

ENGINEERING TRIPOS PART IIB
ENGINEERING TRIPOS PART IIA

Monday 27 April 2009 2.30 to 4

Module 4D16

CONSTRUCTION AND MANAGEMENT

*Answer not more than **three** questions.*

All questions carry the same number of marks.

*The **approximate** percentage of marks allocated to each part of a question is indicated in the right margin.*

There are no attachments

STATIONERY REQUIREMENTS

Single-sided script paper

SPECIAL REQUIREMENTS

Engineering Data Book

CUED approved calculator allowed

You may not start to read the questions printed on the subsequent pages of this question paper until instructed that you may do so by the Invigilator

1 (a) Briefly outline the hierarchy of plans and planning guidance for new major developments in England and Wales. What are Section 106 agreements? Present and discuss one example of a recent new development, outlining how the scheme was amended and developed in order to achieve planning permission. [50%]

(b) What is an Environmental Impact Assessment (EIA) and what is the content of an Environmental Statement (ES)? Briefly outline the stages of an EIA for a new large-scale construction project and give examples of the air and water quality aspects that would need to be included in the ES. [50%]

2 A firm of consulting civil engineers is advising a client on a large-scale development that includes a 40,000 seat stadium. Stadium design is outside their area of expertise.

(a) Describe what actions they might take to get a suitable design team appointed to prepare tender documents, how it would be made up and what ongoing procurement process they might recommend. [30%]

(b) Describe to what stage should the design be taken by the design team for tender, and what documents should be prepared for the tender. [30%]

(c) Describe how the successful contractor would organise the final design and the work packages, how they would control their costs and where the design responsibility would lie. Use examples from the lectures where possible. [40%]

3 (a) Discuss and explain the prevalence of sub-contracting in modern British construction. What different types of sub-contractor or sub-contract are there? How may their expertise be called upon at an early stage in the design process, and how may the work of the various sub-contractors be properly co-ordinated? Illustrate your answer by describing the input of one sub-contractor to the design of a major construction project. [50%]

(b) Select one major construction project, either in the UK or abroad, and address two or three major challenges that the main contractor had to face and how they were resolved. [50%]

4 (a) Under English law, what is the standard of care expected of a professional engaged in some aspects of construction work? Discuss whether there are procurement routes within which a professional may become subjected to a higher standard, should claims arise when things go wrong. What steps might a professional engineer take to ensure that they are not exposed to this higher level of liability? [50%]

(b) Outline the main features of professional indemnity insurance for engineers in construction, explaining what is and what is not covered by a typical policy. Who should take out such insurance, and why, and for how long? [50%]

(TURN OVER

5 (a) The concepts of 'risk management' and 'risk assessment' play prominent roles in discussion of the organisation of modern construction. Discuss these concepts briefly explaining the contexts to which they each apply, and outlining the various types of risks which are covered. Describe briefly giving examples:

(i) how construction contracts may take different forms so as to apportion risk differently to the parties involved; [30%]

(ii) how the various hazards arising in construction may be predicted and provided against. [30%]

(b) What scale(s) of risk are typically used in a simple approach to risk assessment for the design phase of a project? Discuss what sorts of hazards and risk might be covered in such an assessment, and why the concepts of acceptable risk and experienced contractors are of importance in this context. [40%]

END OF PAPER