CONSTRUCTION AND ENVIRONMENTAL RISK: A NEW APPROACH? SEEKING THE WISDOM OF SOLOMON

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7 October 1997

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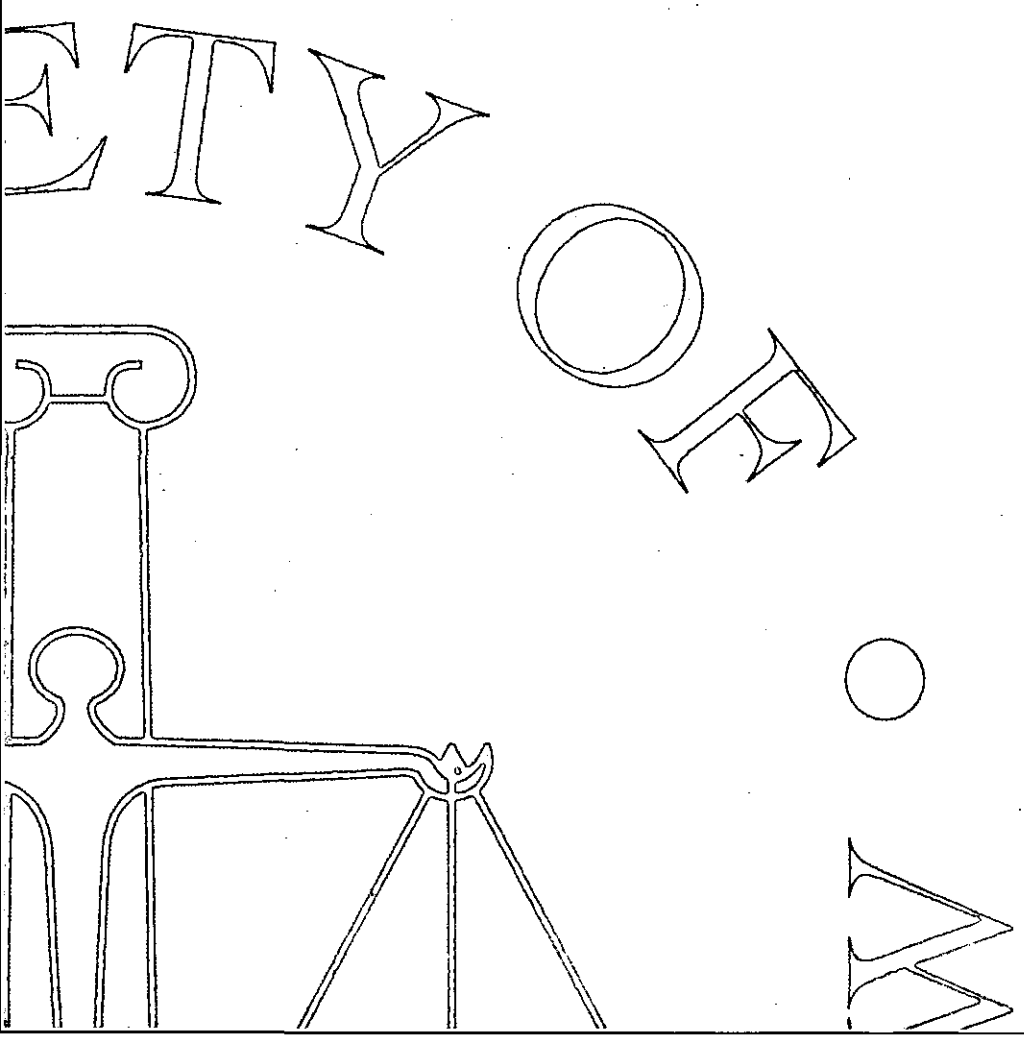

SOCIETY OF CONSTRUCTION LAW

Construction and Environmental Risk: A New Approach? Seeking the Wisdom of Solomon

by

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A paper presented to the Society of Construction Law at a meeting in London, 7 October, 1997

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1 Introduction

What are some of the practical issues raised by environmental risk? The employer - he will often give insufficient attention to the issue; his decision-making is often based on poor information and guesswork; he may have a limited awareness of regulatory issues such waste-disposal (prosecutions and other problems recently with disposal of construction waste). Contractors - they exhibit similar shortcomings; tenders fail to reflect the potential for costs and delay; this can lead to significant pressures which lead possibly to regulator intervention etc. Consultants - often have a patchy skill-base as regards contamination issues; their PI and contamination cover is often limited (or non-existent as regards the latter); such weaknesses can lead to a fundamentally-flawed strategy for project management etc. if they do not understand complexity connected with contamination. Funding institutions - they demonstrate a sensitivity to the issues that result, in many cases, to demands for a Rolls-Royce job; this approach can squeeze the developer/owner if the latter has not ensured that contractors etc. have taken an appropriate stance on risk. Regulators - those at the local level can be very zealous and eager to use enforcement sanctions to deal with problems such as waste disposal. Local planning authorities can vary in approach (depending on whether they have a financial stake in the land) - leading to different standards and, potentially, problems in the future with funding institutions, tenants etc.

What do we need? The wisdom of Solomon? Perhaps that is asking too much. However, I do suggest that we employ something similar. The "Solomon principle" (as revealed below) is perhaps the working basis for addressing environmental risk when faced with a development site.

2 The Solomon Principle

Why is Solomon so famous? The main reason is his "wisdom". But what made him wise? Was his intelligence the only factor? Was a command of religious and civil procedures the basis of his fame? Was a faultless mastery of architecture and masonry the only requirement for his being a successful project manager for temple development? I think that intelligence - an intellectual mastery of facts and figures - is only part of the equation. Wisdom is much broader. Wisdom implies experience and a deeper appreciation of fundamental issues. A mastery of facts and figures is only part of the answer. Wisdom implies an aptitude for politics, for understanding how communities and groups think and operate. It implies an instinctive grasp of psychology - an understanding of what motivates individuals and groups. Wisdom is not just about facts, numbers and spreadsheets. Experience and insight also come into the equation - an understanding of the human factor. Intelligence and a grasp of hard facts is not the whole answer. Dealing with contamination risk requires a similar breadth of skills. Knowledge is one element - but it must be allied to insight and experience - a knowledge of human psychology. I turn first to knowledge - an understanding of the facts and figures.

3 The Solomon Principle - Risk and Knowledge

Contamination poses a difficult problem for all concerned. At its heart is a fundamental issue - the lack of facts and figures. This knowledge gap is central - and tackling it is a key issue. Good intelligence about the underlying situation is essential if the Solomon principle is to play its part effectively. Contamination risk is something that does not necessarily jump out and shout its name. Much contamination is latent - and the problems posed by latent defects may well have a similar set of lessons for us when dealing with contamination risk. But discovering the nature and extent of contamination can be costly - and this is where owners, developers, employers etc. start to hesitate. Consultants can be over-enthusiastic about muddy-boots testing: if environmental consultants were to adhere to the BSI Draft for Discussion guidance on the assessment of contamination, the costs would be horrendous for a large site. Yet in many cases the knowledge gap can be filled by a less expensive and time-hungry

desk-top study. The experienced psychologist, like Solomon, can grasp the essential characteristics of the subject very quickly. The experienced consultant can form a reliable view of the problem without always resorting to detailed sampling. So, if no information is at hand, indicating the past uses of the site and surrounding area a desk-top study can often provide a reasonably clear picture of the risks posed. In many cases it can indicate that, on balance, there is little to worry about. Such information would then be used by the Planning Supervisor (an important person who needs to be brought on board early on) to address the tasks of risk management.

There may already be some indication that past uses might pose a problem. Such information may come from the process leading up to the grant of planning permission. There may be planning conditions that have been imposed as a result of known historical uses - or the general history of the area. Perhaps the site is in an area formerly dominated by Victorian manufacturing activity - before being cleared in the 1950s and 1960s. Thousands of municipal gasworks have long since disappeared - leaving only small clues but enough of a legacy to worry any bank that might be lending money for the construction. So consultants and contractors should watch out for streets with addresses like "Gas Lane" etc. when tendering for a project. In such cases, it may be pointless commissioning a desk-top study as the potential for contamination may already be sufficiently established. In such a case, some on-site investigations will be warranted. If soil investigations for stability etc. are being commissioned, it may well be opportune to broaden these to cover contamination issues. (Do not forget to address issues such as made ground when commissioning subsurface investigations - one of our clients forgot about this when relying on a report by environmental consultants. The report showed no contamination problem but did not address more general issues of soil stability - such as compaction risk. The clients assumed that ground conditions did not pose a problem. They were wrong. Much of the site was made ground and this added considerably to the cost of site-preparation works.)

Gaining a clear picture of the nature and extent of contamination allows the contamination risk to be quantified and managed more effectively. Naturally, this will involve a number of assumptions and caveats. Defining the extent of contamination

to the nth degree is not a practical and cost-effective course of action. Some consultants may well give the impression that they can provide a definitive assessment. So careful management of consultants is important - to prevent them running a standard suite of tests when a less extensive sampling protocol may well be justifiable (though bear in mind the funding institution's preference for cast-iron solution - if relevant). Another problem is plain English. Consultants are happier with their augers, sample bottles and test results: they rarely excel at concise, consistent and critical report-writing. They can go overboard with issues such as phytoxicity (which is often of little commercial relevance) - while forgetting to provide a "reliability assessment" - i.e. an assessment of the validity of the findings and conclusions. They often fail to provide different strategies - high capital cost/low maintenance, low cost/time-expensive and other such combinations. In some cases however it is the employer that is at fault: consultants can work best when they have clear guidance on what is "material" in terms of cost to the employer. If the employer is only concerned about problems that hit the £100,000 mark or mean a one month slippage, the consultant should be made aware. If the client only wants "commercial" advice from the consultant, he must provide some basic pointers on what, for the client, are the key commercial issues in the case at hand - and provide some quantifiable statement of their materiality. A good consultant will then be able to "take a view" on the risks discovered: he will be able to offer practical remediation options, be able to say what gaps there are in the assessment and how these could affect the risk. (An outstanding consultant will be able to form an accurate view on the client's perceptions of the commercial issues and get on with the job in an effective way. However, in most cases second-guessing the client may not be that easy for the environmental consultancy. This is especially the case as most of the actual assessment will be performed by relatively junior staff who have good technical skills but lack commercial experience and an understanding of how the client is likely to view the issues.)

4 Solomon Principle - Applied Psychology

The second key aspect of the Solomon principle is applied psychology. Wisdom is thus also about appreciating how people react to situations. If you remember the story of the child and the two women each claiming parentage you will see how Solomon's

wisdom operated. He knew how the real mother would react - that only the real mother would sacrifice her own interests for those of her baby. He may not have been able to predict precisely how the real mother would react - whether she would throw herself in front of the swinging blade or else give up her claim. Solomon did know, however, that his order to cut the baby in two would provoke a selfless act by the real mother. He knew she would do something dramatic to save that baby's life. So wisdom is also about predicting other people's reactions - understanding the psychological component. Solomon engineered a situation that would provoke a reaction that would reveal the truth. Solomon was, perhaps, the first psychologist. The Solomon principle is about knowing what makes people tick. Once you take that perspective then you can move on to dealing with the dubious behaviours of people and groups. So the Solomon principle, when faced with problematic behaviour, is also about analysing psychological responses (whether at the group or individual level) and then engineering a change in attitudes and behaviour.

How does applied psychology bear on contamination risk? First, many of the people involved in a construction project will be treating the challenges posed by that project in the way that they have always done. People do not like change. They feel comfortable with the standard answers to the standard questions. Some may realise that this is a risky strategy - but will, for the sake of winning the contract, overlook the risks and hope that they do not materialise. If this attitude affects the whole project, clearly risks such as those connected with contaminated land are not adequately addressed. The employer's staff overlook the knowledge gap; the architects and surveyors do not want to address the issue, as their PI cover does not extend to such issues; the planning supervisor is brought in too late anyway - and is rather more concerned with the obvious health and safety issues than worrying about the contamination problem.

Sometimes there are individuals who take a more appropriate stance - and avoid the standard responses to problems that are only dimly perceived. This might be to the advantage of the individual and group - I shall note how some developers can exploit the weaknesses in current approaches and make money out of the contamination fog. It is said that, in the land of the blind, the one-eyed man is king. But fear of the evil

eye of jealousy may often make him unwilling to announce his gift of sight: he could risk retribution from the herd and not only lose his sight but his life. So the group's preference for the status quo can be self-perpetuating. So, even though the group acts in ways that are counter-productive, the costs of this are often not examined. So contamination risk may often be swept under the carpet. Addressing such a risk means some extra expense - and the benefits of such "insurance" do not immediately make themselves apparent. It also means that individuals stand out from the herd. The wise player is the one who can steer the herd in a better direction: he is the one that tackles this institutional blindness head on - creating pro-active and effective procedures to address the risk in a cost-effective way. In terms of construction and environmental risk, this means, for example, that tendering procedures should ensure that the cost implications of addressing such risk are taken on board. Assessment of bids should reflect the importance of risk assessment and management. The industry needs to realise that the herd instinct is leading it into troubled (polluted) water.

5 Legislative Risk - Contaminated Land Regime Etc.

Before turning to some of the attitudinal/behavioural changes that put risk assessment and its management in a proper focus, it is perhaps pertinent to touch on the current situation as regards the contaminated land regime. Apart from the waste regulation regime and landfill tax, this is perhaps one of the key issues that needs addressing. However, the final form of this regime is still not clear. We have the legislative framework set out in the Environment Act 1995. However, the Environment Secretary, Michael Meacher, has gone on record as regards the present Government's concerns to examine that framework with a view to making two possible changes. The first would be to institute some sort of official "sign off" - thus permitting an owner who has carried out remediation to be assured that no further remediation will be required. The second would be to examine the appropriate defences against a charging order where a past polluter had, at the time, acted properly and yet still had caused the problem that now become manifest in a pollution problem which was serious enough to warrant action. The current draft of the Guidance has not met with universal acclaim. It is over-complex, badly-worded in parts and might lead to many cases of the public purse bearing the burden. Add to this the fact that local authorities are

poorly resourced and are unlikely to relish implementing the regime and we have a picture of continued confusion over this particular element of environmental law.

However, the contaminated land regime is not the only issue - and just because it might be amended or delayed is not a reason to ignore the general problem. Powers to deal with existing or imminent water pollution are going to be improved quite soon. Development activity resulting in water pollution can therefore result in action under a more effective regime than currently applies. This regime has some overlap with the contaminated land regime - though it is not subject to the same policy constraints/guidance as the former. Indeed, one concern among those responding to the guidance on contaminated land is that the water-pollution regime may well be a Trojan horse for rather more draconian action.

Existing legislative regimes (such as the waste regulation regime) are naturally still relevant. As more brownfield sites are pressed into use, the problems posed for dealing with contamination increase. In some cases, the site cannot easily be "cleaned" by the simple remedy of moving the contamination to one area and putting it under the car park. In many cases, the contamination will not just be waste - it may well be "special waste", to which a more rigorous set of standards apply. The Environment Agency is currently giving considerable attention to development sites where buried waste is being excavated and moved around. Projects that involve "special waste" problems invariably cost more and generate more regulator (and local press) interest. Invariably, the costs involved will be a bone of contention unless the contractual documentation clearly allocates responsibility. Risk analysis is thus essential - and this is where PFI may offer a clue as to future practice on all development projects.

6 PFI and Risk Analysis

Risk analysis has become institutionalised in PFI projects, since allocating risk to "the party best placed to control risk" is a fundamental aim of project agreements - as the PFI guidance puts it. However, this principle of risk allocation is difficult to apply where the "knowledge gap" prevents the parties from easily agreeing on who is "best placed to control risk". The risk that needs to be controlled can arise in two different

ways. First, there is risk connected with historical contamination of the land (often built-upon). The nature and extent of the contamination can only really be gauged when the site in question has been cleared - and, if below surface level construction runs deeper than the previous construction, the possibility of coming across material contamination cannot be discounted. Below-building contamination can therefore be a problem - especially as assessing it may not, for practical purposes, be a viable option. Historical contamination of open land is slightly easier (though still expensive) to assess. The second way in which the risk can materialise is through the act or omission of the contractor while engaged in demolition or construction. This can occur without there being any material contribution from pre-existing contamination. In this case, the Project Co is clearly best placed to control that risk and so should bear that risk. If problems arise from contamination affecting open land then, as long as the Project Co has had the necessary time to conduct appropriate tests, the Project Co should be able to assume such risk. The Project Co should also consider on-site migration of contamination from neighbouring properties - and the consequent risk posed for the project by this. The Project Co should thus be able to manage on-site, open space contamination risk, and off-site contamination risk if given the time to make the necessary investigations. With the first type of contamination risk (below-structure), the answer is not so simple.

Theoretically, the public body should be best placed to determine what has been the historical legacy of its use of the site. Yet this is not often that simple - NHS Trusts, for example, may not have the necessary documentation from which to construct such an historical profile of below-structure activities. As many city-centre hospitals have histories going back to early Victorian workhouses the historical picture can get rather hazy. NHS Trusts have resisted taking on contamination risk - a possible compromise may lie in their assuming liability for loss arising from pre-existing contamination under buildings (where intrusive investigation is difficult): this leaves the Project Co to assume liability for losses on open land.

The NHS Trust may find this acceptable if consultants can give comfort as regards the likelihood and nature of any risk posing a problem for redevelopment of land under buildings. (If the structure has been around for a long time, it may have effectively

sterilized the site - leaving only the risk posed by such pre-Victorian urban uses as plague pits to be of concern. Desk top studies drawing on local archives may help fill the knowledge gap in such cases.)

Project Co is thus left to carry out such investigation of open spaces and the boundary to assess the risks posed by any contamination that pre-exists the Project Agreement. This may need some care, given the location of old services, tunnels etc. found in some of the older hospitals. The depth of any boreholes and their number and spread is one of those issues that has to be left to the consultants to address. For the Project Co, it is important to construct a brief and appointment that gives the consultant a clear framework. A cost-effective strategy needs to be developed by the consultants. Clearly, with a construction project, the major risk is that posed to workmen involved in the demolition and site preparation stages.

The consultants should thus employ a thorough and consistent approach to the risk posed by contamination - using the source-pathway-receptor model. In this case, a key receptor will be the workmen engaged in site clearance and any remediation work. After this stage, the focus changes to employees, patients and visitors: off-site migration (particularly if this may affect groundwater) needs to be addressed. But, if the site is underlain by clay or other similar material, the risks posed by groundwater contamination are clearly going to be minimised, as the pathway to other groundwater resources may be cut. A good consultant will thus focus on the receptors and the ways in which relevant pathways will be cut. Hard surfaces and proper management of any soft landscaping areas should help prevent contaminants reaching employees, patients and visitors. Such treatment will not usually mean significant extra costs. Structural problems will often pose the greatest cost-burden: soil borings should be able to catch any relevant problems with ground conditions. The consultants should also be able to provide reliable estimates of cost and delay - the consultancy should have personnel experienced in executing remediation works and dealing with difficult ground conditions. A report on open space areas and the risks posed by neighbouring sites (from which contamination may migrate along stated pathways) should thus fill that information gap. Project Co will then be able to make a reasonable assessment of the

costs that may arise from pre-existing contamination. Such issues will then be factored into the whole package.

The PFI process creates a "market" when it starts with the pre-tender procedures. It could well be argued that Trusts should commission such a report (following standard procedures and protocols established centrally) at this early stage. Even if the report is not completed, at least participants could see that contamination is being given some attention and they could also review the terms of the consultants' appointment. (Questions regarding the validity of the final report could thus be handled more efficiently - and not left hanging.) This may be hoping for too much - but at least it would provide all those initially involved in tendering with a common baseline. In this way, the risk would be addressed upfront - not ignored. PFI could thus operate in a clearer environment - rather than stumbling around in the kingdom of the blind.

Information is a time-critical commodity. This is particularly true in the bidding situation - and where the information needs to be digested and perhaps analysed.

7 Other Factors

The above raises the issue of adopting a more pro-active approach to risk assessment and management in the context of a construction project. Such arguments may not convince everyone. Market imperfections and a shortage of reliable information may not be seen as posing significant commercial risks. Yet other factors are at play. Risk assessment and management may be imposed on players by other factors. There is the general rise in awareness of environmental issues. As noted already, funding bodies can be particularly difficult with environmental issues. This is unlikely to diminish. Developers may find themselves continually squeezed - and, as they exert pressure further down the chain, the industry will gradually adjust. Another factor is an increasing awareness among those involved with landholdings in the public sector that contamination issues need to be given more serious attention. This perhaps raises a wider issue relating to construction, contamination risk and the public estate. The legacy of munitions, nuclear weapons and other serious contamination is something which is an ever-present issue when public land is being sold or developed. (The

Environment Minister, Michael Meacher, acknowledged in early summer the problem posed by radioactive dumps at thousands of locations around the country.) Central and local government (even former nationalised industries) will perhaps start to look at this historical legacy and consider a strategy for dealing with these risks in a coherent manner. This is not to say that billions of pounds need to spent on clean-up. A risk-based strategy looking at those sites that pose real problems is the most effective way. When (if?) the contaminated land regime kicks in the management of environmental risk affecting the public estate will become a more visible issue. As land is sold off for development, the need to address contamination issues will continue to gain a higher profile and employers, consultants, contractors and other professionals will need to face up to the risks rather than push them to one side.

Another factor for construction professionals is the current Government's focus on regeneration - perhaps with a more local/social emphasis. Partnership is clearly going to be a major aspect of regeneration - privately-owned sites will be developed in a way which public sector agencies consider appropriate for long-term regeneration of communities. With the focus on reclaiming derelict and other such brownfield sites, the issue of contamination is clearly not going to go away. Whether the project is infrastructure or commercial/residential development, the risk posed by contamination will remain with us. Since public sector bodies will invariably be involved and democratic structures will probably be more evident, the visibility of contamination issues will not decline - it will probably increase.

Add to this the challenge of providing for those extra 4.4 million households (again with the emphasis on brownfield) and we see further evidence that the industry must start to look at the risks in an effective way. I need not make reference to the continuing restrictions on greenfield development and the commitment to develop an integrated transport policy, so that travel is reduced rather than encouraged. Development of new and existing sites in existing urban areas is going to be the norm for the next decade or so. Greenfield development is going to be reserved for the exceptional types of development - only justifiable if an existing urban location is not available - the "sequential test" instituted by the last Secretary of State for the Environment is clearly going to be applied to all development proposals. Development

of existing urban areas must the focus - once all existing out of town developments have been built out. The planning system and the general policy objectives of the Government in terms of regeneration and sustainable development indicate that all construction professionals need to open their eyes to the risks posed by brownfield development. Those who get in early will be able to benefit from the market imperfections that currently are enjoyed by a select few.

8 An Environmental Risk Matrix - Some Elements

If PFI offers some idea of a new approach, then a more explicit recognition of the need to assess and allocate risk in the relevant contractual documentation is needed. PFI encourages the use of risk matrices to focus on such issues - through, primarily, the thorny problem of risk allocation. In the context of environmental liability involving a development site, there are three principal parties:- the Employer, the Consultant and the Contractor. Risk-allocation under PFI suggests that those best placed to manage the risk should be given that risk. (This is a somewhat simplistic principle perhaps, but that is what the PFI approach currently says.) So what sort of risks might be subjected to analysis and allocation by a risk matrix that PFI practice applies to similar problems?.

- A major area is the risk arising from release of contaminants and creation of a source-pathway-receptor by way of the initial investigation, by intrusive means, of a site.
- (Non-intrusive investigation is very unlikely to lead to problems - unless it involves the consultants gaining access to areas not otherwise visited - and being exposed there to contamination from merely walking around.) As regards an intrusive investigation (often called a Phase II), the following activities might be addressed in a risk matrix:
- Locating underground services
- Obtaining necessary private-law licences to permit investigations
- Obtaining necessary public-law permits
- Addressing the health and safety issues as regards consultancy staff etc
- Ensuring site security - safety of public and trespassers
- Preventing vandalism/damage of contractor's plant and monitoring equipment
- Providing appropriate access to relevant areas for sampling and monitoring/processing

- Ensuring compliance with any waste disposal/effluent discharge controls when carrying out testing/reinstatement/disposal of sampled material
- Reinstatement of pits, boreholes, landscaping etc.
- Accidental damage to property or injury to third parties arising from any of the foregoing.

Some are relatively easy to assign. Providing access to the relevant areas should be for the employer to arrange; but, if the survey is being conducted before the land has been secured, the employer will probably have to agree the terms of a licence with the land-owner for such sampling - and ensure the appropriate matching of risks in any contract with the consultants/contractors involved in the sampling. Some will be more problematic - often involving that difficult issue of filling the information gap.

In terms of the detailed planning and execution of a remediation strategy, (sometimes referred to as Phase III) another set of risks could be addressed in a risk matrix. These include the following:

- Dealing with contamination that is significantly different from that indicated by the consultants' investigations
- Addressing the problems created by faulty monitoring and treatment facilities - (design or execution?)
- Impact of restricted access (operational requirements of occupiers etc.) on costs and timescale
- Other delays - late permits/licences, poor information, bad weather, plant breakdown etc
- Harm caused to property and/or people/livestock etc. because a source-pathway-receptor linkage is created - whether on-site, during transportation and at final disposal.

For each party, these risk will pose different issues and carry different weights. The Client may well take a view on such risks and assume some of them - but this should be done in an informed way. Signing the Client up to risks without getting that informed consent is not the way to keep clients - if things go wrong, the costs

associated with contaminated land can be very considerable. The pro-active lawyer will also advise on the factors they should be borne in mind when appointing consultants and contractors to deal with environmental issues. What skills and experience should they have - what will be the key competencies that they should demonstrate? The lawyer should also caution against a favourite Client tactic - trying to offload the environmental risk onto a consultants' PI cover! This may seem to be an appealing strategy, but often the PI cover is not really there (cover is rarely available, except on an aggregate basis) and this strategy is no substitute for the Client equipping himself with the appropriate knowledge and an understanding of the risks.

9 Building and Civil Engineering Contracts

In terms of drafting, the following points should perhaps be borne in mind. (I make extensive use of Marshall Levine's discussion in his FT Law & Tax "Special Report" on "Construction and Environmental Law" in this section of the paper.) Most standardised building contracts these days do not address the subject to the environment and as such the impact of environmental legislation at all. A traditional building contract, such as JCT '80, will provide an agreement between an employer and a contractor to carry out and complete works, as described in various contract documents, by a completion date and in accordance with certain criteria for the building works laid down in the contract documents, or elsewhere in the building contract. Usually, if the contractor is late in completing a project (that is, he fails to complete the works by the agreed completion date), unless the contractor can demonstrate to the independent architect's satisfaction that an extension of time can be claimed, thereby extending the completion a date agreed by the architect, the contractor will be liable to the employer for liquidated and ascertained damages, fixed at a pre-agreed rate in the building contract, for the period from the date the contractor should have completed to the date he does complete the works. This arrangement can be complicated by a mechanism under which the contractor is obliged to complete the works in phases or sections, in which case the contractor is obliged to complete the works in those stages and each of the stages can be extended by permission of the architect, on a claim being submitted by the contractor. If there is no extension, the contractor is liable in relation to the failure to complete each stage by the due date, to

pay the employer at the pre-agreed rate of liquidated and ascertained damages for later completion of such phase or section.

There are various ways in which, under the current format of UK building contracts, an environmental issue can present draftsmen of building contracts with problems.

(i) **Unforeseen ground conditions**

There may well be issues of liability as between the employer and contractor for an environmental problem arising on, under or in relation to the site, which was neither advised to the contractor by the employer, or which, if advised by the employer, turned out to be a problem far greater than that anticipated or advised. This may or may not have been covered in the tender documents. Moreover, issues may arise as to whether there is a misrepresentation or non-disclosure. Usually, under most building contracts (e.g. JCT 80), unless something is expressly stated or implied otherwise, the contractor takes the risk of adverse physical ground conditions.

(ii) **Extensions of time, loss and expense**

There may be issues as to how such events described in para 9.1 above affect the grounds for extending time under the contract and claims for loss and expense under the contract. Also, how will this impact upon the employer's right to claim or set off liquidated and ascertained damages under the building contract?

(iii) **Compliance with statutory requirements**

The way in which most building contracts are drafted obliges the contractor to comply with all Acts of Parliament, instruments, rules or orders made under Acts of Parliament etc., with regard to the works. In most modern forms of standardised contracts, these requirements are known as 'statutory requirements'.

The contract usually goes on to provide that, if there is a divergence between the statutory requirements and any of the contract documents, the contractor should give notice of any divergence and the architect is liable to issue an instruction in relation to the divergence, which could ultimately give rise to an instruction for a 'variation', which will itself possibly give rise to an extension of time and thus a claim for loss and expense under cl 26 of JCT 1980. The contractor also indemnifies the employer against liability for fees or other charges demanded under relevant statutory requirements but the contract sum is extended to reflect such fees or charges arising from compliance, unless they are peculiarly priced under the contract bills and included therein.

There are grounds, however, for assuming that the statutory requirements provision, as it impacts upon an obligation to comply with statutory requirements, as well as upon grounds for extensions of time, claims for loss and expense and claims and rights of set-off for liquidated and ascertained damages, does cover the full extent and effect of environmental legislation. However, the guidance suggested in para 9.1 above should be taken.

There is nothing under standardised UK building contracts which specifically and directly addresses the issues arising from breach or non-compliance with specific environmental legislation. This is the case in respect of both compliance with EC environmental directives, and in relation to compliance with national legislation, such as the Environment Act 1995, the Environmental Protection Act 1990, the Control of Pollution Act 1974 and other Acts of Parliament.

One view is that, as there is merely a reference to 'statutory requirements' throughout the agreements and an obligation on the contractor to comply fully with such requirements, this will necessarily ensure that the contractor assumes all responsibilities for compliance with environmental legislation. Another view is that, unless building contracts are amended to reflect and allocate specifically, the possible cost of compliance with environmental legislation, there is a risk that the contractors, through the principles enunciated in 'caveat emptor' or 'contracting party beware', may be taking on more liability than they imagine.

In this respect, for the future, it would be advisable directly to address environmental issues within the content of UK building contracts and update them to deal specifically with the subject of compliance with environmental legislation and the apportioning of risk and cost, rather than leaving matters to chance and interpretation. This is particularly relevant where contracts have been drafted without the benefit of identifying existing environmental legislation and particularly where environmental legislation is embryonic.

(iv) **JCT contracts**

It is very clear that 'environment' and 'environmental regulation' do not feature at all in the JCT regime. This must change. Although the contractor is obliged to comply with 'Statutory Requirements', if the contractor finds a divergence between the statutory requirements and the contract documents, the contractor must tell the architect under JCT '80, or inform the employer under JCT '81. The divergence could lead to the architect or client giving an instruction, leading to a variation and, in such circumstances, the contractor would be granted both an extension of time and, possibly, successfully pursue cost and expense claims under the relevant contractual procedures.

This is particularly interesting in the light of the publication of the Prime Cost Contract under JCT 1992. Under this agreement (cl 1.5), the contractor is to carry out and complete the works in accordance with the contract documents and the architect's instructions, as economically as possible (cl 1.5.1.1) and so as not to engage a greater number of persons upon the site than is reasonably required. However, if the architect considers that the contractor is not complying with these provisions, he may disallow costs. It seems, therefore, that if the project hits an environmental snag, there is considerable latitude given to the architect to decide who bears the cost. If these issues are not identified in the drafting, the provisions of cl 1.5 of the Prime Cost Contract leave the client and the contractor to the architect's mercy as to who bears the cost.

Clearly, the absence of any direct provision in relation to problems caused by environmental hazards, whether in the nature of adverse ground conditions,

compliance notices under the Environmental Protection Act 1990, duty of care obligations under s34 of that Act, or other notices or demands from local authority and waste management authorities, could lead to confusion and uncertainty within construction projects. It would seem that the clauses already existing in JCT '80 and '81 would ultimately work in the contractor's favour but much would depend on the extent to which the client or architect has included provisions in the preliminaries, or the bill of quantities, or in the drawings, or otherwise placed the risk of adverse ground conditions or receipt of unfriendly environmental notices or information on the contractor.

Matters become much more clear when the employer has commissioned an environmental study of the site and provides such a study and the problems and issues inherently arising from the conclusions to the study to the contractor as part of the tender package. In such circumstances, the building contractor should make it clear upon whom the burden and cost of compliance with such a study falls, as it affects the construction project and any environmental legislation emanating from matters identified in the study.

(v) Changes to building contracts - law and practice

It would seem that in the future, with the advent of more environmentally unfriendly sites being encountered in construction work, whether building, civil engineering, or howsoever arising, there will be a need to address the environmental issues in four ways. First, clarifying up front in the tender documentation, contract documents or the technical documents forming part of the contract, the extent to which environmental issues have been encountered and what issues need to be addressed in the carrying out of construction work. This will predetermine a need for environmental audits and enquiries on the relevant sites, which perhaps are not being done at the moment.

Second, once the issues are identified it would need to be stated in the contract, with suitable provisions which amend the normal 'care of the works', 'indemnity', 'extensions of time' and 'claims for additional loss and expense' provisions, to apportion the contractual risk of compliance with these issues. Either the employer

expects the contractor to assume the risk in pricing for the job, or albeit perhaps in more unusual circumstances, the contractor expects that the employer should assume the risk.

Third, it may well be necessary to separate out those risks which the employer should carry out and those which the contractor (or consultant) should carry and state them clearly through agreed lists.

Fourth, this exercise should probably form part of the total quality management approach to contracting and environmental issues should be specifically addressed in the quality manual or site safety manual for the construction project - bringing the role of the planning supervisor to the fore. (This emphasises, perhaps, the importance of ensuring that the planning supervisor is not just appointed as an afterthought - as seems to be the current approach. Managing risk - especially risk of an environmental kind - is the key task of the planning supervisor and a strategic approach to the whole project is something which he can help promote.)

(vi) **Civil Engineering Contracts - Introduction**

Turning to civil engineering, we should bear in mind the following warning - "By comparison with building work... it [civil engineering work] is in general much more attended by unexpected factors and unpredictable quantities of work which may affect its economics." Hudson's Building and Engineering Contracts, Chapter 2. In the same way as most standardised building contracts do not tackle as such the subject of environmental legislation and compliance by the contractor with such legislation, most civil engineering contracts these days address the problem of compliance with environment legislation in an oblique way.

Traditional civil engineering contracts such as ICE Conditions of Contract (6th edn.), or ICE Design and Construct Conditions (1st edn.) oblige contractors, under their standard terms and conditions to:

'take full responsibility for the adequacy, stability and safety of all site operations and methods of construction';

'be deemed to have inspected and examined the Site and its surroundings and information available in connection with it and to have satisfied [itself] so far as is practical and reasonable in relation to ground conditions and to have obtained all information in relation to risk contingencies arising thereto'.

In any event, the contractor who does encounter adverse site conditions which 'could not in his opinion reasonably have been foreseen by an experienced contractor' is entitled to give notice to the engineer to seek a variation claim. Therefore the contractor usually takes the risk of adverse site conditions. The matter rests with the engineer as to whether to grant an extension of time or accept a claim for loss and expense arising from such a request. In addition, the contractor is usually obliged to comply with all Acts of Parliament, regulations and bye-laws for any local statutory authority which relates to the works. In much the same way as the regime on building contracts, an environmental issue can present draftsmen of civil engineering contracts with several problems:

(vii) **Unforeseen Ground Conditions**

Issues of liability shared between the employer and the contractor for environmental problems arising on, under or in relation to the site which an experienced contractor could not have reasonably foreseen may be the responsibility of the employer. Alternatively, if the employer has made proper site investigations with information provided to the contractor as to the condition of the site (this may or may not have been provided for the employer by the engineer), a contractor would be hard pressed to argue that he had no notice of it or could not reasonably have foreseen its effect. As with most building contracts, under a civil engineering contract such as ICE Conditions Design & Build or FIDIC (4th edn.), unless something is expressly stated or implied otherwise under the contract, the contractor takes the risk of adverse physical ground conditions.

(viii) **Extensions of Time**

The impact of the contractor being able to seek additional time or claim for loss or expense arising from the need to seek compliance with environmental legislation, or deal with ground conditions arising from an environmental problem which was not foreseen or notified to a contractor and which no reasonable contractor could have identified, will need to have some impact on the programme for the project and the employer's right to claim or set off liquidated and ascertained damages under the civil engineering contract.

(ix) **Statutory Requirements**

There are definitive obligations under most civil engineering contracts requiring the contractor to meet contractual obligations. Unless stated otherwise, legislation such as the Environmental Protection Act 1990 and the Environment Act 1995 will be caught by these provisions. There may be protection for the contractor under the civil engineering contract (see cl 26(3) of ICE (6th edn), which states that the contractor is not required to indemnify the employer against the consequences of a breach of statutory requirements which is the unavoidable result of complying with the other terms and conditions of the contract or indeed an engineer's instruction. Therefore, if an engineer incorrectly instructs a contractor not to carry out work which is in definitive contradiction to environmental legislation, e.g. to ignore a noise pollution notice etc., the employer carries the risk.

(x) **ICE (Institute of Civil Engineers) 6th edition**

Under a typical civil engineering contract, there is no specific reference to environmental matters. Under cl 8(3) of ICE (6th edn), although the contractor assumes full responsibility for the adequacy, stability and safety of all site operations and methods of construction, ultimately, the responsibility for the works will be dependent, in environmental terms, upon the detail and adequacy of the contract documents and the extent to which compliance with environmental factors has been

spelt out in those documents. In other words, this is another situation where there is a need to ensure at the formulation of the contract where appropriate (and there will be an increasingly strong need to do this in the future), for the inclusion in specifications, drawings and instructions as to how to deal with matters which involve environmental concerns and drawing these to the specific attention of the contractor up front in the contract documents. When necessary, it will be sensible to go further and oblige the contractor to comply with its various obligations in relation to specific environmental regulation, or include provisions addressing environmental matters in the preparation of the health and safety plan to be produced by the engineer, acting as planning supervisor under the CDM Regulations. If this practice exists, the contractor will then know at tender stage to what extent any further cost should be contributed to compliance with environmental legislation. Also, cl 11(1) of ICE 6th Edition provides that the employer is deemed to have made available before submission of tender all information on ground condition, even if in reality he has not so provided. This provision has not really been understood. It is felt to mean that the contractor will always take the risk of ground conditions, but commentators have felt that this provision does not necessarily work. However, cl 12 of ICE (6th edn) does provide that, if the contractor encounters physical conditions or artificial obstructions, there are opportunities for the contractor to claim additional costs arising from physical conditions or artificial obstructions encountered on site, but only if the engineer confirms that the contractor could not have reasonably foreseen the difficulties. If the engineer decides that the conditions or obstructions could not have been foreseen, there is an opportunity for an extension of time and a further profit to be claimed by the contractor in relation to the extra costs incurred by it. Clearly, if an extension of time is granted, the employer's right to deduct liquidated damages is deferred.

FIDIC 4th edn

Although the FIDIC, the Federation International Des Ingenieurs-Conseils, (4th edn.) resembles the ICE contract in some ways, it does demonstrate something of an improvement in dealing with environmental risk. Thus there is a reference in cl 19.1 (i.e. the 'safety, security and protection of the environment' provision) which addresses environmental matters in a more direct way. This obliges the contractor to take all

reasonable steps to 'protect the environment on and off the site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of his methods of operation'.

Under cl 19.2 (the employer's responsibilities), the employer is obliged to have regard to safety on site and to keep the site in an orderly state to avoid danger to persons. There is no definition of 'taking all reasonable steps' and therefore FIDIC (4th edn) does not really apportion the responsibility of compliance in a sufficiently clear manner. In addition, the grounds for extensions of time do not refer specifically to environmental circumstances arising under cl. 19.1 to enable the contractor to extend time. Extensions of time are dependent upon the decisions of the engineer, after due consultation with the employer and the contractor. There is therefore no guidance or clear statement of the assumption of risk, indicating on whose shoulders liability should remain. Early statements of good practice referred to above in relation to ICE (6th edn) apply equally to FIDIC (4th edn).

(xii) **Other contracts**

Under IMech, IChem (lump sum and reimbursable) and GC Works 1 & 2, environmental issues have again simply not been addressed in a way which is now needed in the light of progressive and far reaching environmental legislation and therefore substantial redrafting to the standard forms would need to be encouraged in order to ensure that:

risk is properly apportioned;
the price of risk is allocated.

Much of the general commentary earlier in this section applies to these contracts as well.

10 Conclusions

A few well-informed developers already know that the market in development sites does not operate very effectively. They exploit the market - when it has undervalued a property. This happens when it responds to vague intimations of contamination. On such occasions, the market invariably over-reacts. If there is no information about contamination, a site that does in fact pose problems will be sold at an overvalue. Some canny developers thus rely on market imperfections to make sizeable profits. Even when contamination has been identified, there are often situations where preliminary estimates of costs (perhaps produced by consultants inexperienced in the actual planning and execution of remediation works) are over-stated. In such a scenario, the market operates imperfectly and so the landowner may be lucky or unlucky: if his site does have problems - but these are not discovered until clearance is underway - he may have secured a price above that which was justifiable. Other players can be caught out by such market imperfections. The developer may find himself footing the bill - or, as if often the case, the contractor (and particularly sub-contractors) will not have properly costed the job and will find that the job is quite a headache.

When the market operates inefficiently in this way, those who are likely to lose out should seek to reduce such inefficiencies by improving the information-base on which the market operates. Filling the knowledge gap makes sense - it enables the market in development land to work more efficiently and reduce the mismatch between the market price and the real value of contaminated land. Making profit from contaminated sites may be more difficult for the few but for the many the risks posed by inaccurate market valuation should be considerably reduced. PFI, with its focus on risk analysis, emphasises that this is the way forward. Questions about the contamination risk need to be posed: answers need to be provided. Information is the key. A risk matrix can help identify those aspects of environmental risk that need to be addressed in this way. The solution may not yet have been completely mapped out by PFI - but the key is there - information as the basis for effective risk assessment and management. Adopting this approach in a consistent and careful way should help the company in question make better decisions about the risk posed by contamination.

We should also consider the broader issue of addressing the need for changing attitudes on an industry-wide basis. The different players often have wildly different perspectives - not unnaturally, given the different impacts that addressing environmental risk can have on the employer, consultant and contractor. There is considerable merit in addressing these issues from an industry-wide perspective: after all, the standardization of contracts was itself based on a view that there ought to be some common ground established between the various players - to make the market work more efficiently by reducing the "transaction" costs. A similar meeting of minds (and perhaps the various professional bodies should be prompted to take up the challenge here) is required to address the problem of contamination risk. We have heard much in the last few years about avoiding the culture of conflict and being over-litigious. These costly traits will continue to trouble the industry unless the conflict-ridden issue of contamination is defused by the industry agreeing a more cooperative basis for assessing and allocating the risk involved. Perhaps a more cooperative spirit can be engendered through the Department of Environment, Transport and the Regions knocking a few heads together: it is struggling with the contaminated land regime - but putting some resources into tackling such problems by way of the development process could well be much more effective than solely relying on a complex statutory scheme for allocating the costs arising from for historical pollution. If the professions and/or the industry itself fail to meet the challenge, some goading may be required: changing attitudes is always painful but market inefficiencies can produce much more of a shock when an unquantified risk hits the balance sheet with a significant liability.

So if we return to a famous biblical building project - the temple of Jerusalem - we are reminded of the Solomon principle. This suggests that we can act more wisely if we use both hard intelligence and an understanding of how people (and groups) act in certain situations. The current environment promotes a short-sighted herd instinct that prefers to ignore contamination risk. That attitude perpetuates an ill-informed market in development sites. In such a situation, the market is an ineffective mechanism for establishing the true value of land. Those who rely on the market are thus relying on a very ill-informed pricing mechanism. A few developers profit from this - but many lose out as they find themselves ill-prepared to deal with a contamination problem that is more serious than they thought. Improving the quality of information about

contamination problems will make the market more efficient. The market will then provide a more accurate assessment of the price. All those involved will then be able to make more enlightened and accurate judgements about risk assessment and management. Opening of eyes to the risks and employing a consistent strategy towards risk assessment and management offers a way forward. Putting the Solomon principle to work will help us all build on sound foundations.