Chapter 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. This book aims to examine the quantification of contract claims on the grounds 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. The starting point is that liability has been established or agreed and the amount of remuneration is the issue. That said, it is of course necessary to have a basis for considering how remuneration should be properly established and therefore this text considers the issue 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 on behalf of one party or another. This chapter briefly considers aspects of the process that provide the basis for evaluation; a detailed discussion is outside the remit of this text.

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 prolongation and disruption etc. Some other sources of claims and the means of minimising the impact of claims are briefly 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 legal basis

This is not a legal textbook and it goes without saying that proper advice on the law should always be sought before mounting any dispute 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 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.

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 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 use 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:

ICE Conditions	The seventh edition of the measurement version of the ICE Conditions of Contract, published by the Institution of Civil Engineers, The Association of Consulting Engineers and the Civil Engineering Contractors Association.
JCT Standard Form	The Standard Form of Building Contract, 1998 edition, Private with Quantities, published by the Joint Contracts Tribunal.
Engineering & Construction Contract also known as the New Engineering Contract (NEC)	The core clauses for priced contracts with activity schedule, or with bill of quantities, of the Engineering and Construction Contract, second edition, November 1995, published for the Institution of Civil Engineers by Thomas Telford Services Ltd.

The ICE Conditions are used to illustrate how contracts that contemplate complete remeasurement of the works address certain issues, while the JCT Standard Form is used to consider the approach of lump sum contracts subject to adjustment under stated circumstances. The Engineering and Construction Contract is used to examine some of the concepts that have gained this contract some measure of approval from critics of the more traditional forms of construction contracts.

There are, of course, many different forms of contract that can be adopted by the parties to a construction contract 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 and it is therefore necessary to restrict the consideration to matters of principle, using the requirements of the various contracts set out above 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 discussion herein will need to be considered in the light of specific requirements in particular contracts. 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.

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, and 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.

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 who asserts must prove, i.e. the party claiming an item of cost or value will have to support it with evidence.
- The second principle is the general standard of proof in English civil law that matters need to be established as being correct 'on the balance of probability' as compared with the standard required in criminal matters where 'beyond reasonable doubt' is the test. 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.

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. So, 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 if relevant. Where such project-specific support for a claimed item of cost is not possible, for instance in establishing overhead charges in a prolongation evaluation, it will still be necessary to produce evidence of the overhead costs incurred with a reasoned analysis of the amount considered to be relevant.

This introduces the two tiers of evaluation common to most evaluations: the direct value of a change or event and the indirect consequences. In many instances the evaluation may require only one or the other but in many cases both tiers will be necessary.

The extent of substantiation for the evaluation may vary depending upon the particular instance and circumstances. However, 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.'

The qualification of 'reasonable' is perhaps unnecessary as it is unlikely any substantiation could be held to require something unreasonable, unless the requirement is specific to the particular contract terms. 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 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.

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 comment 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 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. For large sums of money it will 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'.

SCL Delay and Disruption Protocol

The Society of Construction Law (SCL) is a UK body of lawyers, surveyors, engineers, architects and others with an interest in the subject of law as applied to construction projects. In October 2002 the SCL published its Delay and Disruption Protocol which deals with the analysis of those matters and the compensation that may be due when they occur. While the Protocol is not without its critics and is regarded, at least in some respects, as controversial by some, it represents a body of thought and opinion from a respected body, only reached after a long and extensive consultation process with interested parties in the industry. Reference is therefore made in this book to some of the conclusions of the Protocol where they are relevant to the discussion of aspects of the quantification of claims for additional payment.

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, although it has model clauses for possible incorporation in contracts. Rather it is intended that it should provide a scheme of guidance for the analysis of delay in construction contracts and the matters that should be addressed in the drafting and negotiation of the construction contract. It is therefore considered to be of limited application to contracts which do not incorporate its recommendations, or which were entered into before its publication. It

does, however, contain 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.

It should, however, be borne in mind that any analysis 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.

Direct and indirect consequences

Many changes or events requiring evaluation for additional payment will have valuation rules set out in the contract. The obvious example is the rules for valuation of variations, discussed in Chapter 3, contained in standard form contracts such as the JCT and ICE forms. 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 'cost' can be recovered.

The evaluation of a variation will usually be subject to the rules of evaluation contained in the contract, but for prolongation and disruption there may be two tiers of evaluation required. Firstly, the direct consequences of the event or change will be required, usually in the form of an analysis of the effect on the contractor's resources and working methods. Secondly, any indirect consequences, such as increased overhead or financial charges, will be necessary. The guidance for supporting the valuation of such indirect consequences is 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, is that if the plaintiff has suffered damage that is not too remote, he must, so far as money can achieve it, be restored to the position he 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'. And 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 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 liquidated and ascertained damages to be applied in the event that delays to the contract completion date affect the profitability and revenues expected from the completed development. Where such losses are not brought within the contract they will be capable of being pursued as a result of breaches on an actual loss 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 the 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 is that the offended party should be put, as far as money can achieve it, in the same position as he would have been but for the intervening event, providing the nature of the damage can be demonstrated to be a natural consequence or within the contemplation of the parties, and is not restricted by express agreements or exclusions in the contract.

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 him 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 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.'

Care therefore needs to taken when considering, for instance, criticisms that a contractor has not taken the most economical means to overcome problems that are the responsibility and liability of others. This might mean that, where a contractor has introduced an additional shift at considerable expense to expedite works delayed by instructed variations, he might still recover those costs even if later analysis suggests 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 should the reasonable costs of his measures be discounted in such circumstances.

This is consistent with the decision quoted in section 3.5.11 later in this book where a court stated that a plaintiff is not under a duty to mitigate but can act as he pleases. However, the defendant is not necessarily liable for all acts but only those properly caused by the breach of duty. The acts properly caused should be judged in light of the above discussion.

This situation has been further considered in *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* (see above). 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; that they could have solved the problems more easily and economically.

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. Barclay's 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 this 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.

Construction risks

The undertaking of construction projects of any substantial size will involve risk to the parties involved. External circumstances such as changes in legislation, tax regimes 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, and the contract should address how all these risks are apportioned between the parties and the 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 that such payments may be required. The need may arise simply as a consequence of the risk allocation.

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.

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.

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 subcontractors are involved, the contract needs to make clear the elements for which the contractor has responsibility. This is 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, despite the opposite being the expectation. This arises from the common circumstance of the client having a design progressed to a particular stage and then novating the design, and usually the designer, to the contractor. The obligation on the contractor is to complete the design and construct the scheme to the completed design.

The difficulty that can arise is that if the design progressed by the client and novated to the contractor proves to have substantive defects, 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, 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.

Design review

The JCT WCD now 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. Observance of such procedure and the approval scheme will of course impact on potential liability for design defects and subsequent liability for the costs of any defects.

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 now includes 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.

By contrast, the New Engineering Contract (NEC) does not specifically require professional indemnity insurance, unless such a requirement is included in the contract data. However, it could arguably be required by the general obligation on the contractor to maintain insurance for matters which are at the contractor's risk.

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 he 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.

1.1 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 arrangements. 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 where they do not impact on the contractor.

This, at best haphazard, approach to risk analysis has often been exceeded by the scant attention paid in the past to any rigorous approach to risk management as the project proceeds.

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, construction, operational 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?
- 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 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 his 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 his programme and methods at some considerable cost, for which he looked to the project 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 lead 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 the above 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 survey. 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, 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 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. 'An ounce of prevention is worth a ton of cure' should be a guiding principle for everyone involved in the construction process, or should that now be 'a gramme of prevention is worth a tonne of cure'?

Risk registers

Many large projects now include a risk register agreed and maintained jointly by the client and contractor. The NEC 3 contract now incorporates a requirement for such a register and the conduct of risk reduction meetings (formerly early warning meetings) between the project manager and client to review the risks, update the register and track progress on identified risk issues. 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 NEC 3 as clause 63.5 requires that in the event that the contractor should

have given early warning but did not, the compensation is to be assessed as if he had given such 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 other forms of contract.

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.

1.2 Risks and records

It has been stated on many occasions that the root cause of many claims and disputes under construction contracts 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 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 payment terms. However, these records may not, of themselves, be sufficient in particular instances and there should be a mechanism for the parties to record 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 marked-up programmes. Devices such as video recording can be equally useful, and in some instances preferable to 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.

It is important to consider who should keep these records and when it is appropriate for the record keeping to be implemented. 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 be necessary.

The standard forms usually have express provisions for record keeping in the event of claim situations. For instance, the ICE Conditions contain provisions for record keeping when dealing with additional payments in clause 52 paragraphs (2) and (3). These provisions allow the engineer to require any specific records that he 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. Such a provision is no more than the express statement of something that would be implied in any event, that if the contractor intends to submit a claim for additional payment as a result of events on site he should keep suitable contemporary records of the events and their consequences.

The record keeping requirement set out in these conditions is 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 he 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 the Housing Grants, Construction and Regeneration Act of 1996 apply.

The adjudication provisions contained in the ICE Conditions at clause 66(6) mirror the timing aspects of the Scheme issued under the Act, 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 he 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 a construction 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.

Many contracts do not contain specific clauses setting out record keeping requirements in the manner of the ICE Conditions. For instance, it is not unusual in international engineering '*ad hoc*' forms to find provisions for a contractor to give notice that he is undertaking works which he 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 instruction. 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 probably that large international engineering contracts, such as those for the oil and gas industries, have substantial requirements for the administration of the contract written in, 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 ICE Conditions, would have the potential of reducing further unnecessary differences and facilitate the joint evaluation of changes and additions.

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 for the offshore oil and gas industry, which contain in clause 14.7 similar provisions to those in the ICE contract, represent best practice. Although such projects are outside the Housing Grants, Construction & Regeneration Act

remit, and the adjudication scheme of the Act does not apply, the CRINE contract contains its 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 for this internal process.

1.3 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 ICE Conditions.

The seventh edition of the ICE Conditions is no different to its predecessor in that clause 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 which 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 him responsible for proper notification and action.

From a payment perspective there are two points to note. Firstly, that clause 12 of the ICE Conditions is inextricably linked to the preceding clause 11, which sets out the contractor's responsibility for interpreting information provided and making his own investigation of the site and its surroundings. Secondly, that the interpretation of information, examination and investigation of the site is deemed by part (3) of clause 11 to be incorporated in the contractor's tender.

The principle is that the contractor cannot escape responsibility for errors or deficiencies in his 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 ICE Conditions or any other clauses or conditions. It is a general principle that is sometimes forgotten when trying to establish a starting point for the evaluation of additional payment.

1.4 Non-reimbursable risks

In contrast to the risks that can generate entitlement to additional matters there are risks that are identified as being clearly the responsibility of one party in any event, but without additional payment if they occur. But 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 in that 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 his own from the delayed completion.

Most contracts provide some recovery for the employer, usually in the form of 'liquidated and ascertained damages', discussed later in Chapter 6, 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. 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.

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 and allocated 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.

1.5 Sources of change and disruption

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 to first ensure the common sources of dispute are understood and controlled, and then to ensure that any disputes, or claims, that arise are properly recorded and 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.

While an in-depth analysis of the causes of claims in construction contracts is beyond the scope of this book it is useful to consider very briefly the most common causes of such problems.

1.5.1 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 contract 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. There will be instances where a risk event occurs and its effects are alleged to give rise to an entitlement to additional 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 above. 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, 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 above chain of analysis.

The legal analysis 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 the above 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 confirm what the financial duties and responsibilities are. Among the issues to address will be: What is the contract sum? 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 financial 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? Should the financial impact have been mitigated from that being claimed?

All these, and usually many other questions, 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 the results 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.

1.5.2 Inadequate pre-contract design and documentation

One of the perennial causes of claims for additional payment is defects in the design or 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.

It is, however, essential in such circumstances that the contract anticipates the completion of design during the construction phase, and procedures are implemented to monitor and control 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.

The above situation is radically different from that where the design is intended to be complete but is not, or 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 his end and is anxious not to spend either more time or expense on it than he absolutely has to. The client wants his plant, factory, office, etc. as soon as possible so that his 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 to a limited extent there will come a point where such sums will create problems if, as in the case of defined provisional sums in the JCT Standard Form using the Standard Method of Measurement of Building Works (SMM7), the contract requires the contractor to make detailed provision for the works in his programme of works. Without definition for significant portions of the work the programme can become nothing better than guesswork and the seedbed of future dispute.

For defined provisional sums to be incorporated in a contract using the JCT Standard Form and SMM 7 it must be possible to set out the nature of the work that is the subject of the sum, the construction of the work, and a statement of any fixing requirements and quantities to indicate the extent and scope of the work. If such a sum is included in the contract then the contractor is deemed to have included in his programme of works and pricing of the contract preliminaries 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 problems.

If the information required for a 'defined' provisional sum is available it does of course beg the question as to why the works are included as a provisional sum rather than being measured in the bill of quantities as 'provisional' quantities?

1.5.3 Design development

In many contracts, especially those with large process facilities, it is often the case that design will continue to develop after the construction contract has been let, for sound technical reasons. The same reservations apply in that the contract must be set up to cater for such development. 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.

Perhaps the most sensible approach to adopt in such instances 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, with detailed programmes produced when the works are fully defined. This may also require the adoption of defined 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 at the outset or by agreement of payment on some form of reimbursement of cost plus defined 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.

1.5.4 Changes in employer requirements

Just as design may change for technical reasons there will be instances where the client's requirements may change, often for unpredicted or unanticipated reasons. Most lump sum and measurement contracts, such as the JCT Standard Form and the ICE Conditions, where the design is undertaken by a team of consultants on behalf of the client, 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 above. If the contract information does not allow proper definition of the financial consequences, then disputes may follow.

A common example of the problems that can be encountered 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 from outside the contract, if such information is available.

If the employer, and often the prime contractor also, 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.

1.5.5 Unexpected occurrences

This is a common cause of claims for additional payment. The contract will usually anticipate the type of occurrences that might occur by allowing time and/or recompense to the contractor for those matters that are the client's responsibility. 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 the best prospect of avoiding a dispute over claims that arise.

1.6 Summary

Having briefly considered and discussed the basis of this book and the principle sources of claims for additional payment, it is necessary to consider how the base from which claims for such payments are assessed can be established.