

Defects Associated with Sub-Surface Ground Conditions in Construction Contracts: A Comparative Legal Synthesis of Aspects of Risk Allocation in Kuwaiti, French, and English Law

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Abstract

No structure can be erected without ground support. However, preliminary investigation may offer little protection against sudden surprises. Topographical features are therefore of great significance for construction projects, playing a decisive role in cost estimates. It is necessary for a successful construction design to carry out a sufficient examination of the site, in order to determine the plan area available for proposed works, and the nature of the subsoil with view to deciding the correct design for foundations or methods of the underground working. The present paper purports to elucidate this concept in its legal framework. The plan of campaign in the legal analysis is a comparative one, with particular emphasis on the position of the Kuwaiti, French, and English Law. The purpose is to sketch some of the key questions in this area, and to assess the present state of the law. The discussion reveals that construction contracts essentially take as their standard the strict liability of constructors, *ie* architect/engineers and contractors; the soil risk is their risk, and their degree of responsibility rises with their technical qualifications. This topic is of particular importance to Middle Eastern and North African countries, in which civil codes draw extensively from their French counterpart. However, although these systems generally enforce a decennial liability scheme, many governments in the region, including Kuwait, has long adopted the FIDIC form for public works contract, albeit with considerable modifications. Statements and opinions as to the law in any jurisdiction should not be taken as definitive. In any particular instance, legal advice should be sought.

Keywords: construction law, Kuwaiti law, French law, English law, ground conditions, liability, contract, tort.

1. Introduction

Soil risk is the greatest unknown in the course of construction.¹ Its economic priority grew significantly in recent decades, due to an increase in subsurface works (tunnels, subways, *etc.*). It is typical for this *ratione soli* risk to play a significant role in construction contracts over all phases of building – including the guarantee phase. A variety of legal and financial consequences could be triggered when the building turns out to be defective because the ground is lacking sufficient stability. As per Catz, the unseen part of a floating iceberg that lies beneath the surface is the most fitting comparison for this situation.²

Various reports show that the largest element of technical and financial risk in building and civil engineering projects normally lies in ground-related problems,³ which lead to late completions, high cost overrun, in addition to legal complications (risks, liabilities, extension of time, *etc.*)⁴ Notwithstanding, comparative law literature reveals that very scant attention is paid to discussions about responsibility for defects resulting from sub-ground conditions; most of the little information available comes in the context of the discussion over adverse ground conditions.

Against this backdrop, the purpose of this paper is deliberately narrow. It is immediately concerned with the problem of defective works, which are attributed to the nature of the ground upon which construction work was carried out.

2. Sub-Surface Investigation Defined

Technically, sub-surface investigation refers to the geo-technical analysis of the sub-soil. It covers a wide range of studies on soils and foundations such as soil-structure interaction, soil properties and behavior, impact of groundwater table movement on building foundations, analysis of surface subsidence (sinkholes) and design of

¹ For more on the abstract notion of 'risk', see: Mashaël A. Alhajeri, 'The Risk Concept on Modern Tort Map: An Analytical Approach to English Law', *Kuwait University Journal of Law*, 25, no. 3 (September 2001).

² Jacques Catz, *Les constructeurs et le risque du sol* (Paris: Editions du moniteur, 1985), p. 253.

³ See generally: Julian Bailey, "What Lies Beneath: Site Conditions and Contract Risk", *International Construction Law Review*, 2007, p. 394. And see also: Ellis Baker and Michael Turrini, "The Underlying Problem: Negotiating the Ground Conditions Issue", a paper presented to the Society of Construction Law, London on 6 November 2012.

⁴ Wafaa Kanaan, *Unforeseen Site Conditions*, (Kuwait: Kuwait University Faculty of Engineering and Petroleum, n.d., unpublished), p. 10.

preventative and remedial measures against such subsidence, and load stability analyses for road embankment.¹ Other terms that denote this process are sub-soil investigation, ground investigation, and terrain investigation. In the due course of this discussion, these terms will be used interchangeably.

The object of these investigation surveys is to determine the soil composition, load bearing capacity, geological faults, erosion, unexpectedly shifting soil strata, hidden obstacles (drainage systems, cables and gas lines), occurrence and location of existing underground facilities, unforeseen underground water tables, and surprising deposits of bedrock.² Results of these studies provide an improved understanding of the behaviour of local soils under construction loads and the related potential impediments that make ground conditions the cardinal risk in every construction contract.

The said investigation can reduce the residual risk associated with unforeseen conditions to a level that is recognised as being tolerable within the project budget.³ However, of all the unknown quantities in a building, the substructure is the most variable, often the result of limited or no preparatory investigations. It is estimated that expenditure on site investigation as a percentage of total project cost is alarmingly low, ranging typically from a mere 0.1% to 0.3% in building projects. Over the past 25 years, ground investigation prices have been forced down in real terms that investigation today is often based upon minimum cost and maximum speed. This inevitably increases the risk of poor quality work.⁴

3. Sub-Surface Investigation - The Process

There are four normal stages for ground investigation: the desk study; site operations (*eg* installing stations to monitor areas of potential landslide or making long-term observations); laboratory and *in situ* testing; and the Report.⁵ Nowadays, the common practice is to engage the services of firms specialising in soil mechanics to take cores by drilling, and to produce from these cores a section drawing showing the strata at various depths and to test the cores. The procedure is necessary in order to furnish architects and engineers (hereinafter A/Es)⁶ with the information they need in order to determine the appropriate foundations for the site.⁷

It is customary to have these surveys and investigations prepared at the pre-investment stage of a project's life, for the purpose of design, cost analyses, and budgeting. However, there is no duty on the employer⁸ to carry out these investigations and surveys. But when actually done, it is essential to provide the contractor⁹ with whatever information available to the employer.¹⁰

Despite its significance, it is reported that in every construction practice, the soil risk is typically a 'remnant risk'; the nature of the matter does not allow for 100% preliminary investigations of the soil.¹¹ In this connection, Abrahamson observes that it is not realistic to expect site investigation to reveal ground condition in their entirety, but provided the data are analysed and interpreted correctly. He posits, convincingly, that:

"Although much site investigation is skimmed to well below a cost effective level, it is rarely economic to remove uncertainty completely, since that might involve opening up every metre of site".¹²

Notwithstanding, comprehensive site and geological surveys are essential and should be carried out by the employer and provided to the tendering contractors.¹³ Thus, the employer takes sample probes, makes these

¹ Civil and Building Department (CBD), *Geotechnical Engineering* (Kuwait: Kuwait Institute for Scientific Research, n. d.), p. 1.

² M. Coombes Davies, *The Laws of Contract Liability as They Specifically Relate to Architectural Practice* (PhD Thesis, 1985), p. 64; Christian Wiegand, 'Allocation of the Soil Risk in Construction Contracts: A Legal Comparison', *ICLR*, Vol. 6, Part. 1, Jan. 1989, pp. 282-309, at p. 282.

³ Kanaan, *ibid*, p. 12.

⁴ Kanaan, *ibid*, p. 11.

⁵ Jack Cottingham and Robert Akenhead, *Site Investigation and the Law* (London: Thomas Telford Ltd, 1984), pp. xi-xii.

⁶ The Architect/Engineer (*Maitre d'Ouvrage*) is normally the prime design professional who produces a set of plans and specifications on which the project is based. The architect has the contractual status to issue instructions and certificates assuring the supervision, coordination and quality of works executed to the client's account or benefit. He usually obtains the services of civil, structural, and electrical engineers as well as landscape architects. In civil engineering contracts, an engineer will perform the architect's role. The term architect/engineer will be collectively used.

⁷ David L. Cornes, *Design Liability in the Construction Industry*, 4th edn. (London: Blackwell Scientific Publications, 1994), p. 72.

⁸ The employer or the client (*Maitre d'Ouvrage*) is the party to whose account, and often on whose site, the construction project is being executed. The terms 'employer' and 'client' are used interchangeably; no special importance attaches to any of these terms.

⁹ The Contractor (*Entrepreneur*) is an individual or a firm licensed to perform certain types of construction activities. There are various types of contractors.

¹⁰ Nael Bunni, *The FIDIC Form of Contract: The fourth Edition of the Red Book* (Oxford: Blackwell Science, 1994), p. 163.

¹¹ Wiegand, p. 284.

¹² Max Abrahamson, 'Risk Management', *ICLR*, Vol. 1, part 3, pp. 241-264, at p. 252.

¹³ Peter Fenn, 'Review of International Practice on the Allocation of Risk of Ground Condition', *ICLR*, vol. 17, part 3, July

known and then communicates them to the contractor. The findings of the investigation report must be presented in a form adequate to design economically for the safe use and stability of the structures and the ground concerned.

The initial, though not always attainable, purpose of sub-soil investigations is for the employer to attempt to free himself of liability *vis-à-vis* the contractor as regards differing site conditions claims,¹ since the basic risk of ground conditions is the risk of actual conditions being different from those expected or anticipated. Accordingly, such clauses are commonly referred to as the ‘differing conditions’ clauses.² They are justified in that an equitable adjustment of the contract on discovery of differing conditions removes the contractor’s need to bid contingency, thus reducing the price in his tender.³

4. The Legal Position

4.1 Roman Law (*Vitium Soli*)

The distribution of risks resultant from the bad condition of the soil (*vitium soli*) in contractual relationships for contraction was known as early as Roman law in the Digests of the *Corpus Juris Civilis* (Emperor Justinian, 533 AD). Analysis of Roman position leads to the conclusion that the Romans considered the distribution of typical spheres of ground risks in a manner that has proved influential in civil law on the responsibilities of employers and constructors⁴ as they stand today.⁵

The position under Roman law is reflected by the following views expressed by several Roman jurists, as follows:

(a) Labeo conceives that, in cases of doubt, the contractor bore the soil risk until he could prove that he had fulfilled his portion of the work in accordance with the contract:

“When you commit yourself to build a sewer and begin the work, and then this collapses due to a cave-in before it has been approved, then you must carry the risk ...”⁶

(b) In a contrary view, Javolemus regards the soil condition as a risk allocated to the employer when the construction site is destroyed by natural geological forces (*vi naturali*), eg earthquake:

“Flaccus had taken over the construction of a house for Marcius, which again collapsed following completion of a part of the house due to renewed settling of the soil; Massurius Sabinus stated in this case that when it occurs on the part of the force of nature, such as earth slide, the damage affects Flaccus”.⁷

Paulus holds a similar position:

“If the unfinished building collapses due to a defect in the ground, the employer had to bear the risk”.⁸

(c) A fourth jurist, Florentinus, also dealt with the question of soil risk. He addressed the case of accidental destruction of the structure during a time by which the employer should have accepted the works, but failed to do so. He allocated the risk of this accidental destruction to the employer:

“When a work performance has been given out in its entirety, the contractor carries the risk until the structure has been accepted by the employer, however, in the event of a contract for measurements at the site with uniform prices, the risk lies with the contractor only as long as no measurements have been made; and in both cases, the employer is responsible to the extent that he is responsible for non-acceptance or non-measurement”.⁹

The collectivity of these views shows that the central principle was that, where there was doubt, the contractor bore the ground risk until he could prove that he had fulfilled his portion of the work in accordance with the contract.

2000, pp.439-453, at pp. 442-452.

¹ In the area of geological survey, it has been estimated that for an expenditure of less than 1% of the construction cost, differing site conditions claims averaging 28% of the construction price might be dramatically reduced. See: Robert J. Smith, ‘Risk Identification and Allocation: Saving Money by Improving Contracts and Contracting Practices’, *JCLR*, Vol. 12, Part 1, Jan. 1995, pp. 40-71; Fenn, p. 451.

² Fenn, p. 442.

³ *Ibid*, p. 441.

⁴ ‘Constructor’ (*Constructeur*) is a blanket term denoting any party engaged in or paid for designing, executing or supervising the works to the extent that renders him liable for defective works. Under some jurisdictions, eg France, the term also encompasses suppliers of materials. Throughout this paper, this term is collectively used to cover all construction professionals.

⁵ Lorenz, *Encyclopaedia of Comparative Law*, Vol. VIII: Specific Contracts, Chapter 8: Contracts for Work on Goods and Building Contracts, note. 126, p. 124.

⁶ D. 19.2.62.

⁷ D. 19.2.37.

⁸ D. 19.2.62.

⁹ D. 19.2.36.

4.2 France (*Vice du sol*)

In France, the government attributes much attention to sub-soil investigation practices. The most prominent specialist entity with regard to this process is *le Bureau de recherche géologique et minières* (BRGM).¹ Professionals who perform soil investigations are registered with the *Ordre des géomètres-experts*.² In terms of legal regulation, however, the effect of soil risk in construction contracts under the civil law system has been hardly investigated, as far as can be determined.

It could be said, in general, that in France, under both the law of private construction contracts, as regulated by the Civil Code, and administrative law for public works contracts, the prevailing rule is that the contractor is under a strict liability as regards damage caused by defects in the ground.³ Pursuant to Art. 1792:

Art. 1792 *Law No. 78-12, 4 Jan. 1978, Art.1-* Any builder of an edifice is liable as a matter of law towards the employer or purchaser of the edifice for damages, *even resulting from a defect in the ground, ...*.⁴

Thus, the law of defects liability in this regard absorbs the problem or risk distribution.⁵

The discussion below about risk allocation will be made with respect to the parties of the building and construction contract.

4.2.1 *The Employer*

Both of the two prevailing model contracts in France, the General Terms of the Contract for Private Construction Contracts (AFNOR)⁶ and the General Terms of Contract for Public Construction Contracts (CCAG),⁷ contain no rules on the obligation of the employer to inspect the soil and to provide corresponding information to the contractor. However, according to both the case law of the *Cour de cassation* on private construction contracts,⁸ and the view of the *Conseil d'Etat* regarding public construction contracts,⁹ the employer is under a duty to make known any known soil risks, although this position is not regulated by codified law.

4.2.2 *The Architect/Engineer*

The A/E is always under a duty to conduct sub-soil surveys, even when this task is not covered in the contract.¹⁰ Courts are very strict with regard to the A/E's obligation to investigate the ground that he is held liable even if the contract stipulates that the ground is presumably good for building on it (*le sol est présumé bon*),¹¹ or when the contract allocates this obligation to the contractor.¹² This, in addition to the stipulation with regard to decennial liability of article 1792, which explicitly holds him liable for all defects in the structure, even those attributed to the condition of the ground. This means that, in principle, the A/E must personally check the ground to ensure that it can bear the projected building; notwithstanding, he is not responsible for the occurrence of totally unpredictable events.¹³

This strict position as regards the A/E's liability in this respect could be linked with the position of French case law, which, as a general rule, constantly affirms that the A/E is under a duty to personally assure the condition of the ground and to verify through tests and surveys that it could support the contemplated structure.¹⁴ This is regarded as an essential obligation on the A/E's side.

4.2.3 *The Contractor*

The contractor is compelled, under Art. 1793 of the *Code civil français* (hereinafter 'CCF'), to obtain a written supplement to the contract for additional expenditures as a result of soil obstacles. He also has, under both private law and that for public construction contracts, a duty to warn the employer about negative attributes in the ground, eg excessive water content in the soil or instability to the construction subsurface during the

¹ Charles Cavallini and Yves Raffestin, *Le guide de la construction : les hommes, les moyens, les méthodes* (Paris: Edition du Moniteur, 1991). p. 86.

² J. L. Meikle and P. M. Hillebrandt, *The French Construction Industry: A Guide for UK Professionals*, p. 39.

³ For more on this, see: Mashael A. Alhajeri, 'Post-Construction Liabilities for Latent Defects in Building and Construction Contracts: The Theoretical Foundations and the Allocation of Risk – A Comparative Study in Kuwaiti, French, and English Law', (PhD thesis, University of Essex, 2004).

⁴ Emphasis added.

⁵ Liet-veaux, *Le droit de la construction*, 9th edn. (Paris: Editions CELSE), p. 337.

⁶ *Association de Normalisation* (French private sector contracts as opposed to government or local administrative contracts)

⁷ *Cahiers des Clauses Administratives Générales*.

⁸ Cass. Civ. 3e, Decision of 20 Feb. 1970; Bull. Civ. 1e, Decision of 17 Mar. 1969, *Recueil Dalloz*, 69, p. 532.

⁹ *Cons. D'Etat*, Decision of 21 July 1970, *Recueil Lebon*, p. 533.

¹⁰ Civ. 9 octobre 1962-D. 1963-I- not. Liet-Veaux.

¹¹ Cass. Civ. 1^{re}, 9 juillet 1975, *Bull. civ.* III, n^o 227, p. 173. This decision attaches this obligation to the A/E's duty to advise the owner.

¹² Cass. Civ. 3^{me}, 19 juin 1973, *D* 1973, somm. P. 141. In a contrary sense, however, see: Cass. Civ. 3^{me}, 20 juin 1979, *J.C.P* 1979. IV, 285.

¹³ Laure Le Servoisier, 'French Decennial Liability of Contractors', *Construction and Engineering Law*, Vol. 1, issue 4, October 1996, pp. 11-12. For more on the defenses with regard to constructors' liability, see, *infra*.

¹⁴ Cass. Civ. 1^{re}, 9 mars 1965, *Bull. civ.* I, n^o 174, p. 131; C.E 3 mai 1974, *Commune de Vierzon, G.P.* 1975, I, p. 121, note. F. Moderne; Cass. Civ. 3^{re}, 4 mai 1984, *J.C.P* 1984 IV, p. 220.

construction work.¹ This rule is founded on the doctrine of ‘good faith’ (*bona fides*) in the execution of contractual obligations.² It should be mentioned in this connection that the requirement of good faith is known to the Common Law on a significantly limited extent, being restrictive to insurance contracts and, in limited instances, performance of obligations.

As for defects that are subject to decennial liability, the contractor would still be liable even when the contract relieves him from this task through including a provision stating that the soil is presumably good for building on it (*le sol est présumé bon*).³

It could be concluded that the position in France under the CCF with regard to defects resulting from soil risk is not very favourable of constructors, *ie* A/Es and contractors. Although the employer is responsible for the soil within the framework of the programme that he sets up (eg employer’s obligation to draw the contractor’s attention to known soil risks), all contractual risks arising from soil condition are in principle allocated to the contractor, including those associated with post-construction defects.

Despite the constructors’ strict liability, attention has to be drawn here to that from one hand, a soil defect (*vice du sol*) could constitute a case of force majeure,⁴ and from the other hand, it seems that with regard to soil defects there is no presumption of liability (*présomption de responsabilité*) in the strict sense, but rather a presumption of fault (*présomption de faute*).⁵ Both facts mean that allowance could be made with regard to suitable defences against warranty.

4.3 Kuwait (*Oyoub Al-Turbah*)

In Kuwait, the most prominent government entity concerned with soil investigation is the Kuwait Institute for Scientific Research (KISR), of which the Civil and Building Department (CBD) is responsible for creating a soil database for the country, and cooperating with other organizations, both public and private, to undertake standard tests relevant to soil behavior evaluation.⁶ The Ministry of Public Works also runs the Governmental Centre for Building Investigation and Laboratories. It extends its services to both governmental entities and the general public with respect to inspection of samples of building materials, monitoring the construction process, and carrying sub-soil inspection tests as well.⁷ A third similar centre, though to a limited extent, was also set up by Kuwait University’s Faculty of Engineering and Petroleum.⁸ These centres are entrusted with identifying what as referred to as *Oyoub Al-Turbah*, *ie* soil vices.

4.3.1 Position under the Kuwaiti Civil Code

In terms of regulation, the Kuwaiti Civil Code (the ‘KCC’) followed the aforementioned position of the CCF, and that of the *Egyptian Civil Code* (the ‘ECC’), by strongly emphasising the strict liability of the A/E and the contractor for the soil risks. Article 692-3 KCC enunciates:

“The warranty includes the collapse that stems from a vice in the land proper ...”.

Although very limited, case law in Kuwait demonstrates that this provision is strictly observed. It was decided that,

“A contractor’s *dhaman* [warranty] on buildings and fixed installations that he builds -as stated in the Explanatory Memorandum of the KCC- covers defects that threaten their solidity and safety, whether the defect existed in materials, workmanship, or the land on which the building was erected, *viz.* soil is unsuitable or failure to take necessary measures to reinforce it or to deepen the foundations in it”.⁹

In another case, it was decided that the contractor was liable under decennial liability provisions when he, in constructing a house, placed the foundations in an unsettled ground, which resulted in numerous cracks and defects in the building, eventually rendering the house structurally unsound.¹⁰

Turning to the Egyptian position, it is established in the jurisprudence of the Egyptian Court of Cassation that hand-over is not a waiver in the employer’s side with regard to the contractor’s fault in laying the foundations in a clay soil that is unsuitable for building, and failure to lay these foundations in the suitable solid

¹ Liet-Veaux, *le droit de la construction*, at p. 339.

² Art. 1134 CCF: “Les conventions légalement formées tiennent lieu de loi à ceux qui les ont faites. Elles ne peuvent être révoquées que de leur consentement mutuel, ou pour les causes que la loi autorise. Elles doivent être exécutées de bonne foi”.

³ Jean-Pierre Karila, *Les responsabilités des constructeurs*, 2nd edn. (Paris : Delmas, 1991), p. 46.

⁴ See, especially, Cass. Civ. 1^{re}, 6 mars 1967, *Bull. civ.* I, n^o 87, p. 63.

⁵ Karila, p. 46.

⁶ Civil And Building Department (CBD), p. 2.

⁷ Ministry of Public Works, <<http://www.mpw.gov.kw/labs1.html>> (12 October 2002).

⁸ Faculty of Engineering and Petroleum, Kuwait University:

<<http://www.kuna.net.kw/story.asp?dsno=273622>> (10 September 2001).

⁹ Decision of the Kuwaiti Court of cassation, commercial Circuit, appeal no. 230/93 rendered in 10/4/1994, published in *Majallat Alkada’a Wa Alkanoon*, 22nd year, part one, February 1999, p. 272.

¹⁰ The Kuwaiti Court of Appeal, Third Commercial Division, Appeal no. 528/1993, rendered on 12 December 1993, (Unreported).

layer.¹

Supporting this point of view, the Egyptian Court of Cassation, in a decision rendered on 10 July 1965, stated:

“If the decision appealed from has concluded that the defect endangering the liability of the contractor for the defects in the building was caused by his fault in laying the bases of the building on an unsettled soil instead of excavating deeper to reach a more solid soil, and that consequently hand-over of the building did not exclude the warranty of the contractor, that decision has rightly applied the law, such a defect being a concealed one that could not be covered by delivery”.²

It could be concluded that constructors have a strict liability with respect to soil-associated defects, because such defects cannot be normally unexpected to an A/E or a contractor; it is one of their principal duties to ascertain the solidity of the soil. Therefore, and generally speaking, soil defects should not be considered as *force majeure* exonerating them from the ambit of decennial liability. Notwithstanding, this liability is not absolute, in the sense that a constructor could exonerate himself from this particular defect. However, rebuttal in this respect is only allowed in very limited circumstances.

In the preparatory works to the ECC,³ it is reported that the Egyptian Parliament’s Legislative Affairs Committee stated that an A/E is meant to be liable for soil defects only if they could be detected by technical inspection according to the rules of the trade, but if the defect in the land is so concealed and subtle that is was undetectable by a ‘prudent architect’ using all the ‘rules of technique’, it would then be considered as constituting a case of *force majeure* for which he is not liable.⁴

On a different note, the ethos behind allocating the soil risk on the contractor seems to escape the attention of Arab doctrine, which satisfies itself with merely advocating it as a strict liability, with no further explanatory discussion as to the reasons behind this position. It is illuminating here to mention that this provision should not be regarded as an unjustified burden over the constructor; in most cases the question of a sub-soil difficulties leading to structural defects is a matter that could be detected at an early stage and the constructor is often likely to be familiarised with the problematic nature of the terrain on the onset of the construction process. Accordingly, a latent defect in the construction work could not be considered as a surprising aspect of the constructor’s venture, if this defect is attributed to soil on which he was working for the whole duration of the project.

This rationale could be reached through interpreting Arts. 692-3 KCC in the light of Art. 665 KCC, which enunciates,

“(1) The contractor must inform the employer immediately about any defect caused, or revealed in the course of the work in the materials provided by the employer, or of other elements have arisen which tend to impede the performance of the work in appropriate conditions. (2) The contractor shall be responsible for all results of his negligence in informing the employer as aforesaid”.

Although this article does not explicitly refer to soil defects, it is an established jurisprudence by Kuwaiti courts that the term ‘other elements’ covers difficulties encountered in the soil also.⁵ This leads to the conclusion that the risk of soil defect is based on the contractual duty as stated in Art. 665.

4.3.2 Position with regard to Public Works Contracts

In the sphere of public works, the above-mentioned contractor’s obligation with regard to soil investigations is reversed by the FIDIC Clause 11⁶ (and the semi-corresponding Clause 11 of the ministry of Public Works (the ‘MPW’) Legal Clauses and Conditions), which appears to require the employer to ‘tell all’. It provides,

“The Employer shall have made available to the Contractor, before the submission by the Contractor of the Tender, such data on hydrological and sub-surface conditions as have been obtained by or on behalf of the Employer from investigations undertaken relevant to the Works, but the Contractor shall be responsible for his own investigation thereof”.

¹ Court of Cassation, appeal no. 325 for the year 30, Technical Office 16, p. 736. Reproduced in *Da’ierat Al-Ma’arif Al-Qanouniyah* (The Legl Encyclopedia) on CD.

² Egyptian Court of Cassation *Bull.*, Vol. 16, p. 736, reproduced in: Naim G. Attia, ‘Decennial Liability and Insurance under Egyptian Law’, *Arab Law Quarterly*, Nov. 1986, pp. 504-524, at p. 510.

³ Vol. V, p. 23, reproduced in: Abdulrazaq Ahmad Al-Sanhuri, *Al-Waseet Fi Sharh Al-Kanoon Al-Madani Aljadeed [Intermediate Treatise on the New Civil Code]*, 3rd edn, 10 vols (Beirut: Manhurat Al-Halabi, 1998, v. 7, p. 105, in the footnote.

⁴ Naim G. Attia, ‘Decennial Liability and Insurance under Egyptian Law’, *Arab Law Quarterly*, November 1986, p. 510.

⁵ See, for example, the Kuwaiti Court of Cassation, *Majmouat Alqawa’ed Allati Akaratha Mahkamat Altamieez*, part 3. vol. III, rule no. 3, p. 943 (on CD).

⁶ FIDIC is an acronym for the *Federation International des Ingenieurs-Conseils*; an international federation of high repute in the engineering industry that was formed in 1913 by five national associations of independent consulting engineers within Europe. Its head quarters are located in Geneva, Switzerland, and are probably most widely known for the preparation of standard forms of contract for international civil engineering projects. In practice, this standard form is mostly implemented in construction projects that are executed in developing countries

The clause then goes on to fix the contractor with the knowledge he is deemed to have obtained and his ascription of knowledge is then complemented by clause 12.1 of both the FIDIC and the MPW conditions.¹ Although to a limited extent, Clause 11 allocates some portion of site risks to the employer, notwithstanding, it also provides that the contractor is responsible for his own interpretation of all the data made available to him by the employer.²

4.4 English Law

Ground investigation in England involves the application of several codes of practice and British Standards that relate to guidance, method and performance of an investigation, specific requirements in the case of *in situ* execution, and laboratory tests.³ This task is usually carried out by the A/E, but it is quite common for other specialist consultants, eg structural engineers, to be engaged either to report on soil conditions, or to advise on more complex aspects of the process, such as the design of foundation.⁴

As for the legal position, it seems that under English law, discussion about liability for defects stemming from sub-soil finds its basis in the context of adverse ground conditions. Discussion below will be dedicated to a) adverse ground conditions b) allocation of risk for soil-related defects.

4.4.1 Adverse Ground Conditions

It is essential for cost implications and also for the purposes of design that soil survey and investigations be conducted and the results obtained made known to the contractor. However, practice reveals that in the majority of construction contracts, very little time is allowed between the call for tenders and the time allowed for the contractors to study the site.

Abrahamson observes that it is unrealistic that larger construction projects are set up on the fiction that a contractor must put his offer together on the basis of soil investigations that were also unable to be performed whatsoever in the competition for tenders. He maintains that it must be a matter for the employer to provide, to the best of his ability, the contractor with such information on the soil as one might reasonably expect of him.⁵

Wallace also shares this view. He states,

“ ... it is remarkable that projects of the greatest importance in this field often appear to be carried out with little or no thorough site or geological survey and a totally inadequate number of boreholes, and yet tendering contractors are in practice required to price the work, which must depend to a great extent upon an accurate assessment of the site conditions , in a period of time permitting nothing but the most cursory visual examination of the site”.⁶

This practice has an undeniable effect on project cost (it is well established that bidders include ‘risk premiums’ or ‘contingencies’ in bids when they are required to assume the risk of differing site conditions). In addition, it often leads to further complications; namely the problem of ‘adverse ground conditions’, ie discovery of resistant substances or other unexpected physical hazards on the site that render the work more onerous.⁷

In the absence of special provisions in the contract documents, the general rule is that there is no duty owed by the employer to identify the subsoil conditions or for that matter topography of the site.⁸ English law views the soil risk as being located with the contractor; the employer is under no duty *vis-à-vis* the contractor to provide information or make soil vices known to him.⁹ Thus, if the soil manifests unexpected difficulties during the construction phase, these remain the contractor’s risk.

It is to be noticed that the fact that the contractor is liable to the employer under a contract to construct the works, notwithstanding the defective designs, will not necessarily exonerate the A/E. If an A/E fails to exercise reasonable care in the examination of the site on which the works are to be constructed, thus failing to ascertain the circumstances affecting it, eg the nature of the soils and strata, and consequently his designs turn to be defective or impracticable, then he may be liable to the employer for losses occasioned to him thereby.¹⁰ In

¹ The FIDIC form also stipulates that the contractor is entitled to additional costs for expenses and time extension for delays resulting from physical obstructions or conditions except climatic conditions not reasonably foreseeable by an experienced contractor (Sub-Clause 12.2) or resulting from fossils, coins, articles of value or antiquity, and structures and other remains or things of geological or archaeological interest discovered at site (Sub-Clause 27.1).

² Bunni, p. 161.

³ Cottingham and Akenhead, p. 105.

⁴ Duncan Wallace, *Hudson's Building and Engineering Contracts*, vol. I, 11th edn. (London: Sweet & Maxwell, 1995), p. 308.

⁵ Abrahamson, pp. 246-254.

⁶ Hudson's, vol. I, no. 2.128, pp. 308-309.

⁷ Stephen Bickford-Smith, Norman Palmer and Ruth Redmond-Cooper, *Butterworths Construction Law Manual* (London: Butterworths, , 1993, p.62.

⁸ Lorenz, p. 43, referring to: *Hudson*, p. 316.

⁹ Wiegand, p. 286.

¹⁰ Lord Hailsham of St. Marylebone, *Building Contracts, Architects, Engineers and Surveyors*. In: *Halsbury's Laws of England*, 4th edn. (Reissue) (London: Buttersworth, 1992, Vol. 4(2), p. 414.

this case the employer has a double remedy through his entitlement to bring an action against either the A/E or the contractor, or against them both.¹

Older English case law, which continues in effect today, holds that the soil risk is treated as a contractor risk.² Abrahamson notes that the position as regard adverse ground conditions information has developed through a general principle and a number of attempts to mitigate this principle,³ as follows:

First, English courts introduced a general principle to the effect that the employer had no duty to give information to contractors, and that even if he did and they, as tenderers, generally relied on the information he provided, then that was a mere “usage of blind confidence”,⁴ and therefore they had no remedy if it was wrong.

However, ensuing unreality led to attempts to mitigate this general principle, though on a limited scale. From 1963, and after nearly a hundred years, courts have developed a general right to contractors to receive compensation for negligent misinformation. At the same time a legislative intervention took place with a view to improve the remedies in England for misrepresentation inducing a contract – by the Misrepresentation Act 1967, as modified and amended. This meant that a successful tenderer who relies on the information the employer provides and accordingly suffers a loss is entitled to full compensation, when he proves the negligent status of the information he received.

Against this backdrop of contractor’s strict liability, it became a common practice for employers in drafting construction contracts to exempt themselves from liability for any data they provide with respect to sub-soil conditions. So long as there is no clear violation of good faith present, judges have consistently held this as a permissible practice.⁵

Thus, in the ICE conditions of contract,⁶ Clause 11(2) provides that prior to tendering his offer, the contractor must make himself as sure as possible of the terrain’s special features, based on all information that were made available to him through the employer. He is responsible for calculating soils risks. His tender supports the assumption that the contractor has visited and carefully inspected the site before submitting it.⁷ It could therefore be concluded that the Common Law favours the employer and disfavors the A/E and the contractor when soil related difficulties materialise during the performance of the construction contract.

4.4.2 Allocation of Risk for Soil-Related Defects

Several decisions of the Court of Appeal have made it clear that the developer, who will usually be the employer, owes a duty in law to subsequent purchasers to examine land on which he intends to build, to ascertain whether it is land on which he can safely build. This duty is independent from contract.⁸ The law as it now stands is that, the employer will be considered as taking an unacceptable risk if he fails to have an adequate ground investigation carried out, save in exceptional circumstances. Experienced developers and engineers will lay themselves open to charges of actionable negligence if they initiate or recommend inadequate ground investigation.

This view was clear in the following cases:

(1) *Money Penny v. Harland*:⁹

An engineer, preparing estimates and plans for a bridge, accepted the results of soils tests taken by the employer’s surveyor, without personally conducting further tests. These results turned out to be false. As a result, the cost estimates for substructure work were so inaccurate to the extent that Abbot C.J. said that it was negligent to go by the information of other which turned to be false, and that the engineer could not recover his fees. He held,

“ ... it is of the greatest importance that for the public that gentlemen in the situation of the plaintiff [architects and engineers] should know that if they make estimates and do not use all reasonable skill and care to make themselves informed they are not entitled to recover anything”.

It could therefore be said that, under English law, in order to come up with the required prudent assessment of site conditions, the standard or degree of investigation must depend upon the particular facts on

¹ Ibid, loc. Cit.

² *Bottoms v York Corp.* (1892); *Re Nuttall and Lynton and Barnstaple* (1899); *Pearce v Hereford Corp.* (1968).

³ Abrahamson, pp. 246-248.

⁴ *Thorn v. London Corporation* (1876) 1 App.Cas. 120.

⁵ Wiegand, p. 306. However, such exemption clauses are interpreted narrowly and can be attacked by the contractor for unreasonableness under s. 11. of the Unfair Contract Terms Act 1977, in conjunction with s. 3 of the Misrepresentation Act 1967.

⁶ The ICE is a form of contract published by the Institute of Civil Engineers, England

⁷ The ICE has also issued the ICE Conditions of Contract for Ground Investigation. These conditions do not relate only to large investigations of major works, they also apply to small and forensic investigations.

⁸ See: *Batty v. Metropolitan Property Realisation* [1978] Q.B. 554., *Acres Ltd v W.S. Hattrell and Partners* 1982 3 WLR 1976., and *Eames London Estates Ltd. v North Hertfordshire District Council* (1980) 259 EG 491.

⁹ *Money Penny v. Harland* (1826) 2 C. & P. 378.

each project, eg. geology and history of the site.¹

(2) *Batty v. Metropolitan Property Realisation*:²

In this case, a point arose about whether the designer has to look beyond his employer's land - thus investigating neighbouring land as well - when he is examining the site before carrying out his design. The developer and the builder had inspected the site, but they had not inspected adjoining land or land on the other side of the valley, where there were signs that a detailed inspection might have revealed a possibility of a landslip on the site. The plaintiffs' house was on the edge of a valley. An earth slip on adjacent land caused damage to their garden, and evidence was given that the house itself was doomed. The plaintiffs succeeded against both builder and developer. The court held that the builder's duty to examine the land before building on it was to be determined by reference to what a careful and competent builder would have done in the same circumstances.

(3) *Eames London Estates Ltd. v North Hertfordshire District Council*:³

The plaintiffs purchased two factory units from developers. The units were built in a site that was part old railway embankment, and part infill to bring the rest of the land to the same height. The architect satisfied himself about the land's bearing capacity by agreeing a figure with the local authority; no other soil survey was carried out. Settlement of filling later took place, causing damage to the buildings.

Expert evidence given to and accepted by the court in the *Eames* case was to the effect:

"I consider it normal practice for an architect to draw his client's attention to the need for ground conditions to be investigated. Also, that the client be advised of the possible need to carry out a detailed site investigation, if the architect was uncertain in any way of the type and bearing capacity of the ground".⁴

Successful claims were brought against the architect, who was held primarily liable for the defective buildings, as well as the builder and the local authority. Giving judgment, Judge Fay QC said:

"An architect cannot shed his responsibility for foundations by ascertaining what will get by the local authority as this architect seems to have done [...] in my judgment he was negligent in specifying this loading for the piers without any attempt to ascertain for himself whether the ground was suitable for this or any other loading".⁵

(4) *Balcomb v Ward Construction (Medway) Ltd.*:⁶

Professionals should consider the effect of trees on the site. It has been published knowledge since 1971 that the felling of trees for the purposes of a development, can result in substantial heave of clay subsoil. This is attributed to the fact that the trees and other large bushes, before they were felled, extract moisture from a shrinkable clay substratum, which moisture is taken up again by the soil when the trees have gone. Eventually, property constructed on clay in the proximity of trees can suffer structural damages of a subsidence nature.⁷ In the *Balcomb* case, an engineer failed to make the proper investigation as to whether there had been trees on the site; he was held liable to his client, the builder, in contract for failing to exercise professional skill and in tort for breach of duty of care. He was also held liable to the employers of the house in tort. Sir Douglas Frank QC found that the engineer:

"was under the impression that where a site with clay subsoil had trees removed, as in this case, the recovery period would take one year or perhaps rather longer for larger trees. However, it was published knowledge and should have been known by a competent engineer in 1971 that clay subsoil takes very much longer that that to recover".

Sir Douglas also set out the required steps for an engineer to take:

"I find the conclusion inescapable that in 1971 a competent engineer encountering London clay as in this case on the site, and finding that there had been, would have caused moisture content and plastic limit tests to be carried out. Had that course been taken it is not disputed, and there can be no doubt that the engineer would have advised, that the proposed foundations were inadequate".

Liability will hence be established where there has been a failure to use 'reasonable' skill and care. Such failure is reflected by the non-making of sufficiently exhaustive enquiries as to sub-soil conditions, and thus failing to give proper advice to a client, ie the advice being neither accurate nor correct.

¹ Hudson's, vol. I, no. 2.129, p. 309.

² *Batty v. Metropolitan Property Realisation* [1978] Q.B. 554.

³ *Eames London Estates Ltd. v North Hertfordshire District Council* (1980) 259 EG 491.

⁴ Judge Edgar Fay QC, at p. 495.

⁵ Judge Edgar Fay QC, at p. 495.

⁶ *Balcomb v Ward Construction (Medway) Ltd.* (1981) 259 Estates Gazette 765.

⁷ The institute of Structural Engineers, *Subsidence of Low Rise Buildings*, p. 37, reproduced in: Richard Stead and Anthony Lavers, 'Tree Root Liability Pruned Back: Who Pays Now in Subsidence Cases?' A Paper Presented to a Meeting of the Society of Construction Law, University of Bristol, 18 July 1998, p. 2-3; Cornes, p. 74. And for a fuller account of this problem, see: Stephen Ellis-Jones, 'Damage by Tree Roots', *New Law Journal*, 3 October 1997, p. 1418.

Conclusion

The situation as regards *ratione soli* risks is complex. Given the tension between what appears to be a strict liability of the contractor and the control of the site by the employer, clear-cut solutions could not be easily reached, and are blurred by the following considerations:

A common practice exhibited by the legal systems under comparison is that the employer is 'master of the soil'; he is the party who assigns the soil to the contractor. He is therefore expected to investigate soil conditions prior to the start of the construction work and to provide the contractor with the corresponding information.

On the other hand, the foregoing discussion reveals that construction contracts essentially take as their standard the strict liability of the contractor; the soil risk is his risk, and his degree of responsibility rises with his technical qualifications.

Even when the employer is responsible for the soil, the contractor is under a duty to supervise, warn and give notice with regard to soil risks, which may rise with the degree of his expertise.¹ He is deemed to have inspected and examined the site, in addition to surroundings and information in connection with the site, and to have satisfied himself so far as is practicable and reasonable before submitting his tender, as to the form and nature of the site, including the ground and sub-soil.

The rationale behind this is that unsafe buildings are public danger; the deterioration of a building may either be attributed to defective construction or to improper soil investigation. This does not affect the responsibility of constructors who are liable, and the law rightly prevents them from shifting the responsibility from themselves to their employers, even if the latter selected the site or authorized the defective buildings. This stance is apparently based on the assumption that in the majority of cases the employer may not possess the necessary know-how that would enable him to detect the defects.

It has to be borne in mind, however, that -outside the scope of defect guarantees- contractor's strict liability under comparative systems operates within a frame in which rules of equity come to play in favour of the contractor (*eg* *theorie de l'imprévision* under the civil law, and the doctrine of frustration under the common Law),² particularly during the construction phase.

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¹ Wiegand, p. 309.

² For more, see: Zweigert and Kötz, *An Introduction to Comparative Law*, trans. by Tony Weir, 3rd edn. (Oxford: Clarendon Press, 1998), pp. 509, 528. Also, In public works contracts, the contractor is entitled for reimbursement for losses incurred due to adverse physical conditions. This is based on the doctrine of unforeseen physical obstructions, also called unforeseen constraints (*théorie des sujétions imprévues*), which is applicable on all administrative contracts, whether provided for in the contract or not. The leading French case on this doctrine is the French *Veyret* case (C.E. mars 1869). In Kuwait, as far as can be determined, the first introduction of this doctrine was on 29 October 1972, through Legal Advice no. 2/1649, rendered by the Department of Legal Advice and Legislation, Council of Ministers.

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