

Solution to 1 : Outline

This question relates to the lectures by Brian Hannon of the City Council Planning Dept, and by Peter Gattie the Professor of Sustainable Development — and the site visit to West Cambridge, in its planning aspects, can be used for illustration.

(a) Mention Planning and Compulsory Purchase Act 2004, development plans, regional spatial strategy, local development frameworks — planning guidance documents etc. Decision process, discussion, conditional approval, section 106 agreement etc. Enforcement means, non-compliance, withdrawal of permission (affects value of site), demolition etc. [50%]

(b) Environmental Impact, compare situation without development to that arising with development, at certain time stages. Public ES statement, EIA directive, some projects do not need EIA, construction phase and completed development; acoustic, vibration, air quality, traffic, water: all need measurement, quantification, engineered improvement. [50%]

## Solution to 2: Outline

This question refers to the two lectures by Ian Liddell on the design process, and to the talk by Carolina Barros on her experiences as a designer in different circumstances — and the design aspects of the CAPE building (seen on the site visit) can be used for illustration.

(a) fairly standard building: concept, scheme design, design development, tender documents — followed by fabrication and construction design. Durrant House, fairly straightforward, all concerned familiar, consider options on structure, services etc, especially basement: costing based on scheme design on standard rate/unit area etc, just prior to tender more elaborate engineering calculations. With non-standard building, e.g. Serpentine Pavilion, needed rapidly, it may be necessary to cut corners, perhaps even work on exchange of letters without a contract, developing design as going along, involving contractors ad-hoc

for advice, very difficult to predict cost in advance —  
so not suitable for a client who wants cost certainty.

(3) Important to have regular meetings, and interchange  
of information, at the various stages, so that the  
various professionals "buy-in" to the design  
at each stage, and are clear about why  
decisions have been reached; Otherwise they  
might come back later and argue, from their  
own narrow viewpoint, for changes in the design  
— can be very costly. Their <sup>leadership</sup> responsibility usually  
rests on architect in early stages, gradually shifts  
to structural engineer and then services. Legal  
responsibility all depend on the contract and  
procurement route — e.g. main contracts under  
Design and Build, with consultants "rotated" to  
work under contracts often in a 2-stage contract.

[40%]

### Solution # 3 : Outline

(a) Main causes of accidents much as before:  
Falls from height, falling objects, vehicle accidents,  
trench collapses etc. Management important (i) for  
legal reasons (can be sued for negligence, or  
arraigned by HSE), and (ii) because of costs  
— loss due to accidents frequently of same order  
as contractor's profit or turnover.

History: various acts applying to different industries,  
Robens report: Health and Safety at Work Act 1974,  
applying to all workplaces including construction: bases  
on assigning responsibility and on risk assessments  
of all activities. Latterly Construction (HS at W)  
Regulation 1996 (dealt practice as building sites) and  
Construction Design and Management Regulation 1994, 2001  
and 2006 — apply to all designers and managers.  
Responsibility to risk-assess the design — are we

specifying work which is unsafe? , must consider how structure can be safely erected — and not necessarily rely on expertise of the 'experienced contractor'. Main responsibility in hands of "principal contractor", usually the main one — but all professionals involved in design have some duties all overseen by the 'planning supervisor'. etc. [60%]

(b) Risk assessment: brainstorming, identify hazards, then assess likelihood and severity — often on simple 1 to 5 scale — and overall assess using product. Tackle most serious first — eliminate, control/mitigate, maybe insure against the rare event with very serious consequences. Different contracts apportion risk differently — e.g. client bears all risk of late design information under a traditional contract, but contractor bears all risk under Design and Build. View of contract will vary according to risk seen — e.g. contractor may put in higher price to bear more risk. [40%]

## Solution to 4: Outline

The question relates to lectures on procurement by Katrina MacFarlane, the contractor's views by Vince Corry, the specialist sub-contractor Peter Miller — and to various aspects of the site visit to LAPE.

(a)(i) Traditional — consultant designs work for client throughout work fully designed prior to tender contractor prices work and lowest price wins. Tend to be adversarial, contractor wanting to make "claims" e.g. for late design instructions, since price was squeezed to secure jobs. But client feels that competition in tender gives lowest price/best value — though quality may suffer.

(b)(i) Design and Build — contractor takes full responsibility for all work, working to a short client's brief, perhaps employing designer under contract. Good for cost certainty, low risk to client — but possible premium to contractor for bearing responsibility. No client influence on design. Good for more routine projects?

⑧ Various form of 2-stage contract, intended to get contractor / specialist subcontractor "on board early" - if they bear expertise to bear, get more "buildability" etc. This was preferred by EMBIS for CU - initial selection of main contractor on quality / price / personnel / expertise: then switch to design-build, with consultants "involved" to work for contractor, tender for sub-contracts, agreed price. Example - CAPE at West Cambridge. [70/1]

⑨ (i) refers to lecture by Eddie Pugh, on building abroad - must study local scene: which contracts have they not experience it, etc.

(ii) This refers back to 2-stage contracts, with involved consultants. For specialist, may appoint also in a 2-stage process, as sub-contractor to main contractor. Advantages - expertise in forms design, buildability etc. Disadvantages - worries about whether the best price is achieved; consultants sometimes do not like involvement.

(30/1)

## Solution to 5: Outline

This refers to lectures by Anthony Lavers on law, and by Charles Hayward on professional indemnity insurance.

(a) 'Reasonable care and skill' is the standard expected of consultants under the traditional form of contract — if a defective building is put up, consultants not liable for damages unless they have failed to exercise "reasonable care" and the usual standard of skill.

Under "fitness for purpose" a contractor may have in effect guaranteed that there will be no significant defect in the product, whether or not skill was exercised in design and construction. A "collateral warranty" is a form of guarantee, by the designer, that the resulting work will be fit for purpose — a heavy liability. Designers can find that they are held to "fitness for purpose" if a defect arises,



and not just "reasonable care and skill", if they have been 'novated' to work for the main contractor in a design-and-build or 2-stage contract. Must avoid, by special clause in novation agreement - or possibly insurance agreement.

Designers have duties, under law of tort, to people not party to contract - not to be negligent, allow work to affect members of public adversely etc. And may also be subject to laws about planning obligations, sustainability etc. [65%]

⑤ PII : covers "claims arising" in the period of insurance, not buildings completed in insurance period. Indemnity for claims for negligence, inadequate work, failures of various kinds - and costs of defending action, legal fees etc. In practice a requirement for all professionals - firms, partnerships etc. Need to keep insurance alive as long as a claim may arise. (48%)