

PRINCIPLES OF DESIGN AND CONSTRUCTION (20CVP322)

Semester 1 2020-21

(1b) Exam paper

This is a (1b) online examination, meaning you have a total of **2 hours plus an additional 30 minutes** to complete and submit this paper. The additional 30 minutes are for downloading the paper and uploading your answers when you have finished. If you have extra time or rest breaks as part of a Reasonable Adjustment, you will have further additional time as indicated on your exam timetable.

You may handwrite and/or word process your answers, as you see fit.

Answer **THREE** questions.

All questions carry equal marks.

1. (a) Critically evaluate the main risks for both health and safety for the following tasks and situations:
 - i) Tower crane erection on a city centre construction site. [5 marks]
 - ii) Demolition of a hospital building which was built in the 1950s. [5 marks]
 - iii) Construction of the in situ concrete structural floors of a 20-storey high building. [5 marks]
- (b) Figure Qu1b summarises the Construction (Design & Management) CDM Regulations. Critically consider the challenges that would be faced by project teams that have not previously worked to these Regulations. [12 marks]

Question 1 continues/...

.../question 1 continued

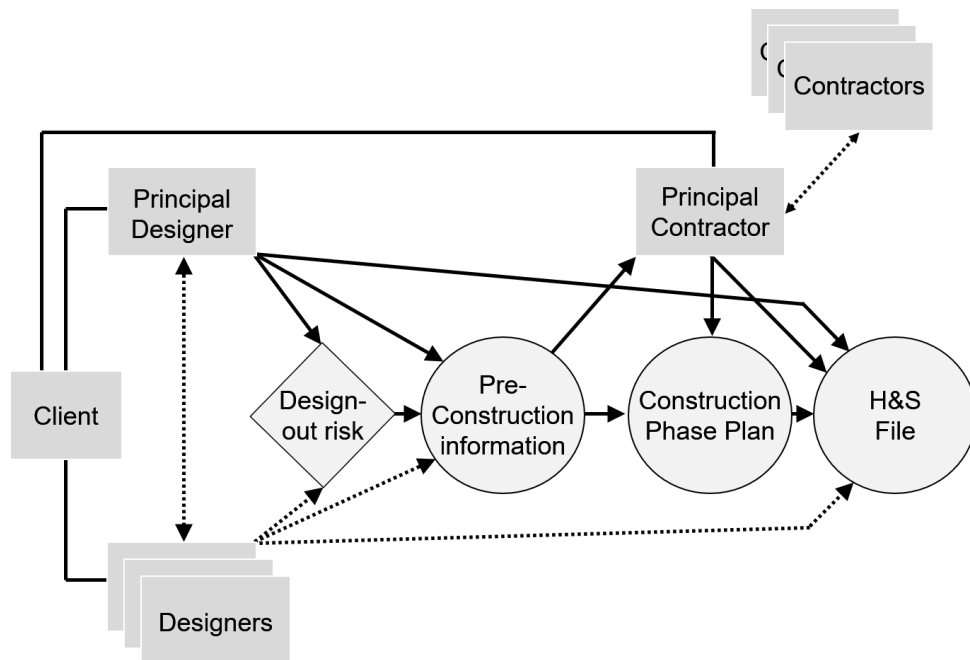


Figure Qu 1b: Construction (Design & Management) Regulations 2015

- (c) Discuss the significance of a change in societal culture regarding the sanctity of human life and its effect on occupational safety and health. [6 marks]

2.
 - (a) Inspection of tender documents is a vital step before the contractor makes a final decision to tender. Analyse the main aspects which the estimating team should explore within the tender documents before making the decision to tender and demonstrate the impact which these aspects could make on the estimate. [16 marks]
 - (b) Critically discuss four types of project overheads. [12 marks]
 - (c) Explain the differences between fixed overheads and time related overheads. [5 marks]

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3. (a) Using examples of existing building and civil engineering project frameworks, analyse the scope of the actions and responsibilities for the construction project stages. [11 marks]
- (b) "Planning software packages produce a professional construction programme. Therefore, we do not need to understand the theory behind various planning tools, their advantages, and disadvantages." Evaluate this viewpoint with reference to the Neale et al. (2016) Planning Toolkit. [11 marks]
- (c) With reference to the context of your home country, evaluate the relevance of Resource Analysis techniques to deliver a more successful construction project. [11 marks]
4. (a) The role of planning is important for consultants who advise clients on construction projects. Critically discuss the planning that needs to be undertaken by such advisors and the consequences of these not being undertaken. [11 marks]
- (b) "Lean Construction principles do not support the use of Network Analysis as a way of planning construction projects." How would construction project managers respond to this statement? [11 marks]
- (c) Covid-19 has severely impacted the construction of a major public infrastructure project. The client is concerned about low on-site productivity, delays, increasing project costs and poor reporting on progress. They have advised the contractor that a stricter regime of project monitoring and reporting will be required. Analyse how the contractor could assess the situation, the monitoring and control strategies available and the implications to their management of the project. [11 marks]
5. (a) Discuss and critique the various theories of design which have been proposed by scholars in recent decades. [16 marks]
- (b) Construction is undergoing a digital transformation. Discuss how digital concepts (such as *BIM*, *Common Data Environments*, *digital twinning*) are reshaping the role of the Design Manager. [17 marks]

A Gibb
T Hassan
P Carrillo
P Demian