and that I will not divulge to any person any information about the questions. | | | |

You should have the following for this examination

- a pen with blue or black ink
- a non-programmable calculator

General instructions

This question paper is the property of City and Guilds of London and should be returned after the examination.

- This examination contains **22** questions. Answer **all** questions.
 - Answer the questions in the space provided.
- The marks for each question are shown in brackets.
- Show **all** calculations.

3

| 1 | Name two methods used to waterproof basements. | (2 marks) |
|---|-------------------------------------------------------------------------------|-----------|
| | | _ |
| | | _ |
| 2 | Describe two techniques used to clad timber-framed domestic buildings. | (4 marks) |
| | | _ |

Identify **three** benefits of volumetric domestic construction techniques.

(3 marks)

Explain why an architect might recommend a deep strip foundation (or concrete trench fill), shown in Figure 1, for a domestic property even though the ground is of good bearing capacity.

(3 marks)

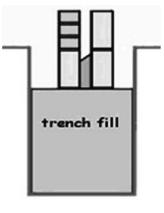


Figure 1

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| | , | f working can be overcome. | (4 m _ |
|-----------------|-----------------------------|---------------------------------------|-------------------------------|
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| | | | - |
| mmarise the tec | nniques used to provide fir | re resistance in a domestic building. | - - - (4 m |
| mmarise the tec | nniques used to provide fir | re resistance in a domestic building. | - - - (4 m |
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Name **two** items of the existing built environment that should be in a site investigation report for a proposed development.

(2 marks)

8

a)

b)

Identify a project for which a diaphragm wall might be specified.

State the reason why a diaphragm wall was specified for that project.

| (1 mark) |
|----------|
| (1 mark) |

| 9 | Describe two methods used to connect structural steel beams and columns. | (4 marks) |
|---|---------------------------------------------------------------------------------|-----------|
| | | |

| 10 | A local authority intends to construct a primary school on land designated as contaminated. |
|----|---------------------------------------------------------------------------------------------|
| | Justify the time and expense required to remediate the land before construction can start. |
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| Explain why laminated timber (glulam) beams and columns may be preferred to steel for the structural frame of industrial and commercial buildings. | | | | |
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(3 marks)

(3 marks)

A damp proof membrane (DPM) can be included either above (Figure 2) or below (Figure 3) the concrete in a solid concrete floor.

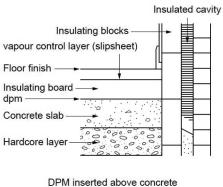
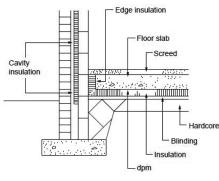


Figure 2



DPM inserted below concrete Figure 3

| a) | Explain why it was decided to place the DPM below the concrete. | (3 marks) |
|-----------|------------------------------------------------------------------------------------------|-----------|
| | | |
| b) | Explain why placing the DPM below the concrete may put the integrity of the DPM at risk. | (3 marks |
| Sta a) | te: two hazards associated with the weather conditions on a building site | (2 marks) |
| b) | one hazard associated with working in a confined space. | (1 mark |

13

| 14 | a) | State one construction tool, or item of equipment, that may cause hand arm vibration (vibration white finger). | (1 mark) |
|----|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| | b) | Describe two ways of reducing hand arm vibration (vibration white finger). | (2 marks) |
| 15 | | lain how a construction company can benefit from collecting statistics on fatalities, or accidents, minor injuries and near misses. | (4 marks) |
| | | | |
| | | | |
| 16 | stru | lain why those responsible for the design and construction of buildings and actures should understand the main requirements of the Control of Substances cardous to Health (COSHH) Regulations. | (4 marks) |
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| design team for a new build school. | (4 marks |
|---------------------------------------------------------------------------------------------------------------------------|----------|
| Describe what is meant by the term TPO. | (2 marks |
| | |
| State the year in which the following items of legislation were most recently enacted. a) Town and Country Planning Act. | (1 mark |
| b) Building Act. | (1 mark |
| Explain how the concept of Buildability is used in modern construction design. | (5 marks |
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(5 marks)

| explain the role of the NHB | C in the design a | na construction | i oi new nouses. | |
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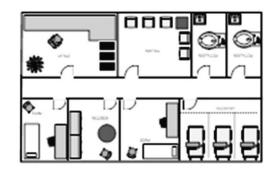
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A property development company has purchased a large detached property that was constructed in the 1920s and which stands in its own grounds. The house is in good condition but has never been modernised. The intention is to convert the house into a residential nursing home and to also construct a new single-storey building in the grounds, on soil of variable load-bearing capacity. This building will function as a clinic specialising in the treatment and care of the elderly, both from the nursing home and from the wider community.

The local authority has requested that the developers consider the following issues.

- Sympathetic conversion of the old house.
- Care, comfort and privacy of the occupants.
- Access to and use of the buildings for elderly and possibly disabled persons.
- Use of modern, sustainable construction techniques to construct the clinic.
- Use of good health and safety practices throughout the project.





Property to be converted

Proposed floor plan for new clinic

| a) | Evaluate one suitable structural form that could be used for the new build clinic. | (3 marks) |
|----|-------------------------------------------------------------------------------------------|-----------|
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| | | |
| b) | Justify the selection of a foundation to be used for the new build clinic. | (3 marks) |
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| | | |

(12 marks)

| buildings in order to meet the criteria required by the local authority. | | | | |
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