



CONTRACT CONDITIONS FOR GROUND RISK UNDER THE 1999 FIDIC SUITE OF CONTRACTS: A CRITICAL REVIEW

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CONTENTS

Abstract

1.	Introduction	
1.1	The Ground Risk	1
1.2	The Purpose of the Research	3
1.3	The Research Method	3
2.	Ground Risk and Unforeseeable Difficulties	
2.1	The Ground Investigations and Site Information	7
2.2	Unforeseeable Ground Conditions	12
3.	Ground Risk: the Contract Provisions in FIDIC	
3.1	Origins and Development of FIDIC Forms of Contract	16
3.2	The Red Book for Construction	18
3.3	The Yellow Book for Plant and Design-Build	23
3.4	The Silver Book for EPC/Turnkey Projects	25
4.	Effect of the Underlying Law	
4.1	The FIDIC Contracts and the Law	30
4.2	Force Majeure	33
4.3	Frustration and Hardship	35
5.	Dealing with the Ground Risks	
5.1	The Crucial issues	39
5.2	The Proposals	43
5.3	Ground Baseline Conditions	44
6.	Conclusions	
6.1	The Position of the Law	46
6.2	The Position of the Contract	47
6.3	Synthesis	49
7.	Bibliography	52
8.	Table of Cases	55
9	Table of Statutes	57
10.	List of Abbreviations	58

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KEYWORDS

FIDIC, Red Book, Yellow Book, Silver Book, Physical Conditions, Ground Risk.

ABSTRACT

This dissertation recalls the uncertainty of ground conditions and the debate on the responsibility for carrying out site investigations and disclosing the available information, identifying ‘foreseeability’ as the core issue in the ground risk.

As the distribution of risk is achieved through the appropriate conditions of contract, and considering that the *Fédération Internationale Des Ingénieurs Conseils* (FIDIC) is perhaps the most popular international form of contract, the ground risk is then analysed through the Red, Yellow and Silver Books of the 1999 Contract Suite, in order to see how these forms of contract allocate the risk among the parties.

In its conclusions, considering that each FIDIC standard form of contract has advantages and weak points, this dissertation attempts to demonstrate that none of them, without amendments, provides an appropriate allocation of the ground risk between the parties.

CHAPTER 1:

INTRODUCTION

‘An experienced contractor will know that anything can happen, particularly in work underground.’¹

1.1 The Ground Risk

The risk deriving from ground conditions is one of the most important aspects in construction projects² since it is an ever present threat, difficult to predict and to avert, that may affect any structure, whether on the surface or underground. Existing site information is hardly ever sufficient, and ground investigations are often difficult to carry out under limited time and financial resources, such as those circumstances that are typical at tendering stage. On the other hand, adverse conditions may cause delays and losses to the extent of turning a successful project into a disaster (e.g. as it occurred in 2006 to Modern Continental Construction Inc. as a result of a tunnel collapse on Boston's *Big Dig Highway* in the USA³).

When adverse ground conditions and insufficient investigations are considered together, the ground risk, or the ‘*great risk*’ as it was defined in *PT & L. Construction Co. Inc. v the State of New Jersey* (1987), ranks as one of most the common causes of construction problems⁴ and claims.⁵ This affirmation is supported by the results of research projects carried out by the University of Hong Kong⁶ and by NEDO in UK⁷.

¹ Abrahamson, *Engineering Law, and the ICE Contracts*, (4th Ed, E & FN Spon, 1979) 66

² Bailey, *What Lies beneath: Site Conditions and Contract Risk*, (2007) 137, SCL, 1

³ The employer’s claims were settled with \$21 million, but the contractor went into liquidation (*Modern Continental Construction Co. Inc.* case no. 08-14558, U.S. Bankruptcy Court, District of Massachusetts).

⁴ ‘The commonest source of risk to construction projects is the ground, [and] it often poses the greatest risk’, Jardine and Johnson, *Risk in Ground Engineering: a Framework for Assessment* (edited by Uff, in *Risk, Management and Procurement in Construction*, King’s College, 1995)

⁵ [among] ‘...the risk to which the site is exposed by nature, perhaps the most controversial, widely litigated and arbitrated subject revolves around what lies below the surface of the ground’ Bunni, *Risk and Insurance in Construction*, (2nd Ed, Spon Press, 2011) 57, para E.1.1.4

⁶ Kumaraswamy, *Common Categories and Causes of Construction Claims*, Const LJ (1997), 13(1), 28-30. The research was carried out in a sample range of 61 projects in Hong Kong

⁷ *National Economic Development Office*, in 1983 and 1988

The latter demonstrated that 45% out of 13,000 building projects in UK were affected by ground condition problems and resulted in delays.⁸

The dissertation describes the issues connected with site investigations, such as the responsibility for the information on site conditions as well as the issue of foreseeability, that are significant in establishing the allocation of ground risk under the law and the contract provisions. To this purpose, the contract terms that are relevant to ground risk are compared and contrasted under various forms of contract, mainly referring to those included under the 1999 FIDIC suite. Then the dissertation analyses how the risk of encountering unexpected adverse ground conditions is administered under the FIDIC forms of contract.

Since FIDIC contracts are rooted in the law of England and Wales due to the original link with the ICE form of contract, the ground risk is mainly analysed under the viewpoint of that jurisdiction. However, since FIDIC is meant to be used internationally⁹, comparisons are made also with the principles of law under other jurisdictions, whether of common law (Hong-Kong, Australia, and USA) or civil law systems (France, Italy, Germany, Ethiopia and UAE). Those jurisdictions have been purposely selected for specific matters of interest, insofar as they may interact with the contract and change the contractual allocation of the ground risk, such as frustration and hardship in common law countries, or force majeure and *imprévision* under civil law. In this aspect, the French doctrine of *imprévision* has been discussed and compared with the Italian law that has developed a trigger-point for its application, with the sharing principle of the Ethiopian civil code that rebalances the consequence of economic disruption such as that caused by an extreme ground event, and with the impossibility to opt out of those statutory provisions under the civil code of UAE.

This dissertation highlights the complexity of the issues related to the ground risk, such as site investigations and disclosure of information, the importance of foreseeability, how the choice among the FIDIC contracts affects contract price and the responsibility for additional cost, and how the contract may interact with the underlying law.

⁸ Ashton, Gidado, *Risk Associated with Inadequate Site Investigation Procedures Under Design and Build Procurement Systems*, (2001) University of Brighton.

⁹ 'FIDIC contracts are not drafted for use in any specific jurisdiction', Baker and Turrini, *The Underlying Problem: Negotiating the Ground conditions*, (2013) 181, SCL, 13

The dissertation also strives to identify how the law and contract provisions related to ground risk are developing.¹⁰

1.2 The Purpose of the Research

*I keep six honest serving-men,
(They taught me all I knew);
Their names are What and Why and When
And How and Where and Who.
(Rudyard Kipling, The Elephant's Child)*

The question in case of changed circumstances due unexpected physical conditions is 'who' bears the risk.¹¹ However, the leading questions of this research are 'how' the risk is allocated between the parties and 'what' the fundamental issue is in the allocation of the ground risk. The overall aim is finding out which, among the FIDIC forms of contract, are more appropriate for projects that are subject to encountering ground risks, such as those involving tunnelling works, and the tools that may be used to identify the responsibility for those risks between the parties. The prize for choosing the most appropriate contract is disputes avoidance, as well as reducing project time and cost.¹²

1.3 The Research Method

The main subjects of research were:

- The ground risk in general.
- Foreseeability.
- The doctrine of force majeure, frustration and hardship.
- Risk Management.
- FIDIC; the forms of contract, particularly the Yellow and Silver Book.
- FIDIC; provisions relevant to ground risks.
- Comparison of similar terms among the forms of contracts to identify differences and possible evolution trends.

¹⁰ The continuous development of the principles of ground risk allocation, in law and contract, brings to mind Eugen Ehrlich's theory of the 'living law' in *Fundamental Principles of the Sociology of Law* (1913)

¹¹ Baker and Turrini, *The Underlying Problem: Negotiating the Ground conditions*, (2013), 181, SCL, 2

¹² 'The Grove Report: Key Terms of 12 Leading Construction Contracts Are Compared and Evaluated', 1998 as quoted by Bunni in *The FIDIC Forms of Contract*, (3rd Ed, 2012), 101

Bailey's paper n. 137 (May 2007) of the Society of Construction Law, that was followed by Baker and Turrini's paper n. 181 of March 2013, and case law such as *Bacal Construction v Northampton*¹³ and the recent decision in *Obrascon*,¹⁴ were the basis to identify the research questions. John Barber's lecture paper, *The Foresight Saga*¹⁵ was both a reference and a source of inspiration insofar as it prompted the author to elaborate the ground risk concepts on FIDIC standard contracts that were not dealt with under that paper.

Then the author reviewed the relevant literature, such as: Bailey's chapter on ground conditions in *Construction Law*, vol. II, 2011, at p. 597 – 604, as well as Baker et al. *FIDIC Contracts: Law and Practice*, chapters 3.147 to 3.170 on adverse physical conditions and foreseeability under FIDIC contracts. More information was found in Klee, *International Construction Contract Law* that provides a chapter (15) on Risk in Underground Construction and in Uff, *Risk Management and Procurement in Construction*, (Chapters 10 and 11).

The author researched for papers on site investigations, allocation of risk, misrepresentation, foreseeability, impossibility and frustration in *Keating on Construction Contracts* and on *Hudson's Building and Engineering Contracts*, *Treitel on the Law of Contract* (passim). *Hudson's* also deals with responsibility for design, site investigations, fitness for purpose and FIDIC contracts (3-111 to 3-126). *Bunni, Risk and Insurance in Construction* provided material on the choice of the site (E.1.1.3), adequacy of soil investigations (E.1.1.4), design, risk and foreseeability (passim). Risk allocation and management is dealt with extensively in Hughes et al. *Construction Contracts* (passim). *Cheshire, Fifoot & Furmston's Law of Contract* explains the doctrine of misrepresentation.

Journals were a valuable source of information, such as: Anderson, Bruner, and Kumaraswamy on *ground risk*; Gidado on *site investigations*, and Abrahamson on *risk management*.

¹³ *Bacal Construction (Midlands) Ltd v Northampton Development Corporation* (1975) 8 BLR 88 CA

¹⁴ *Obrascon Huarte Lain, v H.M. Attorney General for Gibraltar* [2015] EWCA CIV 712.

¹⁵ <https://keats.kcl.ac.uk/pluginfile.php/1446527/mod_resource/content/6/FORSYT2015-16.pdf> King's College, 2015

The research included case law on site investigations, ground conditions and foreseeability that is referred to in the dissertation, such as *Obrascon*,¹⁶ *Bacal v Northampton*,¹⁷ *Howard Marine & Dredging v Ogden*,¹⁸ *Abigroup Contractors v Sidney Catchment Authority (No.3)*,¹⁹ *United States v Spearin*,²⁰ and *Mitsui Construction v A.G. of Hong-Kong*.²¹ Case law unrelated to ground conditions was also researched as far as needed to deal with specific points that are connected with the subject of this dissertation, e.g. *The Wagon Mound*²² for remoteness and foreseeability.

The principles of force majeure, hardship and impossibility as the consequence of unforeseeable conditions were analysed and compared with the doctrine of *imprévision* and ‘unbalanced contracts’ under civil law jurisdictions as in France, Italy, Ethiopia and the United Arab Emirates (UAE) that were selected because of particular provisions in dealing with that doctrine, by consulting the relevant civil codes and literature. In particular, *Chitty on Contracts* (vol.1, 23-007) and McKendrick, *Contract Law*, (p. 255 and 258) were consulted on England and Wales jurisdiction, while the author consulted UNIDROIT, inter-alia, to find a fitting definition of ‘hardship’.

Moreover, the responsibility for ground conditions at common law (particularly England and Wales, as well as USA) was compared with the approach in France and Germany, as to how the law may interact with the contract where the latter becomes ineffective e.g. when ‘it deviates substantially from the statutory model’, since both jurisdictions allocate the risk onto the employer as a general principle.²³ Materials for this section were drawn from Jaeger and H  k, *FIDIC – A Guide for Practitioners*, from the ICLR paper of Rosener on German Law, Civil Codes as well as from the books *Studies in European Construction Law* and Bailey, *Construction Law*, Vol. II.

¹⁶ [2015] EWCA CIV 712

¹⁷ (1975) 8 BLR 88 CA

¹⁸ *Howard Marine & Dredging Co. Ltd. v Ogden & Sons (Excavations) Ltd* (1978) 2 All ER 1132 CA

¹⁹ [2006] NSWCA 282

²⁰ 248 US 132 1918

²¹ (1986) 33 BLR 1, 10 Con LR1

²² *The Wagon Mound 2*, [1967] 1 AC 617

²³ This may occur ‘in case of contractual shifting of the ground risk from the employer to the contractor’, ref. Rosener, *Unforeseeable Ground Conditions*, (2000) ICLR, 109

On FIDIC, the author explained and contrasted the principle of risk sharing and the terms on ground conditions in the various forms of contracts, analysing directly the contracts as well as the information gathered from the books of Baker et al. and Jaeger cited above, and from Bunni, *The FIDIC Forms of Contract, Third Edition*, as well as the ICLR papers written by Booen, Corbett, Delmon, Gaede, Glover and Wade. The provisions of FIDIC were also compared with those of other forms of contracts, such as ICE and NEC and the standard form used in Hong Kong and Singapore.

Finally the author analysed the use of ground baseline reports as an option of resolving *the ever-shifting line*²⁴ of risk sharing in case of changed conditions, as a means to define what may be considered as foreseeable under the contracts. Interesting papers on ground risk and baseline reports were obtained from the American Society of Civil Engineers (ASCE) and the Institution of Civil Engineers (ICE) in London.

²⁴ Term taken from Bruner, *Force Majeure and Unforeseeable Ground Conditions...*, (2000) ICLR, 56

CHAPTER 2:

GROUND RISK AND UNFORESEEABLE DIFFICULTIES

*The only certainty in tunnelling lies in its uncertainty*²⁵

2.1 Ground Investigations and Site Information

Under most jurisdictions, the allocation of risk for ground conditions is regulated by the terms of the contract that, where permitted, may overrule the law provisions at common and civil law²⁶ as "*the parties have made their own law by contracting ...*".²⁷

Accordingly, the responsibility for soil investigations and the geotechnical data primarily depends on the form of contract, and then on the implied terms and the rules of the law of the contract. In common law, the evolution of case law, resulted in alternating positions.

In *Bottoms v York*²⁸ (1892) there were insufficient site investigations and the employer provided the design, but did not disclose a report on ground conditions. The court upheld that, without express guarantees by the employer, the contractor was responsible for ground conditions. The principle that the employer's design does not carry an implied warranty²⁹ was affirmed again in *Sharpe v San Paulo Brazilian Railway*³⁰ (1873) and *Thorn v London* (1876)³¹ where the employer's design imposed a method of work that was not buildable. By contrast, the *Spearin*³² doctrine in the US determined that there was an absolute responsibility of the employer, if the contractor is obliged to build according to given plans.³³

²⁵ Bruner, *Force Majeure and Unforeseen Ground Conditions in the New Millennium*, (2000), ICLR, 57

²⁶ Reference to the notes on subsoil conditions under several jurisdictions included in '*Studies in European Construction Law*', 2015 ESCL. As an exception, the Supreme Court of Italy ruled that the contractor may not waive the responsibility under the contract for serious defects due to ground conditions (CC 7 Jan. 2000/81 GI, 2000, 977).

²⁷ A dictum of the CA from *World Online Telecom v I-Way Ltd* [2002] EWCA Civ. 413, but is not a ground conditions case.

²⁸ *Bottoms v York Corporation* (1892), HBC 4th Ed, ii, 208

²⁹ A warranty is defined as '*enforceable contractual promise*' in *Keating on Construction Contracts*, 10th Ed, Chapter 6, para 6-037

³⁰ (1873), LR 8, Ch App 597

³¹ (1876) 1 App Cas 120.

³² *United States v Spearin*, 248 US 132 1918

³³ Klee, *International Construction Contract Law*, (2015, Wiley) 368

The employer's duty of disclosing all the available ground information is a matter of contract.³⁴ A duty of disclosure is '*not yet recognized under English Law*'³⁵ but such obligation was upheld in *Morrison–Knudsen v State of Alaska*³⁶ in USA where the general rule is:

*Where the Owner possesses special knowledge, not shared by the contractor, which is vital to the performance of the contract, [the owner] has an affirmative duty to disclose such knowledge. It cannot remain silent with impunity.*³⁷

In fact, '*a conscious decision to accept a risk as a matter of business calculation is acceptable. It is said that it is not acceptable if the risk is hidden*'.³⁸ This principle could be invoked as a matter of good faith in civil code countries.

By comparison, in civil code countries, the same principle could be invoked as a matter of good faith, and furthermore the French law recently coded it in Art.1112-1,³⁹ which states that the party that is aware of information of decisive importance to form the synallagmatic consensus in the contract must inform the other who is unaware of it.

In Australia, in *Dillingham Construction v Downs*⁴⁰ the court affirmed that the employer had a duty of care in providing correct ground information, at least as far as what is known to him. By contrast, if the employer makes a statement '*without any belief in its truth*' this may be held to be a '*false representation*', as in *Pearson and Son v Dublin Corporation*;⁴¹ also this principle would fit under the doctrine of good faith⁴² had it been

³⁴ This principle was upheld in *Dillingham Construction v Downs*; e.g. FIDIC Sub-Clause 4.10 provides that: '*The Employer shall have made available to the Contractor for his information ... all relevant data in the Employer's possession ...*'

³⁵ Furst, et al. *Keating on Construction Contracts*, (9th Ed, Sweet & Maxwell, 2012), Ch. 6-009 p.181

³⁶ (1974) 519, P 2d 834

³⁷ *Hardeman–Monier–Hutcherson v United States*, 458 F 2d, 1364 (Ct C1 1972), as reported in Bruner, *Force Majeure and Unforeseen Ground Conditions in the New Millennium*, (2000), ICLR, 77. The US theory of the employer's *superior knowledge* might be linked to English law with *Hedley Byrne & Co Ltd v Heller & Partners Ltd*, in which a person possessing special knowledge assumes a responsibility to another person within a contractual relationship (ref. *Chitty on Contracts*, 32nd Ed, Vol 1, para 1-170).

³⁸ Bailey, *Construction Law*, Vol. II, 2011, Informa, para 3.74, 157, note 271

³⁹ *Ordonnance* n° 2016-131 of 10 February 2016; this statutory provision may not be waived by the parties. (1972) 2 NSWLR 49

⁴¹ (1907) AC 351

⁴² Cicero reminded us that '*Aliud est celare, aliud tacere*' (To conceal is one thing, to be silent is another), *De Officiis*, Book III.

accepted at common law. In *Bacal Construction v Northampton Developments*⁴³, it was held that the employer had guaranteed the ground conditions; actually the contract incorporated a report on the foundation design, and the importance of determining the baseline geotechnical assumptions of the parties will be further discussed. In *Obrascon*⁴⁴ it was affirmed that the contractor should not rely only on the information provided by the employer, but has to find out the actual conditions by himself and to ‘*make provisions for a possible worst case scenario*’ as well as ‘... *make a substantial financial allowance within the tendered price...*’. As stated by Carrick in *Foreseeing the Unforeseeable*,⁴⁵, a ‘*high threshold of foreseeability has been set by this judgement.*’ This position is contrasted in *Mitsui Construction v Attorney General of Hong Kong*⁴⁶ by Lord Bridge who stated that tenderers ‘*could either gamble on encountering more or less favourable ground conditions or they could anticipate the worst case and price their tenders accordingly, ...* but concluded by finding that ‘... *an eminently sensible means of ensuring that the contractors receive no less and the Government pay no more than a reasonable price for the work actually done.*’

Without a practical opportunity for the contractor to investigate the site during the bidding stage⁴⁷ and without an employer’s duty of disclosure under the contract or at law, the bidder would be unlikely to base its tender on an adequate evaluation of the ground conditions,⁴⁸ considering that site investigations are costly and time consuming and, at that stage, there is no certainty of benefit.⁴⁹ The employer may have a narrow budget for carrying out site investigations, however the difference with the contractor’s position is that usually the employer chooses the site, and will always benefit from site investigations, since he will own the resulting information that may save time and reduce the final cost of the project.

⁴³ *Bacal Construction (Midlands) Ltd v Northampton Development Corp.* (1975) 8, BLR 88

⁴⁴ *Obrascon Huarte Lain, v H.M. Attorney General for Gibraltar*, [2015] EWCA Civ 712

⁴⁵ *Ground Conditions*, Construction Law Review, 2016, 22

⁴⁶ (1986) 33 BLR 1, 10 Con LR 1.

⁴⁷ This point was raised by Abrahamson in *Risk Management*, page 248. It is unlikely that a tenderer will be allowed to carry out own site investigations other than visual geomorphology or mere site inspections.

⁴⁸ “*It is usually considered impracticable for each tenderer to conduct detailed site investigations*”, Kumaraswamy, *A Construction Risk “Underview”*..., Const L J 1995, 11(5), 334-342

⁴⁹ Bunni, *The FIDIC Forms of Contract*, (3rd Ed, 2012), 310

Moreover, at that early stage, the employer is in the best position to manage unfavourable conditions, e.g. by changing the site location or making the appropriate changes to the design.⁵⁰

In *Ove Arup v Mirant Asia-Pacific Construction Ltd*⁵¹ the designer was held to be responsible for verifying the load bearing assumptions of the ground before undertaking the design of foundations that failed. In *Obrascon v Attorney General of Gibraltar*⁵² where the Court ruled that an experienced contractor should apply its judgement and verify the employer's assumptions, rather than relying 'slavishly' on them.

Moreover, in *Ove Arup*, L. J. May stated that

A perfect and complete knowledge of the ground may be impossible to achieve. That does not, however, mean that a foundation designer does not have to see to it in appropriate circumstances that his assumptions are verified to the extent that a reasonably competent design would require.

The complexity of predicting the behaviour of the ground is shown by *Humber Oil Terminals Trustees Ltd v Harbour & General Works (Stevin) Ltd*,⁵³ where the Court held that the ground conditions could have been anticipated *but how that material will behave when subject to forces* was unforeseeable.⁵⁴ In *Abigroup Contractors Pty Ltd v Sydney Catchment Authority*,⁵⁵ when discussing ground investigations, the court conceded that 'it will not always be economical or even possible to do so.'

By contrast, in *Surrey v Carroll-Hatch*⁵⁶ the consulting engineer was denied the execution of deep tests by the architect, as he 'could not afford it'. The Court of Appeal held that both architect and engineer were jointly liable to the employer in contract and negligence, for 'taking a chance' and designing a building without sufficient investigations.

⁵⁰ E.g. a type of dam is chosen on the basis of site conditions, when the investigations results are available.

⁵¹ [2005] ABC. L.R. 12/21

⁵² [2015] EWCA CIV 712.

⁵³ (1991) 59 BLR 1 CA.

⁵⁴ Bailey, *Construction Law*, (Vol II, Informa, 2011), 598. In the *Stevin* case, at 6.22 Justice Parker observed that '... the [physical] condition was thus a transient condition, the elements of which existed at the time the contract was made but which came together only near the point of failure'

⁵⁵ [2006] NSWCA 282

⁵⁶ 1979, 617, (BC CA)

In *City of Brantford v Kemp & Wallace-Carruthers*⁵⁷ the engineer that did not make sufficient boreholes was held as negligent for not drawing the client's attention to his choice, even though it benefitted him financially.⁵⁸ Courts do not excuse recklessness and, as in *IBA v EMI & BICC Construction*⁵⁹ when referring to design, it was affirmed that '*the law requires even pioneers to be prudent*'. While site investigations are part of the design, which carries a fitness for purpose obligation,⁶⁰ the question of responsibility here should focus only on the investigations done before executing the contract.

Finally, all questions converge on the fundamental issue: who is responsible for the ground risk. At first, the responsibility has to be searched in the express provisions of the contract as it will be discussed in the following chapters.

Site investigations and foreseeability are closely connected and are fundamental factors in determining both the means of avoiding/mitigating the risk and which party has to bear its consequence under the contract. It is evident that '*Without a properly procured, supervised and interpreted site investigation, hazards which lie in the ground beneath the site cannot be known*'⁶¹ and that without proper investigations, there is a hazard that engineering cannot anticipate. Yet, even a thorough ground investigation, providing detailed engineering knowledge, cannot rule out the risk of ground problems in construction.

In an article of 1994, the *Site Investigation Steering Group* of ICE warned that '*you pay for a site investigation whether you have one or not, and you are likely to pay considerably more if you do not, or if it is inadequately designed, executed or interpreted*.'⁶² Therefore, site investigations are necessary and should be carried out to the maximum extent permitted by time and funds available.

⁵⁷ (1960) 23 23 DLR (2d) 640 (Ont. 1960)

⁵⁸ Bunni, *Risk and Insurance in Construction*, (2nd Ed. Spoon Press, 2011), 59

⁵⁹ (1980) 14 BLR 1, HL. It is not a ground conditions case.

⁶⁰ Reference to Lord Scarman's celebrated obiter in *IBA v EMI and BICC*, *supra*

⁶¹ Littlejohn, '*Ground, Reducing the Risk. Briefing*', (Feb 1994), vol 102, Issue 1, ICE. DOI 10.1680/icien.1994.25846.

⁶² *Ibid.*

However, irrespective of its extent, ground investigations cannot rule out the ground risk and, beyond implementing a risk management policy, attention should be given also to matters of contract and law such as foreseeability and risk allocation.

2.2 Unforeseeable Ground Conditions

In principle, where the risk of a supervening event is foreseen at the time of executing a contract, '*the contract was made with reference to that risk*' and '*the parties should not be discharged if that event indeed occurs*'.⁶³ Then either the loss lies where it falls or is allocated by contract for which there is no uniform position, as shown below.

Under the Government General Conditions of Contract for Civil Engineering Works, 1999 Edition, Hong Kong, Clause 13(1) places all risks related with the '*nature of the ground and subsoil*' on the contractor, excluding any relief for risks and obligations that are unforeseeable.

The ICE form of contract, as well as FIDIC 1987 and FIDIC 1999 does not refer directly to '*ground conditions*', but to *Unforeseeable Physical Conditions* (Red and Yellow Books) or *Unforeseeable Difficulties* (Silver Book) which include ground related risks. Sub-Clause 4.12 of the 1999 suite has different provisions, according to the contract form. The Red and Yellow Books define 'physical conditions' as natural or man-made or other physical obstructions and pollutants, excluding climatic conditions,⁶⁴ and unforeseeable physical condition entitle the contractor to additional time and cost. In essence, the line that divides the risk of physical conditions between the parties could be named '*foreseeability*'.

By contrast, the Silver Book provides for '*total responsibility*' of foreseeable conditions on the contractor and the exclusion for the employer of additional cost for unforeseeable conditions.

Under FIDIC, unforeseeable means a risk event '*not reasonably foreseen by an experienced contractor*' at the time of tender,⁶⁵ while '*reasonableness*'⁶⁶ implies that the

⁶³ Peel, *Treitel on the Law of Contract*, (13th Ed., Sweet & Maxwell, 2011), 960

⁶⁴ FIDIC 1999 provides for exceptionally adverse climatic conditions under Sub-Clause 4.8(c) and for extreme events under Sub-Clause 19.1(v), Force Majeure, giving entitlement only to extension of time.

⁶⁵ As defined under FIDIC, Red and Yellow Book, Sub-Clause 1.1.6.8, whilst there is no such definition under the Silver Book. In the MDB Contract (Pink Book) the time refers to the '*Base Date*'.

notion of foreseeability is not absolute. The qualification as to the date of submission of the tender prevents ‘*the benefit of wisdom of hindsight*’⁶⁷ to interfere with the interpretation of what is unforeseeable.⁶⁸

The NEC3 form of contract defines ‘*reasonable foreseeability*’ of physical conditions from the viewpoint of risk-analysis, so that it is unreasonable to allow for risks that have a small chance of occurring [Clause 60.1.(12)].

At common law, it would be unreasonable to allow for risks that are too small or remote, as it was established in *Bolton v Stone*.⁶⁹ A probabilistic approach similar to NEC3 is consistent with the decision of the Privy Council in *the Wagon Mound*,⁷⁰ where it was held that the probability of the risk must be weighed against its importance, which is the same approach adopted in risk analysis. In tort law, the test of foreseeability is based on remoteness, which is ‘*the foresight of a reasonable man*’⁷¹ giving rise to a duty of care; however in FIDIC contract, the ‘*man in the Clapham omnibus*’ is replaced by the ordinary competence of a specialist, be it a consultant or an ‘*experienced contractor*’.

In *Hadley v Baxendale*⁷², the term ‘foreseeable’ was defined as a condition which could reasonably be anticipated to be encountered or contemplated at the time the parties made the contract ‘*according to the usual course of things*’. What could be contemplated ‘*under these special circumstances so known and communicated*’ would also be deemed to be foreseeable.

In FIDIC, there is an express clause excluding consequential losses (Sub-Clause 17.6),⁷³ yet the aforesaid notion may be connected with Sub-Clause 17.3 [*Employer’s Risk*]

⁶⁶ Lord Radcliffe gave the following definition: ‘*The fair and reasonable man (...) represents after all no more than the anthropomorphic conception of justice*’; *Davies Contractors v Fareham* [1956] AC 696

⁶⁷ *BMD Major Projects Pty Ltd v Victorian Urban Development Authority* [2009] VSCA 221 at 34. ‘*The benefit of ...*’ is quoted from *Arnold v Britton* [2015] UKSC 36 at 20

⁶⁸ Lord Hoffmann stated in *ICS v West Bromwich* [1998] 1 WLR 896 that the ‘*Interpretation is (...) the meaning which the document would convey to a reasonable person having the background knowledge which would reasonably have been available to the parties in the situation in which they were at the time of the contract*’.

⁶⁹ [1951] AC 850

⁷⁰ [1967] 1 AC 617, at p. 642, as quoted by Barber in *The Foresight Saga*, p. 6

⁷¹ *The Wagon Mound test*, described in Winfield, Jolowitz, *Tort*, 19th Ed. 2014, Sweet & Maxwell, p. 186

⁷² [1854] EWHC J70

⁷³ With some exceptions (e.g. sub-clauses 16.4 and 17.1) and the limit of liability under the contract that is

which excludes the risk of ‘*forces of nature which is Unforeseeable*’⁷⁴ or against which an experienced contractor could not have been expected to take reasonable precautions.’

In *Berent v Family Mosaic Housing, LB of Islington*,⁷⁵ foreseeability and remoteness were linked to the question of whether it is reasonable to do anything in the light of the consequences of the risk.

In *Wimpey & Co. v Poole and Others*⁷⁶ the court said that a test of negligence should be applied on the basis of the degree of knowledge and awareness that is expected from a professional man [e.g. the experienced contractor] that ‘*ought reasonably to foresee [what] would cause damage*’. In that case, the judge turned down the claimant’s assertion that the ground investigation report provided by the employer was ‘*impossible*’ to verify, and rephrased the words into ‘*impracticable*’.⁷⁷

As the law distinguishes between the responsibility of the ‘*ordinary man*’ and the standard of skill and care that is expected of a professional, the term ‘experienced contractor’ recalls the test of *Bolam v Friern Hospital Management*⁷⁸ that is required to ‘... *be alert to the hazards and risks inherent in any professional task he undertakes to the extent that other ordinarily competent members of the profession would be alert*’. There is a presumption that the contractor is experienced, as this may be compared with the competence of an employee that is taken to have promised to possess the skill necessary for the proper performance of his work, as it was held in *Harmer v Cornelius*.⁷⁹

However, the law does not require of a professional man that he be ‘*a paragon, combining the qualities of a polymath and prophet*’,⁸⁰ but requires that he makes

up to the amount of the contract price

⁷⁴ The capital letter refers to the definition under Sub-Clause 1.1.6.8.

⁷⁵ [2012] EWCA Civ 961. The *Berent* case added one more risk-evaluation factor: the social value of risk-taking. However this matter is unrelated to the ground risk, and in fact it was not a case on ground conditions.

⁷⁶ (1984) 27 BLR

⁷⁷ This term indicates that performance is yet physically possible, but it would be beyond technical or financial convenience. This subject will be further elaborated under Chapter 4.

⁷⁸ [1957] 1 WLR 582

⁷⁹ (1858) 5 CBNS 236, from Zimmerman and Visser, *Southern Cross: Civil Law and Common Law in South Africa*, (1996, Clarendon Press – Oxford), 414

⁸⁰ *Eckersley v Binnie & Partners* (1988) 18 Con LR 1. It was also affirmed that ‘... *a professional man should command the corpus of knowledge which forms part of the professional equipment of the ordinary member of his profession.*’

reasonable investigations to minimize the unknowns.⁸¹

In *CJ Pearce v Hereford Corp.*,⁸² a case under ICE 4th Edition, it was held that the circumstances (damage to an old sewer) were reasonably foreseeable by an experienced contractor and the claim was set aside; *'the issue of what the contractor ought to have foreseen is largely one of fact'*, or as it was elsewhere defined, it is *'a matter for expert evidence'*.⁸³ Under Sub-Clause 4.12, the Red and Yellow Book state that the *'Engineer may take account of any evidence of the physical conditions foreseen when submitting the tender'* which is an invitation to state clearly what were the assumptions made by the contractor at the tendering stage.

According to Bunni,⁸⁴ there might be a conflict of interest between the designer's responsibility at pre-contract stage and that of the contractor during construction, as the contractor may argue that *'if the [ground] conditions could have been foreseen by an experienced contractor, then they should have been foreseen by the engineer and (...) the design should have catered for the (...) risk'*. The suggested solution is to define in the contract a method of allocating the risk of unexpected events due to ground conditions and the circumstances that would define them.⁸⁵ Unless Sub-Clauses 12 (ed. 1987) or 4.12 (ed 1999) are qualified in the particular conditions as indicated by Bunni, the definition of unforeseeable conditions is open to interpretation and, considering the costs involved, it is likely to become a dispute. Lastly, the issue of foreseeability may also be resolved under the governing contract by shifting the entire risk to the contractor such as in FIDIC EPC Silver Book, with the caveat that FIDIC recommends giving more time to the contractor for soil investigations and for the evaluation of the risks.⁸⁶

In conclusion, ground conditions should be investigated and interpreted in order to define the terms of *foreseeability* that, with the exception of the FIDIC Silver Book EPC Contract, is the key issue to determine who bears the ground risk and its consequences.

⁸¹ Hoek, *'Geotechnical Considerations in Tunnel Design and Contract Preparation'*, Transaction Institute Min. Metall. (1982), 91:A 101-9, 3

⁸² (1968) 66 LGR 647

⁸³ Baker et al., *FIDIC Contracts, Law and Practice*, (5th Ed 2009, Informa), para 3.55, 89

⁸⁴ *The FIDIC Forms of Contract*, (3rd Ed, 2012, Blackwell,) ch 16, 313

⁸⁵ *Ibid.* 314

⁸⁶ *FIDIC Contracts guide*, (First Ed 2000), 4

CHAPTER 3:

GROUND RISK – CONTRACT PROVISIONS IN FIDIC

‘Contracting parties are generally free to allocate the risk on whatever basis they see fit’⁸⁷

3.1 Origins and Development of FIDIC Forms of Contract

In 1956 the Association of Civil Engineers (ACE) published a form of contract that was designed for international construction. That form of contract was based on the domestic ICE Form, named the Overseas (Civil) Conditions of Contract,⁸⁸ which in 1957 was followed by the Conditions of Contract (International) for Works of Civil Engineering Construction. The ‘Red Book’ as it was called, was published by the *Fédération Internationale Des Ingénieurs-Conseils* (FIDIC). This explains why the FIDIC standard forms that are designed for international contracts⁸⁹ with a limited domestic usage, are rooted in common law⁹⁰ and why there are evident similarities between ICE and FIDIC.⁹¹

In 1987, FIDIC published the Fourth Edition of the Red Book as a measurement contract for civil engineering construction work designed by the employer. That standard form provides for an impartial Engineer standing as the first tier decision-maker and includes a Clause 12.2 on ‘*Physical Obstructions or Conditions*’, a broad term encompassing anything but climatic conditions. That sub-clause entitles the contractor to time and cost when meeting obstructions and conditions that are not foreseeable by an experienced contractor. Comparing those provisions with ICE Conditions of Contract, Fifth Edition,⁹² it is evident that the key points are the same: i.e. *physical conditions* excluding adverse weather and *reasonable foreseeability* by an *experienced contractor*.⁹³

⁸⁷ Bailey, *Construction Law*, (vol III, Informa, 2011) 597-598

⁸⁸ Bunni, *The FIDIC Forms of Contract*, (3rd Ed, Blackwell, 2012) Ch 1

⁸⁹ *Foreword* to FIDIC, 1987

⁹⁰ Jaeger, Hök, *FIDIC - A Guide for Practitioners*, (Springer, 2010), 99

⁹¹ E.g. there is a numbering continuity between ICE and FIDIC, in Clause 12 on physical conditions, as detected by Baker et al. in *FIDIC Contracts, Law and Practice*, 5th Ed, Informa, 87, note 88

⁹² Those key elements remained unchanged in ICE, at least until the 7th edition

⁹³ Wallace, *The ICE Conditions of Contract, Fifth Edition, A Commentary*, (Sweet & Maxwell, 1987)

In 1995, by the *Orange Book*, the *Conditions of Contract for Design-build and Turnkey* a lump sum contract with a single point responsibility and introduced a twenty clauses structure that was followed in the 1999 suite of contracts.

In fact, in 1999, FIDIC published a suite of four contracts:

- a) The Condition of Contract for Construction (*Red Book*),
- b) The Conditions of Contract for Design-Build (*Yellow Book*),
- c) The Conditions of Contract for EPC/Turnkey Projects (*Silver Book*),
- d) The Conditions for the Short Form of Contract (*Green Book*).

There are other FIDIC forms of contract, such as the Conditions for Design, Build and Operate Projects (*Gold Book*), designed for long term operations paid on a lump-sum basis, and the MDB Harmonized edition (*Pink Book*), which is based on measurement of quantities and ‘harmonizes’ FIDIC with provisions required by the World Bank and other multilateral development banks (MDB).⁹⁴ The analysis that follows mainly focuses on the three Books of the 1999 Suite: Red, Yellow and Silver, as they represent the main classical/neoclassical contracting system and show three different principles of dealing with ground-conditions related issues.

The components of the 1999 Rainbow Suite contracts can be broadly distinguished by the responsibility for providing the design and by the model of risk allocation.

The Red Book is a single stage measurement contract, for works designed by the employer who bears the risk of quantity and design.

In the Plant and Design-Build (*Yellow Book*), the contract is based on the principle of fitness for purpose of the works, the scope of which is defined in the ‘employer’s requirements’. The design is carried out by the contractor and the burden of unforeseeable risks is placed on the employer.

The EPC/Turnkey Projects (*Silver Book*) is a design-build contract, where the contractor has to deliver works that are fit for the purpose, taking the ‘*total responsibility for the design and execution of the project*’.⁹⁵ Moreover, Sub-Clause 4.12 (c) excludes that the price may be adjusted on account of any ‘*unforeseen difficulties or costs*’.

⁹⁴ *DRB Forum*, December 2014, vol 18, Issue 4, 2

⁹⁵ *Foreword*, FIDIC EPC/Turnkey Project, 1999

3.2 The Red Book for Construction

The 1999 edition follows the Fourth Edition of 1987 which is still ‘*a major source for conditions of contract (...) worldwide*’.⁹⁶

The Red Book is a form ‘*recommended for building or engineering works designed by the employer*’. The works may include some elements designed by the contractor⁹⁷ to the extent specified in the contract or for Value Engineering proposals,⁹⁸ for which the contractor is responsible to the extent of fitness for purpose.⁹⁹ The contractor ‘*shall not otherwise be responsible for the design or specification of the Permanent Works*’¹⁰⁰ that are designed by the employer, but either party is required to promptly give notice to the other of any error or defect of technical nature in the design.¹⁰¹ The contractor’s obligations for the execution of employer’s designed works are in accordance with specifications, instructions and in a ‘*proper workmanlike and careful manner in accordance with recognised good practice*’¹⁰² that ‘*relates generally to standards of skill and care*’.¹⁰³

Under all the forms of FIDIC 1999 Suite, Sub-Clause 4.10 deals with obligations and responsibility in respect of site data. The employer is required to (i.e. *shall*) disclose all relevant data in his possession before and after the Base Date of the Tender. The site is chosen by the employer and, under the Red Book, the permanent works are mainly designed by the employer, and the Drawings are included in the Contract.

Nevertheless, the contractor is responsible for the interpretation of the site data provided by the employer, and is deemed to have obtained all necessary information as to risks, contingencies, and other circumstances which may influence or affect the tender or the works, to the extent ‘*which was practicable (taking account of cost and time)*’ and ‘*to have been satisfied (...) as to all relevant matters, including (without limitations): the form and nature of the site, including sub-surface conditions (...) the extent and nature*

⁹⁶ Bunni, *The FIDIC Form of Contract*, (3rd Ed., Blackwell, 2012), in Preface, p. xxvi

⁹⁷ Foreword to FIDIC 1999 Contract

⁹⁸ Sub-Clause 13.2(b); see Booen, ‘*Three Major New FIDIC Books*’, ICLR, 2000, 32

⁹⁹ Sub-Clause 4.1(c)

¹⁰⁰ Sub-Clause 4.1, 3rd para

¹⁰¹ Sub-Clause 1.8

¹⁰² Sub-Clause 7.1(b)

*of the work and Goods necessary for the execution and completion of the Works’.*¹⁰⁴ However, the Silver Book does not include any provision similar to that stated in the Red and Yellow Books. The *Mitsui*¹⁰⁵ case may indicate the boundaries of Sub-Clause 4.10 under a remeasurement contract, such as the Red Book:

The employer cannot have it both ways: either this is essentially a re-measurement contract or it is not. (...) it would need very clear language to show an intention on the part of the contractor to contract on the basis of assumed knowledge. ...

... The contractor is not to be deemed to have ascertained what could obviously not be ascertained but only "the general nature of the ground ..."

The 1999 edition departs from the equivalent Sub-Clause 11.1 of the 1987 edition which ended with the proviso that ‘*the Contractor is deemed having based his tender on the data made available by the Employer and on his own inspection and examination...*’ This sentence was omitted in the 1999 edition, which would appear to indicate no obligation to rely on the employer’s data. Actually this depends on the interpretation of the terms of the contract; for instance, in *Bacal Construction v Northampton Developments*,¹⁰⁶ it was held that the employer had given a warranty on the data it provided, whilst in *Obrascon*¹⁰⁷ the quantity provided by the employer was not to be relied upon, but an experienced contractor would have to find it out by itself:

I am wholly satisfied that an experienced contractor at tender stage would not simply limit itself to an analysis of the geotechnical information contained in the pre-contract site investigation report and sampling exercise.

A similar position was held in *Van Oord UK Ltd & Anor v Allseas UK Ltd*:¹⁰⁸

¹⁰³ Baker et al. *FIDIC Contracts: Law and Practice*, (5th Ed. 2009, Informa), para 3.27, 64.

¹⁰⁴ Sub-Clause 4.10 of Red and Yellow Book

¹⁰⁵ [1987] HKLR 1079

¹⁰⁶ (1975) 8, BLR, B.L.R. 88

¹⁰⁷ [2015] EWCA CIV 712

¹⁰⁸ [2015] EWHC 3074 (TCC)

Every experienced contractor knows that ground investigations can only be 100% accurate in the precise locations in which they are carried out. It is for an experienced contractor to fill in the gaps and take an informed decision as to what the likely conditions would be overall’.

Since it is true that ground investigations can never be perfectly accurate¹⁰⁹ and considering that, unless the site is located in an urban area, often the contractor has no opportunity to obtain site data but from the employer, the contractor should not be held responsible for their completeness and accuracy.¹¹⁰ In cases similar to those mentioned above¹¹¹ the limiting factor would be the constraints of time and cost to collect data.¹¹²

As regards to the *extent of the work*,¹¹³ should the measured quantities eventually differ from billed quantities so much as to make the original price rates inapplicable, as in *Mitsui*,¹¹⁴ then the provisions of Sub-Clause 12.3(a) or 13.1 would apply to determine new appropriate rates.

Sub-Clause 4.11 deals with the sufficiency of the Accepted Contract Amount that must be based on the data, information, interpretations and examinations, referred to in Sub-Clause 4.10 and must be interpreted in conjunction with Sub-Clauses 4.12.

Sub-Clause 4.12 provides that the Contractor gives notice as soon as practicable after it encounters adverse physical conditions at the Site, which he considers to be unforeseeable, and the contractor shall give the reasons why those conditions are Unforeseeable. In that case,

The Contractor shall continue executing the Works, using such proper and reasonable measures as are appropriate to the physical condition, and shall comply with any instruction which the Engineer may give.

¹⁰⁹ *Ove Arup v Mirant Asia Pacific*: ‘...a perfect and complete knowledge of the ground may be impossible to achieve’.

¹¹⁰ Position held by Sandberg in ‘A Contractor’s View on FIDIC Conditions of Contract for EPC Turnkey Projects’, (1999) ICRL, 53. At common law, a similar position was held in *Morrison-Knudsen International Inc. v Commonwealth of Australia* where, in view of the technical complexity of obtaining site information in time before submitting a tender, it was doubted that potential or actual tenderers may be expected to obtain them ‘...by their own efforts’.

¹¹¹ *Obrascon* and *Van Oord* are not Red Book cases, but have matching conditions.

¹¹² Sub-Clause 4.10, 2nd para

¹¹³ Sub-Clause 4.10(c)

¹¹⁴ [1987] HKLR 1079

In essence, to the extent that the contractor encounters physical conditions on site that are unforeseeable, he shall be entitled to claim for time and cost related with that event. In that case, the contractor has the duty of minimizing the loss and to keep working in accordance with the engineer's instructions and otherwise to undertake '*... any proper and reasonable measures acceptable to the Engineer which the Contractor may take...*' as stated in the 1987 Edition. Those provisions are the same for the Yellow Book, but nothing similar is contemplated under the Silver Book, where evidently the contractor must be free to implement those measures that he designs, and be unhindered by employer's instructions.

The notice giving provision under Sub-Clause 4.12 is a warning to the employer that, with some exceptions, he is in charge of the design, so that he may devise appropriate measures to control that adverse event and carry out timely investigation for the purpose of determining the contractor's entitlements to extension of time or to additional Cost. Risks should possibly be allocated to the party that can manage them better,¹¹⁵ having the technical or political capacity of tackling them, or to the party that can either bear their cost or be insured against them.¹¹⁶ Ultimately, if the responsibility for the risk is placed on the party that is unable to overcome its consequences, the project may stop and both parties will incur additional and otherwise avoidable costs.¹¹⁷ Since the employer provides the design, which entails the power of making and deciding the extent of site investigations '*which ought to minimize or avoid the [ground] risk,*'¹¹⁸ he is responsible for those risks which are not expected. Moreover, under a measurement contract the contractor is compensated for the actual quantity of work done, and the employer pays for the risk of an unexpected quantity increase only if it eventuates. In turn, the contractor has to bear only those risks that can be assessed at the time of the tender.¹¹⁹

The criticism of this provision is that the employer may underestimate the situation while saving on site investigations, or may understate the risk in order to obtain a lower

¹¹⁵ Latham, *Constructing the Team*, para 5.18 (6), 37

¹¹⁶ Plummer, '*Managing Risk*', *Hydropower & Dams* (2015), Vol 22, Issue No. 6, 45.

¹¹⁷ The author rephrased a sentence included in Barber, '*The Foresight Saga*', 1

¹¹⁸ Uff, *Risk Management and Procurement in Construction*, 1995 King's College, ch 3, 66

¹¹⁹ Wade, '*FIDIC Standard Form of Contract – Principles and Scope of New Books*', (2000), ICLR, 11

tender.¹²⁰ That conduct would be sanctioned as misrepresentation or negligent misstatement.¹²¹ On the other hand, the contractor may have little incentive to mitigate the consequences of an unforeseeable event considering that a measurement contract is a shield from the risk of increasing quantities of work and that Sub-Clause 12.3 allows new rates to be determined if the quantity of any item of work varies more than 10%. In *Mitsui*,¹²² the dispute was about the re-rating of actual quantities of work when facing a substantial difference from the quantities originally estimated in the bill of quantities. Answering the question of ‘what is included within the contract sum’ the Court of Appeal of Hong Kong held that changes of quantities caused by unforeseen ground conditions are to be considered as a Variation.

In the *Guidance for the Preparation of Particular Conditions*¹²³ FIDIC proposes an alternative to Sub-Clause 4.12 for major sub-surface works in which the risk of unforeseeable conditions is shared between the parties in a proportion to be agreed.

Under Sub-Clause 4.12, the engineer may consider the effect of all physical conditions ‘*in similar parts of the Works*’ and other events in which the conditions were more favourable than foreseen, in order to determine the net effect of those adjustments but the engineer may not apply a net reduction of the contract price. Under Sub-Clause 8.4, the engineer ‘*shall review previous determinations and increase, but shall not decrease the total extension of time*’. In this way, also the contractor retains a degree of certainty of the contract price and the employer has no incentive to conceal favourable information from tenderers.¹²⁴

The 1999 Red Book is generally considered a balanced form of contract because of its principle of even-handed risk sharing, by which the employer pays the lowest price ‘*having further costs when particular unusual risks actually eventuate*’, and the contractor ‘*avoids pricing such risks which are not easy to evaluate*’.¹²⁵ By contrast, the

¹²⁰ As it occurred in *Pearson and Son Limited v Dublin Corporation* 1907, AC 357

¹²¹ In *IBA v EMI and BICC* (1980) 14 BLR 9, Lord Davies defined a negligent misstatement that which is ‘*misleading and without reasonable ground*’ to which the author adds ‘... *that it is ... likely to be relied upon*’ quoting from *Caparo Industries Plc. v Dickman* [1990] 2 AC 605

¹²² (1986) 33 BLR 1, 10 Con LR1

¹²³ Page 7

¹²⁴ Booen, ‘*The Three Major New FIDIC Books*’, (2000) ICLR, 35

¹²⁵ *Introductory Note to First Edition* (1999) *Conditions of Contract for EPC/Turnkey Projects*, 1

remeasurement model of contract has *per se* been criticized as unfair to the employer, since it would be ‘*providing compensation for the contractor against virtually all unexpected or unforeseeable physical or pricing outcomes of any kind...*’.¹²⁶

3.3 The Yellow Book for Plant and Design-Build

The Yellow Book is a form recommended for electrical and mechanical plant and for the execution of engineering works designed by the contractor.¹²⁷ This form of contract is indicated for the supply and erection of plant and the relevant construction works, designed by the contractor and paid on the basis of a lump sum price i.e. the Accepted Contract Amount that is paid out at monthly intervals according to the estimated value of the works.

In the Yellow Book, ‘*the Contractor shall carry out and be responsible for the design of the Works*’¹²⁸ on the basis of the *employer’s requirements*; however the contractor has to search with due care and warn the employer of errors and defects in the contract documents within a given period. As long as the error could not be reasonably discovered, Sub-Clause 1.9 entitles the contractor to be compensated for the consequence of errors in the employer’s requirements.

Whilst under the Red Book the contractor has the obligation to act with reasonable skill and care, under Sub-Clause 4.1 of the Yellow Book the contractor’s conduct is guided by *fitness for purpose* in respect of design and works obligations, with the limitation that it must be reasonable:

*The obligation to design a product fit for the purpose is (...) tempered by the fact that only ‘reasonable’ fitness is demanded.*¹²⁹

Sub-Clause 4.10 on Site Data in the Yellow Book is the same as that in the Red Book. Since under the Yellow Book the design is prepared by the contractor, it is important to consider the paragraph stating that the contractor is deemed to have considered all risks

¹²⁶ This statement referred to an ICE contract; Wallace, ‘*English Standard Forms: A Consideration of the Main Characteristics*’, *Comparative Studies in Construction Law: The Sweet Lectures*, (Odam, Construction Law Press 1995), 23

¹²⁷ *Foreword to the Conditions of Contract for Plant and Design-Build*, 1999

¹²⁸ Sub-Clause 5.1

¹²⁹ *Viking Grain Storage Ltd. v T H White Installation Ltd*, (1985) 33 BLR 103, QBD(OR)

to the extent which was practicable ‘*taking account of cost and time*’. This is followed, under Sub-Clause 4.12, by the principle that, in case of adverse physical conditions, the contractor may be entitled to time and cost to the extent that the site conditions were unforeseeable.

Under Sub-Clause 5.1, the responsibility for faults on the site information and errors in the employer’s requirements is borne by the contractor, if an experienced contractor would not have discovered them within the stated time. Incidentally, under that clause, *the contractor warrants that he, his designers and design Subcontractors have the experience (...) necessary to carry out the design*, however this does not demonstrate that whatever was not discovered by the contractor is perforce deemed to be unforeseeable,¹³⁰ but is meant to elevate to a professional level, the responsibility borne by the contractor in connection with the employer’s requirements, when determining an entitlement to variations under Clause 13 further to errors in that document.¹³¹ In practice it is difficult to demonstrate that the physical conditions were not foreseeable, as in fact it was held in *Obrascon*,¹³² under an amended FIDIC Yellow Book contract where, in a claim for unforeseeable quantities of contaminated ground, it was held that the contractor would have had to investigate and find out the actual conditions by himself. At law, there is no excuse if the contractor fails to detect evident defects as in *Balcomb v Ward Construction (Medway) Ltd.*¹³³

Sub-Clause 5.2 empowers the employer to review, comment and approve the contractor’s design. This is negative for the contractor insofar as the employer, without responsibility on his part, may interfere with the contractor’s design and the documents he submits. In practice, the contractor cannot claim for a variation in case of interference, unless the employer has caused a major change to the contract.

In conclusion, since except for parts designed by the employer, the contractor is in charge of the design, which includes site investigations, he bears the risk of increasing quantities

¹³⁰ Ref: *The FIDIC Contract Guide*, First Edition, 2000, 57: “...this definition does not refer to what he (as, arguably, an experienced contractor) claims to have foreseen...”

¹³¹ The author’s own conclusion refers to the last paragraph in Sub-Clause 5.1 and is indirectly supported by Van der Puil and Van Weele, *International Contracting*, (2014), Imperial College Press, 206

¹³² [2015] EWCA Civ 712

¹³³ (1981) 259 EG 765.

in line with the notion that the risk should be borne by the party that can manage it best.¹³⁴ On the other hand, the Yellow Book allocates to the employer the risk of those physical conditions that are deemed to be unforeseeable. In view of the foregoing, the pricing of the contract does not need to be inflated with contingencies and, within the known conditions, the employer may be certain of a fixed price for his project. Therefore this is a balanced ‘risk package’ to both parties, but carries the uncertainty of what may be considered as foreseeable.

3.4 The Silver Book for EPC/Turnkey Projects

The Introductory Note to the first edition of the Silver Book, announced that, beyond the forms of contract where the employer is going to pay for risk only if it eventuates, this form is meant to satisfy the need for fixed time and price contract, for which the employer is ‘willing to pay more – sometimes considerably more’ in exchange for certainty.¹³⁵

According to the intentions of FIDIC, the certainty provided by the turnkey lump sum formula is supposed to attract private investors and financiers,¹³⁶ but this assumption is in contradiction with the Harmonized/MDB Contract that is promoted by multilateral banks, since the latter is a measurement contract based on a modified Red Book.

The Silver Book is a contract where the contractor bears most of the risks in exchange for contingencies in his contract price, with the warranty of performance and fitness for purpose.¹³⁷ The allocation to the contractor of the risk for ground conditions irrespective of their foreseeability was defined as ‘unrealistic’¹³⁸ and ‘attracted the most comments

¹³⁴ See Latham, *Constructing the Team*, HMSO, 1984. Moreover, in ‘Risk Management’, (1984), ICLR, Vol 1 Part 3, 244, Abrahamson proposed that the risk should be borne by the party that receives the preponderant economic benefit of running it, or has the best interest in avoiding it, or that can deal with the risk more efficiently.

¹³⁵ Wade, ‘FIDIC Standard Forms of Contract, Principles and Scope of the Four New Books’, (2000) ICLR, para 3, 11

¹³⁶ Actually this form of contract is popular with ‘all types of employers... [either] government departments or private developers...’. Wade, ‘FIDIC Standard Forms of Contract...’, (2000), ICLR, 15

¹³⁷ The Foreword to the EPC contract states that: ‘the contractor takes total responsibility for the design and execution of the project with little involvement of the Employer ... providing a fully equipped facility, ready for operation (at the turn of a key)’ [emphasis added].

¹³⁸ Wade, ‘FIDIC’s Standard Forms of Contract – Principles and Scope of the Four New Books’, [2000] ICLR, 11

[from] *dissenters*.’¹³⁹ The main issue is the departure from ‘*the traditional principles of balanced risk sharing*’¹⁴⁰ for placing on the contractor’s the total responsibility of delivering the result.

A striking feature of the Silver Book is the contractor’s responsibility for the accuracy of the employer’s requirements,¹⁴¹ which is the document that specifies the purpose and scope of the works,¹⁴² i.e. the employer’s own desiderata. Since the contents of this document are under the employer’s control, this provision was commented to be in contradiction with the ‘*fundamental principle of a fair contract*’.¹⁴³

By comparison, in *Stormont Main Working Club v Roscoe Milne Partnership* (1998),¹⁴⁴ the employer was held to be responsible for the sufficiency of ‘the brief’ specifying the purpose of the project; however that was a design contract and the form was not the Silver Book.¹⁴⁵

Actually, in *The Silver Book – The Reality*,¹⁴⁶ Wade¹⁴⁷ wrote a letter to ICLR in which he justified this provision by explaining that the contractor is supposed to be more experienced than the employer in establishing what is necessary to ensure that the Works are fit for the purpose. He also explained that, while in the Yellow book a period of time is given to the contractor to check the employer’s requirements and site data for errors, under the Silver Book, the contractor should be afforded such opportunity and the time to check site conditions before submitting his bid, as recommended in the *Introductory Note to the First Edition* of the Silver Book.

The contractor is free *to carry out the work in the chosen manner*, provided that the end result meets the purpose,¹⁴⁸ yet the contractor is not free to depart from the employer’s

¹³⁹ Baker et al. *FIDIC Contracts: Law and Practice*, 87

¹⁴⁰ Ibid.

¹⁴¹ Sub-Clause 5.1

¹⁴² Sub-Clause 1.1.1.3

¹⁴³ Sandberg, ‘A contractor’s View on FIDIC Conditions of Contract for EPC Turnkey Projects’, (1999) ICLR, 50

¹⁴⁴ 13 Con LR 126

¹⁴⁵ The cause of action was unrelated to ground conditions.

¹⁴⁶ <<http://fidic.org/sites/default/files/THE%20SILVER%20BOOK%20Reply.pdf>> (accessed 3/09/2016)

¹⁴⁷ Christopher Wade was the Chairman of FIDIC’s Contracts Committee and Leader of the Task Group that prepared the Conditions of Contract for EPC/Turnkey Projects, First Edition 1999

¹⁴⁸ FIDIC 1999, *Introductory Note to the First Edition* of the Conditions for EPC/Turnkey Projects

requirements if he can achieve in another way the specified performance,¹⁴⁹ whilst '*there is no provision that diminishes the responsibility of the contractor, if the employer does choose to interfere and instruct how the work has to be carried out.*'¹⁵⁰ Moreover, the Silver Book imposes on the contractor the responsibility also for the parts designed by the employer, for which he has the obligation to detect and rectify errors or defects. All the foregoing contributed to the generation of controversy on this form of contract.¹⁵¹

The EPC formula, associated with the contractor's autonomy in the supervision and the method of execution of the works, is meant to give the contractor a better possibility of managing the risks and keeping time and cost under control. The employer has the duty to provide the employer's requirement for the contract, for which he is not responsible and to ensure that cash flow is maintained through regular payments, for which he has to demonstrate the availability of funds.

This form of contract requires sufficient time to prepare the bid and assess the risks, as well as time for tests on completion, so as to ensure that, upon completion, the project is fit for the purpose and compliant with the agreed specifications and quality standards. In fact, FIDIC's introductory notes to the Silver Book indicate that this form of contract should not be used when '*there is insufficient time or information ... to scrutinize and check the Employer's Requirements*', when there is '*substantial work underground or work ... which tenderers cannot inspect*', or if the employer '*intends to supervise or control closely the Contractor's works*', or if the employer intends '*to review most of the construction drawings*', and '*if the amount of interim payments is to be determined by an official or other intermediary.*'¹⁵² The last sentence is related to the introduction of an Employer's Representative in lieu of the 'traditional' Engineer.

Under Sub-Clause 4.10 of the Silver Book, the employer is obliged to share with the contractor all available site information '*on subsurface and hydrological conditions including environmental aspects*'. Unlike the Red and Yellow Book, the contractor takes responsibility not only for the interpretation of those data, but for verifying their accuracy

¹⁴⁹ Corbett, '*FIDIC's New Rainbow – An Overview of the Red, Yellow, Silver and Green Test Editions*', (1999) ICLR, 44

¹⁵⁰ Ibid.

¹⁵¹ Atkin Chambers, *Hudson's Building and Engineering Contracts*, (12th Ed, Sweet & Maxwell, 2010) para 3-117, 511

and sufficiency. Sub-Clause 4.12, that in the Red and Yellow Book is named '*unforeseeable physical conditions*', in the Silver Book has a wider scope of application since it is named '*unforeseeable difficulties*' for which the contractor takes total responsibility and is deemed having made allowance for sufficient contingencies in the contract price. This should be read in conjunction with Sub-Clause 4.11 where the contractor warrants the sufficiency of the contract price.

In the Silver Book the notion of foreseeability is no longer relevant to separate the responsibilities between the parties. However, under Sub-Clause 5.1 the contractor is not responsible for *portions, data or information* that are *immutable* or cannot be verified during the tendering period, like deep underground conditions, and the responsibility for information provided by the employer may be disputed in case of misrepresentation or when data have been deliberately concealed.

By comparison, the *Orange Book* allocates the risk of '*Unforeseeable Sub-surface Conditions*' to the Employer, whilst offering the design-build construction of the Works in accordance with the Employer's Requirements for a fixed lump-sum. The difference between Orange and the Silver Book is that, in the former, the contractor does not have the total, undivided responsibility for all ground risks, nor is he responsible for the employer's requirements. As regards to the Yellow Book, the differences are that this form of contract provides for 'physical conditions',¹⁵³ and that, when determining the additional cost of adverse physical conditions, it balances their negative effect with the reduction in cost due to events that were more favourable than foreseen. Notwithstanding that, Orange and Yellow Book are substantially similar as far as the allocation of ground risk is concerned.¹⁵⁴ As regards to the 'unbalanced' i.e. the total allocation of ground risk on the contractor, Wade explained in '*The Silver Book – The Reality*'¹⁵⁵ that the EPC/Turnkey contract was intended for projects where the risk of unforeseen ground conditions is small, considering that in most construction sites, e.g. in

¹⁵² *Introductory Note to the First Edition*, Silver Book, 2

¹⁵³ Refer to Sub-Clause 4.12. This term has a broader scope of application as compared with mere '*sub-surface conditions*'

¹⁵⁴ Besides that, there are substantial differences, e.g. the presence of the Engineer (Yellow Book) or the Employer's Representative (Orange Book)

¹⁵⁵ <<http://fidic.org/sites/default/files/THE%20SILVER%20BOOK%20Reply.pdf>> (accessed on 03/09/2016)

town, the ground conditions are well known.

Therefore, the Silver Book places a far greater risk on the contractor, but it also enables him to design and build the project on his own, which should result in a buildable and more cost efficient design that reduces risks while maximizing time and cost savings.

The Silver Book enables the contractor to run the project with minimal employer's interference and, using a good risk management policy, ultimately the risk is balanced by the possibility of saving the contingencies built in the price, which is a powerful incentive to mitigate the relevant risk, also *in terrorem* that the additional costs may exceed those contingencies.

The Silver Book may be disadvantageous to the employer who, for the sake of a '*higher degree of certainty of final price ad time*',¹⁵⁶ pays contingencies to the contractor even before the risk eventuates. Moreover, considering the unbalanced allocation of risks to the contractor, the employer is at risk that after paying the higher price he is deprived of the ultimate results by an '*improvident contractor*'¹⁵⁷ who did not properly assess the risk. In fact, the employer's risks include also that of choosing a lump sum with an inadequate amount of contingencies, and the bid that includes the least contingencies is likely to be chosen as 'the best offer'. Ultimately, '*if the [ground] condition is unforeseeable, then within the bounds of reason no amount of time and no amount of money spent pre-construction is going to allow one to divine the unforeseeable*'.¹⁵⁸

In conclusion, whilst there is no risk free contract for either party, irrespective of the contract form, '*yet it must be remembered that, if events have operated upon the contract to produce a result which is disadvantageous (even severely disadvantageous) to one party upon a proper construction of the contract, that does not necessarily mean that the contract itself was unfair*'.¹⁵⁹

¹⁵⁶ Booen, '*The Three Major New FIDIC Books*', (2000) ICLR, 25

¹⁵⁷ The term is borrowed from *Clea Shipping v Bulk Oil* [1984] 1 All ER 129,

¹⁵⁸ A. Gaede Jr. '*The Silver Book: an Unfortunate Shift from FIDIC's Tradition of Being Even-handed and of Focusing on the Best Interest of the Project*', (2000) ICLR, 488.

¹⁵⁹ As stated by Sir Alan Huggins V-P in *Mitsui*, [1987] HKLR 1079

CHAPTER 4:

EFFECT OF THE UNDERLYING LAW

Pacta sunt servanda,... sed rebus sic stantibus.

(Agreements are to be observed ... but as long as circumstances remain unchanged)

4.1 The FIDIC Contracts and the Law

The general rule of obligations is that '*pacta sunt servanda*' irrespective of changed conditions supervening after executing the contract. Case law has repeatedly confirmed it even in front of unforeseen changes, such as in *Workshop Tarmacadam v Hannaby*,¹⁶⁰ ruling that, had the parties wished to make provisions for the event of unforeseen conditions, they would have provided specific terms in the contract.

However, the governing law of the contract may interact with the contract itself and provide relief in order '*to do what is reasonable and fair, as an expedient to escape from injustice where such would result from enforcement of a contract in its literal terms after a significant change in circumstances.*'¹⁶¹ For example, in case of extreme changes, common law might discharge the parties from responsibility under the doctrine of frustration, while in civil law the principle of *imprévision* would apply. As an example of statute overriding the contract, the civil code would enforce an extended liability period for latent defects in France,¹⁶² in Italy¹⁶³, in Germany,¹⁶⁴ in Ethiopia¹⁶⁵, or in UAE¹⁶⁶, despite any different contract term¹⁶⁷ and the law would fill the gap in the absence of express contract provisions. Whilst FIDIC forms provide for physical conditions, under other circumstance the law would establish the following.

Under the jurisdiction of England and Wales, '*the contract rules on who bears the responsibility for unforeseen ground conditions and allocation of risks (...) on whatever*

¹⁶⁰ (1995) 66 Con LR 105 (CA)

¹⁶¹ *J. Lauritzen AS v Wijsmuller BV, (The Super Servant Two)*, [1990] 1 Lloyd's Rep 1

¹⁶² Art 2270 Code Civil.

¹⁶³ Art 1669 Codice Civile

¹⁶⁴ Art 634a (1).2, BGB

¹⁶⁵ Art 3282 Civil Code

¹⁶⁶ Art 880 Civil Code

¹⁶⁷ Defects Liability: generally 1-2 years under particular conditions of Clause 11, FIDIC 1999

basis [the parties] *see fit*¹⁶⁸ but, unless otherwise stipulated in the contract, the risk of ground conditions is borne by the contractor, even if unexpected¹⁶⁹ unless the employer gives his warranty as to the information on expected ground conditions or the assumptions made by the contractor were the result of a misrepresentation.¹⁷⁰ The warranty cannot be implied unless the information on ground conditions is incorporated in the contract¹⁷¹ without a valid disclaimer and, otherwise, the contractor is responsible. In particular, where the contractor is contract bound to satisfy itself of the site conditions, he is not entitled to assume that he was given a warranty.¹⁷² Therefore, where there is no express warranty, the risk belongs to the contractor.¹⁷³ In comparison, as noted by Baker and Turrini,¹⁷⁴ under FIDIC Silver Book the employer does not give any warranty.¹⁷⁵ The Yellow Book apparently gives such warranty when it states that the contractor shall have based its contract amount on the site data provided by the employer, with the caveat that they are subject to the contractor's interpretation;¹⁷⁶ but the *Obrascon*¹⁷⁷ case has made clear that the contractor cannot blindly rely on those site data.

In England and Wales, a lump sum contract would impose an absolute undertaking on the contractor in case of differing site conditions.¹⁷⁸ In common law, lump sum contracts do not entitle the contractor to having relief for adverse ground conditions, as Justice Brandeis stated in *United States v. Spearin*:¹⁷⁹ '*when one agrees to do for a fixed sum a thing possible to be performed, he will not be excused or become entitled to additional compensation because unforeseen difficulties are encountered*'¹⁸⁰...

¹⁶⁸ Bailey, *Construction Law*, (Vol II, Informa 2011) 598

¹⁶⁹ Chao-Duivis et al. *Studies in European Construction Law*, (ESCL, 2015) ch 10, 746.

¹⁷⁰ Baker, Turrini, *The Underlying Problem: Negotiating the Ground Conditions...*, (2013) 181, SCL, 18

¹⁷¹ *Bacal Construction (Midlands) Ltd v Northampton Development Corporation* (1975) 8 BLR 88 CA

¹⁷² *Keating on Construction Contracts* 10th Ed, ch 6, Section 5, para 6-044

¹⁷³ Baker, Turrini, '*The Underlying Problem: Negotiating the Ground Conditions ...*', 2013, 181, SCL, 14

¹⁷⁴ *Ibid.*

¹⁷⁵ Sub-Clause 4.10 '*The Employer shall have no responsibility for the accuracy ... of such data, except as stated in Sub-Clause 5.1*' i.e. immutable data or those which cannot be verified

¹⁷⁶ Sub-Clause 4.11 [*Sufficiency of the Accepted Contract Amount*]

¹⁷⁷ *Obrascon Huarte Lain, v H.M. Attorney General for Gibraltar* [2015] EWCA CIV 712

¹⁷⁸ Bailey, *Construction Law*, (Vol II, Informa, 2011), 601

¹⁷⁹ (248 U.S. 132)

¹⁸⁰ Furst et al. *Keating on Construction Contracts*, (9th Ed Sweet & Maxwell, 2012) para 8-44, 602.

This dictum points out that, even in a lump sum contract, there is at least an exception to observing the agreement, namely the impossibility of performance. What became known as the ‘*Spearin doctrine*’ affirms that ‘*if the contractor is bound to build according to plans and specifications prepared by the owner, the contractor will not be responsible for the consequences of defects in the plans and specifications*’. If this concept is compared with FIDIC, it would not conflict with the Red Book where, except to the extent specified in the contract, the contractor ‘*shall not otherwise be responsible for the design or specification of the Permanent Works*.’¹⁸¹

In France, the employer is responsible for ground conditions (art.552) insofar as the owner of the land, but where the law interacts with the contract, the question is who bears the obligation of result (fitness for purpose) normally linked with lump sum contracts. Art. 1792 of the French *Code Civil* provides that ‘all builders’ i.e. the designer, the engineer and the contractors (art. 1792-1) be responsible for damages caused by ground conditions if the work done becomes unfit for the intended purpose.

Under German law, the shifting of all the ground risk on the contractor is not permitted (art. 644–645)¹⁸² since the site is considered as ‘materials supplied by the employer’ for which the employer is responsible.

At common law, despite disclaimers of the accuracy of information provided by the employer, as in Sub-Clause 5.1, any case of misrepresentation i.e. erroneous site information on which the contractor relies, or information deliberately concealed by the employer would be sanctioned as in *Pearson and Son v Dublin Corporation*¹⁸³ and any term excluding that liability would be voided by statute.¹⁸⁴

In civil law countries, the underlying law may shift responsibility from the contractor to the employer or apply principles that are not recognised at common law, such as that of good faith or the doctrine of rebalancing the contract. The freedom of contract enables the parties to import in contracts under common law, those legal concepts belonging to the Roman-Germanic system, so that *good faith* is included in the JCT SBC/2011 form,

¹⁸¹ Red Book, Sub-Clause 4.1

¹⁸² Jaeger, Hök, *FIDIC - A Guide for Practitioner*, (Springer, 2010), 107

¹⁸³ (1907) AC 351

¹⁸⁴ Section 3, *Misrepresentation Act* 1967

Schedule 8, Clause 1¹⁸⁵ and *Force Majeure* is incorporated in FIDIC under Clause 19.

Frustration, hardship and impossibility are legal concepts that may be applicable under the governing law of the contract and could be invoked by either party to address the negative consequences of physical events and ground conditions in particular.

4.2 Force Majeure

The principle of Force Majeure derives from the French Code Civil, in turn originating from the Roman system: '*vis major cui resisti non potest*' i.e. the irresistible superior might that causes the impossibility of performance¹⁸⁶ or *Unmöglichkeit*¹⁸⁷ in German Law.

Where this principle may be invoked, it excuses the parties from not performing some or all their obligations under the contract due to a supervening event that makes performance impossible, that is beyond the control of the parties, and is unforeseeable or cannot be resisted or overcome. It may exempt that party from the application of damages and may be a cause for termination of the contract. The impossibility of performance as opposite to being merely more onerous (economic impossibility) makes the doctrine of force majeure similar to the English law of frustration.¹⁸⁸

The notion of 'supervening' impossibility is in contrast with the contractual terms governing adverse ground conditions since they relate to pre-existing conditions, as in *Olympus Corporation v the United States*:¹⁸⁹ '*The government construes the [differing ground conditions] clause to apply only to conditions existing at the time of contracting*.'

Under England and Wales jurisdiction, there is no implied principle of force majeure, unless it is expressly included under the contract.

¹⁸⁵ Mosey, 'Good Faith in English Construction Law – What does it Mean, and Does it Matter', (2015) ICLR, 393.

¹⁸⁶ '*Ad impossibilia nemo tenetur*': nobody is held to do what is impossible.

¹⁸⁷ The German civil code, *Bürgerliches Gesetzbuch* (BGB), distinguishes between initial impossibility (Art. 311) and supervening impossibility (Art. 275). Force Majeure (*Höhere Gewalt*) is distinguished from impossibility (*Unmöglichkeit*).

¹⁸⁸ McKendrick, *Force Majeure and Frustration*, (2nd Ed, Informa 2013), 6

¹⁸⁹ No 96–5002

However, at common law, force majeure may be found in Canada (e.g. *Atlantic Paper Stock v St Anne-Nackawic Pulp and Paper*,¹⁹⁰ in which the Supreme Court defined it as:

... An act of God or force majeure clause (...) generally operates to discharge a contracting party when a supervening [event] makes performance impossible. The common thread is that of the unexpected, something beyond reasonable human foresight and skill.

The French Code Civil Art. 1148 exempts the parties from performing their obligations in case of force majeure or incident, when it is impossible to do so and the occurrence was unpredictable and unpreventable. Force Majeure is also included in art. 273 of civil code of the United Arab Emirates, where if the performance is totally impossible the contract is cancelled, while in case of partial or temporary impossibility that part of the contract may be extinguished.

Force Majeure is foreseen also in the Italian civil code (art. 1256 -1258). The law defines Force Majeure as that extraordinary and unforeseeable¹⁹¹ event not caused by the obligor, which prevents the normal performance of the contract, despite any action undertaken by the obligor to eliminate it.¹⁹²

The Red Book of FIDIC 1987 does not expressly refer to Force Majeure, but includes as employer's risk under Sub-Clause 20.4 (h) '*any operation of the forces of nature against which an experienced contractor could not reasonably have been expected to take precautions*'.

The FIDIC 1999 Suite dedicates Clause 19 to Force Majeure that is defined as an exceptional event beyond the control of the parties, and which the parties could not have prevented or overcome. This definition does not limit the application of force majeure under the broader principles of the governing law, where applicable.¹⁹³ Under the 'Rainbow Suite', Force Majeure may extend the time for completion or terminate the contract and/or increase the cost of the contract.

¹⁹⁰ [1976] 1 SCR 580

¹⁹¹ Sentence No. 12235, (Italian) Supreme Court of Cassation, sect. III, 25th May 2007. The question of foreseeability was held to be based on circumstances and subject to interpretation, from the ordinary viewpoint of a reasonable person (i.e. the man ... in the *Vatican* omnibus?)

¹⁹² Sentence No. 965, (Italian) Supreme Court of Cassation, sect. V, 28th February 1997.

¹⁹³ Baker et al. *FIDIC Contracts, Law and Practice*, (5th Ed, Informa, 2009), para 8.333, 498

Nevertheless, Clause 19 does not include any provision referring to adverse ground conditions, but only to *natural catastrophes* which are unlikely to be attributable to events due to ground conditions. Under the contract, such natural events do not entitle the contractor to additional costs, but only to a time extension.

4.3 Frustration and Hardship

Frustration, hardship and impossibility are legal rules that may be applicable under the governing law of the contract and could be invoked by either party to address the extreme negative consequences of physical events and ground conditions.

Under English statute, the *Law Reform (Frustrated Contracts) Act 1943*, is applicable when, without default of either party, the performance of the contract has become impossible and, as a result ‘*the parties ... [are] discharged from the further performance of the contract.*’¹⁹⁴. In order to invoke frustration, the party in distress should demonstrate that the conditions under which the contract is performed have changed so radically that it can be said: ‘*non in haec foedera veni*’, i.e. this is not what I promised to do.¹⁹⁵ This provision operates for exceptional circumstances, e.g. catastrophic event, such as that litigated in *Wong Lai Ying v Chinachem*,¹⁹⁶ a ground related event that prevented the contract from being performed because a slide changed the conditions of the site.

Art. 6.2.2 of UNIDROIT defines as ‘hardship’ a situation ‘*where the occurrence of events fundamentally alters the equilibrium of the contract,*’ ... ‘*either because the cost of a party's performance has increased or because the value of the performance a party receives has diminished,*’ It must be a supervening event beyond the control of the parties, that was unforeseeable when the contract was executed, making performance ‘*unexpectedly burdensome or even impossible*’.¹⁹⁷ There is a similarity between frustration and hardship, but the former derives from common law and statute, resulting in the determination of the contract, whilst the latter is not contemplated in English law, as it refers to economic disruption (*bouleversement*).

¹⁹⁴ Section 1(1)

¹⁹⁵ *Davis Contractors Ltd v Fareham Urban District Council* [1956] UKHL 3

¹⁹⁶ (1979) 13 BLR 81 PC

¹⁹⁷ *Taylor v. Caldwell* (1863) 3 B & S 826; 122 Eng. Rep. 309 (K.B. 1863)

Where the economic balance of the contract is upset by unforeseeable circumstances, but performance is still possible, there is an implied term under civil law that upholds the notion of hardship: the doctrine of *imprévision* that under French law is enshrined in art. 1195,¹⁹⁸ reciting as follows:

*Where a change of circumstances that was unforeseeable at the time of the contract's conclusion renders performance exceedingly onerous for a party that had not accepted to assume such risk, the party may ask the other party to renegotiate the contract. (...) In the event of refusal or failure of the renegotiation, the parties may agree to terminate the contract, on a date and on terms determined by them, or jointly apply to a judge to proceed with its adaptation. Failing agreement within a reasonable period of time, the judge may, upon a party's request, revise the contract or terminate it, on the date and terms he decides.*¹⁹⁹ [Emphasis added].

At common law, the House of Lords took a different position in *British Movietones Ltd v London and District Cinemas Ltd*²⁰⁰ where it refused to give the court the discretion to impose an equitable solution to changed circumstances. In *Chitty on Contracts*²⁰¹ it is stated that:

... As we have noted, some judges have maintained that the doctrine seeks to give effect to the demands of justice, but these statements cannot be invoked to justify the conferral upon the courts of a wide-ranging discretion to re-write the parties' bargain in the name of "fairness and reasonableness".

The implication that a judge may adapt, revise or terminate the contract,²⁰² contrasts with the 'sanctity of contract', but the author believes that 'it requires a strong case to persuade the court'²⁰³ that the obligations in a contract must be rewritten. Such 'strong

¹⁹⁸ *Ordonnance n. 2016-131* of 10/02/2016, enforceable in contracts concluded after 01/10/2016

¹⁹⁹ Translation obtained from: *A French Revolution: Hardship finds its way in the Civil Code* (ICC-FIDIC Conference, Istanbul 29/03/2016): <<http://www.iccwbo.org/News/Articles/2016/A-French-revolution-Hardship-finds-its-way-into-the-Civil-Code/>> (accessed on 30/07/2016)

²⁰⁰ [1951] 1 K.B. 190. This is cited in *Chitty on Contracts*, (32nd Ed. Vol. 1, 2015, Sweet & Maxwell), para 23-008

²⁰¹ *Chitty on Contracts*, (31st Ed. Vol 1, 2012, Sweet & Maxwell, Chapter), para 23-017

²⁰² In French: '... réviser le contrat ou y mettre fin, à la date et aux conditions qu'il fixe'

²⁰³ A reference to Lord Hoffman's dictum in *Chartbrook Ltd v Persimmon Homes Ltd* [2009] UKHL 38;

case' is generally undefined under statutory provisions, whilst the common law acknowledges only the doctrine of frustration, that does not rebalance the conditions but terminates the parties' obligations under '*radically different*' conditions.²⁰⁴

Other than France, the doctrine of *imprévision* applies to other civil law jurisdictions as well, as indicated in the following examples that were selected for their peculiarities.

Art. 1664 of the Italian civil code recites that, if geological conditions that were not foreseen by the parties result in a considerable increase of the cost of performing of the contract, the contractor is entitled to an equitable compensation. By comparison, when the contract performance becomes physically or legally impossible, the scope of the work may be lawfully reduced or the contract may be terminated (art. 1463 and 1454). The peculiarity of the Italian Civil Code is making direct reference to geological conditions and setting the '*natural limit of the risk*' beyond which the court may apply an equitable adjustment of the price at 10% of the contract price, even though this limit remains at the court's discretion.²⁰⁵

Also the civil code of Ethiopia provides a statutory remedy for administrative contracts where the economic balance is upset by unforeseeable external conditions, beyond '*the extreme limit which could be expected on the making of the contract*', and mandates the parties to be '*sharing in the loss*'.²⁰⁶

In UAE, art. 249 of the Civil Code recites that:

*if exceptional circumstances of a public nature which could not have been foreseen occur as a result of which the performance ... even if not impossible becomes oppressive for the obligor so as to threaten him with grave loss, it shall be permissible for the judge ... to reduce the oppressive obligation to a reasonable level ...and any agreement to the contrary shall be void.*²⁰⁷

The mandatory provisions of law that rebalance the effects of the economic impossibility of performing the contract, override contract terms such as the '*total responsibility*' of

[2009] 1AC 1101, ('... *no limit to the amount of red ink*...') even though that contract re-writing was under the guise of interpretation (McKendrick, *Contract Law*, 10th Ed, 2013, Palgrave Macmillan, 163).

²⁰⁴ *Davis Contractors Ltd v Fareham Urban District Council* [1956] AC 696 at 729

²⁰⁵ Luminoso, *Codice dell'Appalto Privato*, 2010, Giuffrè Editore, 506.

²⁰⁶ *Civil Code of the Empire of Ethiopia* (authored by Rene David), Art. 3183 – 3185

FIDIC Silver Book, and demonstrate how contracts may interact with the framework of the governing law.

At English law, there is no such rebalancing, synallagmatic doctrine as in civil code jurisdictions, except where patently unfair terms may be held to be unconscionable, as in *Lloyd's Bank v Bundy*.²⁰⁸ A case for unfair terms was pleaded in *Mitsui Construction Co. Ltd. v. Attorney General of Hong Kong*, but this claim was rejected.²⁰⁹

Under FIDIC 1999, Sub-Clause 19.7 deals with impossibility and recites that '*if any event or circumstances outside the control of the parties ... makes it impossible or unlawful for either or both Parties to fulfil its or their contractual obligations or which, under the law governing the contract, entitles the Parties to be released from further performance of the Contract...*'. This clause would not relieve the contractor from its obligation of performance, if the work becomes merely more difficult, complex or costly.²¹⁰

In conclusion, if the ground risk eventuates, while the civil code would provide the possibility of financial relief under extremely onerous circumstances, the common law would not offer more than ending the contract for frustration, and otherwise the contract is king. Then '*the position may be harsh on a party who has entered a bad bargain, but it has its merit in being clear. Once again there is tension between the demand for certainty and a concern for fairness.*'²¹¹

²⁰⁷ Cotran et al. *Business Laws of the United Arab Emirates*, vol. III, 1987, Graham & Trotman Limited

²⁰⁸ [1974] EWCA 8, a case unrelated to ground conditions.

²⁰⁹ [1987] HKLR 1079

²¹⁰ Bunni, *The FIDIC Form of Contract*, (3rd Ed., Blackwell, 2013), 227

²¹¹ McKendrick, *Contract Law: Text, Cases and Materials*, (5th Ed., Oxford, 2012), 744

CHAPTER 5:

DEALING WITH THE GROUND RISK

*Risk can be managed, minimized, shared ... but ... it cannot be ignored.*²¹²

5.1 The Crucial Issues

Risk management is defined as the process of identifying the risks and their likely cost, their reduction and the spreading of the residual risk among the parties,²¹³ allocating the unavoidable uncertainty according to selected criteria, such as that of placing it to the party that can best control its consequences²¹⁴, and that has an incentive to minimize the risk.²¹⁵ However, the parties may elect to depart from these principles, and shift the risks in accordance with other criteria, e.g. in return for a premium. Contract and law often interact in providing remedies in case of supervening adverse ground conditions, but under English law and in most jurisdictions, with few exceptions, it is up to the parties to decide the ground risk allocation under a contract, and *'the courts are loath to interfere'*.²¹⁶ Contracts are the main tool for apportioning the risk among the parties, and standard forms promote a common understanding of the terms of the agreement, providing known mechanisms to deal with uncertainties and the consequences of risks²¹⁷. FIDIC provides a range of contract forms and, in order to establish which form of contract is more appropriate to deal with the risk of ground conditions, several factors have to be considered, for example, which party carries out the design,²¹⁸ the nature of the work (e.g. in the surface or underground), the nature of responsibility (i.e. 'skill and care' or 'fitness for purpose') or subjective factors such as the propensity of each party to bear certain risks or what the parties believe to be more favourable to them.

²¹² Latham, *Constructing the Team*, 1994, HMSO, Chapter 3.7, 14

²¹³ Mosey, *Early Contractor Involvement in Building Procurement*. (Wiley-Blackwell, 2009) 273

²¹⁴ Mosey, 'PPC 2000: The first Standard Form of contract for Project Partnering', Sept. 2001 SCL, 4

²¹⁵ Uff, *Risk Management and Procurement in Construction*, Part I, Ch 3, 52

²¹⁶ Bailey, 'What Lies beneath: site Conditions and Contract Risk', 2007, 137, SCL, 6

²¹⁷ Hughes et al, *Construction Contracts*, (5th Ed. 2015, Routledge, Chapter 1.3.1 9)

²¹⁸ Gaede, in 'The Silver Book: an Unfortunate Shift ...', ICLR 2000, 487, affirms that *'in the Red and Yellow Books the allocation of risk for unforeseen ground conditions is not determined by which party ... provides the design'*. In fact, the allocation of ground risk is determined according to foreseeability; being in control of design matters for the responsibility for ground investigations and the management of risk.

Is there a contract that is more favourable to one of the parties? The answer is that every contract carries its load of risk for each of the parties, and if the situation changes, the balance of risk originally envisaged by the parties may be disrupted. For example, the *ICC arbitration case No. 10619/AER/ACS of 2002*,²¹⁹ involved a road construction contract under the Red Book 4th Ed. 1987, that was stipulated before the design had been completed and without a prior survey of the road corridor. In the final statement, the quantities of work had doubled, resulting (inter-alia) in additional time and time-related costs. The dispute that followed ended up in arbitration.

The risk sharing principle of Red Book is based on the notion of foreseeability that is included under Sub-Clause 4.12 and on the employer's responsibility for the design of the permanent works, except for those parts that are designed by the contractor. Therefore the risk reducing strength of the Red Book is that the design and site investigations are to be completed before undertaking the construction stage, minimizing uncertainties of site conditions.

As regards the Yellow Book, the case *Obrascon*²²⁰ highlighted the dichotomy between reliance on site information provided by the employer and its interpretation. In fact, Akenhead J. held that the actual situation was not unforeseeable (a '*foreseeable uncertainty of what and where*') and '*... that experienced tendering contractors needed to look at all the available information and also to understand it. This is (correctly) not a case in which it ... amounted to a warranty or representation*' (emphasis added).

In the Yellow Book, the risk of physical conditions is borne by the contractor to the extent that such conditions are foreseeable. The contractor bears the 'fitness for purpose' obligation to design and construct the permanent works in accordance with the employer's requirements. The contractor is not responsible for errors in the information provided by employer's requirement, provided they could not have been discovered with due skill and care at pre-contract stage. As it was held in *Obrascon*, the Yellow Book places on the contractor the responsibility for the interpretation of the site data, but provides a limitation '*to the extent which was practicable taking account of time and*

²¹⁹ *ICC International Court of Arbitration Bulletin*, Volume 19, No. 2-2008, 85-90

²²⁰ *Obrascon Huarte Lain v H.M. Attorney General for Gibraltar* [2014] EWHC 1028 (TCC) at 221-223

cost'. The Yellow Book provides for the contractor's design responsibility and for a lump sum fixed contract price.

However, the contract makes time and cost remedies available to the contractor to the extent that he encounters physical conditions that are unforeseeable.²²¹ In view of the uncertain boundary of what is deemed to be foreseeable, both parties are exposed to the risk of price uncertainty.

The Silver Book is a turn-key contract, where the contract price is a non-adjustable lump sum and all the risk of adverse physical conditions is borne by the contractor. The lump sum contract price should include an amount for contingencies, meaning that a portion of risk is paid upfront by the employer, in consideration that any further extra cost that should materialize during the contract period will be borne by the contractor.

The Silver Book places on the contractor the responsibility for the sufficiency, accuracy and interpretation of the site data, except as stated in Sub-Clause 5.1 which includes a limitation on information which cannot be verified, or on data '*which are stated in the Contract as being immutable o the responsibility of the Employer*'. However, despite the intention of the Silver Book as to giving certainty, this provision might create '*an area of argument as to where the contractor might legitimately say that the employer's requirements contained data and information that cannot be verified by the contractor*'.²²²

Unless otherwise provided for in the contract, the employer is not responsible for the *accuracy or completeness* of the data he provided, or for errors in the employer's requirements²²³ so that all the risks are left to the contractor. On that basis, the contract imposes on the contractor the undivided responsibility for ground conditions, irrespective of whether they are unforeseeable or not. The advantage of the Silver Book for the contractor lies in the capacity of being in control of design and anticipating or managing the risk, finding the most efficient time and cost solutions, possibly saving the contingencies.

²²¹ Sub-Clause 4.12

²²² Atkin Chambers, *Hudson's Building and Engineering Contracts*, (12th Ed., Sweet & Maxwell, 2010) Ch. 3-117, p.511

²²³ Silver Book, Sub-Clause 5.1

However, the contractor must be given ‘*time and opportunity to carry out to obtain and consider all relevant information before the contractor is asked to sign on a fixed contract price*’.²²⁴

Nevertheless, most tenderers are not afforded that opportunity, as the employer is rushing to start the works and the contractor has no opportunity to carry out investigations on his own, but is compelled to rely on information provided by the employer without the benefit of a warranty on their accuracy. FIDIC also points out that the Silver Book is not indicated ‘*if construction will involve substantial work underground or work in other areas which the tenderer cannot inspect*’.²²⁵ The rationale is that underground work is inherently more risky for the contractor and that the employer bears the risk of carrying the responsibility for the accuracy of data that he provided and cannot be verified because of the nature of the work.²²⁶ Yet the Silver Book is used for underground work because of the allure of a ‘fixed price with no risk’ package.

The agreed contract price in Silver Book is likely to be higher than the market price, because of contingencies that might eventually turn out to be a windfall for the contractor. In case the contract goes wrong, there is always a risk that, without remedies under the contract, the contractor may invoke extreme solutions at law, such as frustration. However, there is no price certainty even with an EPC lump sum contract, since it may be interfered with by the governing law of the contract, as discussed in Chapter 4.

The status of design and site investigations prior to executing the contract is another factor that should bring the parties to analyse carefully which contract is suitable under the circumstances. The core of the matter is choosing the most appropriate form of contract, with the full understanding of what the parties are going to contract for.

In conclusion, the crucial issues causing uncertainties under the contract are:

- a) the responsibility for the accuracy and completeness of site investigations and
- b) the boundary of foreseeability, so as to define what are differing site conditions.

²²⁴ FIDIC: *Introductory Note to the First Edition*

²²⁵ Ibid.

5.2 The Proposals

The site investigations are the basis on which the parties may anticipate the ground risk and on which the contractor may estimate a price and add contingencies.

As explained by Gaede in *'The Silver Book, an Unfortunate Shift...'*²²⁷ in order to provide equal bidding basis to bidders, it would be reasonable that the employer would carry out the site investigations. The rationale is that the employer is likely to have a full and long term access to the construction site before the design-build phase and he benefits of long term, *'immutable'* site information.

In the Silver Book, where the contractor is responsible for site information and even for errors of the employer, it would be logical to assign the pre-contract site investigation duties to the perspective contractor, under a preliminary contract, so as to rebalance the *'superior knowledge'*²²⁸ of the employer. In such case the contractor would have *'the opportunity to satisfy himself as to risks, contingencies and other circumstances concerning the site conditions'*.²²⁹ The resulting report, produced by the contractor and delivered to the employer, would ensure that the contractor undertakes his commitment after having satisfied himself of the correctness and sufficiency of the site information. Those reports should be incorporated in the contract, so as to make them binding to the parties. By contrast, the dispute in *Obrascon* was caused by the mistaken assumption that the site information provided by the employer could have been relied upon. In conclusion, who is responsible for site investigations should warranty for the accuracy of the relevant information.

In order to dispel the uncertainties as to foreseeability and the use of employer's information on ground conditions, the answer could be that of pre-establishing the conditions upon which the contractor has to base his tender, by means of a *'ground baseline report'*, that is incorporated in the contract as the benchmark to measure what is foreseeable and what should be defined as *'differing site conditions'*.

²²⁶ Silver Book, Sub-Clause 5.1 (d)

²²⁷ Gaede, (2000) ICLR, 485

²²⁸ Doctrine developed after the case *Helen Curtis v United States*, 160 Ct 437, 312F.2d 774 (1963)

²²⁹ Hosie, *'FIDIC: Red, Yellow and Silver Book - The Treatment of Unforeseeable Physical Conditions'*, CLR of July 2014, 3

The baseline report could be linked to Sub-Clause 4.12 as ‘particular conditions’ under e.g. the Yellow Book since it provides relief to the contractor when meeting conditions that are Unforeseeable. Sub-Clause 4.12(c) of the Silver Book excludes any adjustment of the contract price in case of hardship and ‘*unforeseen difficulties or cost*’. The author is familiar with EPC/Turnkey based contracts with bespoke particular conditions that mitigate the rigour of the Silver Book in the event of circumstances exceeding the agreed ‘baseline’. Those conditions would entitle the contractor to an extension of time, but could for example exclude compensatory relief, thus providing a risk sharing mechanism in order to motivate both parties in resolving the ground issue.

5.3 Ground Baseline Conditions

In the United Kingdom, against the practice of allocating to the contractor ‘*the full risk arising from the ground not behaving in accordance with the model he formulated*’, CIRIA (Rep. 79, 1978) recommended the introduction of ‘... *a set of Reference Conditions ... established by the engineer and, after discussion with, and modification by the contractor, these be used as a basis for the settlement of disputes.*’²³⁰

The Ground or Geotechnical Baseline Report (GBR), i.e. an account of ground information and their interpretation, ‘*against which any change can be judged*’²³¹, was recommended by the USNCTT²³² in 1991 as a means of providing ‘*a more equitable allocation of the risk of unknown ground conditions*’. Also JCOP²³³ a code of practice for tunnelling in UK, recommends sharing the design information [8.2], and preparing of Ground Reference Conditions by the designer [8.3.2.(c)].

Whilst allocating the unforeseeable ground risk to the employer, the advantages of GBR are the avoidance of ambiguities and the reduction of resulting disputes.²³⁴ These reports should provide the factual situation as it is known by both parties at the time of executing the contract, accompanied by a warranty, and free from disclaimers. By determining the *assumed conditions which affect time or cost*, the *changed conditions clauses* answer the

²³⁰ Hoek, ‘*Geotechnical Considerations in Tunnel Design and Contract Preparation*’, 1982, Transaction Inst. Min. Metall. 91:A101-9, 6

²³¹ Ibid.

²³² US National Committee on Tunnelling Technology, that first proposed GBR in 1974 in ‘*Better Contracting for Underground Conditions*’ (Edgerton, 2008)

²³³ *Joint Code of Practice for Risk Management of Tunnelling Works in the UK*, 1st Ed. 2013

ground risk questions, namely which information should be disclosed and which conditions are to be considered as foreseeable in a contract.

In essence, '*the purpose of the changed conditions clause [in lump sum contracts] is thus to take at least some of the gamble on subsurface conditions out of bidding*'.²³⁵

²³⁴ Gould, '*Geotechnology in Dispute Resolution*', Journal of Geotechnical Engineering, July 1995, p.524

²³⁵ *Olympus Corporation v United States* No 96-5002

CHAPTER 6:

CONCLUSIONS

*The allocation of risk between [the] parties is essentially a matter for their agreement.*²³⁶

6.1 The Position of the Law

Responsibility for site investigations and for adverse ground conditions finds no uniform doctrine under common law and civil law jurisdictions. It is difficult to separate facts i.e. *the immutable data*²³⁷ referred to in the Silver Book, from opinions in the information provided by the employer which, on its own, is not sufficient to divide what ought to be reasonably foreseeable, from what was unforeseeable²³⁸ before executing the contract. Where there is no express agreement as to responsibility for the ground risk, the common law in England would consider the matrix of fact i.e. ‘*having regard to the entirety of relationship between the parties*’ ... [but] ‘*there is no implied warranty from the owner that the contractor will be able to perform such work without encountering [adverse] physical conditions*’.²³⁹ At common law, without a warranty there is no responsibility for site information provided by the owner/employer,²⁴⁰ and finally ‘*under English law, in the absence of express provisions, the risk is generally borne by the contractor*’ [emphasis added],²⁴¹ which underlines that the terms of risk allocation among the parties are primarily set out by the contract.

Under extreme changes of conditions, the risk may be subject to limitations, because any of the parties may invoke the doctrine of frustration at common law, whilst civil law may provide relief in case of physical and economic impossibility of performing the contract. In England and Wales, force majeure is not an implied term, but may be included in the contract.

²³⁶ Bailey, *Construction Law*, (2011 Vol. II, Informa), Ch 3.73, 156

²³⁷ ‘Immutable’ is defined as ‘acontextual’ i.e. a fact, in Brown, ‘*Industry Standard Terms: Another Fly in the Ointment of the Contractual Intent*’, Const. L.J. 272, 2013.

²³⁸ ‘*If the additional or varied work is so peculiar, so unexpected and so different from what any person reckoned or calculated on, it may not be within the contract at all; Thorn v London Corporation (1876) 1 App. Cas 120.*

²³⁹ Bailey, *Construction Law*, (Vol. II, Informa 2011), Ch. 8.38, p. 598

²⁴⁰ Baker, Turrini, ‘*The Underlying Problem: Negotiating the Ground conditions*’, (2013), 181, SCL 14

²⁴¹ Baker, Turrini, ‘*The Underlying Problem: Negotiating the Ground conditions*’, (2013), 181, SCL p. 18

As an example, *NEC3 Engineering and Construction Contract* includes Clause 19 [*Prevention*] which in effect is a term of force majeure. Also FIDIC that, although it was conceived as an international contract, it is rooted in the common law, provides Clause 19 with express provisions for Force Majeure. The foregoing demonstrates that the principles of civil law may sometimes cross the borders of Continental Europe and become effective in English law based contracts.

Nevertheless, the prevailing principle of law is that '*the contracting parties are generally free to allocate the risk ... between themselves on whatever basis they see fit.*'²⁴²

6.2 The Position of the Contract

The allocation of risk is a matter of contract strategy and the result of the freedom of contract, as pointed out above. Under FIDIC, with the exception of the Silver Book, contracts consistently provide a link between site investigations and foreseeability, with the corollary that this concept determines the allocation of the ground risk under the contract. In fact, whenever a risk was foreseeable it is deemed to be included and provided for by the contractor.

FIDIC 1999 Suite provides different models of allocating the ground risk, from the Red Book re-measurement contract, to the lump-sum turnkey Silver Book, in which risk and cost are factors inversely proportional to one another.

The Red Book allocates the responsibility for design to the employer and, as a re-measurement contract, also the risk of additional quantities. It provides for revised rates if the quantities change more than 10% or if the conditions of work have changed.²⁴³ The employer benefits of a lower contract price, as he pays only for the work done and for changed conditions when they actually occur. Yet the final price is uncertain and, but for a fixed percentage, the employer takes all the risks of changed conditions. The *Mitsui*²⁴⁴ case demonstrates that re-measurement contracts do not always compensate the contractor for changed conditions when the as-built quantities differ from those estimated in the Bill of Quantities, since without a Variation the rates may no longer be appropriate

²⁴² Ibid.

²⁴³ Sub-Clause 12.3 [*Evaluation*]

as they do not automatically pay him the consequential costs e.g. the increased time for completion. Since the parties are bound by the unit rates of the contract, “*this may mean, in the extreme, that a Variation can be valued ‘wrongly’, by the correct application of the Bill of Quantities*”.²⁴⁵

Under the Yellow Book, the design is the contractor’s risk, but the risk of ground conditions is borne by the employer when the change is unforeseen. However, the *Obrascon* case held that the contractor should have included contingencies in the lump sum and should have foreseen the unforeseeable.²⁴⁶

Under the Silver Book, the employer receives the benefit that, for a fixed price, the contract shifts the risk of increased costs for ground conditions to the contractor. However, even the fixed price is not a certainty, since the contractor may invoke the contract exceptions of physical impossibility²⁴⁷ or that the data cannot be verified.²⁴⁸ A case of impossibility as the result of changed conditions was invoked in *Turiff Ltd v the Welsh National Water Development*²⁴⁹ that may have opened the gates to claims for ‘commercial impossibility’; yet, in English law, it did not.²⁵⁰ From a risk-management perspective, a turnkey contract gives the employer the advantage of uniting the designer and the contractor under one single counterpart; on the other hand it also gives the employer the disadvantage of abdicating the control on the design to the contractor and that of running the strategic risk of placing the odds of success or failure upon one contractual figure.

The single point risk can be mitigated by dividing the same project in parts that are tendered under different contracts, or by combining measurement and lump sum forms of contract within the same project. Projects likely to be affected by ground risk could be contracted under alternative types of contracts, such as a target cost form with a price

²⁴⁴ (1986) 33 BLR 1, 10 Con LR1

²⁴⁵ Baker et al., *FIDIC Contracts, Law and Practice*, (5th Ed., Informa 2009), para 4.59, 170

²⁴⁶ Carrick, ‘*Foreseeing the Unforeseeable*’, *Ground Conditions, Construction Law Review*, 2016, 18

²⁴⁷ Sub-Clause 4.12

²⁴⁸ Sub-Clause 19.7

²⁴⁹ [1994] Const. LY 122

²⁵⁰ ‘*The question of law on physical/commercial impossibility has still not been answered conclusively*’; Mak, ‘*Physical Impossibility and Frustration*’, *Arbitration* 1988, 64(2), 137-148, p.9 Westlaw (accessed on

ceiling²⁵¹ beyond which the additional cost is shared between the parties, as recommended by the *International Tunnelling Association (ITA)*.²⁵² Actually FIDIC did not produce any 'target cost' model so far, but indicated the Yellow Book as the basis to draft a new form of contract for tunnelling and underground works²⁵³. In 1996, ITA concluded that there is no standard or preferred method of contracting for tunnelling projects.²⁵⁴

Indeed, *there is no perfect contract*,²⁵⁵ but each model has a risk profile that balances the risk of cost and time according to the contractual choice of the parties. Ultimately, the form of contract to be used has to be chosen by weighting all the circumstances, e.g. the degree of knowledge of the site conditions, and considering what is '*appropriate to the objective and constraints of the project*'.²⁵⁶

6.3 Synthesis

Responsibility for the site investigations is determined by the contract, whilst as an implied term, site investigations should be carried out with reasonable skill and care, and should also be fit for the purpose.²⁵⁷

Where there are no express provisions under the contract and there is no warranty as to the accuracy of data on ground conditions,²⁵⁸ the relevant risk is allocated to the parties by the principles of the law governing the contract.²⁵⁹

24/8/2016)

²⁵¹ Price capping as a means of reducing uncertainty is mentioned in Bailey, '*What Lies Beneath...*': (2007) 137, SCL, 6

²⁵² '*ITA Position Paper on Types of Contract*', Tunnelling and Underground Space Technology, Vol.11 No. 4, p. 421, 1996, Elsevier Science Ltd. (Source: Dr. T. W. Mellors).

²⁵³ *FIDIC International Users' Conference*, London, 1 and 2 December 2015

²⁵⁴ '*ITA Position Paper on Types of Contract*', 1996, Tunnelling and Underground Space Technology, Vol 11 No. 4, 428,

²⁵⁵ Phillips, '*Drafting Dispute Management Clause: Principles of Risk Management ...*', Const. LJ 2009, 25(3), 199-205

²⁵⁶ Capper, *Management of Legal Risks in Construction*, (1994), SCL, 44, p.2

²⁵⁷ *IBA v EMI & BICC Construction* (see note 58)

²⁵⁸ *In Cooperative Insurance Society Ltd v Henry Boot* [2002] EWHC 1270 (TCC) and Const. L.J. 2003, 19(2), 125-126, a ground conditions report not included in the contract did not constitute a warranty or a representation of prevailing ground conditions. Therefore it did not generate rights for the contractor.

²⁵⁹ Baker, Turrini, '*The Underlying Problem: Negotiating the Ground conditions*', 181, 2013, SCL p.14

Above all, without a warranty under the contract, the site investigation data cannot be relied upon by the bidder that instead *'should be allowed to price what is asked to undertake'*²⁶⁰ and the extent of the risk he undertakes should not be open ended.

Under FIDIC Red and Yellow Book, the contract provides that any risk that is foreseeable should be borne by the contractor, whilst the consequences of unforeseen conditions are borne by the employer. The issue of this principle is the definition of what may be considered to be 'foreseen'. Uncertainty can be removed or reduced by establishing the boundaries of foreseeability in *'a clear, complete and unambiguous way'*²⁶¹ if a mechanism defining what is foreseeable is incorporated in the contract by setting the ground baseline conditions.

Under a standard contract form like the Yellow Book, the *'baselines'* would define the scope of Unforeseeable Physical Conditions under Sub-Clause 4.12, with the proviso that the complexity of the ground risk in construction, makes it difficult to devise contractual provisions applicable to all the circumstances. The incorporation of a ground baseline report in the Silver Book could provide a measure of control to the unlimited one sided risk; moreover it would place all bidders on even ground and avoid the building-up of contingencies for an undefined risk without measure. Then, the employer would benefit of lower prices, considering that such contingencies, if included in the contract price, would have to be paid irrespective of whether the risk materializes or not. Instead, those sums could be retained by the employer and be disbursed only if and when due, in case of an unforeseen ground risk. In alternative, those apparent savings could be invested in the most appropriate insurance cover for the same risk, e.g. an Integrated Project Insurance, or an all-inclusive insurance policy.²⁶²

In that ideal scenario *'bidders need not weigh the cost and ease of making their own borings against the risk of encountering an adverse subsurface, and they need not consider how large a contingency should be added to the bid to cover the risk. They will*

²⁶⁰ Uff, *'The interplay of Contract Terms and Common Law'*, 1993, SCL, 22, p.11

²⁶¹ Ryan, *Devising Contract Terms in Construction Contracts...*, 424, in Hughes, *14th Annual ARCOM Conference 1998*, <http://www.arcom.ac.uk/-docs/proceedings/ar1998-418-427_Ryan.pdf>

²⁶² For example, subject to limits and deductibles, those policies would indemnify the insured for direct damages and also for consequential losses, or even for loss of profit.

*have no windfalls and no disasters.*²⁶³

In conclusion, no FIDIC form of contract may be said to be best suited to deal with the ground risk, because the most *appropriate* contract is the one chosen by the parties and tailored to the circumstances that is capable to ‘*render more certain the practical and financial consequences of matters which are physically and factually uncertain at the time of entering the contract*’.²⁶⁴

²⁶³ *Olympus Corporation v United States* No. 96–5002

²⁶⁴ Capper, ‘*Management of Legal Risks in Construction*’, 1994, SCL, 44, p. 4

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TABLE OF CASES

	PAGES
<i>Abigroup Contractors v Sidney Catchment Authority (No.3)</i> , [2006] NSWCA, 282	5, 10
<i>Arnold v Britton</i> [2015] UKSC 36	13
<i>Atlantic Paper Stock v St Anne-Nackawic Pulp and Paper</i> , [1976] 1 SCR 580	34
<i>Bacal Construction (Midlands) Ltd v Northampton Development Corporation</i> , (1975) 8 BLR 88 CA; [1976] 1 EGLR 127	4, 5, 9, 19, 31
<i>Balcomb v Ward Construction (Medway) Ltd.</i> (1981) 259 EG 765	24
<i>Berent v Family Mosaic Housing, LB of Islington</i> , [2012] EWCA Civ. 961	13
<i>BMD Major Projects Pty Ltd v Victorian Urban Development Authority</i> [2009] VSCA 221	13
<i>Bolam v Friern Hospital Management Committee</i> [1957] 1 WLR 582	14
<i>Bolton v Stone</i> [1951] AC 850	13
<i>Bottom v York Corporation</i> (1892) HBC (4 th Ed.), Vol 2, p 208	7
<i>British Movietones Ltd v London and District Cinemas Ltd</i> , [1951] 1 K.B. 190	36
<i>Caparo Industries Plc. v Dickman and Ors.</i> [1990] 2 AC 605	22
<i>Chartbrook Ltd v Persimmon Homes Ltd</i> [2009] UKHL 38; [2009] 1AC 1101	36
<i>City of Brantford v Kemp & Wallace-Carruthers Ltd</i> (1960) 23 23 DLR (2d) 640 (Ont. 1960)	11
<i>CJ Pearce v Hereford Corp.</i> (1968) 66 LGR 647	15
<i>Clea Shipping v Bulk Oil</i> [1984] 1 All ER 129	29
<i>Cooperative Insurance Society Ltd v Henry Boot</i> [2002] EWHC 1270 (TCC); Const. L.J. 2003, 19(2), 125-126	49
<i>Davies Contractors Ltd. v Fareham Urban District Council UDC</i> [1956] AC 696-698	13, 35, 37
<i>Dillingham Constructions Pty Limited v Downs</i> [1972] 2 NSWLR 49	8
<i>Eckersley v Binnie & Partners</i> (1988) 18 Con LR 1	14
<i>Hadley v Baxendale</i> , [1854] EWHC J70	13
<i>Hardeman–Monier-Hutcherson v United States</i> , 458 F 2d, 1364 (Ct C1 1972)	8
<i>Harmer v Cornelius</i> , (1858) 5 CBNS 236	14
<i>Hedley Byrne & Co Ltd v Heller & Partners Ltd</i> [1964] AC 465	8
<i>Helen Curtis v United States</i> , 160 Ct 437, 312F.2d 774 (1963)	43
<i>Howard Marine & Dredging Co Ltd. v Ogden & Sons (Excavations) Ltd</i> , (1978) 2 All ER 1132 CA	5

<i>Humber Oil Terminals Trustees Ltd v Harbour & General Works (Stevin) Ltd.</i> (1991) 59 BLR 1 CA.	10
<i>Independent Broadcasting Authority v EMI Electronics and BICC Construction Ltd</i> (1980) 14 BLR 1, HL	11, 22, 49
<i>Investors Compensation Scheme Ltd v West Bromwich Building Society</i> [1998] 1 WLR 896	13
<i>J. Lauritzen AS v Wijsmuller BV (The Super Servant Two)</i> [1990] 1 Lloyd Rep 1	30
<i>Lloyd's Bank v Bundy</i> [1974] EWCA 8	38
<i>Modern Continental Construction Co. Inc.</i> case no. 08-14558, U.S. Bankruptcy Court, District of Massachusetts	1
<i>Morrison–Knudsen v Commonwealth of Australia</i> (1972) 13 BLR 114	20
<i>Morrison–Knudsen v State of Alaska</i> , (1974) 519, P 2d 834	8
<i>Pearson and Son Limited v Dublin Corporation</i> 1907, AC 357	8, 22, 32
<i>Olympus Corporation v The United States</i> , 96-5002	33, 45, 51
<i>Obrascon Huarte Lain, v H.M. Attorney General for Gibraltar</i> , [2015] EWCA CIV 712.	4, 5, 9, 10, 19, 20, 24, 31, 40, 43, 48
<i>Ove Arup v Mirant Asia-Pacific Construction Ltd</i> [2005] ABC.L.R. 12/21	10, 20
<i>Overseas Tankship (UK) Ltd v The Miller Steamship Co or 'Wagon Mound' No 2</i> [1967] 1 AC 617 Privy Council	5, 13
<i>PT & L. Construction Co Inc v the State of New Jersey</i> , 108 N.J. 539 (1987)	1
<i>Sharpe v San Paulo Brazilian Railway</i> , (1873) LR 8, Ch. App. 597	7
<i>Stormont Main Working Club v Roscoe Milne Partner.</i> (1998) 13 Con LR 126	26
<i>Surrey (District) v. Carroll-Hatch and Associates Ltd.</i> , 1979 617 (BC CA)	10
<i>Taylor v Caldwell</i> (1863) 3B & S 826; 122 Eng. Rep. 309 (KB 1863)	35
<i>The Wagon Mound No.2</i> , [1967] 1 AC 617 (see above: <i>Overseas Tankship</i>)	5, 13
<i>Thorn v London</i> (1876) 1 App. Cas.120	7, 46
<i>Turiff Ltd v the Welsh National Water Development</i> , [1994] Const. LY 122	48
<i>Van Oord UK Ltd & Anor v Allseas UK Ltd</i> , [2015] EWHC 3074 (TCC)	19, 20
<i>Viking Grain Storage Ltd. V T H White Installation Ltd</i> , (1985) 33 BLR 103, QBD(OR)	23
<i>United States v Spearin</i> , 248 US 132, 1918	5, 7, 31, 32
<i>Wimpey & Co. v Poole and Others</i> , (1984) 27 BLR	14
<i>Wong Lai Ying v Chinachem</i> , (1979) 13 BLR 81 PC	35
<i>World Online Telecom v I-Way Ltd.</i> [2002] EWCA Civ. 413	7
<i>Workshop Tarmacadam v Hannaby</i> , (1995), 66 Con LR 105 (CA)	30

TABLE OF STATUTES

	PAGES
<i>Law Reform (Frustrated Contracts) Act</i> , 1943	35
<i>Misrepresentation Act</i> , 1967	4, 22, 31, 32
<i>Civil Code of the Empire of Ethiopia</i>	2, 37
French Law: <i>Ordonnance</i> n° 2016-131 of 10 February 2016	8, 36
French <i>Code Civil</i>	30, 32-34
German <i>Bürgerliches Gesetzbuch</i> (BGB) [Civil Code]	5, 30, 33
Italian <i>Codice Civile</i>	30, 34, 37
United Arab Emirates, <i>The Civil Code</i>	2, 34, 37

LIST OF ABBREVIATIONS

<i>FIDIC</i>	= <i>Fédération Internationale Des Ingénieurs Conseils</i>
<i>ICLR</i>	= <i>International Contract Law Review</i>
<i>NEDO</i>	= <i>National Economic Development Office</i>
<i>SCL</i>	= <i>Society of Construction Law</i>