

1.1 Introduction

This book is a practical text that seeks to demystify the measurement of site labour/resource productivity.

In line with the Society of Construction Law *Delay and Disruption Protocol* launched in October 2002, this book also puts forward a rational and sufficiently accurate method of quantifying the effects of disruption in terms of both cost and time.

Disruption claims impact on the whole of the construction industry, so this book is written for all those members of the construction industry who are involved in submitting, evaluating, awarding, managing and resolving disruption claims.

It is my view that the methods used to quantify disruption must be readily usable by site management. Agreement at this level is the target of the solutions proposed, as it is hoped that this prevents the claim escalating to the formal dispute resolution procedures. It has been my experience that resolving claims for delay and disruption at site level reduces the souring of site relationships and prevents loss of senior management/head office time, which in turn prevents the cost of formal dispute resolution (adjudication, arbitration and litigation).

The solutions proposed in this book also seek to be realistic and to recognise that, in practice, any method of quantifying the cost and time effects of delay and disruption must be sufficiently accurate, robust and useful that the method employed at site level can also be used (if needed) by adjudicators, arbitrators and judges.

Construction disputes, albeit nominally about money, invariably involve issues to do with time. Extension of time claims self-evidently involve time, as do claims for Liquidated Damages.

Similarly, claims for prolongation costs, loss and expense or disruption are all fundamentally about time. The effective management of time is therefore a part of everything we do in construction and it is at the heart of all construction contracts.

Cost and time are interdependent. From a project management perspective, the treatment of cost (most commonly in the BoQ) and time (in the programme) as independent models fails to provide a mechanism of direct performance/efficiency comparison. It also prevents the systematic evaluation of the effects of variations and delay. Delay and disruption are associated with time and will often have a related impact on cost.

Whilst it may be tempting to require the development of a system that can quantify the costs associated with disruption to almost laboratory standards, it must be remembered that the construction site is not a laboratory and it is simply uneconomical, impractical, unnecessary and unrealistic to expect to develop such a complex system. In practice, there is a need to balance the desire for extreme accuracy with practical reality; – this book recognises this practical hindrance and therefore proposes a solution that is sufficiently accurate for the quantification of disruption claims.

This book aims to demonstrate how the actual site labour productivity measurements can be used to provide an objective and automatic basis for quantifying the effects of disruption in terms of cost and time to arrive at a figure for the loss/expense payable to the contractor. The present position in construction disruption-based disputes is that settlement is often reached after extensive, and sometimes highly subjective, negotiations. The parties' positions are usually severely weakened by a lack of records that may actually demonstrate the effect of a "disruptive" event on the contractor's work operations. If the contractor's productivity could be recorded sufficiently faithfully and simply, it could be used as objective evidence to accurately demonstrate the effect the disruption has actually had on the site productivity. The equating of labour productivity loss to disruption is therefore a realistic and objective measure of the effect of disruption on the contractor's work operation.

Delays are an endemic feature of the construction and engineering industries. In the construction industry, the aim of project control is to ensure the projects finish on time, within budget and achieve other project objectives. It is a complex task undertaken by project managers in practice, which involves constantly measuring progress, evaluating plans, and taking corrective actions when required. During the last few decades, numerous project control methods, such as Gantt Bar Chart, Program Evaluation and Review Technique (PERT) and Critical Path Method (CPM), have been developed. A variety of software packages have become available to support the application of these project control methods, for example Microsoft Project, Asta Power Project, Primavera, etc.

Despite the wide use of these methods and software packages in practice, many construction and engineering projects still suffer time and cost overruns.

There have been numerous studies on the identification of influencing factors of project time and cost overruns worldwide. These studies have found that the most important variables causing construction delays and disruption are: poor contract management; financing and payment of completed works; changes in site conditions; shortage of materials; imported materials and plant items; design changes; and subcontractors.

1.2 The aims of this book

The aim of this book is to provide guidance in relation to disruption and loss of productivity claims. The contents of this book are intended to give its readers the information and practical details to be considered in formulating disruption and loss of productivity claims.

One of the recurring themes in this book is good record keeping on projects. Whilst a lack of progress related records may not be fatal to a claim, it does make a reasonable settlement into an uphill battle. Readers will observe my continuing advice on good record keeping.

The book has been arranged in six chapters:

Chapter 1 Introduction: details general principles relating to extensions of time, delay claims and the SCL Protocol.

Chapter 2 Contracts and Case Law: looks at the relevant loss and expense clauses in the JCT and NEC contracts, plus case law concerning disruption, loss of productivity, mitigation and acceleration.

Chapter 3 Programmes and Record Keeping: deals with the fundamental matter of the project programme, together with the important matter of record keeping during the project.

Chapter 4 Delay and Disruption: looks at the fundamentals of these two issues.

Chapter 5 Loss of Productivity: included in this chapter are examples of two techniques to demonstrate disruption and productivity loss.

Chapter 6 Acceleration and Mitigation: this final chapter looks at the fundamentals of these two issues.

At the end of the book are three appendices which I consider the reader will find helpful. These are:

Appendix 1: Definitions and Glossary.

Appendix 2: Standards for the Levels of a Programme or Schedule.

1.3 Appendix 3: Society of Construction Law: Delay & Disruption Protocol (October 2002) The SCL Protocol

In October 2002, the Society of Construction Law (SCL) published its 'Delay & Disruption Protocol'. This Protocol provides guidance to people dealing with submissions for extension of time and delay claims, both during a contract and after completion of the works. The Protocol runs to some 82 pages and was drafted by a group of experts from all sections of the construction industry.

The Protocol envisages that decision-takers, e.g. contract administrators, adjudicators, dispute review boards, arbitrators, judges, may find it helpful in dealing with time-related issues.

There are 21 Core Statements of Principle in the Protocol. Of these, about 11 relate to ‘disruption’, ‘loss of productivity’ and/or ‘acceleration’. These are:

1. **Programme and records:** To reduce the number of disputes relating to delay, the Contractor should prepare and the Contract Administrator (CA) should accept a properly prepared programme showing the manner and sequence in which the Contractor plans to carry out the works. The programme should be updated to record actual progress and any extensions of time (EOTs) granted. If this is done, then the programme can be used as a tool for managing change, determining EOTs and periods of time for which compensation may be due. Contracting parties should also reach a clear agreement on the type of records that should be kept.
2. **Concurrent delay – its effect on entitlement to compensation for prolongation:** If the Contractor incurs additional costs that are caused both by Employer Delay and concurrent Contractor Delay, then the Contractor should only recover compensation to the extent it is able to separately identify the additional costs caused by the Employer Delay from those caused by the Contractor Delay. If it would have incurred the additional costs in any event as a result of Contractor Delays, the Contractor will not be entitled to recover those additional costs.
3. **Identification of float and concurrency:** Accurate identification of float and concurrency is only possible with the benefit of a proper programme, properly updated.
4. **Mitigation of delay and mitigation of loss:** The Contractor has a general duty to mitigate the effect on its works of Employer Risk Events. Subject to express contract wording or agreement to the contrary, the duty to mitigate does not extend to requiring the Contractor to add extra resources or to work outside its planned working hours. The Contractor’s duty to mitigate its loss has two aspects – first, the Contractor must take reasonable steps to minimise its loss; and secondly, the Contractor must not take unreasonable steps that increase its loss.
5. **Valuation of variations:** Where practicable, the total likely effect of variations should be pre-agreed between the Employer/CA and the Contractor, to arrive if possible at a fixed price of a variation, to include not only the direct costs (labour, plant and materials) but also the time-related costs, an agreed EOT and the necessary revisions to the programme.
6. **Basis of calculation of compensation for prolongation:** Unless expressly provided for otherwise (e.g. by evaluation based on contract rates), compensation for prolongation should not be paid for anything other than

work actually done, time actually taken up or loss and/or expense actually suffered. In other words, the compensation for prolongation caused other than by variations is based on the actual additional cost incurred by the Contractor. The objective is to put the Contractor in the same financial position it would have been if the Employer Risk Event had not occurred.

7. **Relevance of tender allowances:** The tender allowances have limited relevance for the evaluation of the costs of prolongation and disruption caused by breach of contract or any other cause that requires the evaluation of additional costs.
8. **Period of evaluation of compensation:** Once it is established that compensation for prolongation is due, the evaluation of the sum due is made by reference to the period when the effect of the Employer Risk Event was felt, not by reference to the extended period at the end of the contract.
9. **Global claims:** The not uncommon practice of contractors making composite or global claims without substantiating cause and effect is discouraged by the Protocol and rarely accepted by the courts.
10. **Acceleration:** Where the contract provides for acceleration, payment for the acceleration should be based on the terms of the contract. Where the contract does not provide for acceleration but the Contractor and the Employer agree that accelerative measures should be undertaken, the basis of payment should be agreed before the acceleration is commenced. It is not recommended that a claim for so-called constructive acceleration be made. Instead, prior to any acceleration measures, steps should be taken by either party to have the dispute or difference about entitlement to EOT resolved in accordance with the dispute resolution procedures applicable to the contract.
11. **Disruption:** Disruption (as distinct from delay) is disturbance, hindrance or interruption to a Contractor's normal working methods, resulting in lower efficiency. If caused by the Employer, it may give rise to a right to compensation either under the contract or as a breach of contract.

Further background and guidance on each of the 21 Core Principles is contained in the four 'Guidance Sections', which are:

Section 1: Guidelines on the Protocol's position on Core Principles and on other matters relating to delay and compensation.

Section 2: Guidelines on preparing and maintaining programmes and records.

Section 3: Guidelines on dealing with extensions of time during the course of the project.

Section 4: Guidelines on dealing with disputed extension of time issues after completion of the project – retrospective delay analysis.

1.3.1 Observations

Firstly, observations on the Core Principles.

(i) Core Principles 2 to 6: Extensions of time

The position on extensions of time is generally good and the advice is sound, although fairly general in nature.

(ii) Core Principle 7: Float, as it relates to time

This is one of the more controversial Principles in the Protocol. The nub of this principle is

- (a) Should the contractor be awarded an extension of time and so preserve the float period for its own use,
or
- (b) Should no extension of time be awarded on the basis that the employer's delay is simply absorbing float and not impacting the contractual completion date.

The Protocol's recommendation is that float is available to the project. In other words, it is available to whichever party uses it first: contractor or employer.

(iii) Core Principle 8: Float, as it relates to compensation

Where a contractor plans to complete before the contract date for completion, the Protocol recommends that he is entitled to compensation, but not an extension of time, if he is prevented from completing to his own planned date, but finishes before the contract date for completion. This is a complicated topic; however, the basic recommendation must be rejected. The position is that, in deciding this question, all the circumstances must be taken into account.

(iv) Core Principle 9: Concurrent delay – its effect on entitlement to extension of time

The Protocol's approach seems to be to take a particular position on the subject of concurrency on the basis that it is a complex topic and a compromise situation is necessary. A basic principle is that no concurrent cause of delay which is the result of any fault of the contractor should reduce the extension of time to which he would otherwise be entitled. This approach basically follows the 'prevention principle' of English law where an employer cannot take advantage of its own breach of contract by imposing liquidated damages on the contractor.

(v) Core Principle 13: Mitigation of delay and mitigation of loss

This is a clear exposition of the situation. More could have been said in the Protocol about the contractor's rights, or otherwise, to claim reasonable costs of mitigation.

- (vi) Core Principle 15: Valuation of variations
The Protocol recommends a mechanism similar to the current JCT price statement for dealing with the valuation of variations and associated extension of time and loss and expense.
- (vii) Core Principle 16: Basis of calculation of compensation for prolongation
It is rightly stressed that ascertainment must be based on actual additional costs incurred by the contractor. However, there appears to be some confusion between a contractor's claims for loss and expense under the contract machinery and claims for damages for breaches of contract. The former are reimbursable under most standard forms of contracts while the latter, being a claim outside the contract, are not so reimbursable.
- (viii) Core Principle 17: Relevance of tender allowances
It is refreshing to see that the Protocol considers that tender allowances have little or no reliance to the evaluation of the costs of prolongation or disruption.
- (ix) Core Principle 19: Global claims
It is good to see that global claims are discouraged.
- (x) Core Principle 20: Acceleration
This is a broadly correct interpretation of the position, but the reference to the possibility of accelerating by instructions about hours of working and sequence of working is to be doubted.
- (xi) Core Principle 21: Disruption
The definition of disruption does not adequately explain that disruption can also refer to a delay to an individual activity not on the critical path where there is no resultant delay to the date for completion. The Protocol also states that most standard forms do not expressly deal with disruption; that, of course, is true. However, the JCT forms refer to regular progress being materially affected. That appears to be broad enough to encompass both disruption and prolongation.

The Protocol's Guidance Section 2 deals with guidelines on preparing and maintaining programmes and records. However, there is not a great deal of guidance on maintaining records generally.

Stress is placed on obtaining an 'Accepted Programme'; that is, a programme agreed by all parties. There are several problems with this. Perhaps the foremost is that the architect will be unlikely to have the requisite skills and/or experience, or indeed the information required, to accept the contractor's programme. He is probably capable of questioning parts of it, but highly unlikely to be possessed of sufficient information to be able to satisfy himself that the programme is workable. The Protocol, rightly, accepts that the contractor is entitled to construct the building in whatever manner and sequence he pleases, subject to any sectional completion or other constraints. The Protocol states,

‘Acceptance by the CA (contract administrator) merely constitutes an acknowledgement by the CA that the Accepted Programme represents a contractually compliant, realistic and achievable depiction of the Contractor’s intended sequence and timing of construction of the works.’

This is placing a responsibility on the architect (or CA as the Protocol prefers) which he is not required to carry. There appears to be no need for a programme to be accepted. It is sufficient if the contractor puts it forward as the programme to which he intends to work. The architect is entitled to question any part which appears to be clearly wrong or unworkable. But, in the light of the contractor’s insistence that he can and will carry out the works in accordance with the submitted programme, it is difficult to refuse a programme unless firm objections can be raised.

The Protocol also recommends that the ‘accepted programme’ be updated with progress at intervals of one month, and more frequently on complex projects.

The Protocol describes the updating process as follows:

‘Using the agreed project planning software, the Contractor should enter the actual progress on the Accepted Programme as it proceeds with the works, to create the Updated Programme. Actual progress should be recorded by means of actual start and actual finish dates for activities, together with percentage completion of currently incomplete activities and/or the extent of remaining activity durations. Any periods of suspension of an activity should be noted in the Updated Programme. The monthly updates should be archived as separate electronic files and the saved monthly versions of the Updated Programme should be copied electronically to the CA, along with a report describing all modifications made to activity durations or logic of the programme. The purpose of saving monthly versions of the programme is to provide good contemporaneous evidence of what happened on the project, in case of dispute.’

All of this is good and sensible advice.

Guidance Section 3 gives guidelines for dealing with extensions of time during the course of the project. It provides much good practical advice, including the importance of calculating extensions of time by means of various programming techniques. Although every architect should be familiar with such techniques, careful consideration should be given to the aptness of any particular technique in a given situation.

The Protocol suggests that extensions of time should be made as close in time to the delaying event, and that these are dealt with promptly by the CA. The Protocol recommends that:

‘...the “Updated Programme” should be the primary tool used to guide the CA in determining the amount of the EOT.’

Again sound advice, with one proviso: the facts surrounding the alleged delay event(s). As Mr Justice Dyson noted in his judgment on the Henry Boot Construction –v– Malmaison Hotel case: *“It seems to me that it is a question of fact in any case, as to whether a relevant event has caused, or is likely to cause, delay to the works beyond the completion date.”*

Guidance Section 4 deals with disputed extensions of time after completion of the project, and spends some time examining the different types of analysis that can be employed.

1.4 Conclusion

The Protocol sets out ways of dealing with delays and disruption. Most of it is in line with what is generally understood to be the law on these matters. However, in some instances, the Protocol steps outside this boundary in order to suggest what it clearly considers to be a simpler or fairer way of dealing with the practicalities. All parties involved in construction contracts must be aware that the Protocol does not take precedence over the particular contract in use unless it is expressly so stated in the contract itself. Therefore, the Protocol’s recommendations should be viewed with caution. It will be of no avail for the architect, contract administrator or employer to argue that he has acted strictly in accordance with the Protocol if the contract prescribes action of a different sort.

And finally...

The author hopes that this book will provide useful guidance for those responsible for preparing extension of time submissions and time-related delay claims; and equally for those people dealing with them. The aim is that these submissions can be resolved amicably, professionally, and with neither party being seriously disadvantaged.

