# 1

# Introduction



It may be thought that there is enough literature on claims in the construction industry, although the continuing incidence of disputes arising from such claims suggests that recent developments in the means of addressing such problems have not eliminated contentious claims. That such disputes feed commercial courts and arbitration centres of many countries with a ready supply of cases to hear at great expense further emphasises the point. This book aims to examine the quantification of contract claims on the basis that many disputes arise from disagreement of the financial consequences of events, even where the liability for those events may not be contested.

The objective of this text is to examine various aspects of evaluating claims for additional reimbursement arising from contracts for construction projects. There is no intention to produce a legal treatise or to address the issues of establishing liability for additional reimbursement. That said, the operation of any contractual machinery relies on the express terms of that contract and the legal background. It is of course necessary to have a basis for considering how remuneration should be properly established. Whilst a few overseas judgments are also considered, this text considers the issues assuming English law applies and is therefore referred to, where appropriate, to establish relevant authorities.

Before commencing any evaluation it is preferable if the person undertaking the task understands how change and disruption to a contract can arise in a manner that requires evaluation of the financial consequences on behalf of one party or another. This chapter briefly considers aspects of the process that provide the basis for evaluation.

Succeeding chapters then go on to consider how the base from which evaluation of additional payments may be established, the effect of changes on the programme of work, the sources of information for evaluation of additional payments, the evaluation of the direct consequences of change in terms of the impact on unit rates, etc., and the evaluation of the time consequences of change in terms of such as prolongation, disruption, acceleration, etc. Some other sources of claims (such as suspension and termination) and the means of minimising the impact of claims are also considered.

The approach taken is to attempt to demonstrate the process, principles and standard of analysis that will be required to produce acceptable claims for additional payment, not to produce a guide to calculating payments under any specific form of contract. The approach does, however, provide those on the receiving end of such claims with guidance on what they should expect to receive in the form of a properly detailed claim and also how to respond to claims that are not properly supported. We have also set out

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alternative approaches to many of the claims considered, including some unusual and hopefully thought provoking methodologies.

## 1.1 The Legal Basis

This is not a legal textbook and it goes without saying that proper advice on the applicable law should always be sought before taking any contractual position based on a legal premise. There are, however, many references in the text to the decisions of the courts in relation to a number of matters, with relevant extracts from the judgments. These extracts and quotations are included to illustrate the various principles under discussion and to underline the standard of analysis and substantiation that is required for claims taken before a formal tribunal. There is no better source for this purpose than published judgments, and the standard required by the courts is the standard by which all evaluations can be judged. However, whilst English legal principles and precedents may have significance in Commonwealth countries and be of interest elsewhere, the difference particularly with codified civil jurisdictions can be marked. Local legal advice must always be sought, particularly from lawyers with experience of construction contracts and disputes. This latter criteria can, however, sometimes be difficult to satisfy in some parts of the world.

The case references and extracts are not intended to be exhaustive but are intended to provide a basis for the reader to conduct further research if he or she so wishes. Full details of cases can be obtained through the internet from sites such as the British and Irish Legal Information Institute (BAILII) (www.bailii.org). Other sites are available both free of charge and commercially.

### 1.1.1 Forms of Contract

The number and range of published standard forms of contract for construction works are extensive. Not only does this text not address all of the many published forms, it is not a guide to any one of the more commonly used forms. The intention of this book is to provide guidance on matters of principle that will have to be addressed under most, if not all, construction contracts under English law. That said, it is obviously useful to apply the provisions to be found in different types of contract to illustrate various points. References are therefore made in the text to the following contracts, using the abbreviations shown below, to show the way in which they deal with specific issues:

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| 'Infrastructure Conditions' | Infrastructure Conditions of Contract published in August 2011, Measurement Version, published by the Association for Consultancy and Engineering (ACE) and Civil Engineering Contractors Association (CECA). |
| 'FIDIC Red Book' | The Fédération International des Ingénieurs-Conseil's (FIDIC) Conditions of Contract for Construction, for Building and Engineering Works designed by the Employer, First Edition 1999. |
| 'SBC/Q' | The Joint Contract Tribunal's Standard Building Contract with Quantities (SBC/Q), published in 2011 by Sweett and Maxwell. The successor to the previously published 'JCT' Standard Form of Contract. |
| 'NEC4-ECC' | The Engineering and Construction Contract, Fourth Edition 2017, published by Thomas Telford Ltd. In this book references to 'NEC4-ECC' are generally to its Option A: Priced contract with activity schedule. |

The FIDIC Red Book and the Infrastructure Conditions are used to illustrate how contracts that contemplate complete remeasurement of the works address certain evaluation issues, internationally and in the UK domestic market respectively. SBC/Q illustrates the approach of lump sum contracts subject to adjustment under stated circumstances. The NEC Form of Contract is used to examine some of the concepts that have gained this contract increasing popularity over recent years, particularly among critics of what are considered by some to be the more adversarial traditional forms of construction contracts. For example, NEC's proactive and prospective approach to the evaluation of change and its use of actual costs, or forecast actual costs, rather than contract rates and prices, as a basis of remuneration for change.

There are, of course, many different forms of contract (both standard and bespoke) that can be adopted by the parties to a construction project depending upon, among other matters, the nature of the enterprises concerned and the nature and size of the project. To consider the detailed requirements of every standard form of contract would need a considerably larger volume than this. It would also require detailed consideration of the applicable law. It is therefore necessary to restrict the consideration to matters of principle, using the requirements of the various contracts considered in this book to illustrate particular points. That is not to say that the principles examined will not relate to other standard forms of contract, or to ad hoc contracts agreed between parties, but that the discussions herein will need to be considered in the light of specific requirements in particular contracts as well as the underlying applicable law. The prime source of information for any evaluation has to be the contract between the parties and its requirements. There is no substitute for reading the contract and any incorporated relevant documents. Regrettably, this is often a starting point more often honoured in the breach than in observance in practice. Domestically, the early use of the NEC contracts approach saw many practitioners applying the traditional approaches of such as the JCT and ICE contracts that they had grown up with, without reading what NEC actually requires them to do and when. As the NEC contracts have gained popularity internationally, many of the problems arising have been the result of practitioners applying approaches that were accustomed to conform to more traditional international forms such as the FIDIC Red Book. These included the very approaches that NEC sought to change. Internationally, many practitioners also fail to consider the applicable law and assume that the law and approaches of their home country will apply. Where such naivety and/or laziness leads to otherwise avoidable disputes is unforgivable.

The parties to a contract can of course agree additional reimbursement in any manner they wish, and can also waive the requirements of their contract if that is expedient and acceptable to both parties. This is often the case in commercial negotiations of additional reimbursement, where the parties may not wish to insist on the detailed substantiation of every component of the evaluation.

This text, however, assumes that the evaluation needs to be substantiated in detail to the standard required in formal dispute resolution procedures under English law. These are also the methodologies that the authors have found are regularly applied internationally. A theme of this book is the benefit that can be obtained by good substantiation in avoiding unnecessary disputes. Such a standard is not only necessary in the event of some form of dispute procedure but is of course the standard of substantiation required by the contract itself. This raises the question of defining the standard required in a formal dispute resolution process.

## 1.2 The Standard of Substantiation

While there may be many facets to the standard required, there are two general principles that should always be borne in mind:

- The first principle is that he or she who asserts must prove, i.e. the party claiming an item of damage, cost expense, loss or value, will have to support it with evidence.
- The second principle is the general standard of proof in many jurisdictions, as it is put in English law, that matters need to be established as being correct 'on the balance of probability'. This contrasts with the standard required in criminal matters where 'beyond reasonable doubt' is the test under English law. This second principle might, however, be subject in practice to a 'sliding scale', i.e. major and central parts of the issues need to be fully substantiated while ancillary or subsidiary parts may be subject to a lesser degree of substantiation. Those minor parts may perhaps be assessed by reference to the results of the more rigorous analysis of the major parts, perhaps on a pro rata basis. If a sufficient and representative sample of preliminaries and general item costs in a prolongation claim have been agreed following detailed checking at $x$% of their claimed values, then it might be concluded that the unsampled costs could also be agreed at that $x$%.

The apparently lower standard of proof in civil matters does not imply that assertions need not be fully evidenced where it is reasonable to expect such evidence. Thus, for instance, a matter of evaluation that involves establishing the cost of materials bought specifically for a contract will require production of invoices and possibly other procurement documents (such as a matching purchase order and delivery receipt note) if relevant. Where such project-specific support for a claimed item of cost is not possible, for instance in establishing off-site overhead charges in a prolongation evaluation, it will still be necessary to produce evidence of the claimant's wider company overhead costs incurred, such as audited company accounts, with a reasoned analysis of the amount considered to be relevant to the claim.

This introduces the two tiers of evaluation common to most change items: its direct consequences in terms of the value of the physical work done and its time consequences in terms such as delay, disruption and acceleration. In many instances the evaluation may require only one or the other but in many cases both tiers will be necessary.

The level of substantiation for the evaluation may vary depending upon the particular instance and circumstances. As noted elsewhere, the express terms of the contract should always be a first point of reference. Local law and other authorities may also be relevant. Internationally there is often a lack of express provision in the contract and also guidance by way of interpretation from the local courts and other authorities. One of the great benefits of English law is that these do exist, as highlighted throughout this book.

For example, in *C.J. Sims Ltd v Shaftesbury PLC* (1991) 60 BLR 94, deciding what was meant by the expression, 'such costs to include loss of profit and contributions to overheads, all of which must be substantiated in full to the reasonable satisfaction of our quantity surveyor', Judge John Newey stated:

> Its words are peremptory – 'all … must be substantiated in full' and the substantiation is to be 'to the … satisfaction of (the defendants') quantity surveyor'. The only qualification is that the quantity surveyor cannot require more than is 'reasonable', which I think means that he cannot require more than the ordinary competent quantity surveyor would.

In this provision, the extent of substantiation to be produced, in the absence of specific requirements, is therefore that required by the ordinary competent quantity surveyor, and it is that substantiation that is the subject of this book.

Having considered the standard to which substantiation is required for such evaluations, the matter arises of the extent of support or analysis deemed necessary to establish that any particular sum would satisfy the principle. Thankfully, the courts have also had to consider such support and analysis by experts on a regular basis and have given useful guidance to those seeking to present reasoned evaluation of claims for additional payment.

For example, in *McAlpine Humberoak Ltd v McDermott International Inc.* (1992) 58 BLR 1, during the course of considering a decision by an Official Referee relating to the analysis of time, delay and disruption in a contract for the fabrication of steel sections of deck for an offshore drilling platform, the Court of Appeal made the following comment on the evidence given by one party's expert and the judge's treatment of that evidence:

> The judge dismissed the defendant's approach to the case as being 'a retrospective and dissectional reconstruction by expert evidence of events almost day by day, drawing by drawing, TQ by TQ [technical query] and weld procedure by weld procedure, designed to show that the spate of additional drawings which descended on McAlpine virtually from the start of the work really had little retarding or disruptive effect on its progress'. In our view the defendant's approach is just what the case required.

While these comments relate to the examination of time and the analysis of delay and disruption, there is no reason to believe that similar comments would not have been made in respect of the calculation of additional payment. However, the *McAlpine Humberoak* case was decided before the introduction of the Civil Procedure Rules 1998 (CPR), following the review of the litigation system by Lord Woolf and the concept of proportionality as an overriding objective in civil litigation, i.e. that the amount of analysis and evidence should be proportionate to the issues in question. Rule 1.1(c) of the CPR requires cases to be dealt with in ways that are proportionate to the amount of money involved, the importance of the case, the complexity of the issues and the financial position of the parties. It is therefore possible that a lesser standard may be satisfactory in some circumstances but that is unlikely to mean that the level of analysis and evidence will be materially reduced, or that evidence that should be available and would be expected by the ordinary competent quantity surveyor, e.g. invoices, receipts, etc., will not be required. A sampling approach might particularly be appropriate. For large sums of money it may be 'proportionate' to expect full substantiation, but lesser sums may be addressed by an abbreviated method. For instance, if the cost of additional visits to site by engineers has been established as being a necessary part of the claim and the costs of the engineer's time has been fully substantiated, it may be quite reasonable to simply present the travel expenses as a schedule without producing every receipt and invoice. Such costs are generally known, and any exceptional differences should be recognisable without production of a full 'audit trail'.

### 1.2.1 SCL Delay and Disruption Protocol

The Society of Construction Law (SCL) is a body of lawyers, surveyors, engineers, architects and others with an interest in the subject of law as applied to construction projects.

Whilst it is UK based, the SCL has various branches around the world and its work is referred to regularly by practitioners as a source of some authority in relation to the evaluation of construction contract claims. Its international reach and influence continues to grow.

In October 2002 the SCL published the First Edition of its Delay and Disruption Protocol ('the Protocol') which deals with the analysis of those matters and the compensation that may be due when they occur. The First Edition was not without its critics and was regarded, by some commentators and practitioners at least in some respects, as controversial. However, it represented a body of thought and opinion from a respected group of specialists, only reached after a long and extensive consultation process with interested parties in the industry. The Second Edition was published in February 2017, following further lengthy consultation, and this has addressed some of the criticisms of the First Edition. It remains to be seen what critics make of the changes that have been made. Reference is made in this book to some of the conclusions of the Second Edition where they are relevant to the discussion of aspects of the quantification of claims.

For these authors, one of the ironies of the increasing reference to the First Edition of the SCL Protocol internationally over recent years was the knowledge that whilst, for example, its description of time impact analysis as the recommended method of delay analysis was being relied on by practitioners and referred to in arbitrations in many jurisdictions, the SCL committee was busy rather watering down that recommendation.

Judicial comment has been limited. There are a number of examples of it being referred to in support of a party's approach. However, in *Adyard Abu Dhabi v SD Marine Services* [2011] EWHC 848 (Comm), [2011] BLR 384, Mr Justice Hamblin noted that:

> … the SCL Protocol is not in general use in contracts in the construction industry and nor has it been approved in any reported case. There was no evidence that the parties were aware of it or that they contracted with it in mind. Further, the SCL Protocol itself says that 'it is not intended to be a contractual document. Nor does it purport to take precedence over the express terms of a contract or be a statement of law.

He concluded that:

> In such circumstances the SCL Protocol can be of little assistance in relation to the legal causation issues which arise in this case.

In relation to approaches to analysis of delays and extensions of time, it has been quoted a number of times in reported cases by parties seeking support for their particular approach: for example, in the English courts in *Great Eastern Hotel Company Limited v John Laing Construction Ltd and Another* [2005] EWHC 181 (TCC); *Balfour Beatty Construction Ltd v The Mayor of the London Borough of Lambeth* [2002] EWHC 597; and *Mirant Asia-Pacific Construction (Hong Kong) Ltd v Ove Arup and Partners International Ltd &Anor* [2007] EWHC 918 (TCC) (20 April 2007); and similarly in the Hong Kong case *Leighton Contractors (Asia) Ltd v Stelux Holdings Ltd* HCCT 29/2004. In Australia, the Supreme Court noted in *Alstom Limited v Yokogawa Australia Pty Ltd* (No. 7) [2012] SASC 49 that the SCL Protocol supported several different approaches to analysis and considered that one of these was to be preferred to a method proposed by the claimant's expert that had no support in any current literature. More recently, in

*Santos v Fluor Pty Ltd* [2-17] QSC 153, the Supreme Court of Queensland took guidance from the most recent edition of the SCL Protocol in relation to the use of a measured mile analysis in relation to a claim for delay and disruption.

The Protocol is not intended to be a contract document, i.e. it is not framed with the intention that it should itself form part of the construction contract. This is made very clear in its Introduction. However, its First Edition did contain model clauses for possible incorporation in contracts, addressing the requirements of a contractor's programme and record keeping. Internationally, the authors have seen those model clauses incorporated into construction contracts, usually with some amendments, as the basis for ad hoc programming and record keeping clauses. The intention of the Protocol is that it should provide a scheme of guidance for the analysis of delay and disruption in construction contracts and the matters that should be addressed in the drafting and negotiation of the construction contract. It contains a thoughtful and well-researched set of guidelines for the methods that can be adopted to resolve the issues of delay in construction contracts, bearing in mind that many of the issues do not have finite, or absolute, answers and the Protocol can only offer a set of balanced and considered views. As ever, it must be remembered that this is subject to the express terms of the contract and the underlying applicable law.

It should, however, be borne in mind that any analysis of the delay and financial consequences of events on a construction contract will only be as sound as the facts on which it is based. There is no substitute for properly recorded factual information as the basis of any analysis. Many citations of the SCL Protocol are often misplaced, as parties seek to legitimise a claim or position without reference to the actual facts of the case.

### 1.2.2 Direct and Time Consequences

Many changes or events requiring evaluation for additional payment will have valuation rules set out in the contract. An obvious example is the rules for valuation of variations, discussed in Chapter 5, contained in standard form contracts such as the SBC/Q (section 5) and FIDIC forms (clause 12). For other matters, such as the evaluation of payments for prolongation of the contract period, or disruption to the progress of the works, there will usually be little or no detailed guidance in the contract for evaluation purposes beyond the principle that 'loss and expense' or defined 'cost' can be recovered, and perhaps that profit can be added in some circumstances.

The evaluation of a variation will usually be subject to the rules expressly set out in the contract, but for items that cause prolongation and disruption there may be two tiers of evaluation required. Firstly, the direct consequences of the event or change will be required to be valued, usually in the form of an analysis of the effect on the site contractor's resources and working methods. Secondly, any indirect consequences, such as off-site increased overhead or financial charges, will be necessary. The guidance for supporting the valuation of such time consequences is generally the same as that set down by the courts for the evaluation of damages for breaches of contract, albeit that many instances will not actually be breaches of contract, but events contemplated by the parties in the contract. The guiding principle, when considering breaches of contract under English law for example, is that if the plaintiff has suffered damage that is not too remote, it must, so far as money can achieve it, be restored to the position it would have been in had that particular damage not occurred.

This does not, however, mean that the claimant can as of right recover every item of cost arising from a breach. The recoverable damages will be restricted to those which could reasonably be foreseen as arising from the breach, and not necessarily all damage. This principle is the rule stated as long ago as 1854 in the case of *Hadley v Baxendale* (1854) 9 Ex. 341 as:

> Where two parties have made a contract which one of them has broken, the damages which the other party ought to receive in respect of such breach of contract should be such as may fairly and reasonably be considered arising naturally, i.e. according to the usual course of things from such breach of contract itself, or such as may reasonably be supposed to have been in the contemplation of both parties at the time they made the contract, as the probable result of the breach of it.

This introduces the doctrine of remoteness of damage, by limiting recovery to costs incurred under the two 'branches' or 'limbs' of *Hadley v Baxendale*. That is, an injured party may not necessarily recover every item of damage resulting from a breach but may be limited to matters considered to arise naturally from such a breach, i.e. 'according to the usual course of things', the first 'limb'. They may also recover for matters considered to have been 'in the contemplation of both parties at the time they made the contract', the second 'limb'.

This of course raises the issue as to what might be considered to arise naturally, or be within the parties' contemplation, and the distinction between consequential losses that may be considered to be recoverable and those which are not. Consequential costs such as loss of profit or finance charges can be recoverable providing they can be shown to fall within the principles of *Hadley v Baxendale*. However, the loss of exceptional profits available from another contract but lost by the late completion of a project were excluded from recovery under the second limb of *Hadley v Baxendale* in *Victoria Laundry (Windsor) v Newman Industries Ltd* [1949] 2 KB 528, which developed the principles applicable to the recovery of damages under the second limb of *Hadley v Baxendale*.

The *Victoria Laundry* case set down three tests for the recovery of damages under the second limb as:

> In cases of breach of contract the aggrieved party is only entitled to recover such part of the loss actually resulting as was at the time of the contract reasonably foreseeable as liable to result from the breach …
> What was at the time reasonably so foreseeable depends on the knowledge then possessed by the parties or, at all events, by the party who later commits the breach …
> For this purpose, knowledge 'possessed' is of two kinds; one imputed, the other actual. Everyone as a reasonable person, is taken to know the 'ordinary course of things' and consequently what loss is liable to result from a breach of contract in that ordinary course … But to this knowledge, which a contract breaker is assumed to possess whether he actually possesses it or not, there may be added in a particular case knowledge which he actually possesses, or special circumstances outside the ordinary course of 'things', of such a kind that breach in those special circumstances would be liable to cause more loss.

In construction terms this means that an experienced contractor, professional design and consultant team, project manager and developer would all know at the outset of a contract to construct a new office building that it may be acquired as a long-term investment for profit by an investor and used for a short-term trading profit by an occupier. The losses that may stem from this type of knowledge are usually brought within the express terms of the contract by the inclusion of express provisions for an agreed rate of delay damages to be applied in the event of contractor culpable delays to the contract completion date. Where such losses are not brought within the contract they will be capable of being pursued as a result of breaches on an actual damages basis.

It is possible for construction, and other, contracts to expressly exclude the recovery of 'consequential losses'. However, such an exclusion may not, of itself, exclude all costs arising under the second limb of *Hadley v Baxendale*, as a consequential loss may be within the first limb of the rule. For instance, in a contract for the supply of concrete masonry blocks the vendors included a clause excluding their liability for consequential loss or damage as a result of late delivery. However, this clause was held not to exclude claims against the purchasers, pursued by their blockwork subcontractors, for damages incurred as a result of delays in the subcontract works caused by the late delivery (*Croudace Construction Ltd v Cawoods Concrete Products Ltd* [1978] 2 Lloyds Rep 55). The loss was considered to be in the normal course of matters and did not need to have been in the contemplation of the parties at the time of the contract.

However, exclusion clauses can in some circumstances exclude the recovery of consequential losses. In *British Sugar PLC v NEI Power Projects Ltd* (1998) 87 BLR 42 an exclusion clause was inserted in the contract limiting the recovery of consequential losses to the value of the contract. This was subsequently held to include the consequential loss of profit as a head of claim.

In summary, the principle for damages evaluations under English law is that the offended party should be put, as far as money can achieve it, in the same position as it would have been but for the intervening event. This is providing the nature of the damage can be demonstrated to be a natural consequence or within the contemplation of the parties when they entered into the contract, and is not restricted by express agreements or exclusions in that contract.

### 1.2.3 Duty to Mitigate

This does not mean that the party suffering a breach of contract by another can treat the breach as a 'blank cheque'. There is a duty on the party incurring additional cost as a result of a breach of contract to mitigate that cost. The principle 'imposes on a plaintiff the duty of taking all reasonable steps to mitigate the loss consequent on the breach, and debars it from claiming any part of the damage which is due to his neglect to take such steps' (*British Westinghouse Electric & Manufacturing Co Ltd v Underground Electric Railway Co of London Ltd* [1912] AC 673). This case laid down a number of principles in relation to the duty to mitigate and the extent to which this might limit a claimant's recoveries.

In *'The Solholt' (Sotiros Shipping Inc) and Another v Shmeiet Solholt* (1983) Com LR 114 the judge stated in respect of mitigation:

> A plaintiff is under no duty to mitigate his loss, despite the habitual use by lawyers of the phrase 'duty to mitigate'. He is completely free to act as he judges to be in his best interests. On the other hand, a defendant is not liable for all losses suffered in consequence of his so acting. A defendant is only liable for such part of the plaintiff's loss as is properly caused by the defendant's breach of duty.

This does not, however, allow the party in breach to sit back and criticise the steps taken by the party suffering the breach; it only requires that the steps taken shall be reasonable in the circumstances. Lord McMillan succinctly summarised the position in *Banco de Portugal v Waterlow & Sons Ltd* [1932] AC 452 506:

> It is often easy after an emergency has passed to criticise the steps which have been taken to meet it, but such criticism does not come well from those who themselves created the emergency. The law is satisfied if the party placed in a difficult situation by reason of the breach of a duty owed to him has acted reasonably in the adoption of remedial measures and he will not be held disentitled to recover the cost of such measures merely because the party in breach can suggest that other measures less burdensome to him might have been taken.

In summary of these cases, a number of principles can be said to apply:

- There is a duty on a party suffering from a breach by another party to take reasonable measures to mitigate its loss resulting from that breach.
- That duty does not limit how the injured party acts; it is free to act as it judges to be in its best interests, but the defendant is only liable for such part of the loss as is properly caused by the breach.
- That duty does not extend to carrying out measures that a prudent person would not normally take in the course of its business.
- The injured party cannot recover that part of its losses that was the consequence of its failure to comply with this duty.
- The costs of reasonable measures that are taken to mitigate loss are recoverable.
- The cost of such measures will not be disallowed merely because the party in breach can suggest that other measures less burdensome to it might have been taken by the claimant.
- The onus of proving that reasonable measures were not taken is on the party defending the claim.
- Whether the measures were reasonable is to be judged at the time and in the knowledge and circumstances under which they were decided upon, not with the benefit of hindsight.
- A party cannot recover any loss that was avoided by its actions, even where those mitigation steps went beyond what is reasonable.

In a construction and engineering context, care therefore needs to be taken when considering, for instance, criticisms that a contractor has not taken the most economical means to overcome the effects on its programme of delays that are the responsibility and liability of the employer or its consultants. This might mean that, where a contractor has introduced an additional work shift at considerable expense to expedite works delayed by instructed variations increasing the work scope, it might still recover those

costs even if later analysis suggests (with the benefit of hindsight) that the works might have been suitably expedited by the original workforce working overtime at less expense. Only if it can be shown that the contractor has been incompetent or has made decisions that no reasonable contractor would take (judged at the time and with the knowledge available when the decision was taken) should the reasonable costs of its measures be discounted in such circumstances.

These principles can have particular relevance in the context of a claim for costs of such as increased overtime working or the introduction of additional resources to a project. Such claims are considered further in Chapter 6 of this book.

By way of illustration of this, and in relation to context of a different type of claim, reference is made to *Maersk Oil UK Ltd (formerly Kee-McGee Oil (UK) PLC) v Dresser-Rand (UK) Ltd* [2007] EWHC 752 (TCC), a case that neatly illustrates a common complaint of defendants, i.e. that costs have been needlessly or recklessly incurred.

The brief facts of the case were that Maersk had purchased a compression facility from Dresser-Rand for use on *Janice A*, a semi-submersible vessel used on the Janice Field in the North Sea. Under the contract, Dresser-Rand undertook to provide a complete compression process and mechanical design package for over £3 million. Maersk contended that the equipment supplied by Dresser-Rand was dangerous and had caused excessive vibration, resulting in fatigue, gas escapes and the production of damaging liquids in the compressor trains.

The costs of investigating the problems and carrying out rectification works were all expenses that flowed naturally from the breach and were recoverable under the first limb of *Hadley v Baxendale*. However, the right to recover such expenses was not unqualified.

Dresser-Rand alleged that Maersk had failed to mitigate the costs incurred in that they had not used Dresser-Rand's knowledge and expertise but had engaged third parties to undertake unnecessary and unreasonable work. Dresser-Rand alleged that Maersk had simply 'thrown' resources at the alleged problems without giving Dresser-Rand the opportunity to carry out rectification works and had not adopted a reasonably cost-effective approach. This is a common complaint of defendants of defects claims in construction contracts where the claimant has had corrective, replacement or remedial works carried out and that they could have solved the problems more easily and economically themselves.

The test the court applied was whether the advice from the third parties used by Maersk had been such a completely inappropriate resource so as to break the chain of causation. The judge applied the test in *Webb v Barclays Bank PLC* [2000] PIQR 8 in which it was held:

> Whether a tortfeasor can avoid liability for subsequent injury tortiously inflicted by a second tortfeasor depends on whether the subsequent tort and its consequences are themselves foreseeable consequences of the first tortfeasor's negligence … Where any injury is exacerbated by medical treatment, the exacerbation may easily be regarded as a foreseeable consequence, for which the first tortfeasor is liable. If the plaintiff acts reasonably in seeking or accepting the treatment, negligence in the administration of the treatment need not be regarded as [an intervening event], which relieves the first tortfeasor of liability for the plaintiff's subsequent condition. The original injury can be regarded as carrying some risk that medical treatment might be negligently given.

In the *Maersk* case, the costs incurred by Maersk through the third parties were clearly recoverable. The work had been undertaken sensibly and by competent persons and while the outcome of some investigations had been spurious, the lines of enquiry followed had been reasonable in the circumstances at the time.

As will be explained in the relevant chapters of this book, the duty to mitigate has particular relevance to certain types of claim arising on engineering and construction contracts. It most commonly arises in relation to employer's claims for the remedying or completion of defective and incomplete works that have been left by a contractor. In this respect, see Chapter 8 and the judgments in cases, for example, such as *Pearce and High v Baxter and Baxter* (1999) EWCA Civ 789 (where the employer could not recover the full costs of remedying defects where there was a defects liability period in the contract but the employer had not given the contractor an opportunity to remedy them even though it was willing and able to remedy them). However, it also has particular relevance to claims for extensions of time arising from delays caused by an employer and the recovery of costs associated by such employer breaches.

## 1.3 Risks

The undertaking of construction projects of any substantial size will involve risk to the parties involved. As a general rule, the larger the project, the greater the risks being assumed by the parties. External circumstances such as changes in legislation, tax regimes, climatic conditions or the general economic climate may, among many other factors, impact upon the progress and/or costs of the works. Practically all projects will also be subject to some degree of internal risk, for instance from unpredictable site conditions or the need to complete some element of design after commencement of the works. The contract should address how all these risks are apportioned between the parties and their respective rights, responsibilities, obligations and liabilities arising in the event that any particular risk materialises.

While this text is concerned with the evaluation of additional payments in construction contracts, it is important that anyone undertaking such evaluation understands the reason why many such additional payments are required. It is not necessarily the result of incompetence or failure by one of the parties or its agents that such payments may be required. The need may arise simply as a consequence of the allocation agreed in the contract of known risks that were recognised and planned for by the parties.

That is not to suggest that risk should be regarded as something unavoidable or unmanageable. Risk analysis and management is a subject on its own but the consequences of failure to properly address the risk management process should be recognised by anyone involved in the management and evaluation of costs and payments on a construction project.

### 1.3.1 Design Risks

It is also important to understand the apportionment of risk inherent in the design of a project and how that is catered for in the contract.

Construction projects, by their very nature, usually contain some risk related to the design of the structures or buildings. That risk may be small where the design is relatively straightforward and the project conditions well known and documented, or may be substantial when difficult or innovative design is involved or where the precise nature of the project conditions cannot be ascertained at the design stage.

If the design is undertaken by the client, either in-house or by retained consultants, and the construction to that design is executed by the contractor, then the demarcation between design and construction risk will usually be quite easy to determine. However, if there are elements of specialist design with which the contractor or its subcontractors are involved, the contract needs to make clear the elements for which the contractor has responsibility. This is often achieved by means such as the 'Contractor Designed Portion' agreement used with JCT contracts.

However, the delineation of design responsibility can become more blurred when the contractor is responsible for design and construction. It may be that whilst the employer engaged design consultants to prepare and issue drawings and specifications to the contractor, the contractor in turn is responsible for the preparation of detailed drawings or shop drawings. Alternatively, the client may have the design progressed to a particular stage and then novate the design, and usually the contract with the designer, to the contractor. The obligation on the contractor is to complete the design and construct the scheme to the completed design.

It is also the case in some jurisdictions that even where the contract places no express design duty on the contractor, the applicable law implies a duty not to construct to a design that poses a wider public risk. This can come as something of a surprise to international contractors working in another legal jurisdiction for the first time. In such instances issues may arise as to where the respective responsibilities are delineated and where any failure actually occurred.

Where there is novation, a difficulty that can arise is that if the design progressed by the client and novated to the contractor proves to have substantive defects. At what stage was the error made? Has the contractor accepted responsibility for those defects in accepting the novated design? Some in the industry interpreted the decision in *Co-operative Insurance Society v Henry Boot Scotland Ltd* (2002) as extending the contractor's express responsibility to complete the design under the JCT With Contractor's Design form of contract (JCT WCD) to include a duty to verify the design handed over by the client.

This problem was clarified in 2005 when the JCT WCD form expressly stated that the contractor is not responsible for any inadequacy in the design provided by the client as the contractor is not required to check the design so provided. However, the contractor is still responsible for checking that any design by the client complies with statutory requirements, unless the contract information expressly warrants that the design is compliant. It will be necessary with other forms of contract, or bespoke contracts, and other jurisdictions, to check the inclusion or extent of the contractor's responsibility for checking the client's design.

It is therefore quite conceivable that claims for payment may arise from problems arising in the project design and allocated in the contract. The incidence and cost of such claims will need to be analysed and managed in much the same manner as construction risks.

### 1.3.2 Design Review

The JCT WCD contains a Contractor's Design Submission Procedure, based on that contained in the JCT Major Projects Construction Contract, providing a timetable for submission of the design by the contractor and approval by the client. This has been incorporated into the JCT's 2016 Design and Build Contract. Observance of such a procedure and the approval scheme will of course impact on potential liability for design defects and subsequent liability for the costs of any defects.

### 1.3.3 Professional Indemnity Insurance

The requirement to obtain, and maintain, insurance cover for design matters may be a requirement of the contract. The JCT WCD 2005 included provision for the contractor to obtain suitable professional indemnity insurance, although previously this was a common requirement by amendment of the previous version of the contract. In SBC/Q clause 6.12 requires the contractor to take out such insurance in relation to any work that is the subject of a Contractor's Design Portion.

By contrast, the NEC4-ECC does not specifically require professional indemnity insurance, unless such a requirement is expressly included by the employer in the Contract Data on the basis that it does not want the risk of the contractor carrying out defective design and being unable to bear the costs of the consequences. Whether the additional costs outweigh the benefit to it of reduced risk will be for the employer to decide.

If a claim is to be made under such insurance the assessment of quantum will usually be on the basis of restitution, i.e. to put the claimant under the policy in the position it would have been in but for the insured event and the contract valuation rules may not be appropriate. Such a claim will usually be on a 'damages' basis.

### 1.3.4 Risk Analysis and Management

If it is recognised that risks are inherent in a construction project, and they are recognised in the contractual arrangements, it is obviously necessary that an objective and thorough appraisal of the risks for a particular project is carried out with the aim of eliminating risks where possible and considering mitigation strategies for those risks that cannot be eliminated should they arise.

Risk analysis can be undertaken by any party to a construction project for that part of the project with which they are concerned. There is, however, only one party that can undertake a comprehensive analysis of the risks and instigate a reasoned allocation and mitigation strategy, and that is the employer or project sponsor. Many contractors, particularly on large projects, will undertake a risk assessment as part of the tender process, but this will be limited to consideration of the risks within their own scope of work and contractual obligations. Often this will be limited to an analysis of 'what can go wrong?' It will rarely consider any of the employer's risks or those of other contractors or subcontractors employed on the project where they do not impact on the contractor.

This, at best haphazard, approach to risk analysis has often been exacerbated by the scant attention paid in the past to any rigorous approach to risk management as the project proceeds. Whilst risk management has become a much more widely recognised

requirement and discipline in many markets, in some parts of the world it is still almost ignored.

A discussion of risk management techniques is beyond the scope of this text, but it needs to be recognised that management and mitigation of risks will lead to mitigation of the need to make additional payments in the construction phase. The prime mover in this process has to be the employer, and the focus of the process should be the whole scope and lifetime of the project encompassing all aspects including finance, environmental issues, construction, operation and ultimately redundancy or decommissioning. There is a great volume of literature on risk analysis and management and there are published schemes of implementation, which can be applied to the lifetime of a project.

Any proper system of risk analysis will need to consider all aspects of the project, but from a commercial perspective it is important that, when deciding on risk transfer, the following matters are taken into account:

- Which party is likely to be best able to control the events leading to, and consequences of, a risk if it occurs?
- Should the client retain some involvement in controlling the risk?
- Which party should carry the risk if it cannot be controlled?
- Is any premium charged for the transfer of risk likely to be acceptable to the transferee?
- Does the premium to be paid exceed the likely benefit of transferring the risk, particularly where the transfer is to a party that is less able to manage the risk economically?
- Will the risk, if it occurs, result in other risks arising? If so, those risks need to be considered as above.

As we are concerned here with the construction phase and evaluation of additional payments, the consequences of the failure to conduct proper risk analysis and mitigation can be simply illustrated using one of the constant sources of dispute in construction contracts, the provision of information relating to physical conditions of the site.

Consider a contract for capital dredging and reclamation works to be undertaken in commercial docks as the preliminary work to the construction of a new dock and quay facility. Part of the tender information issued to the bidding contractors included a marine survey described in the tender documents as 'indicating the depths of water in the dock with the lock gates closed', i.e. the lowest level of water to be anticipated in the docks. The successful contractor deployed a substantial range of marine equipment and vessels to undertake the reclamation phase of the project only to discover its vessels grounding on the dock bottom at times when the dock gates were open, and the minimum level of water was therefore being exceeded! It was apparent that the depths of water shown on the tender survey information did not exist. Not unnaturally the contractor was somewhat perturbed and ultimately had to reorganise its programme and methods at some considerable cost, for which it looked to the client for reimbursement.

In the ensuing protracted discussions it emerged that: the survey provided as part of the tender information was six years old at the time of tender; the docks were subject to silting as they were located adjacent to an estuary; and no maintenance dredging had been undertaken in the intervening period in the area of the works. This in turn led to further protracted discussions as to what an experienced marine contractor could, or should, know, including comment by the engineer that the reference to the survey 'indicating the depths of water in the dock with the lock gates closed' should have been

disregarded by tenderers as it was included as part of a preamble inserted by the engineer's quantity surveyor!

Whatever the outcome of such a scenario, and it had to be expensive for one or more of the parties involved, one simple truth emerged. The whole costly episode could have been avoided if the employer, or engineer, had recognised that the survey information was out of date and taken one of two possible courses, either obtaining an up-to-date survey and issuing it with the tender documents, or not issuing any survey information but making the facility available to the tenderers to undertake their own surveys. The former would be preferable, requiring only one survey and avoiding any difficulties of access for multiple surveys by different companies. The real lesson is that a proper risk analysis should have identified the need for a minor expenditure on survey information, which could have prevented considerable expense and delay and consequent dispute, if only the risk had been identified and mitigated.

With the development of risk analysis and management techniques, and their greater acceptance and adoption, it may not be too fanciful to presume that failure to implement such a scheme could in the future be taken into account in the assessment of costs arising from the incidence of a risk. This could at some point result in a defence against a claim failing on the allegation that a proper risk assessment process would have identified the problem. Perhaps at some point the rule in *Hadley v Baxendale* will need to be considered in the light of, or absence of, a risk analysis and management process.

In any event, whatever the legal implications, it has to be good commercial sense for all parties to a contract to identify and consider all potential risks before commencing on the project. 'A gramme of prevention is worth a tonne of cure' should be a guiding principle for everyone involved in the construction process.

### 1.3.5 Risk Registers

Many large projects now include a risk register agreed and maintained jointly by the client and contractor. The NEC3-ECC contract included in its clause 16 requirements for such a register and the conduct of risk reduction meetings (formerly early warning meetings) between the project manager and contractor (together with others such as subcontractors, suppliers and the employer as desirable) to review the risks, update the register and track progress on identified risk issues. In NEC4-ECC the equivalent provisions are now in clause 15. Reference is now to an 'Early Warning Register' and the form has returned to the reference to 'early warning meetings'. It is interesting to consider that this ongoing review and updating might impact on the risk allocation in the project and therefore will need to be carefully monitored to ensure that there is no significant transfer of risk from one party to the other without proper sanction.

This emphasis on managing and providing early identification and warning of risks is carried through to the valuation of compensation events in NEC4-ECC as clause 63.7 requires that in the event that the contractor should have given early warning but did not, the compensation is to be assessed as if it had given such a warning. This could result in the contractor suffering a reduced level of cost recovery or reduction in time allowed for an event. The project manager is likely to treat any absence of early warning as a lost opportunity to take alternative action or issue other appropriate instructions in relation to the event. Similar provisions are not uncommon in bespoke engineering contract, although there are no such requirements in the Infrastructure Conditions, SBC/Q or

the FIDIC Red Book. When assessing quantum in such circumstances it is therefore necessary to ensure that any alternative view of the actions and consequences is properly taken into account.

Incidentally, many international arbitrations see arguments regarding the quantification of claims preceded by arguments regarding notice and whether the lack of notice is a condition precedent under the terms of the contract and the applicable law. This is usually put as an all or nothing defence, without considering it as a question of potential mitigation. That notices were not given may not preclude the claims, but what about their effects on quantum? Had the employer and its representatives known at the time of the claimed effects of an event or decision, would they have acted differently, issued an instruction or similar, in order to mitigate the effects? It is striking how often this issue is not raised by employers as a secondary issue relating to notices. A potential position may be that, even if the lack of notice does not entirely defeat the claim on the basis of a condition precedent, it still might reduce its quantum. This is presumed on the basis either that there was a failure of a duty to mitigate or that the lack of notice was a breach by the contractor for which the resulting and unnecessary costs in the claim are damages incurred by the employer. Whether this second suggestion is possible may particularly depend on the applicable law.

### 1.3.6 Risks and Records

It has been stated on many occasions that the root cause of many claims and disputes on construction and engineering projects is the failure to place risk plainly on one party or the other. This is sadly true, but often overlooked in the preparation of many contracts, and any failure to identify clearly the party carrying a particular risk is likely to result in disputed claims for additional payment if the risk occurs. In addition, further disputes as to the valuation of change and disruption also occur where the risk is placed plainly on one party and where the contract allows the party carrying the risk to claim additional payment in defined circumstances. The risk allocation may be plain, but the financial consequences of its occurrence may be open to a range of opinion and argument.

There may also be circumstances where the risk apportionment is defined and the entitlement to claims for additional payment is clear, but the value of the additional payment cannot be calculated from the contract provisions. It is in such instances that a further risk element may be thought to enter the contract, the risk carried by a party failing to keep adequate or proper records of the events and consequences of such a risk occurrence.

It is often said that a party to a construction contract dispute will soon realise that unless it has good records, its case will be at least diminished or, at worst, lost. This is no exaggeration and the need for careful substantiation of claims for additional payment is a theme of the following chapters. Any party to a construction contract who does not understand, or fails to implement, the requirement to keep proper records runs a very real risk of seeing subsequent claims for additional payment reduced or even negated.

What constitutes a proper, or reasonable, record may vary with the nature of the works and the terms of the contract. Many contracts, for instance those with a large mechanical engineering content with weld examination and approval procedures, may require extensive records for quality control, which will also be useful and reliable for evaluation of additional payments. However, these records may not, of themselves, be sufficient

in particular instances and there should be a mechanism for the parties to record the following events with reasonable accuracy:

1. The progress of the works with reference to physical milestones and significant events. The means of achieving such records will vary but they may not be restricted to paper records such as revised programmes or programmes marked up with progress. Devices such as photographs and video recording can be equally useful, and in some instances preferable alternatives.
2. The deployment of resources, both labour and plant, in a manner which not only identifies the scale of the resources but also allows identification of the activities undertaken in the recorded period.
3. Deliveries of critical materials and items for incorporation in the works, such as equipment packages for mechanical installations. Procurement documentation should normally be available to establish the sequence and timing of pre-delivery activities.
4. Deliveries of other prerequisites to construction such as design drawings and details or access to work areas.

It is important to consider such issues as: who should keep these records; when it is appropriate for the record keeping to be implemented; the extent to which they should be agreed; and if they should be taken jointly. Many disputes arise in the evaluation of claims for additional payment as a result of inadequate records, but probably just as many arise from disagreements as to the veracity and accuracy of records submitted by one party to the other.

While it might not be appropriate for both parties to verify all records throughout the course of a large project there is certainly an argument that such an approach might significantly reduce the risks of disputes generated by disagreement of the consequences of a specific event. At the very least it is both necessary and reasonable for both, or all, parties to agree records if notice has been given that a claim for additional payment may arise, as is required by some contract terms. This is not always the case and neglect of this aspect can exacerbate an existing dispute as to evaluation or create one where a dispute should not have been necessary.

Many standard forms have express provisions for record keeping in the event of claim situations. For instance, the Infrastructure Conditions contain provisions for record keeping when dealing with additional payments in clause 53 paragraphs (2) and (3), in the same terms as the previous ICE Conditions. The FIDIC Red Book clause 20.1 requires the contractor to keep contemporary records to substantiate any claim, and allows the engineer to monitor those records and instruct that further records are kept. These provisions allow the engineer to require any specific records that it may believe will be material, but there is, in any event, a requirement that the contractor shall keep any contemporary records that may be necessary to support a subsequent claim. Even where a standard form does not set out such requirements, it would be open to the parties to incorporate those of such as the model records provision of the First Edition of the SCL Protocol or similar. These provide no more than the express statement of something that should be implied in any event. That is, if the contractor intends to submit a claim for additional payment as a result of events on site, it should keep such contemporary records of the events and their consequences that are required to establish the claim 'on the balance of probabilities' or whatever other standard of proof applies.

The record keeping requirements set out in these conditions of the FIDIC Red Book and the Infrastructure Conditions are plain and reasonable, but it should be noted that, while the contractor is under a duty to keep records once notice has been given, there is no compulsion on the engineer to verify the records, keep copies or issue instructions as to any further records it may require. In most instances this may not be a problem and the contractor's records when inspected may be sufficient and acceptable. It would seem prudent, however, to sound a note of caution where adjudication provisions required by such as the UK's Housing Grants, Construction and Regeneration Act of 1996 ('the HGCRA') apply, as updated by the Local Democracy Economic Development and Construction Act of 2009. The implications of these Acts are outside the remit of this book, but the timing issues of the Adjudication process introduced in 1996 have to be considered in the context of record keeping.

The adjudication provisions contained in the Infrastructure Conditions at clause 66B mirror the timing aspects of the Scheme issued under the HGCRA, and give an adjudicator 28 days from referral to reach a decision, extendable by 14 days only by consent of the referring party. If the engineer has to verify extensive records and consider their implications at the same time as submitting the employer's case for consideration by the adjudicator it could be under some difficulty. The effect of the adjudication scheme in respect of records is to reinforce the advisability of joint contemporary records, and careful consideration by both parties of the nature of the records required. It is possible that, in the light of adjudication provisions and timetables, the day is not too far away when an employer's supervisory consultant will be held to be negligent in not ensuring they were in a position to answer allegations in an adjudication based on records of the works. A further requirement of the speed of adjudication may be that records are required instantly and in a suitable format without time to forensically create them or put them into suitable form.

The increasing adoption of fast-track adjudication schemes similar to those of the UK in other jurisdictions means that this need for quick access to readily useable records could apply anywhere. A problem with the introduction of what is sometimes referred to as a 'quick and dirty' third party dispute resolution process in some jurisdictions is that they do not have a matching discipline for keeping such records.

Many contracts do not contain specific clauses setting out record keeping requirements in the manner of the FIDIC Red Book. It is not unusual in international engineering 'ad hoc' forms to find provisions for a contractor to give notice that it is undertaking works that it considers are a change from, or additional to, the contract requirements but for which the employer has declined to issue a required 'change order' or other necessary instructions. Such provisions are often termed 'disputed change orders', and there may be a further process in the contract for acknowledged change orders to have disputed consequences, where the employer acknowledges the validity of a change order but not the claimed consequences. The purpose of such clauses is to enable the parties to proceed with the works without the delay generated by arguments as to whether or not a particular matter is, or is not, a change or addition to the contract requirements. Such clauses therefore typically contain requirements for notification of the potential dispute, but equally typically are less specific on the requirements for the contractor to keep records or the employer's right to require particular records to be kept and made available. The sanction for ultimately inadequate records in such instances is often stated to be the right of the employer to refuse payment.

The reasoning behind the often vague record keeping requirements of such clauses is often that large international engineering contracts, such as those for the oil and gas industries, have substantial requirements for the administration of the contract written into their specifications, together with extensive quality control and safety records, which may be considered to provide the basic sources of information required. It does, however, seem that some more specific record keeping for particular notified instances of possible dispute, such as that contained in the FIDIC Red Book, would have the potential of further reducing the potential for disputes.

In this context the provisions of the General Conditions of Contract issued by the CRINE Network (Cost Reduction in the New Era) in June 1997, superseded by the LOGIC Marine Construction contract in Edition 2 in 2004, for the offshore oil and gas industry, contain in clause 14.7 similar provisions to those previously in the ICE contracts. It is suggested that these represent best practice. Although such projects are outside the HGCRA's remit and its adjudication scheme does not apply, the CRINE/LOGIC contracts contain their own resolution of disputes provision at clause 37. This clause contemplates a more internal approach to dispute resolution, but the requirement to keep records of disputed variation works is bound to increase the chances of success in such an internal process.

### 1.3.7 Reimbursable Risks

Not all risks entitle the party carrying them to additional payment if they arise. There are reimbursable risks and non-reimbursable risks.

The principle often adopted in contract drafting is that the party best able to control the risk is the party who should be responsible for that risk in the contract. Consider, for example, the treatment of unforeseen physical conditions in the Infrastructure Conditions and other standard forms of construction and engineering contracts based on the old ICE approaches.

The FIDIC Red Book is no different to the ICE Conditions that were its basis, in that clause 4.12 allows the contractor to claim additional payment if unforeseen physical conditions are encountered. This is often referred to mistakenly as the 'unforeseen ground conditions' clause, but it covers any physical condition that could not be foreseen. In *Humber Oil Terminal Trustees v Harbour & General* (1991) 59 BLR 1 the clause was held by an arbitrator to include foreseeable ground conditions that acted in an unpredictable manner when subjected to particular forces. It is good sense for the contract to make the contractor responsible for notifying such conditions if they are encountered and, in conjunction with the engineer, devising remedial or other measures. The contractor is the party that can be expected to become aware of such problems before others and therefore the contract makes it responsible for proper notification and action.

From a payment perspective there are two points to note. Firstly, that clause 4.12 of the FIDIC Red Book is inextricably linked to the preceding clauses 4.10 and 4.11, which set out the contractor's responsibility for interpreting information provided and making its own investigation of the site and its surroundings. Secondly, that the interpretation of information, inspections and examinations contemplated by clause 4.11 is to be incorporated in the contractor's tender. The principle is that the contractor cannot escape responsibility for errors or deficiencies in its tender and must be considered to have included for all predictable circumstances as would be anticipated by a reasonable and competent contractor.

This means that when assessing entitlement to additional payments it is not the tender computation that is the starting point but the provisions that should have been made in the light of available information and reasonable enquiry. This starting point is not unique to these clauses of the FIDIC Red Book or any other clauses or conditions, including those also based on the old ICE Conditions. It is a general principle that is sometimes forgotten when trying to establish a starting point for the evaluation of additional payment in relation to reimbursable risks.

### 1.3.8 Non-reimbursable Risks

In contrast to the risks that can generate entitlement to additional payment obligations, there are risks that are identified as being clearly the responsibility of one party in any event, but without additional payment to the other party if they occur. However, that does not mean they will not impact on other parties to the contract.

For instance, most construction contracts place the risk of obtaining the quantity and quality of labour resources plainly on the contractor, but if the contractor cannot provide the required resources, the employer, or owner, will almost certainly be affected because completion of the project is likely to be delayed. While the contractor will not be able to recover additional costs in respect of any prolongation of the contract period, and related resource costs, through the construction contract, the employer will usually suffer costs of its own from the delayed completion.

Most contracts expressly provide some recovery for the employer, usually in the form of delay damages, discussed in Chapter 6 of this book, but these will often not provide full recompense for all costs incurred. It is not unusual in large engineering projects for such damages to be restricted by a cap expressed as a percentage of the contract price, resulting in major delays being even more harmful to the employer, where its actual costs and losses exceed its capped recoveries from the contractor. Indeed it is not unusual for the rate of liquidated damages stated in many building and civil engineering contracts to be less than the employer's anticipated loss as the insertion of realistic losses as damages would deter or prevent contractors from undertaking the works. Employers do, however, have the option of not including a rate of delay damages in the contract and relying on their actual damages arising from the contractor's failure to complete on time. Dangers with this alternative approach are that the employer will have to prove its actual damage and that bidding contractors may be deterred by a lack of limit on their potential liability. These issues are discussed in detail in Chapter 6.

A further alternative for the employer, where the contractor is in breach and its rate of damages would be insufficient to reimburse its true losses, might be to determine the employment of the contractor. For example, clause 8.4 of SBC/Q empowers the employer to terminate the contractor's employment for 'failure to proceed regularly and diligently with the Works'. Effectively, the employer might here be said to be trying to limit its losses. It was particularly seen as an approach on some commercial projects in the Middle East after the crash of 2007/2008, where the preceding efforts of contractors were hampered by boom and then bust, and developers saw an opportunity to both avoid making a claim against an insolvent party and to retender the works at significantly lower rates and prices.

Delays in completing a construction project can have significant knock-on effects on related parts of the employer's business and can cause substantial disruption and cost to

even large, well-managed and well-financed organisations. It is therefore in the interests of all parties to a construction project that the risks inherent in its undertaking are properly understood, analysed, allocated and managed throughout the lifetime of the project. Many disputes arise simply from an imperfect understanding of risks at the outset and an often remarkable failure to attempt to manage and mitigate the risks as the project proceeds, particularly where the result is late completion and a substantial cost overrun.

## 1.4 Sources of Change

Many disputes over additional payments arise from the failure to record and detail the consequences of risks when they do arise. The most successful route to minimising disputes and their effects is first to ensure that the commonly arising risk events are understood and either anticipated and prevented or controlled, and then to ensure that any consequences that arise are properly recorded and the claims for associated additional time and money are properly presented. A full and well-supported presentation of a problem will usually be the first requirement to ensuring that the cause and effect are understood by all and are capable of rational analysis and resolution without the need for them to evolve into dispute with the potential for protracted, contentious and expensive formal proceedings.

A review of such as the lists of 'Relevant Events' in SBC/Q's clause 2.29 or the 'compensation events' in NEC4-ECC's clause 60.1 will identify most of the causes of change under construction and engineering contracts. An in-depth analysis of all of the potential causes of claims related to change is beyond the scope of this book, but it is useful to consider very briefly the most common causes of such issues.

### 1.4.1 The Process of Analysis

The previous discussion of risk management and the need to maintain records where the occurrence of a risk event involves a departure from the anticipated path of the project works makes clear that, while there should be a clear and defined risk register and risk management plan for any major project, the effects of risks cannot always be totally avoided or mitigated. On projects other than those of a very minor size, there will be instances where a risk event occurs, and its effects are alleged to give rise to an entitlement to additional time and/or payment. In such circumstances all the previous comments about records and substantiation will apply and if the required information is presented in a logical and comprehensible format the chances of avoiding unnecessary disputes will be increased.

In breach of contract cases lawyers often refer to the required chain of analysis as being:

Duty – Breach – Cause – Effect – Damage

This chain of analysis anticipates that the claiming party will fulfil each of the parts set out in it. That is, it will establish: what duty was owed to it by the other party; the cause of the alleged breach of duty; the facts of the breach itself and the effects of the breach; and lastly the damage that results from the breach and is required as compensation.

While this book is primarily engaged with the last step in this chain, that of substantiating the damage or value of an additional entitlement, there is no doubt that the task

of establishing the quantum of a claim is much simplified and stands a greater chance of success if the claim itself has been fully analysed and established from the root causes as anticipated by the chain of analysis. An example of this is in relation to quantifying disruption claims. Analysis that goes back part way through the chain of causation to better detail of the effects of disruption can facilitate a more detailed approach to quantification.

The legal analysis of a claim will be concerned with liability, i.e. establishing whether or not there has been a breach that gives rise to an entitlement, but the same analysis can be applied to quantum. Using this chain of analysis, and considering it with the evaluation of quantum in mind, the various steps might involve the following matters:

*Duty*. This first step in the chain of analysis is primarily concerned with establishing the obligations and responsibilities of the parties to the contract. It is important in doing so to also confirm what the financial duties and responsibilities are. Among the issues to be addressed will be: What is the contract sum? What is its basis? How is it to be measured and adjusted? What notice, if any, has to be provided of financial impacts?

*Breach*. In applying the financial provisions of the contract have any of the obligations and responsibilities established under the 'Duty' analysis been breached? If so, in what respect? Is the breach material or is it of little consequence?

*Cause*. What is the cause of any breach in the obligations and responsibilities? Is the cause relevant to any analysis of the financial impacts?

*Effect*. This is where the quantum analysis often begins to assume equal importance with the liability analysis. Along with the effects of the liability analysis it will be necessary to analyse the financial effects of the liability breaches, and the impact, if any, of the first three stages of the financial analysis. What are the financial impacts of the liability breaches? Are there any breaches of the financial obligations and responsibilities that affect the financial impacts?

*Damage*. Where a damages claim is being considered it will be necessary to consider aspects of sustainability and proof of the financial effects. Are any of the financial impacts too remote to be claimed? Are the records of events and costs sufficient to support the claim being made? Has the legal burden of proof been satisfied? Should the financial impact have been mitigated from that being claimed? Does the claim overlap with other claims or additional recoveries elsewhere?

All these, and usually many other questions (such as the legal issue of contractual notice), will arise in the course of analysing a claim for additional payment. It is not possible to produce a comprehensive listing of possible questions as many will stem from the type and terms of the contract, the circumstances of the claim being made and the financial impacts being claimed. What is important is that a rigorous and logical analysis is employed and that the results are incorporated into the claim evaluation.

If this process is followed it should help provide properly established and supported claims for payment. This is, in itself, one of the most important steps to avoiding disputes. Sadly, it is also one of the most often ignored steps.

### 1.4.2 Inadequate Pre-contract Design and Documentation

One of the perennial causes of claims for additional payment under construction and engineering contracts is error or omission in the design and specification documentation issued for a project at the outset.

This problem should not be confused with contracts where design information is issued at the outset in an incomplete form for known and planned reasons. The most common incidence of contracts commencing with incomplete design is that of major projects where the length of time required to complete the design before commencement of work on site would be unacceptable to the employer. There is nothing intrinsically wrong with such an approach and it is often necessary for large schemes to begin the early phases of construction before the design of later stages is completed. However, that reality must be recognised by all from the outset of the project and its contract terms drafted accordingly.

It is, however, essential in such circumstances that the contract anticipates the completion of design during the construction phase and that procedures are implemented to monitor and control both the required processes and the effects. In particular, from a quantum viewpoint, the payment terms and provisions need to be set up to allow the payment for the later stages to be calculated during the contract period.

Such a situation is radically different from that where the design is intended to be complete, but is not, or where there are omissions in the documentation and/or contradictions between contract documents. Such problems often result from inadequate or badly managed pre-contract phases where the preparation of design and contract documentation is compressed into too short a time frame. The pressures in pre-contract periods are understandable; the client almost invariably views the construction process as a means to its end and is anxious not to spend either more time or expense on it than it absolutely has to. The client wants its plant, factory, office, etc., as soon as possible so that its end is achieved without delay and too much expense. There has to be an education process to ensure that any client, particularly one not regularly engaged in construction projects, understands that apparent savings in time and expenditure in the pre-contract phase can result in more substantial delays and expenditure in the construction phase. The client may still have reasons to pursue early commencement of the project, but in such circumstances it should be acknowledged that it is a commencement with incomplete information, and adapt accordingly.

One of the devices sometimes adopted in such circumstances is to include extensive provisional sums for work that has not been fully, or sometimes not even partly, designed or defined. While this may be acceptable in some circumstances, it is suggested that it should be kept to a limited extent, where 'needs must' and too many employers and their consultants misuse this as an excuse for not getting the design properly firmed up at contract stage. See in this regarding the judgment of Mr Justice Akenhead's judgment in the High Court's Technology and Construction Court in *Walter Lilly & Company Limited v (1) Giles Patrick Cyril Mackay and (2) DMW Developments Limited* [2012] EWHC 1773 (TCC) (12 July 2012). In that case the contract was based on the JCT Standard Form of Building Contract 1998 Edition Private Without Quantities, but the design was so undeveloped that all of the building works were the subject of provisional sums. The judge described the project as 'a disaster waiting to happen'. In the event costs overran several-fold.

Particular problems may arise if the contract makes a distinction between 'defined' and 'undefined' provisional sums. As an example, if it states that the bills of quantities have been prepared in accordance with the measurement rules in NRM2 (which are the same in this respect as its predecessor SMM7, incorporated into the definitions of SBC/Q). NRM2 rule 2.9.1.3 states that the contractor is deemed to have made provision in its programme of works for work covered by 'defined' provisional sums, but not those

covered by 'undefined' provisional sums. Without definition for significant portions of the work, the programme can become nothing better than guesswork and the seedbed of future dispute. Issues can also arise as to whether a provisional sum was actually 'defined' or 'undefined' and hence covered by the programme or not.

A useful description of a provisional sum was provided by Lord Justice May in the judgement of the Court of Appeal in *Midland Expressway Ltd v Carillion Construction Ltd (No. 1)* in 2006, thus:

> [a provisional sum is] used in pricing construction contracts to refer either to work which is truly provisional, in the sense that it may or may not be carried out at all, or to work whose content is undefined, so that the parties decide not to try to price it accurately when they enter into their contract. A provisional sum is usually included as a round figure guess. It is included mathematically in the original contract price but the parties do not expect the initial round figure to be paid without adjustment. The contract usually provides expressly how it is to be dealt with. A common clause in substance provides for the provisional sum to be omitted and an appropriate valuation of the work actually carried out to be substituted for it. In this general sense, the term 'provisional sum' is close to a term of art but its precise meaning and effect depends on the terms of the individual contract.

For defined provisional sums to be incorporated in a contract using NRM2, rule 2.9.1.2 requires it to provide: the nature and construction of the work that is the subject of the sum; the construction of the work; a statement where and how it is to be fixed; a statement of what is to be fixed to it; and quantities to indicate the extent and scope of the work and any specific limitations. If such a sum is included in the contract then the contractor is deemed to have included in its programme of works and pricing of the contract preliminaries and general items for the work covered by the provisional sum. In practice, the information is sometimes very vague and on occasion completely absent, notwithstanding it is still described as a defined provisional sum. Such abuses can only lead to later disagreement. Furthermore, there may be disagreement regarding the information and whether it does actually satisfy the requirements of NRM2 rule 2.9.1.2, for example where a statement as to where and how provisional sum work is to be fixed is vague or incomplete.

Furthermore, where the requirements of NRM2 rule 2.9.1.2 are met and the information required for a 'defined' provisional sum is available, it does often beg the question as to why the works are included in that provisional sum rather than being measured in the bill of quantities, perhaps with the rider that they are only 'provisional' quantities.

It is useful to note that the NEC4-ECC form of contract does not provide for the use of provisional sums. That approach is based on the position that if an employer cannot clearly define part of the works at the time the contract was formed that work should not be included in the contract because it is not reasonable to expect the contractor to include work without a clear indication of its cost and programme implications. Under NEC4-ECC the preferred approach is to deal with such work by use of the early warning system and register with the work being valued as a compensation event in accordance with the contract terms. Employers may wrongly believe that reduces certainty of price in relation to the subject work, but the real effect may be the advantage of removing an area that is particularly prone to disagreement.

### 1.4.3 Design Development and Approval

In many contracts, especially those with large process facilities, it is often the case that the design will continue to develop after the construction contract has been let, for sound technical reasons. This could be because technology has moved on or legislative requirements in relation to the end product of the process have changed. The same reservations as stated elsewhere apply, in that the contract must be set up to cater for such developments. If substantial portions of the works either cannot or will not be fully defined or designed, or the design is likely to alter in significant respects, then the payment and planning provisions should be structured to cater for the anticipated design development. The use of provisional sums in this regard has been discussed elsewhere.

Where the design is particularly incomplete, and intended to be completed later, one approach to adopt is for the contractor to be obliged to produce a detailed programme for the first period of the works, perhaps six months, with the adoption of milestone dates to be achieved for completion of the works and detailed programmes produced when the works are fully designed. This may also require the adoption of agreed sums for the designed work, where full definition is possible at the outset, and the agreement of a means of pricing the works yet to be designed, whether by schedules of rates agreed in the contract or by agreement of payment on some form of reimbursement of cost plus agreed overhead and profit additions.

If the agreements at the outset do not realistically reflect the intended manner by which the works will be procured then future problems are almost guaranteed. However, even where the contract terms reflect the reality of the approach, the position can be subject of further abuse, giving rise to different sorts of problems.

Even where the employer appoints architectural and engineering design consultants, it is common for contractors to be required to develop the design of the works to an extent set out in the contract. This is recognised, for example, in clause 4.1 of the FIDIC Red Book. The specifications will then usually set out the details of the extent to which the contractor will design as well as the procedures for gaining the approval of the employer's architect or engineer of that design before the related work can be carried out. Typically the contract documents will set out an approval procedure involving alternative codes from the employer's representative, such as:

| | | |
|---|---|---|
| Code 1 | 'Work may proceed' | The contractor can commence construction against that design. |
| Code 2 | 'Revise and resubmit. Work may proceed subject to incorporation of comments' | The contractor can commence construction so long as it complied with the comments. |
| Code 3 | 'Revise and resubmit. Work may not proceed' | The contractor cannot commence construction and must resubmit the design, addressing the comments. |
| Code 4 | 'Review not required. Work may proceed' | The contractor can commence construction against that design. |

Failure by the employer's representative in relation to such approval processes should entitle the contractor to an extension of time. In the case of the FIDIC Red Book, this is covered by clause 1.9 'Delayed Drawings or Instructions', where it will also entitle the

contractor to any resulting costs incurred and reasonable profit thereon. However, such procedures for contractor design and approval are often abused. For example:

1. Where it is used to require the contractor to develop the design through stages that ought to have been carried out by the employer's designers. Thus, the contractor is not just required to produce 'shop drawings' but to complete the designers' incomplete or inadequate work.
2. Where the evaluation of the contractor's drawings unfairly rejects the design or requires revision and resubmission on spurious grounds. Thus, for example, a drawing that ought to have been given Code 1 is designated Code 3.
3. Where the approver takes an inordinate time to evaluate or respond to the design, be it longer than the approval period stated in the specifications or a reasonable time if no specific period is stated.
4. Where the employer's designer uses the approval process to require what should be covered by variation instructions under the contract. The contract documents should clarify that the review of shop drawings should be limited to checking that they comply with information given and the design provided to the contractor. This does not mean that the employer can instruct variations to that design under the pretext of a Code 2 or Code 3 requirement to revise and resubmit.

### 1.4.4 Access or Possession

It is obvious that a fundamental duty of an employer is to provide the contractor with access to, or possession of, the site of the works. For example, the obligation is expressly spelt out in clause 2.1 of the FIDIC Red Book, clause 2.4 of SBC/Q and clause 33.1 of NEC4-ECC. This may include sectional access dates. Particularly on linear transport projects, it may be agreed via a schedule of access dates that the contractor will be given possession in parcels as it proceeds down the chainage of the railway or highway.

In practice, particularly on linear transportation projects such as roads and railways, where land for the route is publicly purchased from many private owners, access or possession is often given at dates later than expected and/or in a manner different to the contract requirements. This may include failure of an obligation to provide 'unhindered access' to the lineage of, for example, a new railway line, including to each side of the line to allow access and working where possession is given but with restrictions such as the owner remaining in occupation.

A feature of many infrastructure projects internationally is a failure of the employer to procure the land, or access to it, at dates and in the sequence that it then undertakes to provide to the contractor under the construction contract. A common retort when the inevitable claims follow is for the employer to assert that the contractor was in delays of its own and did not need the land when promised! This can evolve into a 'chicken and egg' argument in which the contractor says its progress was delayed by land being handed over late against the contract schedule, but the employer says it procured the land to suit the contractor's actual progress.

Particularly damaging for the contractor's costs is where parcels of land are not only handed over late but in a different order to that in the contract and with no foreseeable date as to when outstanding parcels will be released.

### 1.4.5 Early Taking over or Beneficial Use

Contracts may provide for the completion of the works in contractual sections, with procedures for extensions of time to be addressed in relation to each, as well as completion of the works as a whole and delay damages agreed in relation to each contractual due date.

In the absence of a set of sectional completion dates agreed in the contract, contracts may also provide for the employer to elect to take possession of the parts of the works as they are completed. The FIDIC Red Book clause 10.2 allows the employer this facility. The clause prohibits the employer from making use of any part of the works other than as a temporary measure specified in the contract or agreed by the contractor, unless the engineer has issued a Taking-Over Certificate for that part. If the employer does use part of the works without such a certificate, then that part is deemed to have been taken over by the employer. The clause entitles the contractor to its costs and reasonable profit arising out of the employer taking over or using a part of the work other than as specified in the contract or agreed by the contractor.

Whilst the FIDIC Red Book constrains the employer from premature use of part of the works, the Infrastructure Conditions provide for it at clause 48(3). It provides that where a substantial part of the works has been used or occupied by the employer, other than as provided by the contract, the contractor may request, and the engineer shall issue, a Certificate of Substantial Completion for that part. In clause 48(4) the engineer can issue a Certificate of Substantial Completion for any part that is considered to have reached that state.

SBC/Q clause 2.6 also provides for early use or occupation of parts of the site or works by the employer. This is dependent on the contractor's consent. Clauses 2.33 to 2.37 also provide for partial possession by the employer, again with the contractor's consent.

Whilst such express contractual provisions provide the facility for an employer to take early possession or use parts of the works, they are often abused and sometimes ignored where the employer wishes to take the benefit without the disadvantages of releasing the contractor for liability for those parts, such as liability for delay damages and retention monies. Chapter 8 particularly considers claims in relation to post-handover costs that contractor's incur as a result of employers taking possession before the full desired scope of works are completed.

### 1.4.6 Changes in Employer Requirements

Just as design may change for technical or legislation related reasons there will be instances where the client's requirements may change, often for unanticipated reasons. Most lump sum and remeasurement contracts, such as the SBC/Q Form and FIDIC Red Book, where the design is undertaken by a team of consultants on behalf of the employer, provide for such changes, within limits, as variations to the contract and contain detailed provisions for quantification of such variations.

Problems can, however, arise with design and build contracts, or other variations on this theme such as EPIC (Engineer Procure Install and Commission) contracts in the oil and gas industries, if the contract does not include sufficient detailed information to establish the chain of analysis discussed elsewhere. If the contract information does not allow proper definition of what the baseline was and hence what has changed and to

what extent, together with the financial consequences, then disputes may seem to follow as an inevitability.

A common example of the problems that can be encountered in this respect is the provision of large elements of the work as performance-specified equipment or packages. If, for instance, a contract includes the provision of a large piece of mechanical equipment costing, say, $2.2 million, but the definition of the package is by specification of its required input and output performance (perhaps with some physical constraints also specified) and a change is required to one or more of the input or output requirements, the analysis of the financial impact of that change becomes very difficult without recourse to information or details from outside the contract, if such information is available.

If the employer, and often also the prime contractor, are not to be left entirely at the mercy of the supplier in such instances, the need for an analysis of the purchase price and potential rates for possible future adjustments should be incorporated wherever possible in the procurement procedure.

Further problems can arise where the degree of change is high and their timing is late against the contractor's progress. The *Walter Lilly* case has been mentioned elsewhere as an example of where works were under-designed at the contract stage and all were subject to provisional sums, such that the employer could decide what it wanted in terms of specification and detail as the works progressed. This is a feature of many high-end housing projects. It is also a feature of public procurement in some markets where the end-users are allowed involvement during construction that lets them chose and change what is required as it is constructed. It is suggested that this approach is not what lump sum designed works contracts such as SBC/Q are intended for. Apart from discouraging such levels and timing of change and also getting greater involvement of those same end-users during the pre-contract design phase, where such a flexible approach is desired, the procurement route and contract should be designed to address that approach. All too often they are not, and the result is a protracted and expensive dispute, as was the consequence in *Walter Lilly*.

It may not be easy to determine whether a change has actually occurred and, even if it has, what exactly the scope of the change is. This may relate to problems with the contract documents, where the contract design or documents are not sufficiently detailed to enable precise comparison with the work as it is actually instructed and built.

### 1.4.7 Contract Documents

The preparation of contract documents, the express terms of those contracts and the effects of implied terms from the underlying law of the relevant jurisdiction are all outside of the remit of this book. However, shortcomings in such documents are a regular cause of claims under construction contracts.

When the contract documents for construction of a tram system to a UK city can span 8506 pages, excluding drawings, it is hardly surprising that problems can arise regarding the interpretation of those documents. Voluminous documents might be assumed to ensure a comprehensive agreement between the parties. In practice, those preparing documents often seem to believe that just including every document since the initial enquiry will ensure this. All too often what it actually results in is contradiction and

confusion. It also often seems to lure the drafter into assuming that because every document has been included and they span thousands of pages, then all issues must be covered, when in fact important matters have been overlooked.

Ad hoc contracts or tailored amendments to standard forms are usually drafted to suit the best interest of the employer commissioning them. However, they are often just the cause of confusion as to what the amendments mean and how they sit with unamended provisions. In jurisdictions applying a 'contra proferentem' or similar interpretation of bespoke provisions, they can often work directly against the party they were intended to benefit. This is a particular problem in international jurisdictions where the adviser drafting the amendments is insufficiently aware of the applicable law and how the changes will fit with them.

One area of drafting of contract documents that quantity surveyors will be particularly involved with is the preparation of bills of quantities. Errors in bills are all too often the basis of contractual claims. Standard methods of measurement such as NRM, the Civil Engineering Standard Method of Measurement ('CESMM'), Fourth Edition, or the Principles of Measurement International ('POMI') are intended to provide instruction to those drafting bills of quantities and certainty for contractors pricing them as to what work is to be allowed for in each item. In practice, failures to follow the principles laid out in such rules causes dispute as to whether work was covered or should be treated as a variation. In lump sum contracts with quantities, such as SBC/Q, there may be express terms to the effect that any departure, error or omission in the measured quantities compared to the requirements of the adopted method of measurement will be treated as a variation under the contract, such as, for example, in SBC/Q clause 2.14.3. Unfortunately those drafting the flawed bills of quantities are often those asked to address the valuation of a resulting variation claim and it seems may be reluctant to admit their original error or be keen to unfairly limit the financial effects.

In remeasurable contracts such as the FIDIC Red Book, items that were missed from the bills of quantities should be picked up in the remeasure. However, the authors have seen it argued by those defending bills that they inaccurately prepared that the remeasure is only of those items set out in the bills. This may be related to provisions occasionally inserted into international contracts to the effect that, notwithstanding the requirement for tenderers to price bills of quantities prepared in accordance with a stated standard method of measurement, tenderers still have to allow for all items on the drawings and specification, even though they are missed in the bills of quantities. This can lead to endless argument as to where a missed item should have been priced and the effects of the express terms of the contract and of the applicable law, custom and practice. It overlooks the fundamental intention of bills of quantities and why they (and the quantity surveying profession) came into the construction industry in the first place. This is to provide consistency and certainty for those tendering for works and for employers comparing their bids and managing their budgets. They should not be abused as a sort of lottery as to which bidders will spot the errors and price accordingly and/or raise tender queries.

### 1.4.8 Unforeseeable Occurrences

That some unforeseeable occurrences will be met on large and lengthy construction and engineering projects may seem so inevitable that they could be described as 'known

unknowns rather than unknown unknows', to paraphrase a past United States Secretary of Defence. The likelihood of such events being met is high on construction and engineering projects given such factors as:

- the susceptibility of some operations to changes or extremes of climatic conditions;
- the susceptibility of other activities to unforeseen ground conditions and obstructions;
- the susceptibility of all operations to changes in resource availability perhaps because of overheating of the market or strike or other civil action;
- the susceptibility of all operations to changes in resource costs perhaps because of the state of the local economy and/or volatility of the local currency;
- the arguably unique location of all projects;
- the unique nature of the design and/or location of most projects;
- the susceptibility of many types of project to changes in the economic or political environment that might render the project unwanted or uneconomic; and
- the long durations of projects that can run into years, which can also increase the likelihood of a project being affected by unforeseeable occurrences.

Given the propensity for such events, contracts will usually anticipate the type of such occurrences that might occur by allowing time and/or recompense to the contractor for those matters that it is considered should not be at the contractor's risk. This generally means those events of a nature that the contractor can neither predict when pricing its tender so as to price the risk with any certainty other than by a conservative contingency allowance, nor control to avoid their occurrence. Some such occurrences might be cost-neutral, so that the contractor gets an extension of time but not money, for example 'exceptionally adverse climatic conditions' under the FIDIC Red Book. Others might give an entitlement to both time and money, such as unforeseeable 'adverse physical conditions or artificial obstructions' under the Infrastructure Conditions.

A further consequences of some unforeseeable events may be that works have to be suspended or contracts terminated. An example of that is how the last economic crash affected projects, particularly in markets that had been overheating prior to the crash, which saw projects paused while employers took stock of the situation and then terminated. Contracts therefore have to provide for the rights of the parties in those circumstances, including suitable remuneration. Claims in relation to the termination of contracts are the particular subject of Chapter 7 of this book.

For client or contractor, and preferably both, the most appropriate means of monitoring such matters is the establishment of a risk register backed with a risk management and mitigation strategy that will enable events that occur to be managed both physically and contractually with the minimum of disruption and effect on both time and money, resulting in the best prospect of avoiding a dispute over claims that arise.

### 1.4.9 Breach of Contract

Whilst this discussion focusses on changes that are foreseeable and instigated by the parties or unforeseeable as part of the exigencies of the construction and engineering process, there are other contract claims that require evaluation that simply arise out of a breach by one party or other of its obligations under the contract. Provision of such as late design or information have been mentioned elsewhere, but we are concerned here

with breaches that do not go to such as extension of time or delay and disruption claims, but result in a direct and recoverable financial consequence of their own. For example, the employer's failure to pay certified sums within time or its wrongful calling of a bond that the contractor has provided. Such other sources of contractual claim are considered in Chapter 8.

## 1.5 Summary

Paramount to the proper presentation and consideration of a contractual claim is an understanding of the relevant terms of the contract and the applicable law. Good legal advice should always be taken, particularly where operating in a foreign jurisdiction.

The terms of contracts vary, standard terms can be the subject of heavy amendment and bespoke terms are often applied. The discussions and ideas in this book are illustrated by reference to particular standard form examples. SBC/Q is an example of a lump sum contract in use in the UK. The Infrastructure Conditions and FIDIC Red Book illustrate the approaches of remeasurable contracts in use in the UK and internationally respectively. NEC4-ECC illustrates the more innovative approach of that suite of contracts.

The necessary standard of substantiation of a contractual claim will vary depending on the terms of the contract and local legal requirements. There may also be issues of the remoteness of the damages and an obligation to mitigate the costs. The SCL Protocol gives a guide to good practice in many areas of quantification related to delay and disruption.

On construction and engineering projects change is almost inevitable. How those risks are allocated is a key element of contract drafting. How they are managed will be essential to the resulting quantum. Risk management is an all too often overlooked discipline in some countries. Certain causes of change repeat between construction and engineering projects no matter where in the world they are carried out. Understanding the common risks and causes of change will help parties to plan for them and manage their effects and resulting claims.

In this book, the evaluation of the consequences of change is considered by reference to their direct consequences on the programme (Chapter 4) and money (Chapter 5) and then their time consequences in terms of, for example, prolongation, disruption and acceleration costs (Chapter 6). Chapter 7 looks at claims arising out of the termination of contracts. Chapter 8 looks at some other possible heads of claim. However, first it is necessary to consider how to establish the base from which such claims for additional payments are assessed.