THE SOCIETY OF CONSTRUCTION LAW
DELAY AND DISRUPTION PROTOCOL

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INTRODUCTION

A. The object of the Protocol is to provide useful guidance on some of the common issues that arise on construction contracts, where one party wishes to recover from the other an extension of time and/or compensation for the additional time spent and the resources used to complete the project. The purpose of the Protocol is to provide a means by which the parties can resolve these matters and avoid unnecessary disputes.

B. It is not intended that the Protocol should be a contract document. Nor does it purport to take precedence over the express terms of a contract or be a statement of the law. It represents a scheme for dealing with delay and disruption issues that is balanced and viable.

C. The Protocol recognises that construction contracts must provide the mechanisms to manage change. Although all the common standard forms of contract provide for the assessment of delay and compensation for prolongation, they do not all do so completely, or in exactly the same way. The Protocol contains guidance as to matters which should be addressed when the contract is being drafted and negotiated. The guidance is intended to be generally applicable to any contract that provides for the management of delay and disruption.

D. The aim is that, in time, most contracts will adopt the Protocol’s guidance as the best way to deal with delay and disruption issues. Until such time, it is acknowledged that the Protocol may have limited application to contracts that have been drafted and negotiated without the Protocol in mind, particularly contracts in existence at the time the Protocol was published. However, much of the guidance in the Protocol covers matters that are not dealt with by the standard forms of contract and can be applied by the contracting parties without causing conflict. In applying the Protocol to disputes arising out of contracts entered into after the Protocol is published, it has to be borne in mind that the Protocol merely represents a set of balanced views on a number of issues, some of which do not have absolute answers.

E. Delay and disruption issues that ought to be managed within the contract all too often become disputes that have to be decided by third parties (adjudicators, dispute review boards, arbitrators, judges etc). The number of such cases could be substantially reduced by the introduction of a transparent and unified approach to the understanding of programmed works, their expression in records, and identifying the consequences of delay and disruption.
F. The Protocol is not put forward as a benchmark of current (2002) good practice throughout the construction industry, though the aim is that the administration of contracts will in due course meet the standards of the Protocol. The cost of achieving this standard should be no more than is required for the best of current standard forms of contract.

G. Users of the Protocol should apply its recommendations with common sense. The Protocol is intended to be a balanced document, reflecting equally the interests of all parties to the construction process.

H. In the on-line version, defined terms in the Protocol are hyper-linked to their definition in Appendix A on the first occasion they appear in the text. Obviously, the hyper-links are usable only where the Protocol is being viewed on screen. In order to make the Protocol as easy to read as possible, the use of capitalisation for defined terms has been kept to a minimum.

I. The Protocol has been produced by a drafting sub-committee formed by a group of members of the Society of Construction Law. The membership of the drafting sub-committee is set out on page 51. The views and opinions expressed and the aims identified in the Protocol are those adopted by the drafting sub-committee. They are not necessarily the views and opinions or aims either of any particular member of the drafting sub-committee or of all the members of the Society as a whole.

J. The information, recommendations and/or advice contained in this Protocol (including its Guidance Sections and Appendices) are intended for use as a general statement and guide only. Neither the Society of Construction Law nor any committee or member of the Society nor any member of the group that drafted the Protocol accept any liability for any loss or damage which may be suffered as a result of the use in any way of the information, recommendations and/or advice contained herein and any person using such information or drafting contracts, specifications or other documents based thereon must in all cases take appropriate professional advice on the matters referred to in this publication and are themselves solely responsible for ensuring that any wording taken from this document is consistent with and appropriate to the remainder of their material.

The Society of Construction Law welcomes feedback on the Protocol and the Guidance Notes: please contact the Society at feedback@eotprotocol.com or the address on the back cover.
CORE PRINCIPLES RELATING TO DELAY AND COMPENSATION

These are the core statements of principle in the Protocol. Guidance as to the background to these points of principle is contained in Guidance Section 1 (pages 10-34). Section references, ‘hyperlinked’ in the on-line version, are provided with each.

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 (see Guidance Section 2).

2. **Purpose of extension of time**

   The benefit to the Contractor of EOT is only to relieve the Contractor of liability for damages for delay (usually liquidated damages (LDs) for any period prior to the extended contract completion date). The benefit of an EOT for the Employer is that it establishes a new contract completion date, and prevents time for completion of the works becoming ‘at large’ (see Guidance Section 1.2).

3. **Entitlement to extension of time**

   Applications for EOT should be made and dealt with as close in time as possible to the delay event that gives rise to the application (see Guidance Section 1.2.4). The Contractor will potentially be entitled to an EOT only for those events or causes of delay in respect of which the Employer has assumed risk and responsibility (called in the Protocol Employer Risk Events). The parties should attempt so far as possible to deal with the impact of Employer Risk Events as the work proceeds, both in terms of EOT and compensation.
4. **Procedure for granting extension of time**

The EOT should be granted to the extent that the Employer Risk Event is reasonably predicted to prevent the works being completed by the then prevailing contract completion date (see Guidance Section 3.2.6). The goal of the EOT procedure is the ascertainment of the appropriate contractual entitlement to an EOT; the procedure is not to be based on whether or not the Contractor needs an EOT in order not to be liable for liquidated damages (see Guidance Section 1.2.9).

5. **Effect of delay**

For an EOT to be granted, it is not necessary for the Employer Risk Event already to have begun to affect the Contractor’s progress with the works, or for the effect of the Employer Risk Event to have ended (see Guidance Section 1.2.12).

6. **Incremental review of extension of time**

Where the full effect of an Employer Risk Event cannot be predicted with certainty at the time of initial assessment by the CA, the CA should grant an EOT for the then predictable effect. The EOT should be considered by the CA at intervals as the actual impact of the Employer Risk Event unfolds and the EOT increased (but not decreased, unless there are express contract terms permitting this) if appropriate (see Guidance Section 1.2.14).

7. **Float as it relates to time**

Unless there is express provision to the contrary in the contract, where there is remaining float in the programme at the time of an Employer Risk Event, an EOT should only be granted to the extent that the Employer Delay is predicted to reduce to below zero the total float on the activity paths affected by the Employer Delay (see Guidance Section 1.3.1).

8. **Float as it relates to compensation**

If as a result of an Employer Delay, the Contractor is prevented from completing the works by the Contractor’s planned completion date (being a date earlier than the contract completion date), the Contractor should in principle be entitled to be paid the costs directly caused by the Employer Delay, notwithstanding that there is no delay to the contract completion date (and therefore no entitlement to an EOT), provided also that at the time they enter into the contract, the
Employer is aware of the Contractor’s intention to complete the works prior to the contract completion date, and that intention is realistic and achievable (see Guidance Section 1.12.1).

9. ** Concurrent delay – its effect on entitlement to extension of time**

Where Contractor Delay to Completion occurs or has effect concurrently with Employer Delay to Completion, the Contractor’s concurrent delay should not reduce any EOT due (see Guidance Section 1.4.1 and 1.4.7).

10. ** 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 (see Guidance Section 1.10.1 and 1.10.4).

11. ** Identification of float and concurrency**

Accurate identification of float and concurrency is only possible with the benefit of a proper programme, properly updated.

12. ** After the event delay analysis**

The Protocol recommends that, in deciding entitlement to EOT, the adjudicator, judge or arbitrator should so far as is practicable put him/herself in the position of the CA at the time the Employer Risk Event occurred (see Guidance Section 4.19).

13. ** 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 (see Guidance Section 1.5.1 and 1.13.1). 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.

14. **Link between extension of time and compensation**

Entitlement to an EOT does not automatically lead to entitlement to compensation (and *vice versa*) (see Guidance Section 1.6.2).

15. **Valuation of variations**

Where practicable, the total likely effect of variations should be pre-agreed between the Employer/CA and the Contractor, to arrive 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 (see Guidance Section 1.7.1).

16. **Basis of calculation of compensation for prolongation**

Unless expressly provided for otherwise (eg 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 (see Guidance Section 1.8.2). The objective is to put the Contractor in the same financial position it would have been if the Employer Risk Event had not occurred.

17. **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 (see Guidance Section 1.9.1).

18. **Period for 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 (see Guidance Section 1.11.1).
19. **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 (see Guidance Section 1.14).

20. **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 (see Guidance Section 1.18).

21. **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 (see Guidance Section 1.19).

*There follow, on pages 10-49, some Guidance Notes, as follows:*

- **Guidance Section 1** to the Protocol gives guidance as to why the Protocol takes the position it does on the recurring Core Principles it deals with. It also contains additional material on other matters that come up repeatedly in delay claims.
- **Guidance Section 2** is a good practice guide on the preparation of programmes and records, and their subsequent use for the management of extensions of time.
- **Guidance Section 3** is a good practice guide on how to deal with extension of time applications during the course of a project.
- **Guidance Section 4** provides guidance as to how to analyse causes of and responsibility for delay where a project has been delayed, and the analysis is only conducted after the project is completed.
GUIDANCE NOTES

Guidance Section 1

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

Introduction

1.1 These are guidelines to explain the Protocol’s position on Core Principles relating to delay and compensation. This section also contains additional material on other matters that come up repeatedly in delay claims. It is not intended that these Guidance Notes should be incorporated into a contract. The structure of this section is to re-state the core statements of principle from the Protocol and then explain or expand on them.

1.2 Extensions of time

1.2.1 The benefit to the Contractor of an EOT is only to relieve the Contractor of liability for damages for delay (usually LDs) for any period prior to the extended contract completion date. The benefit of an EOT for the Employer is that it establishes a new contract completion date, and prevents time for completion of the works becoming ‘at large’.

Guidance

1.2.2 It is often incorrectly thought that an entitlement to an EOT automatically carries with it an entitlement to compensation for prolongation costs during the period of the EOT. The main effect of an EOT is merely that the Contractor is relieved of its liability for liquidated damages during the period of the extension. Its entitlement to compensation is usually to be found in other provisions of the contract. The benefit of an EOT for the Employer is that it establishes a new contract completion date, and prevents time for completion of the works becoming ‘at large’ (see Guidance Section 1.4.12).

1.2.3 If the good practice promoted elsewhere in the Guidance Notes with regard to keeping of records and preparation, acceptance and updating of programmes is followed, then the
scope for factual disagreement about a claimed entitlement to an EOT will be reduced.

1.2.4 Applications for EOT should be made and dealt with as close in time as possible to the delay event that gives rise to the application.

Guidance

1.2.5 As noted in Appendix A, ‘CA’ is the Contract Administrator, which includes the Architect or Engineer and the Employer itself where there is no independent person appointed under the contract to deal with matters such as extensions of time.

1.2.6 As explained in Guidance Section 1.2.2, entitlement to an EOT does not automatically lead to an entitlement to compensation for prolongation. Standard forms of contract often provide that some kinds of delay events which are at the risk of the Employer so far as time for completion is concerned carry no entitlement to compensation for prolongation; delay resulting from adverse weather conditions being the most common example. They are sometimes misleadingly called ‘neutral events’; in fact, they are only neutral in the sense that one party bears the time risk and the other party bears the cost risk. The Protocol calls them ‘non-compensable Employer Risk Events’.

1.2.7 Most if not all the standard forms of contract contain obligations on the part of the Contractor to give notice to the CA as soon as an Employer Risk Event occurs that the Contractor considers entitles it to an EOT. Some require notice of the occurrence of an Employer Risk Event irrespective of whether it is likely to affect the contract completion date (ie what the Protocol refers to as Employer Delay to Completion), and some require notice of all events that adversely affect progress irrespective of liability or consequence. In some standard forms these notices are expressed to be conditions precedent (ie pre-conditions) to entitlement. Whatever the contract says, the Contractor should give notice to the CA of any Employer Delays as soon as possible. The CA should also notify the Contractor as early as possible of any Employer Delays of which it is aware.

1.2.8 The parties should attempt so far as possible to deal with the impact of Employer Risk Events as the work proceeds, both in terms of EOT and compensation. Each EOT application should be assessed as soon as possible after the event occurs, and in any event not later than one month after the application has been received by the CA. CAs should bear in
mind that it is permissible to deal with EOTs incrementally (see Guidance Section 1.2.14). The Protocol’s recommended procedure for assessing EOTs using the programme is set out in Guidance Section 3.

1.2.9 The goal of the EOT procedure is the ascertainment of the appropriate contractual entitlement to an EOT; the procedure is not to be based on whether or not the Contractor needs an EOT in order not to be liable for liquidated damages.

1.2.10 If the CA does not make a determination of the EOT entitlement resulting from an Employer Risk Event when an EOT is in fact due, there is a danger that the EOT mechanism may fail, leaving the Contractor only obliged to finish the works within a reasonable time, having regard to the parties’ rights and obligations under the contract (with the uncertainty which that creates). For this reason, a competently drafted construction contract should contain provisions entitling the CA on its own initiative to determine an EOT, even if the Contractor has not applied for one, or has applied with insufficient information. A properly drafted EOT clause will also contain general wording to allow an EOT to be granted in respect of acts (or omissions) of prevention or breach of contract by the Employer. Such wording is needed because the English courts have held that wording such as ‘any other special circumstances’ does not cover breaches by the Employer.

1.2.11 Generally, an EOT should be granted to the extent that the Employer Risk Event is predicted to prevent the works being completed by the then prevailing contract completion date. This process requires consideration of the available float, which should be dealt with as provided in Guidance Section 1.3. It also requires consideration of issues of concurrency, which should be dealt with as provided in Guidance Section 1.4. Illustrations of the application of the Protocol to different situations are shown graphically in Appendix D.

1.2.12 For an EOT to be granted, it is not necessary for the Employer Risk Event already to have begun to affect the Contractor’s progress with the works, or for the effect of the Employer Risk Event to have ended.

1.2.13 The practice of some CAs of waiting to see what the full effect an Employer Risk Event has on the works before dealing with the Contractor’s application for EOT is not good practice. If the Contractor is entitled to an EOT, it should receive it, and the CA should not wait to see if the
Contractor actually needs the EOT, in order not to be liable for liquidated damages.

1.2.14 Where the full effect of an Employer Risk Event cannot be predicted with certainty at the time of initial assessment by the CA, the CA should grant an EOT for the then predictable effect. The EOT should be considered by the CA at intervals as the actual impact of the Employer Risk Event unfolds and the EOT increased (but not decreased, unless there are express contract terms permitting this) if appropriate.

1.3 **Float** as it relates to extensions of time

1.3.1 Unless there is express provision to the contrary in the contract, where there is remaining float in the programme at the time of an Employer Risk Event, an EOT should only be granted to the extent that the Employer Delay is predicted to reduce to below zero the total float on the activity paths affected by the Employer Delay.

**Introduction**

1.3.2 Float is the amount of time by which an activity or group of activities may be shifted in time without causing delay to a contract completion date. Appendix A explains the different types of float. The date in question may be a sectional completion date, the overall completion of the works or an interim milestone. The ‘ownership’ of float causes particular arguments in disputes over entitlement to EOT. A Contractor may argue that it ‘owns’ the float, because, in planning how it proposes to carry out the works, it has allowed additional or float time to give itself some flexibility in the event that it is not able to carry out the works as quickly as it planned. If, therefore, there is any delay to the Contractor’s progress for which the Contractor is not responsible, it may contend that it is entitled to an EOT, even if the delay to progress will not result in the contract completion date being missed, but merely in erosion of its float. On the other hand an Employer may typically say that the Contractor has no contractual remedy for being prevented from completing the works at any time prior to the contract completion date, and is therefore not entitled to an EOT unless the delay to progress will result in a contract completion date being missed. So (the Employer may say) the project owns the float.
1.3.3 Parties should ensure that this issue is addressed in their contracts. The expression ‘float’ rarely if ever appears in standard form conditions of contract. Where the wording of the EOT clause in a contract is such that an EOT is only to be granted if the Employer Delay delays completion beyond the contract completion date, then the likely effect of that wording is that total float has to be used up before an EOT will be due. If the wording of the EOT clause is such that an EOT will be due whenever the Employer Delay makes the Contractor’s planned completion date later than it would have been if it were not for that delay, then total float will probably not be available for the benefit of the Employer in the event of Employer Delay. Some conditions of contract give no indication as to whether an Employer Delay has to affect the contract completion date or merely the Contractor’s planned completion date before an EOT is due.

1.3.4 Each of the permutations described above can create unfairness and/or uncertainty. Under contracts where the Employer Delay has to affect the contract completion date, if an Employer Delay occurs first and uses up all the total float, then the Contractor can find itself in delay and paying LDs as a result of a subsequent Contractor Delay which would not have been critical if the Employer Delay had not occurred first. Under contracts where the Employer Delay only has to affect the Contractor’s planned completion date, the Contractor is potentially entitled to an EOT every time the Employer or CA delays any of its activities, irrespective of their criticality to meeting the contract completion date. Under the type of contract that is silent or ambiguous about float, uncertainty exists and disputes are likely to follow.

1.3.5 Many conditions of contract have a provision that allows a final review of any EOT granted or not granted, reflecting what is perceived to be fair or reasonable. That provides the potential to remove some of the unfairness indicated above. But reliance on what a CA perceives to be fair or reasonable is not always a good recipe for certainty. Where EOTs are granted retrospectively, it is possible to review separately the effect of different types of delay and make decisions on EOT entitlement, again based on fairness or reasonableness. But it is a very important principle of this Protocol that applications for EOT should be made and dealt with as close in time to the delay event that gives rise to them, and the ‘wait and see’ approach should be discouraged (see Core Principle 3, and Guidance Section 1.2.4).
1.3.6 The wording at the beginning of Section 1.3.1 is what the Protocol considers is appropriate in circumstances where the parties in their contract have not made clear provision for how float should be dealt with, and in the light of the position it takes on the relevance of float to compensation (see Core Principle 10). It believes it to be consistent with current judicial thinking, which is that an Employer Delay has to be critical (to meeting the contract completion date) before an EOT will be due. It has the effect that float is not time for the exclusive use or benefit of either the Employer or the Contractor.

1.3.7 It follows from this approach that a Contractor has no entitlement to an EOT merely because an Employer Risk Event prevents the Contractor from completing the works earlier than the contract completion date or because an Employer Delay to Progress takes away the Contractor’s float on any particular activity.

1.3.8 If the Contractor wants to make allowance for the possibility of Contractor Delays, then it should include in the activity durations in its programme such additional time as the Contractor believes is necessary to reflect the risk of such delays to those activities. Alternatively, it may identify such allowances as separate activities in the programme entitled ‘Contingency for … [eg groundwork]’. Either is perfectly acceptable and prudent planning practice.

1.3.9 Accurate identification of float is only possible with the benefit of a proper programme, properly updated. Recommendations for the preparation of such a programme are set out in Guidance Section 2.

1.4 Concurrency as it relates to extensions of time

1.4.1 Where Contractor Delay to Completion occurs concurrently with Employer Delay to Completion, the Contractor’s concurrent delay should not reduce any EOT due.

Introduction

1.4.2 Concurrency is a contentious issue both because there are differing views on the correct approach to concurrency when analysing entitlement to EOT and because there are differences about the meaning of concurrency itself.

1.4.3 The aim of this part of the Protocol is therefore to provide guidance in order that issues of concurrency can be recognised and disposed of in an agreed manner as part of
the overall delay analysis. The guidance given is a compromise, taking account of the different competing arguments, but represents what the Protocol considers to be the most appropriate solution.

**Guidance**

1.4.4 True concurrent delay is the occurrence of two or more delay events at the same time, one an Employer Risk Event, the other a Contractor Risk Event, and the effects of which are felt at the same time. True concurrent delay will be a rare occurrence. A time when it can occur is at the commencement date (where for example, the Employer fails to give access to the site, but the Contractor has no resources mobilised to carry out any work), but it can arise at any time.

1.4.5 Where true concurrent delay occurs, the Contractor should nevertheless be entitled to an EOT for the Employer Delay to Completion, dealt with in accordance with Guidance Section 1.2. Separate analyses should be carried out for the concurrent delay events. The Employer Risk Event should be analysed first.

1.4.6 The term ‘concurrent delay’ is often used to describe the situation where two or more delay events arise at different times, but the effects of them are felt (in whole or in part) at the same time. To avoid confusion, this is more correctly termed the ‘concurrent effect’ of sequential delay events.

1.4.7 **Where Employer Risk Events and Contractor Risk Events occur sequentially but have concurrent effects, here again any Contractor Delay should not reduce the amount of EOT due to the Contractor as a result of the Employer Delay.** Again, it will be necessary to carry out analyses of each delay (see 1.4.5 above). This analysis will be important for determining whether any compensation will be due for the Employer Delay (see Guidance Sections 1.8 and 1.10). Analyses should be carried out for each event separately and strictly in the sequence in which they arose.

1.4.8 Where an Employer Risk Event occurs after the contract completion date, in a situation where failure to complete by the contract completion date has been caused by Contractor Delays, the principle set out in Section 1.4.7 above should apply, except where the Employer Risk Event is a non-compensable Employer Risk Event. In such an event, no EOT (or compensation) should be due. Where an EOT is due after the contract completion date, the Employer Risk Event does not exonerate the Contractor for all its delays prior to the Employer Risk Event occurring. The effect of
the Employer Risk Event should be assessed as described above and any EOT found due should simply be added to the contract completion date.

1.4.9 Illustrations showing the application of the Protocol to situations where there is float, concurrent delay, concurrent effects of sequential delays, and the effects of Contractor recovery plans are attached as Appendix D.

1.4.10 Accurate identification of concurrency is only possible with the benefit of a proper programme. The Protocol’s recommendations for the preparation of such a programme are set out in Guidance Section 2.

1.4.11 Because judges only come to consider concurrency issues after the delays have occurred and disputes have arisen, current English law focuses on an ‘after the event’ analysis of cause and effect of the different delays, and/or which of a number of delays is the dominant one. The Protocol takes a different approach, consistent with its objective of encouraging parties to deal with EOT applications as close in time as possible to the delay event that gives rise to the application and discouraging the ‘wait and see’ approach (see Core Principle 3 and Guidance Section 1.2). The simple approach to concurrency adopted by the Protocol aims to provide contracting parties with clarity and certainty about entitlement to EOT at the time delay events occur, rather than waiting for their full effect to be felt and then analysed afterwards.

1.4.12 The position the Protocol takes on concurrency is also influenced by the English law ‘prevention principle’, by virtue of which an Employer cannot take advantage of the non-fulfilment of a condition (for example, to complete the works by a certain date), the performance of which the Employer has hindered. Where there has been Employer Delay, this may prevent the Employer charging the Contractor with LDs for failure to achieve a contract completion date. Time for completion of the works may become ‘at large’ until a new contract completion date is set by the granting of an EOT. The Protocol’s wording avoids this danger and also prevents arguments as to whether an Employer Delay that acts concurrently with a Contractor Delay does actually hinder the progress of the Contractor in any way.

1.4.13 Finally, the Protocol’s position on concurrency prevents an Employer or CA taking advantage of a Contractor’s delay after the contract completion date to issue instructions and make changes without having to give an EOT. It cannot be
correct that an Employer should be able to charge the Contractor with LDs at a time when the Contractor is carrying out extra work ordered by the Employer or CA.

1.5 Mitigation of delay

1.5.1 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.

1.5.2 Note that the requirement in the UK Joint Contracts Tribunal (JCT) contracts for the Contractor to use 'best endeavours' to prevent delay in the progress of the works and prevent completion of the works being delayed beyond the completion date may place a higher burden on the Contractor than the normal duty to mitigate. In the event of Employer Delay, it is of course open to the Employer to agree to pay the Contractor for additional mitigation measures. See Guidance Section 1.13 below for mitigation of loss.

1.6 Financial consequences of delay

1.6.1 Delay will result in additional cost. The question of who should bear the cost of delay is often contentious. The Protocol is not primarily concerned with the question of the valuation of the direct cost (labour, plant and materials) of change to or variation of the works. It is mainly concerned with the Contractor's cost of prolongation and disruption. The Contractor's cost of prolongation mostly comprises the extended use of time-related resources.

1.6.2 Entitlement to an EOT does not automatically lead to entitlement to compensation (and vice versa).

Guidance

1.6.3 It is a common misconception in the construction industry that if the Contractor is entitled to an EOT, then it is also automatically entitled to be compensated for the additional time that it has taken to complete the contract. Under the common standard forms of contract, the Contractor is nearly always required to claim its entitlement to an EOT under one provision of the contract and its claim to compensation for that prolongation under another provision. There is thus no absolute linkage between entitlement to an EOT and the entitlement to compensation for the additional time spent on completing the contract.
If the method used to assess the amount of an EOT is prospective, ie based on the likely Employer Delay to Completion, and the method used to assess time for prolongation compensation is retrospective, ie is based on the loss and/or expense actually incurred, then the two assessments of time may produce different results. This is only to be expected, and does not necessarily indicate errors in either method. Entitlement to an EOT does not automatically result in entitlement to compensation for the same period, or at all.

1.7 Valuation of variations

1.7.1 Where practicable, the total likely effect of variations should be pre-agreed between the Employer/CA and the Contractor, to arrive at if possible, 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 extension of time and the necessary revisions to the programme.

Guidance

1.7.2 Every competently drafted construction contract contains a mechanism entitling the Employer to vary the works by addition or deletion, with a mechanism for determining the price of the variation. The standard forms sometimes, but not always, contain wording enabling the parties to agree in advance of the execution of the variation, what its fixed price will be. This practice is supported by the Protocol.

1.7.3 Users of design and construct forms of contract are reminded that it is essential to have a list of rates and prices to be used in the event of change in the Employer’s requirements.

1.7.4 Typically, variation clauses provide that where the varied work is of a similar character and executed under similar conditions to the original work, the tendered contract rates should be used. Where the work is either not of a similar character or not executed under similar conditions, the tendered contract rates can be used, but adjusted to take account of the different circumstances. If the work is quite dissimilar, reasonable or fair rates and prices are to be determined. Fair or reasonable rates will generally be reasonable direct costs plus a reasonable allowance for overheads and profit.

1.7.5 Under the JCT standard forms of building contract, any loss and/or expense caused by an adverse effect on the progress of the works as a result of acts or omissions of the Employer
is to be ascertained separately from the direct cost and associated preliminaries/overheads of an instructed variation.

1.7.6 Under the UK Institution of Civil Engineers (ICE) standard forms of civil engineering contract and some other standard forms, prolongation compensation arising from variations is to be valued if possible as part of the variation at or on the basis of the rates and prices in the bill of quantities or schedule of rates, or on the basis of a fair valuation.

1.7.7 It is not good practice to leave to be compensated separately at the end of the contract the prolongation and disruption element of a number of different variations and/or changes. This is likely to result in the Contractor presenting a global claim, which is a practice that is to be discouraged. Where it is not practicable to agree in advance the amounts for prolongation and disruption to be included in variations and sums for changed circumstances, then it is recommended that the parties to the contract do their best to agree the total amount payable as the consequence of the variations and/or changes separately as soon as possible after the variations are completed.

1.7.8 Though some standard forms of contract have a provision that where a variation affects unvaried work, the affected unvaried work may be treated as varied, these provisions are rarely used. The use of these provisions is encouraged, in order to promote early agreement on the complete effect of the variation.

1.8 Compensation for prolongation

1.8.1 Delay causes prolongation. Prolongation causes increased cost. The recoverability of compensation for prolongation depends on the terms of the contract and the cause of the prolongation. Obviously, any prolongation costs resulting from Contractor Risk Events must be borne by the Contractor. Compensation for prolongation resulting from Employer Risk Events will primarily comprise the Contractor’s extended use of time-related resources, notably its site overheads. It is, however, not possible to say that compensation for prolongation comprises exclusively additional time-related resources because other types of recoverable loss may result from Employer Risk Events.

1.8.2 Unless expressly provided for otherwise in the contract (eg by evaluation based on contract rates – see Section 1.8.5 below), 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.

**Guidance**

1.8.3 The recovery of prolongation compensation depends on the terms of the contract and the cause of the prolongation. Prolongation costs may be caused by any kind of Employer Risk Event – a variation, a breach of contract, or other identified provision in the contract – for example, unforeseen ground conditions.

1.8.4 Whether the cause of the prolongation is governed by a provision in the contract or a breach of contract, it is up to the Contractor to demonstrate that it has actually suffered loss and/or expense before it becomes entitled to compensation, unless the contract provides otherwise.

1.8.5 Arguments about proof of loss could be reduced or avoided altogether if the contract contained an agreed amount per day that can be applied to each day of prolongation. This is the reverse of the normal Employer’s liquidated damages provision. It may be necessary to have a number of different agreed amounts to be applied depending on the stage in the project where the delay occurs. One method of fixing the figure(s) would be for the Contractor to price a schedule of rates with indicative quantities at tender stage.

1.8.6 If the prolongation is caused by a variation, then it is recommended that the compensation for prolongation should be agreed as soon as possible after completion of the variation and where practicable included in the valuation of the variation (see Guidance Section 1.7.7).

1.9 **Relevance of tender allowances for prolongation and disruption compensation**

1.9.1 The tender allowances have limited relevance to the evaluation of the cost of prolongation and disruption caused by breach of contract or any other cause that requires the evaluation of additional costs. The tender allowances may be relevant as a baseline for the evaluation of prolongation and disruption caused by variations.

**Guidance**

1.9.2 For prolongation or disruption compensation based on actual cost or loss and/or expense, the tender allowances are not
relevant because the Contractor is entitled to its actual costs of the prolongation or disruption.

1.9.3 It is a common misunderstanding in the construction industry that if the Contractor has made no or inadequate allowance for site overheads in its tender, then that fact limits or removes its entitlement to compensation for prolongation and/or disruption where the basis of recovery is actual cost incurred. This is not correct. Under these circumstances recoverable compensation requires the ascertainment of the actual cost of remaining on site for the additional time. The tender allowances are therefore of little relevance to the ascertainment of compensation under these circumstances.

1.9.4 The tender allowances may be a useful reference point for the evaluation of prolongation and disruption caused by a variation, but only in those circumstances where the different conditions or circumstances under which the variations are carried out make it inappropriate to apply the contract rates or prices. Notwithstanding the advice of the Protocol, there is nothing to prevent the use of the tender allowances as a rough guide for the agreement of prolongation costs or for checking the recovery of prolongation costs through the value of varied work, if that is what the parties for convenience wish to do.

1.10 **Concurrency** as it relates to compensation for prolongation

1.10.1 If the Contractor incurs additional costs that are caused both by Employer Delay and Contractor Delay, then the Contractor should only recover compensation if it is able to separate the additional costs caused by the Employer Delay from those caused by the Contractor Delay.

**Guidance**

1.10.2 As it is in relation to EOT, concurrency is one of the most contentious issues in the determination of recoverable prolongation compensation. Contention arises when the Employer would be liable to compensate the Contractor for being kept on site longer than expected, but the Contractor was late in carrying out work of its own, and so would have been late completing the work anyway. Should the Employer be obliged to compensate the Contractor in these circumstances?

1.10.3 Answering this question does not always prove difficult in practice. The prolongation compensation will be recoverable if the Contractor can prove that its losses result from the
Employer Delay. Proper analysis of the facts may reveal the true cause without argument.

1.10.4 Where an Employer Risk Event and a Contractor Risk Event have concurrent effect, the Contractor may not recover compensation in respect of the Employer Risk Event unless it can separate the loss and/or expense that flows from the Employer Risk Event from that which flows from the Contractor Risk Event. 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. In most cases this will mean that the Contractor will be entitled to compensation only for any period by which the Employer Delay exceeds the duration of the Contractor Delay.

1.10.5 The loss and/or expense flowing from an Employer Delay cannot usually be distinguished from that flowing from Contractor Delay without the following:
1.10.5.1 an as-planned programme showing how the Contractor reasonably intended to carry out the work and the as-planned critical path;
1.10.5.2 an as-built programme demonstrating the work and sequence actually carried out and the as-built critical path;
1.10.5.3 the identification of activities and periods of time that were not part of the original scope;
1.10.5.4 the identification of those activities and periods of time that were not part of the original scope and that are also at the Contractor’s risk as to cost; and
1.10.5.5 the identification of costs attributable to the two preceding sub-sections.

1.10.6 This analysis should be co-ordinated with any analysis carried out by the Contractor to establish its rights to an EOT, while remembering that the entitlement to an EOT and the entitlement to compensation may not be co-extensive.

1.10.7 Illustrations showing the application of the Protocol to situations where there is float, concurrent delay, and concurrent effects of sequential delays and the effects of Contractor recovery plans are attached as Appendix D.

1.11 **Time for assessment of prolongation costs**

1.11.1 Liability for compensation must first be established by showing that the prolongation has been caused by an Employer Risk Event. 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.

Guidance

1.11.2 Arguments commonly arise as to the time when recoverable prolongation compensation is to be assessed: is it to be assessed by reference to the period when the Employer Delay occurred (when the daily or weekly amount of expenditure and therefore compensation may be high) or by reference to the extended period at the end of the contract (when the amount of compensation may be much lower)?

1.11.3 The answer to this question is that the period to be evaluated is that in which the effect of the Employer Risk Event was felt.

1.11.4 If amounts of compensation per day for prolongation were pre-agreed, then the point in time when the compensable prolongation occurred would need to be consistent with what has been agreed.

1.12 Float as it relates to compensation

1.12.1 If as a result of an Employer Delay, the Contractor is prevented from completing the works by the Contractor's planned completion date (being a date earlier than the contract completion date), the Contractor should in principle be entitled to be paid the costs directly caused by the Employer Delay, notwithstanding that there is no delay to the contract completion date (and therefore no entitlement to an EOT), provided also that at the time they enter into the contract, the Employer is aware of the Contractor's intention to complete the works prior to the contract completion date, and that intention is realistic and achievable.

Guidance

1.12.2 It is important to understand the significance of the statement above, and to contrast it with the position taken in the Protocol on the effect of total float on EOT (see Guidance Section 1.3). In relation to EOT, the Protocol takes the position that an Employer Delay should not result in an EOT unless it is predicted to reduce to below zero the total float on the activity paths affected by the Employer Delay. When it comes to compensation, the Protocol considers that, unless there is agreement to the contrary, the Contractor should be
entitled to compensation for the delay, even if the delay does not result in an EOT. As with the effect of float on entitlement to EOT, the Protocol recommends that contracting parties expressly address this issue in their contract. They should ask themselves the question: if the Contractor is prevented by the Employer from completing on a date earlier than the contract completion date, should it have a remedy? If so, in precisely what circumstances? If not, then the contract should say so expressly.

1.12.3 Where the parties have not addressed this issue in their contract, for the Contractor to have a valid claim, the Employer must be aware at the time the contract is entered into of the Contractor’s intention to complete prior to the contract completion date. It is not permissible for the Contractor, after the contract has been entered into, to state that it intends to complete early, and claim additional costs for being prevented from doing so.

1.12.4 The Protocol recognises that the position it takes on this issue might be thought to conflict with the decision of HH Judge Fox-Andrews in the (English) Technology and Construction Court in *Glenlion Construction Ltd v The Guinness Trust* (1987) 39 BLR 89, where it was held that there was no implied term of the building contract in question that the Employer in that case should so perform the contract as to enable the Contractor to complete the works in accordance with a programme that showed the works being completed before the contract completion date. Providing the Employer is aware of the Contractor’s intention prior to the contract being entered into, there should be no such conflict. The Protocol considers that, as a matter of policy, contractors ought not to be discouraged from planning to achieve early completion, because of the price advantage that being able to complete early is likely to have for the Employer. But the potential for conflict reinforces why the issue should be addressed directly in every contract.

1.12.5 The recoverable compensation in the situation described in 1.12.1 will normally only comprise the increased costs of the time-related resources directly affected by the Employer Delay to Progress. Recovery of such compensation will also be subject to considerations of concurrency, as described in Guidance Section 1.10.

1.13 Mitigation of loss

1.13.1 The Contractor should do all it reasonably can to avoid the financial consequences of Employer Delay.
**Guidance**

1.13.2 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.

1.13.3 Most construction contracts include a requirement to the effect that the Contractor must do all it can to avoid, overcome or reduce delay. Some forms actually make compliance with such provisions a condition precedent to the recovery of compensation or relief from LDs.

1.13.4 The limitations on the Contractor’s obligations to mitigate Employer Delay are set out in Guidance Section 1.5. The Contractor does not have a duty to carry out any change in scope any more efficiently than the original scope. Neither is the Contractor obliged to expend money in order to mitigate the effect of an Employer Risk Event. If the Employer wishes the Contractor to take measures to mitigate the Employer Delay (whether by adding extra resources, by working outside its planned working hours or otherwise), the Employer should agree to pay the Contractor for the costs of those mitigation efforts.

1.13.5 It is the obligation of the Contractor to proceed with the works so as to complete on or before the completion date. However, the method, speed and timing of the activities forming the contract scope are generally left to the Contractor’s discretion, subject to any stipulated prior process of acceptance of method and/or programme.

1.13.6 In the event that changes are made to the scope of the works, the Contractor has a similar obligation as to efficiency in relation to the changed scope as it has to the original scope.

1.14 **Global claims**

1.14.1 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.

**Guidance**

1.14.2 If the Contractor has made and maintained accurate and complete records, the Contractor should be able to establish the causal link between the Employer Risk Event and the resultant loss and/or expense suffered, without the need to make a global claim. The failure to maintain such records
does not justify the Contractor in making a global claim. The Protocol’s guidance as to the keeping of records is set out in Guidance Section 2.

1.14.3 In what should only be rare cases where the financial consequences of the various causes of compensation are impossible to distinguish, so that an accurate apportionment of the compensation claimed cannot be made between the several causative events, then in this rare situation it is acceptable to quantify individually those items of the claim which can be dealt with in isolation and claim compensation for the remainder as a composite whole.

1.14.4 The Contractor will nevertheless need to set out the details of the Employer Risk Events relied on and the compensation claimed with sufficient particularity so that the Employer knows the case that is being made against it.

1.15 **Claims for payment of interest**

1.15.1 Some standard forms of contract make provision for the way interest, as a component of compensation, is payable. Interest may also be a component of damages if it can be shown that the loss (in the form of additional interest paid) was actually suffered as a result of a breach of the contract, and the loss was in the contemplation of the parties at the time of contracting. There are also statutory rights to interest.

**Guidance**

1.15.2 The following are legitimate bases for claims for interest under contracts subject to English law, subject to express contractual provisions to the contrary where relevant, and proof where necessary.

**Interest pursuant to contract**

1.15.3 The parties can agree in the contract the rate of interest and the circumstances in which it will be payable. The rate may not be enforceable if it is penal in not being a ‘genuine pre-estimate of loss’. Various standard forms of contracts contain an express contractual right to interest.

**Interest as damages/finance charges**

1.15.4 It is the position in most areas of business that interest payable on bank borrowings (to replace the money due) or the lost opportunity to earn interest on bank deposits, is quantifiable as damages where the claimant can show:
1.15.4.1 that such loss has actually been suffered; and
1.15.4.2 that this loss was within the reasonable contemplation of the parties at the time of contracting.

1.15.5 It is recognised that, in the construction industry, it will always be in the contemplation of the parties at the time they enter into their contract that if deprived of money the Contractor will pay interest or lose the ability to earn interest. Contractors therefore need only establish that the loss was actually suffered.

**Time when interest starts to run**

1.15.6 There are often arguments as to the date on which interest on a Contractor’s claim should start to run. Contractors will argue that it should be the date on which they incurred expenditure for which they are entitled to compensation. Employers will say that interest should run only from the date that the Contractor has provided all information needed to satisfy them that the expenditure has been incurred.

1.15.7 The appropriate starting date will not be the same in all circumstances, but generally the starting date for the payment of interest should be the earliest date on which the principal sum could have become payable, which will be the date for payment of the certificate issued immediately after the date the Contractor applied for payment of the loss and/or expense. This will be subject to any notice requirements in the contract. In contracts where there are no certificates, the Protocol recommends that interest should start to run 30 days after the date the Contractor suffered the loss and/or expense.

**Statutory interest on debts**

1.15.8 In considering claims for prolongation costs (and any other monetary claims) the parties should be aware of the various statutory rights to interest that may be available to an adjudicator, judge or arbitrator should they not resolve their dispute. These statutory rights include the Late Payment of Commercial Debts (Interest) Act 1998, section 35A of the Supreme Court Act 1981, section 49 of the Arbitration Act 1996 and the Judgment Act 1838.
1.16 **Head office overheads**

*Guidance*

1.16.1 This section applies to claims for compensation other than the valuation of variations on the basis of rates and prices in the bill of quantities or schedule of rates.

1.16.2 Head office overheads can be sub-divided into: ‘dedicated overheads’ which through careful record keeping can be attributed to the specific Employer Delay; and ‘unabsorbed overheads’ (such as rent and some salaries) which are incurred by a Contractor regardless of its volume of work.

1.16.3 Unless the terms of the contract render unabsorbed overheads irrecoverable, they are generally recoverable as a foreseeable cost resulting from prolongation. The Contractor must be able to demonstrate that because of the Employer Risk Events it was prevented from taking on other overhead-earning work.

1.16.4 Before it can recover unabsorbed overheads, the Contractor must be able to demonstrate that it has:

- failed to recover the overheads it could reasonably have expected during the period of prolongation; and

- been unable to recover such overheads because its resources had been tied up by Employer Risk Events.

1.16.5 The Contractor should make all reasonable efforts to demonstrate through records the head office overheads that it has failed to recover. If it is not otherwise feasible to quantify the unabsorbed overheads, formulae may be used (with caution) to quantify unabsorbed overheads once it has been successfully demonstrated that overheads have remained unabsorbed as a result of an Employer Risk Event. The burden of proving that is has unabsorbed overheads always rests with the Contractor. A formula just serves as a tool for the quantification of the loss.

1.16.6 The three most commonly used formulae for assessing unabsorbed head office overheads are Hudson, Emden and Eichleay. They are set out in Appendix A.

1.16.7 The use of the Hudson’s formula is not supported. This is because it is dependent on the adequacy or otherwise of the tender in question, and because the calculation is derived from a number which in itself contains an element of head office overheads and profit, so there is double counting.
1.16.8 In the limited circumstances where a head office overhead formula is to be used, the Protocol prefers the use of the Emden and Eichleay formulae. However, in relation to the Eichleay formula, if a significant proportion (more than, say, 10%) of the final contract valuation is made up of the value of variations, then it will be necessary to make an adjustment to the input into the formula, to take account of the fact that the variations themselves are likely to contain a contribution to head office overheads and profit.

1.16.9 The CA or, in the event of a dispute, the person deciding the dispute, should not be absolutely bound by the results of a formula calculation. It is possible that the use of a particular formula will produce an anomalous result because of a particular input into it. It is suggested that the result of the use of one formula be cross-checked using another formula. A spreadsheet to do this is available on this website: http://www.eotprotocol.com/. Or, if you are reading this online, click here for a direct web link.

1.16.10 The tender allowance for head office overheads may be used, if that is what the parties for convenience wish to do.

1.17 Profit

Guidance

1.17.1 Profit on other contracts, which the claimant maintains it was prevented from earning because of an Employer Risk Event, is generally not recoverable under the standard forms. If the contract allows the recovery of a profit element in addition to any other compensation, the amount of profit allowed should reflect the fact that there is no risk involved in the earning of that profit. An appropriate rate may be arrived at from the Contractor’s audited accounts for the three previous financial years closest to the Employer Risk Events for which audited accounts have been published.

1.17.2 The tender allowance for profit may be used, if that is what the parties for convenience wish to do.

1.18 Acceleration

1.18.1 Some forms of contract provide for acceleration by instruction or by collateral agreement. In other forms, acceleration may be instructed by reference to hours of working and sequence. The Contractor cannot be instructed
to accelerate to reduce Employer Delay, unless the contract allows for this.

**Guidance**

1.18.2 Where the contract provides for acceleration, payment for the acceleration should be based on the terms of the contract.

1.18.3 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.

1.18.4 Where acceleration is instructed and/or agreed, the Contractor is not entitled to claim prolongation compensation for the period of Employer Delay avoided by the acceleration measures.

1.18.5 Where a Contractor accelerates of its own accord, it is not entitled to compensation. If it accelerates as a result of not receiving an EOT that it considers is due to it, 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.

1.19 **Disruption**

1.19.1 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.

**Guidance**

1.19.2 Disruption is often treated by the construction industry as if it were the same thing as delay. It is commonly spoken of together with delay, as in ‘delay and disruption’. Delay and disruption are two separate things. They have their normal everyday meanings. Delay is lateness (eg delayed completion equals late completion). Disruption is loss of productivity, disturbance, hindrance or interruption to progress. In the construction context, disrupted work is work that is carried out less efficiently than it would have been, had it not been for the cause of the disruption.
1.19.3 Disruption to construction work may lead to late completion of the work, but not necessarily so. It is possible for work to be disrupted and for the contract still to finish by the contract completion date. In this situation, the Contractor will not have a claim for an EOT, but it may have a claim for the cost of the reduced efficiency of its workforce.

1.19.4 Not all disruption is subject to the payment of compensation. The Contractor will be able to recover disruption compensation only to the extent that the Employer causes the disruption. Most standard forms of contract do not deal expressly with disruption. If they do not, then disruption may be claimed as being a breach of the term generally implied into construction contracts, namely that the Employer will not prevent or hinder the Contractor in the execution of its work.

1.19.5 Disruption has to be established in the normal cause and effect manner. Disruption is not just the difference between what actually happened and what the Contractor planned to happen. The objective of the compensation for disruption is to put the Contractor in the same financial position it would have been in if the disruption had not occurred.

1.19.6 The most common causes of disruption are loss of job rhythm (caused by, for example, premature moves between activities, out of sequence working and repeated learning cycles), work area congestion caused by stacking of trades, increase in size of gangs and increase in length or number of shifts. But these are also symptoms of poor site management.

1.19.7 The starting point for any disruption analysis is to understand what work was carried out, when it was carried out and what resources were used. For this reason, record keeping is just as important for disruption analysis as it is for delay analysis. The most appropriate way to establish disruption is to apply a technique known as ‘the Measured Mile’. This compares the productivity achieved on an un-impacted part of the contract with that achieved on the impacted part. Such a comparison factors out issues concerning unrealistic programmes and inefficient working. The comparison can be made on the man-hours expended or the units of work performed. However care must be exercised to compare like with like. For example, it would not be correct to compare work carried out in the learning curve part of an operation with work executed after that period.

1.19.8 It may be difficult to find un-impacted parts on some contracts. Comparison of productivity on other contracts
executed by the Contractor may be an acceptable alternative, provided that sufficient records from the other contracts are available to ensure that the comparison is on a like for like basis. Failing that, it might be acceptable to use model productivity curves and factors developed by a number of organisations from data collected on a range of projects (eg by the US Army Corps of Engineers, International Labour Organisation, Mechanical Contractors’ Association of America Inc, Chartered Institute of Building etc). These curves provide general guidance and they should be used only if they are relevant to the working conditions and type of construction and are supported by evidence from the party seeking to prove disruption.

1.19.9 When establishing the compensation for disruption it is necessary to isolate issues that can affect productivity but are unrelated to the Employer’s liability. These issues can include weather, plant breakdowns, dilution of supervision, contractor management and acceleration. The Contractor has an obligation to manage its own change efficiently and any failure to do this should not be compensated.

1.19.10 The use of unsupported percentage additions to assess disruption is not advocated. However, on very simple contracts where evidence of disruption can be demonstrated, this practice may be acceptable, provided that the percentage addition is small (for guidance, no more than 5% on labour and plant).

1.19.11 It is essential for the Contractor to maintain and make available to the CA good site records in order that the CA may carry out proper assessments of disruption. The Contractor should also be required to give prompt notice of disruption, in order that the CA can promptly investigate the claim.

1.19.12 It is recommended that the compensation for disruption caused by variations should be agreed as soon as possible after completion of the variation and where practicable included with the valuation of the variation (see Guidance Section 1.7.7).

1.19.13 It is recommended that the compensation for disruption caused by other events that are the liability of the Employer be compensated by the actual reasonable costs incurred, plus a reasonable allowance for profit if allowed by the contract.
1.20 **Claim preparation costs: are they recoverable?**

1.20.1 Most construction contracts provide that the Contractor may only recover the cost, loss and/or expense it has actually incurred and that this be demonstrated or proved by documentary evidence. The Contractor should not be entitled to additional costs for the preparation of that information, unless it can show that it has been put to additional cost as a result of the unreasonable actions or inactions of the CA in dealing with the Contractor’s claim. Similarly, unreasonable actions or inactions by the Contractor in prosecuting its claim should entitle the Employer to recover its costs. The Protocol may be used as a guide as to what is reasonable or unreasonable.
Guidance Section 2

2. Guidelines on preparing and maintaining programmes and records

Introduction

2.1 It is not intended that these Guidance Notes should be incorporated into a contract, but contract drafters may wish to consider this guidance when drafting their contracts. Many EOT disputes would be avoided if the parties properly monitored and recorded progress of the works during the course of construction. Those who have to advise on disputes about late completion often find that there is uncertainty and a lack of records as to when events occurred and who caused what delay. Good record keeping and good use of a programme removes some of the uncertainty surrounding these issues. Records kept in a suitable format should reduce the cost of analysing delays considerably.

The programme

2.2 As early as possible in the project, the Contractor should submit and the CA should accept a programme (using commercially available critical path method project planning software) showing the manner and sequence in which the Contractor plans to carry out the works. In principle, the procedure should be no different for small, medium or large projects (the smaller the project, the less this will involve). The Protocol does recognise that its recommendations may be thought to be onerous for smaller projects, but one of the Protocol’s aims is to bring about a change in this attitude.

2.2.1 Most standard forms of contract contain inadequate requirements for generating an Accepted Programme and/or keeping it up to date. The Protocol recommends that the parties reach a clear agreement on the programme. The agreement should cover:

2.2.1.1 The form the programme should take. This will depend on the type and complexity of the project, but in all but the simplest of projects, it should be prepared as a critical path network using commercially available critical path method project planning software. Both the Contractor and the CA should have a copy of the software package used to prepare the project programme. For the programme to be suitable for use as a tool for the analysis and management of change, it must be
properly prepared so that, when a change occurs, it can accurately predict the effects of that change. The programme should be provided in electronic form to the CA. Using the software, the Contractor should identify on the programme where the critical path(s) lie(s). The programme should clearly identify all relevant activities, including those that relate to design, manufacturing, procurement and on-site construction. It should also record the information the Contractor reasonably requires from the Employer or CA, and what that information is, when it is required and all Employer or CA activities and constraints (such as approvals and Employer-supplied services or materials). The way the programme should record when information is required from the Employer or the CA is by logically linking the information to the activities of the Contractor that are dependent on the information (and not by means of fixed dates). More detailed suggestions as to how the programme should be prepared are provided below and in Appendix B.

2.2.1.2 Interaction with method statement. For it to be fully understood, the programme should be read in conjunction with a method statement describing in detail how the Contractor intends to construct the works, and the resources (which may be those of its sub-contractors) it intends to use to do so. The Protocol strongly recommends that the contract should also require the Contractor to provide such a method statement, and the programme and the method statement should be fully cross-referenced.

2.2.1.3 The time within which the Contractor should submit a draft programme for acceptance. This should be a reasonable time (which will depend on the complexity of the project) after the commencement of the contract, to allow the Contractor sufficient time to plan the contract works properly. Ideally, the draft programme should be submitted and accepted before the works are started. A tender programme is unlikely to be sufficiently developed immediately to become the Accepted Programme, though it should form the basis of the draft programme. An initial programme showing only the first three months of work in detail may be submitted before the Accepted Programme – see Appendix B. The draft
programme should not attempt to encompass any changes or delays that have occurred since the contract commencement date. Any such post-commencement changes or delays should be dealt with in accordance with the EOT procedure in Guidance Section 1.2 after the programme has been accepted.

2.2.1.4 **A mechanism for obtaining the acceptance of the CA of the draft programme.** The Contractor (not the CA) controls the method and sequence of construction (and bases its tender price on its ability to do so). Therefore, providing the Contractor complies with the contract, the Contractor may construct the works in the manner it thinks appropriate. The contract provisions for accepting the draft programme should reflect that fact. It might also contain wording to the effect that if the CA does not respond to the Contractor regarding the programme within a specified time, it should be deemed accepted. Once it is accepted, the draft programme becomes the **Accepted Programme**. Acceptance by the CA 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. Acceptance does not turn the Contractor’s programme into a contract document, or mandate that the works should be constructed exactly as set out in the Accepted Programme (if the programme is made a contract document, the Contractor may become entitled to a variation whenever it proves impossible to construct the Works in accordance with the programme). Nor does it amount to a warranty by the CA to the Employer that the programme will be achieved. The Protocol regards the agreement of the Accepted Programme as being very important. Disagreements over what constitutes the Accepted Programme should be resolved straight away and not be allowed to continue through the project. Consideration should also be given to providing the Contractor with a financial incentive to submit a draft programme and have it accepted: the Protocol recommends that a sum be allowed by the Employer in the contract price payable on the provision by the Contractor of a proper programme, and further payments for properly updating the programme.
Correspondingly, a contract term might allow for withholding of part of any payment due to the Contractor, or liquidated damages (properly pre-estimated so as not amount to a penalty) to be deducted for failure to provide and update the programme.

2.2.1.5 **Requirements for updating and saving of the Accepted Programme.** The contract should require that the Accepted Programme be updated with actual progress using the agreed project planning software and saved electronically at intervals of no longer than one month (more frequently on complex projects). 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.

2.2.2 The Accepted Programme (which then becomes the Updated Programme) should be the means by which actual against planned progress is monitored, and (as will be seen later) can be used as a tool for determining EOT. If the CA disagrees with the amount of progress the Contractor considers it has achieved, it should notify the Contractor, and the CA and Contractor should then attempt to reach agreement. If they do not agree, the CA’s view should prevail unless and until overturned under the contract dispute resolution procedures, and the CA’s view on progress should be reflected in the Updated Programme.

2.2.3 The Contractor may wish to change or develop the Accepted or Updated Programme, either to expand the detail of activities that it had not fully planned at the time of acceptance of the programme or (where necessary) to change
the logic or sequence of activities. Once the Accepted Programme has been updated with any progress to form the Updated Programme, the Updated Programme should be the programme which is revised. Whenever it does so, the Contractor should notify the CA and provide an electronic copy of the draft revised programme, together with any revision to the method statement and an explanation for the changes made. The Contractor is free to propose these changes, but the CA should review and if appropriate accept the draft revised programme as described in Guidance Section 2.2.1.4. Once a revised programme is accepted by the CA, it replaces the previously Accepted or Updated Programme. Some standard forms of contract allow the CA to request the Contractor to submit a revised programme where the Contractor is in delay.

2.2.4 Actual construction and the Contractor’s current intentions should always be reflected in the most recently submitted copy of the programme. The Protocol recognises that contractors do sometimes fall into delay that is their own responsibility, so it is realistic to expect that the programme may in these circumstances show completion being predicted to occur later than the contract completion dates. The Contractor should however plan and reflect in the programme the steps it intends to take to reduce its delay and the contract should contain provisions allowing the CA to require the Contractor to produce such a revised programme. Acceptance by the CA of such a revised programme does not constitute acceptance of the Contractor Delay; it merely acknowledges that the programme reasonably reflects the current situation.

2.2.5 Compliance with the requirements of the contract in respect of the programme is very important, both from the point of view of managing the project when it is under construction and understanding the causes of delay if the project is completed late. If the Contractor fails to meet its obligations with respect to the programme, the CA may consider invoking the contract provisions for dealing with general defaults by the Contractor. In this situation, the CA should also (to the extent possible) maintain and update a copy of the programme based on its own knowledge.

**Guidance**

2.2.6 The programme should be prepared using the ‘activity on node’ (precedence) method rather than the ‘activity on arrow’ method and should show the operations to be undertaken in sufficient detail to provide proper forward visibility (ie so as to enable the effect of changes and delays
on dates and resources to be predicted with as much accuracy as possible. The most convenient format (particularly for hard copy) is a linked bar chart (cascade diagram) which shows the planned duration, start and finish dates of the activities as well as their interdependencies.

2.2.7 The maximum duration of an activity in the programme may be specified in the contract, depending on the complexity of the project. As a guide, no activity or lag (other than a summary activity) should exceed 28 days in duration. Wherever possible, an activity should encompass not more than one trade or operation.

2.2.8 Activities should be linked together by the appropriate logic links such as finish to start, start to start and finish to finish. Lags may be introduced for non-work periods (such as curing of concrete) but better visibility and understanding is provided if such matters are shown as activities in themselves. Activities to be executed by the use of overtime and/or additional shifts should be identified and explained. All logic links should be inserted. There should be no negative lags or open ends/hanging activities that would produce false criticality. Excessive leads and lags should be avoided. If requested by the CA, the Contractor should provide an explanation as to why particular leads and lags have been applied. Manually applied constraints such as ‘must start’ or ‘must finish’ fixed dates, ‘zero float’ and other programming techniques that can have the effect of inhibiting the programme from reacting dynamically to change should be avoided.

2.2.9 Key resources such as labour (including that which relates to design where relevant), tradesmen, major plant items, dedicated resources, major materials and work rates should be indicated for each activity.

2.2.10 An example of a programme clause for inclusion in construction contracts (subject to careful checking by the drafter as to its integration into and compatibility with the remainder of the documents comprising the contract) is given in Appendix B.

2.3 Software

2.3.1 It is essential for the parties to agree the software that is to be used to produce the programme.

2.3.2 Difficulties in dealing with EOT issues both during the design and construction and final account stages of a construction project will be significantly increased if the
parties have not agreed in the contract the type of software to be used to produce the contract programme. Commercially available software should be used or specified in the tender documents; specialist in-house software should be avoided.

2.4 Records

2.4.1 It is often complained that there is a lack of good record keeping and a lack of uniformity of approach to record keeping in the construction industry. The Protocol recommends that the parties reach a clear agreement on the records to be kept. The starting point for any delay analysis is to understand what work was carried out and when it was carried out.

2.4.2 Examples of draft clauses which can be incorporated into construction contracts depending on their size and complexity (subject to careful checking by the drafter as to its integration into and compatibility with the remainder of the documents comprising the contract) are attached as Appendix C.
Guidance Section 3

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

Introduction

3.1 This part of the Protocol sets out a recommended procedure to be followed in order to deal efficiently and accurately with extension of time applications. It requires that the parties to the contract will have followed the recommended good practice on programmes and records set out in Guidance Section 2 above. It is not intended that these Guidance Notes should be incorporated into a contract.

3.2 Extension of time procedure

3.2.1 All the requirements of the conditions of contract relating to the application for and the granting of extensions of time should be followed strictly.

3.2.2 As well as the particulars that may be required under the form of contract, the Contractor should generally submit a sub-network to be inserted into the Updated Programme, as close as possible to the date of what the Contractor alleges to be the Employer Risk Event, showing the actual or anticipated effect of the Employer Risk Event and its linkage into the Updated Programme. Further guidance on the form of the sub-network is given in Guidance Section 3.2.9. It should also be accompanied by such documents and records as are necessary to demonstrate the entitlement in principle to an EOT. Simply stating that Employer Risk Events have occurred and claiming the whole of any delay apparent at the time of the events is not a proper demonstration of entitlement.

3.2.3 Before doing anything else, the CA should consider whether or not the claimed event or cause of delay is in fact one in respect of which the Employer has assumed risk and responsibility (ie that it is an Employer Risk Event). The Contractor will potentially be entitled to an EOT only for those events or causes listed in the contract as being at the Employer’s risk as to time. These events vary between the different standard forms of contract, and care is needed when reading them. If the CA concludes that the event or cause of delay is not an Employer Risk Event, the CA should so notify the Contractor. Without prejudice to that, the CA may
wish to comment on other aspects of the Contractor’s submission. When granting or refusing an EOT, the CA should provide sufficient information to allow the Contractor to understand the reasons for the CA’s decision.

3.2.4 In the absence of a submission that complies with this section, the CA (unless the contract otherwise provides) should make its own determination of the EOT (if any) that is due, based on such information as is available to it. Given that it is difficult if not impossible to withdraw an EOT once granted, it is reasonably to be expected that, where the CA has not been presented with the necessary information on which to base its decision, the CA will award only the minimum EOT that is likely to be justified.

3.2.5 If the Contractor does not agree with the CA’s decision, it should so inform the CA immediately. Disagreements on EOT matters should not be left to be resolved at the end of the project. If no agreement can be reached quickly, steps should be taken by either party to have the dispute or difference resolved in accordance with the dispute resolution procedures applicable to the contract.

3.2.6 The Protocol recommends that the Updated Programme should be the primary tool used to guide the CA in determining the amount of the EOT. The EOT should be granted to the extent that the Employer Risk Event is predicted to prevent the works being completed by the then prevailing contract completion date.

Guidance

3.2.7 A guide to the amount of EOT is obtained by using the Updated Programme. The steps to be taken are as follows:

3.2.7.1 the Programme should be brought fully up to date (as to progress and the effect of all delays that have occurred up to that date, whether Employer Delays or Contractor Delays) to the point immediately before the occurrence of the Employer Risk Event;

3.2.7.2 the Programme should then be modified to reflect the Contractor’s realistic and achievable plans to recover any delays that have occurred, including any changes in the logic of the Programme proposed for that purpose (subject to CA review and acceptance as provided in Guidance Section 2.2.3);

3.2.7.3 the sub-network representing the Employer Risk Event should then be entered into the programme; and
3.2.7.4 The impact on the contract completion dates should be noted.

3.2.8 Prior to determining the effect of an Employer Risk Event on the programme, any patently unrealistic logic or durations should be corrected by agreement, failing which the CA’s view should prevail unless and until overturned under the contract dispute resolution provisions.

3.2.9 The sub-network referred to above should be prepared by the Contractor in the same manner and using the same software as the Accepted Programme. It should comprise the activities and durations resulting from the Employer Risk Event. For example, the sub-network for a variation would comprise the instruction for the variation, the activities required to carry out that variation and its linkage to the Updated Programme. For a breach of contract, the sub-network would represent the consequences of that breach. The Contractor should submit the sub-network to the CA for agreement. The CA should agree the sub-network and, once agreed, the sub-network should be inserted into the Contractor’s Updated Programme. Any disagreement about the sub-network should be resolved quickly and (like all delay issues) not left till after completion of the project.

3.2.10 The assessment of the impact of delays (whether Contractor Delays or Employer Delays) should be at a level appropriate to the level of detail included in the Accepted Programme and taking into account the size and complexity of the works and the delays being analysed.

3.2.11 The methodology described in this section is known as ‘time impact analysis’. The Protocol recommends that this methodology be used wherever the circumstances permit, both for prospective and (where the necessary information is available) retrospective delay analysis. The methodology will not be capable of being used contemporaneously unless a proper programme has been prepared, accepted and updated as recommended in Guidance Section 2 above.

3.2.12 As noted in Guidance Section 1.4.7, where Employer Risk Events and Contractor Risk Events occur sequentially but have concurrent effects, the time impact analysis method described in Guidance Section 1.2 should be applied to determine whether an EOT is due. In this situation any Contractor Delay should not reduce the amount of EOT due to the Contractor as a result of the Employer Delay. Analyses should be carried out for each event separately and strictly in the sequence in which they arose.
3.2.13 Although the programme should be the primary tool for guiding the CA in his determination of EOT, it should be used in conjunction with the contemporary evidence to ensure that the resulting EOT is fair and reasonable. It will also be necessary for the parties to apply common sense and experience to the process to ensure that all relevant factors are taken into account, and that any anomalous results generated by the programme analysis are managed properly.
Guidance Section 4

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

4.1 If the programme management recommendations in the Protocol and Guidance were followed during the course of the works (a planned network programme and method statement prepared, proper records kept and the programme updated regularly), but the analysis of delaying events was not carried out contemporaneously, the analysis of the impact of events can generally be carried out retrospectively.

4.2 However, if the recommendations of the Protocol and Guidance have not been adopted during the course of the works in regard to the preparation of records and network programmes, the method used to analyse and assess delay and prolongation after a project has been completed will largely be dictated by:

- the relevant conditions of contract;
- the nature of the causative events;
- the value of the dispute;
- the time available;
- the records available; and
- the programme information available;
- the programmer’s skill level and familiarity with the project.

The terms of the contract

4.3 Some forms of contract provide that the Contractor is only entitled to relief from LDs for Employer Risk Events that actually cause delay to completion. Collapsed as-built, as-planned v as-built, and time impact analysis may be suitable for those forms.

4.4 Other forms of Contract provide that the Contractor is entitled to relief from LDs for the likely effect of an Employer Risk Event. Under those forms impacted as-planned and time impact analysis may be appropriate.

The nature of proof required

4.5 As-planned v as-built analysis can be used for identifying delays to progress but is restricted by its inability to identify concurrency, re-sequencing, mitigation or acceleration. It is useful as a starting point in relation to other, more complex methods of analysis.
4.6 Impacted as-planned is based on the effect of Employer Risk Events on the planned programme of work. This is thought to be the simplest form of delay analysis using CPM techniques since it involves the least amount of variables. The usefulness of the impacted as-planned technique is restricted due to the theoretical nature of the projected delays that are determined using this technique and uncertainty as to the feasibility of the Contractor’s as-planned programme.

4.7 Collapsed as-built is based on the effect of Employer Risk Events on the programme of work as it was actually built. Similar to the as-planned v as-built, the use of this technique is restricted by its inability to identify concurrency, re-sequencing, redistribution of resources or acceleration. This is particularly the case when the nature of the as-built logic is complex, requiring subjective reconstruction of as-built logic. Where acceleration, redistribution of resources or re-sequencing has taken place during the course of the works to overcome the effects of Events, this form of analysis may produce unreliable results.

4.8 Time impact analysis is based on the effect of Delay Events on the Contractor’s intentions for the future conduct of the work in the light of progress actually achieved at the time of the Delay Event and can also be used to assist in resolving more complex delay scenarios involving concurrent delays, acceleration and disruption. It is also the best technique for determining the amount of EOT that a Contractor should have been granted at the time an Employer Risk Event occurred. In this situation, the amount of EOT may not precisely reflect the actual delay suffered by the Contractor. That does not mean that time impact analysis generates hypothetical results – it generates results showing entitlement. This technique is the preferred technique to resolve complex disputes related to delay and compensation for that delay.

**The factual material available**

4.9 If there is neither a planned network programme nor as-built records then CPM analysis, if at all possible, can only be based on the *ex post facto* creation of the planned programme from the tender documentation and an impacted as-planned analysis.

4.10 If there is a good as-planned network programme but it has not been updated with progress and there are no as-built records then an impacted as-planned analysis may be appropriate.

4.11 Where there are good as-built records but the as-planned programme was not produced in adequate detail or not produced at all, a collapsed as-built programme may be appropriate.
4.12 Where an as-planned programme and an as-built programme exist or the as-planned programme was regularly updated but little information is available in relation to the network logic followed, then an as-planned vs. as-built analysis may be appropriate.

4.13 The table below summarises the types of analysis that can be conducted depending on the types of factual material available. An ‘X’ indicates the factual material that is required for a particular analysis, but in some cases there are alternatives, as indicated in the table:

<table>
<thead>
<tr>
<th>Type of analysis</th>
<th>As-planned programme without network</th>
<th>Networked as-planned programme</th>
<th>Updated as-planned networked programme</th>
<th>As-built records</th>
</tr>
</thead>
<tbody>
<tr>
<td>As-planned v as-built</td>
<td>X</td>
<td>or X</td>
<td>and X</td>
<td>or X</td>
</tr>
<tr>
<td>Impacted as-planned</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collapsed as-built</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Time impact analysis</td>
<td>X</td>
<td>or X</td>
<td>and X</td>
<td></td>
</tr>
</tbody>
</table>

The amount in dispute and the cost of the analysis

4.14 As-planned v as-built and impacted as-planned are generally the cheapest and simplest methods of analysis.

4.15 Collapsed as-built is also an analysis simple to perform although it is often more laborious and subjective because of the inherent difficulty of establishing accurate as-built logic from records.

4.16 Time impact analysis is the most thorough method of analysis, although it is generally the most time-consuming and costly when performed forensically.

4.17 In order to avoid or at least minimise disputes over methodology, it is recommended that the interested parties try to agree an appropriate method of analysis before the disputing parties begin their retrospective (ie after the event) delay analyses. Where litigation or arbitration has been commenced, in the absence of agreement, careful consideration should be given to obtaining the decision of the judge or arbitrator as to the appropriateness of the method proposed, before proceeding with a full delay analysis. Failure to consult the other party on delay analysis methodology and/or to identify and have resolved differences in methodology is a matter that the Protocol considers might be taken into account by the judge or arbitrator in awarding and allocating recoverable costs of the dispute.
4.18 Flowing from the above, it follows that:
4.18.1 the parties should agree and set out in writing (or agree a method to decide) the most appropriate method of determining delay to completion for their particular dispute;
4.18.2 the parties should agree who is to carry out the analysis (they should consider appointing a joint independent expert programming consultant).

4.19 The Protocol recommends that, in deciding entitlement to EOT, the adjudicator, judge or arbitrator should so far as is practicable put him/herself in the position of the CA at the time the Employer Risk Event occurred. He/she should use the Updated Programme to establish the status of the works at that time. He/she should then determine what (if any) EOT entitlement could or should have been recognised by the CA at the time. The results may not match the as-built programme, because the Contractor’s actual performance may well have been influenced by the effects of attempted acceleration, re-sequencing, redeployment of resources or other Employer and Contractor Risk Events, in order to try to avoid liability for LDs. That does not necessarily mean that an EOT will not be due. As stated in Guidance Section 1.2.13, it is not good practice for CAs to ‘wait and see’ what the full effect of an Employer Delay is, and justify not granting an EOT if the Contractor, by making efforts beyond that which are required of it under the Contract, overcomes the Employer Delay. As stated in Guidance Section 1.2.9, EOT is a matter of entitlement, not need. The Protocol considers that the process of dealing with disputed EOT issues after the completion of the project should not replicate and validate that ‘wait and see’ approach, and that is why it considers that, in deciding EOTs, adjudicators, judges or arbitrators should so far as is practicable put themselves in the position of the CA at the time the Employer Risk Event occurred.
Concluding notes

5. Concluding notes and dedication

5.1 The Protocol recognises that improved education and training in programming techniques will be required by both Contractors’, Employers’ and CAs’ staff before the recommendations of the Protocol and its Guidance Sections can achieve widespread acceptance throughout the construction industry. The fact that this may be necessary does not lead the Protocol to alter its recommendations, as such education and training would serve to improve project management as a whole, and not just the management of delay. For example, the Protocol believes that better use could be made by Employers and CAs of project management tools in preparing and evaluating a master plan for the project as a whole, of which the Contractor’s programme will form a part, and for managing the effect of change throughout the construction process.

5.2 The Protocol is dedicated to the memory of John Burbidge, former managing director of Henry Boot Construction Ltd and member of the SCL delay group, who sadly died in December 2000. John disliked disputes but was a tireless thinker about the type of contract anomalies the Protocol addresses and was convinced of the need to iron them out for the good of the construction industry.

16th October 2002
Much of the work involved in drafting this Protocol was carried out by the following individuals:

**Drafting sub-committee**

Jeremy Winter (chairman)  
Richard Bayfield  
Paul Brough  
Anthony Caletka  
Jonathan Douglas  
Peter Johnson  
Stuart Jordan  
Stuart Nash  
Keith Pickavance  
Jim Pragnell  
David Richards

Thanks also to the following for their contributions, comments and support

- Paul Bennett  
- Michael Blackburne  
- John Burbidge  
- John Burgess  
- Gerlando Butera  
- John Crane  
- Mike Desmond  
- John Dye  
- Tony Elven  
- Nigel Gamble  
- Brian Gayton  
- Roger Gibson  
- Andrew Grantham  
- John Hammond  
- Paul Kelly  
- Keith Kirkwood  
- John McGuinness  
- Christopher Miers  
- Jacqueline Mimms  
- Anthony Morgan  
- Brendan Murphy  
- Walter Murphy  
- Octavian Dan  
- Greg Russell  
- Peter Shaw  
- Michael Stokes  
- Kate Sullivan  
- John Temprell  
- Douglas Treacher  
- Dennis Wiles  
- Simon Wrightson  
- Andrew Yendall

Drafts of the Protocol were reviewed and commented on by many individuals and organisations. Their comments were duly studied by the drafting sub-committee and, where considered appropriate, have influenced the wording of the clauses. The drafting sub-committee wishes to record its appreciation of the time and effort devoted by all those who commented. The ultimate decision on the form and content of the document rests with drafting sub-committee.
APPENDIX A

Definitions and glossary

This Appendix provides explanations for words and expressions commonly used in situations where there has been delay to or disruption of a construction project. Not all the terms contained in the Appendix are to be found in the Protocol. In order to make the Protocol as easy to read as possible, the use of capitalisation for defined terms has been kept to a minimum.

acceleration
The execution of the planned scope of work in a shorter time than anticipated or the execution of an increased scope of work within the originally planned duration.

Accepted Programme
The Protocol recommends that the Contractor be required to submit a draft programme for the whole of the works to the CA and that this draft programme be accepted by the CA. Once accepted by the CA, it is known in the Protocol as the Accepted Programme.

activity
An operation or process consuming time and possibly other resources. An individual or work team can manage an activity. It is a measurable element of the total project programme.

activity float
The duration contingency directly related to a single activity built into the planned duration of that activity. Activity float is established simply by dictating an activity duration that is greater than the actual time needed to complete that activity.

activity-on-the-node network
A network in which the nodes symbolise the activities. A precedence diagram.

as-built programme
The record of the history of the construction project in the form of a programme. The as-built programme does not necessarily have any logic links. It can be merely a bar-chart record of the start and end dates of every activity that actually took place. ‘As constructed programme’ has the same meaning.

change/variations
Any difference between the circumstances and/or content of the contract works as carried out, compared with the circumstances and/or content under
which the works are described in the contract documents as required to be or intended to have been carried out. A change or variation may or may not carry with it a right to an extension of time and/or additional payment.

**collapsed as-built**
A method of delay analysis where the effects of events are ‘subtracted’ from the as-built programme to determine what would have occurred but for those events.

**compensation**
The recovery or payment of money for work done or time taken up whether by way of valuation, loss and/or expense or damages.

**compensable event**
Expression sometimes used to describe what in the Protocol is an Employer Risk Event in respect of which the Contractor is entitled to compensation.

**completion date**
See contract completion date.

**concurrency**
True concurrent delay is the occurrence of two or more delay events at the same time, one an Employer Risk Event, the other a Contractor Risk Event and the effects of which are felt at the same time. The term ‘concurrent delay’ is often used to describe the situation where two or more delay events arise at different times, but the effects of them are felt (in whole or in part) at the same time. To avoid confusion, this is more correctly termed the ‘concurrent effect’ of sequential delay events.

**concurrent delay**
See concurrency.

**constructive acceleration**
Acceleration following failure by the Employer to recognise that the Contractor has encountered Employer Delay for which it is entitled to an EOT and which failure required the Contractor to accelerate its progress in order to complete the works by the prevailing contract completion date. This situation may be brought about by the Employer’s denial of a valid request for an EOT or by the Employer’s late granting of an EOT. Not (currently) a recognised concept under English law.

**Contract Administrator (CA)**
The person responsible for administration of the contract, including certifying what extensions of time are due, or what additional costs or loss and expense is to be compensated. Depending on the form of contract the person may be referred to by such terms as Employer’s Agent, Employer’s Representative, Contract Administrator, Project Manager or Supervising Officer or be specified as a particular professional, such as the Architect or the Engineer. The contract administrator may be one of the Employer’s employees.
contract completion date
The date by which the Contractor is contractually obliged to complete the works. As well as being an overall date for completion, the contract completion date may be the date for completion of a section of the works or a milestone date. The expression ‘completion date’ is sometime used by Contractors to describe the date when they plan to complete the works (which may be earlier than the contract completion date). The Protocol avoids this confusion by using the expression ‘contract completion date’.

Contractor
The party responsible for carrying out the works is generally referred to as the ‘Contractor’. The Protocol is applicable to sub-contracts as well as main contracts, so when it is being applied to a sub-contract, it is the sub-contractor that is being referred to as the ‘Contractor’ in the Protocol.

Contractor Delay
Expression commonly used to describe any delay caused by a Contractor Risk Event. The Protocol distinguishes between: Contractor Delay to Progress which is a delay which will merely cause delay to the Contractor’s progress without causing a contract completion date not to be met; and Contractor Delay to Completion which is a delay which will cause a contract completion date not to be met.

Contractor Delay to Completion
See Contractor Delay.

Contractor Delay to Progress
See Contractor Delay.

Contractor Risk Event
An event or cause of delay which under the contract is at the risk and responsibility of the Contractor.

Contractor’s planned completion date
The date shown on the Contractor’s programme as being the date when the Contractor plans to complete the works under the contract.

critical delay
See critical path.

critical path
The sequence of activities through a project network from start to finish, the sum of whose durations determines the overall project duration. There may be more than one critical path depending on workflow logic. A delay to progress of any activity on the critical path will, without acceleration or re-sequencing, cause the overall project duration to be extended, and is therefore referred to as a ‘critical delay’.
critical path analysis (CPA) and critical path method (CPM)
The critical path analysis or method is the process of deducing the critical
activities in a programme by tracing the logical sequence of tasks that directly
affect the date of project completion. It is a methodology or management
technique that determines a project’s critical path. The resulting programme
may be depicted in a number of different forms, including a Gantt or bar chart,
line-of-balance diagram, pure logic diagram, time-scaled logic diagram or as a
time-chainage diagram, depending on the nature of the works represented in
the programme.

culpable delay
Expression sometimes used to describe what the Protocol calls Contractor
Delay.

date for completion
The date by which the contractor is expected to complete the works, which
may be earlier or later than the contract completion date.

delay event
An event or cause of delay, which may be either an Employer Risk Event or a
Contractor Risk Event.

Delay to Completion
In common usage, this expression may mean either delay to the date when the
contractor planned to complete its works, or a delay to the contract completion
date. The Protocol uses the expressions Employer Delay to Completion and
Contractor Delay to Completion, both of which mean delay to a contract
completion date – see their definitions.

Delay to Progress
In the Protocol, this means a delay which will merely cause delay to the
Contractor’s progress without causing a contract completion date not to be
met. It is either an Employer Delay to Progress or a Contractor Delay to
Progress.

disruption
Disturbance, hindrance or interruption of a Contractor’s normal work
progress, resulting in lower efficiency or lower productivity than would
otherwise be achieved. Disruption does not necessarily result in a Delay to
Progress or Delay to Completion.

duration
Duration is the length of time needed to complete an activity. The time period
can be determined inductively, by determining the start and finish date of an
activity or deductively by calculation from the time necessary to expend the
resources applied to the activity.

Employer
The Employer is the party under the contract who agrees to pay for the works.
In some of the standard forms, the party who agrees to pay for the works is
referred to as the Developer, the Owner, the Client or the Authority. The Protocol is applicable to sub-contracts as well as main contracts, so when it is being applied to a sub-contract, it is the main contractor that is being referred to as the Employer in the Protocol.

**Employer Delay**
Expression commonly used to describe any delay caused by an Employer Risk Event. The Protocol distinguishes between: **Employer Delay to Progress** which is a delay which will merely cause delay to the Contractor’s progress without causing a contract completion date not to be met; and **Employer Delay to Completion** which is a delay which will cause a contract completion date not to be met.

**Employer Delay to Completion**
See Employer Delay.

**Employer Delay to Progress**
See Employer Delay.

**Employer Risk Event**
An event or cause of delay which under the contract is at the risk and responsibility of the Employer.

**excusable delay**
Expression sometimes used to describe what in the Protocol is an Employer Delay in respect of which the Contractor is entitled to an EOT.

**extension of time (EOT)**
Additional time granted to the Contractor to provide an extended contractual time period or date by which work is to be, or should be completed and to relieve it from liability for damages for delay (usually liquidated damages).

**float**
The time available for an activity in addition to its planned duration. See free float and total float. Where the word ‘float’ appears in the Protocol, it means positive not negative float, unless expressly stated otherwise.

**free float**
The amount of time that an activity can be delayed beyond its early start/early finish dates without delaying the early start or early finish of any immediately following activity.

**Gantt chart**
Bar chart – named after the originator, Henry Gantt.

**global claim**
A global claim is one in which the Contractor seeks compensation for a group of Employer Risk Events but does not or cannot demonstrate a direct link between the loss incurred and the individual Employer Risk Events.
**hammock**
An activity representing the period from the start of an activity to the completion of another. Sometimes used as a way of summarising the duration of a number of activities in a programme as one single duration.

**hanging activity**
An activity not linked to any preceding or successor activities. Same as dangling activity.

**head office overheads**
Head office overheads are the incidental costs of running the Contractor’s business as a whole and include indirect costs which cannot be directly allocated to production, as opposed to direct costs which are the costs of production. Amongst other things, these overheads may include such things as rent, rates, directors’ salaries, pension fund contributions and auditors’ fees. In accountancy terms, head office overheads are generally referred to as administrative expenses, whereas the direct costs of production are referred to as costs of sales.

**head office overheads formulae**

**Hudson formula**
\[
\frac{O&P \times \text{contract sum} \times \text{period of delay}}{100 \times \text{contract period}}
\]
O&P: head office overheads and profit percentage in tender.

**Emden formula**
\[
\frac{O&P \times \text{contract sum} \times \text{period of delay}}{100 \times \text{contract period}}
\]
O&P: head office overheads and profit percentage (actual).

**Eichleay formula**
\[
\text{contract turnover} \times \text{fixed overheads for contract period} \times \text{total turnover} = \text{contract contribution}
\]
\[
\text{contract contribution} = \frac{\text{weekly contribution from contract}}{\text{contract period}}
\]
\[
\text{weekly contribution} \times \text{delay} = \text{sum claimable}
\]
See the spreadsheet referred to in the Protocol for using these formulae.

**impact**
The effect that a change has on an activity or the effect that a change to one activity has on another activity.

**key date**
Expression sometimes used to describe a date by which an identifiable accomplishment must be started or finished. Examples include ‘power on’, ‘weather-tight’ or the start or completion of phases of construction or of phases or sections of the contract, or completion of the works.

**lag**
Lag in a network diagram is the minimum necessary lapse of time between the finish of one activity and the finish of another overlapping activity. It may
also be described as the amount of time required between the start or finish of a predecessor task and the start or finish of a successor task. (See logic links.)

**lead**
The opposite of lag, but in practice having the same meaning. A preceding activity may have a lag to a successor activity – from the perspective of the successor activity, that is a lead.

**liquidated and ascertained damages, liquidated damages, LADs, LDs**
A fixed sum, usually per week or per day, written into the contract as being payable by the Contractor in the event that the works are not completed by the contract completion date (original or extended).

**logic links - the normal links are as follows:**

**Finish-to-start**
The convention in figure 1 shows the normal sequential relationship of one activity following another. Activity B cannot start until activity A has finished.

![Finish-to-start diagram]

Figure 1 – finish-to-start relationship

**Lagged finish-to-start**
In figure 2, below, ‘d’ implies a normal lag relationship between activities A and B; that is, B cannot start until ‘d’ days have elapsed after activity A has finished. An example of this might be the curing time of concrete between completion of the pour and the commencement of further work on the concrete.

![Lagged finish-to-start diagram]

Figure 2 – lagged finish-to-start relationship

**Start-to-start**
In the relationship at figure 3, below, activity B cannot start until activity A has started or perhaps, more accurately, activity B can start at the same time as activity A but not before it.

![Start-to-start diagram]

Figure 3 – start-to-start relationship
**Lagged start-to-start**
In figure 4, ‘d’ indicates a start-to-start relationship with the delay imposed showing that activity B cannot start until the period ‘d’ has elapsed after activity A has started. This convention provides one of the facilities to overlap the execution of activities.

![Diagram](image1)

Figure 4 – lagged start-to-start relationship

**Finish-to-finish**
In the example at figure 5 of a finish-to-finish relationship, activity B cannot finish until activity A has finished. It implies that B can finish at the same time as A, but not before it.

![Diagram](image2)

Figure 5 – finish-to-finish relationship

**Lagged finish-to-finish**
In figure 6 below, ‘d’ indicates a finish-to-finish relationship but with a delay, i.e., activity B cannot finish until ‘d’ days (or whatever time units have been used) have elapsed after activity A has finished. This convention provides a second means of overlapping timing of activities.

![Diagram](image3)

Figure 6 – lagged finish-to-finish relationship

**Lagged start and finish**
There may be occasions where a lag is required both on the start and finish of related activities. This is achieved by the convention shown below at figure 7, that is, activity B cannot start until ‘d’ days after activity A has started and activity B cannot finish until ‘t’ days after activity A has finished.

![Diagram](image4)

Figure 7 – lagged start and finish relationship
**Negative lag**
The arrangement or sequence in which the successor activity is allowed to start chronologically before the predecessor activity has been completed. Below, activity B cannot start until 4 days before A is planned to finish.

![Figure 8 – negative lag](image)

**method statement**
A written description of the Contractor’s proposed manner of carrying out the works or parts thereof, setting out the assumptions underlying the programme, the reasoning behind the approach to the various phases of construction and listing all the work encapsulated in the programme activities. It may also contain the activity duration calculations and details of key resources and gang strengths.

**milestone**
A key event selected for its importance in the project. Commonly used in relation to progress, a milestone is often used to signify a key date.

**mitigation**
Mitigate means making less severe or less serious. In connection with Delay to Progress or Delay to Completion, it means minimising the impact of the Risk Event. In relation to disruption or inefficient working, it means minimising the disruption or inefficiency. Failure to mitigate is commonly pleaded as a defence or partial defence to a claim.

**must start/ must finish**
Most project management software allows the planner to specify that an activity must start or must finish on a specific date. Using the software in this way restricts the ability of the programme to react dynamically to change on the project.

**negative lag**
See logic links above.

**negative total float**
Expression sometimes used to describe the time by which the duration of an activity or path has to be reduced in order to permit a limiting imposed date to be achieved. Negative float only occurs when an activity on the critical path is behind programme. It is a programming concept, the manifestation of which is, of course, delay.
non-compensable event
Expression sometimes used to describe what the Protocol calls a Contractor Risk Event.

non-excusable delay
Expression sometimes used to describe what the Protocol calls Contractor Delay.

path
An activity or an unbroken sequence of activities in a project network.

PERT
Programme Evaluation and Review Technique: a programming technique, similar to critical path analysis, but whereby the probability of completing by the contract completion date is determined and monitored by way of a quantified risk assessment based on optimistic, pessimistic and most likely activity durations.

planned completion date
See Contractor’s planned completion date.

Practical Completion
The completion of all the construction work that has to be done, subject only to very minor items of work left incomplete. It is generally the date when the obligation to insure passes from the Contractor to the Employer and the date from which the defects liability period runs. This is the term used under the Joint Contracts Tribunal (JCT) family of contracts. Under the Institution of Civil Engineers (ICE) forms and in the International Federation of Consulting Engineers (FIDIC) forms it is referred to as Substantial Completion.

precedence diagram
A multiple dependency, activity-on-node network in which a sequence arrow represents one of four forms of precedence relationship, depending on the positioning of the head and the tail of the sequence arrow. (See logic links.)

programme
The programme illustrates the major sequencing and phasing requirements of the project. Otherwise known as the schedule.

prolongation
Prolongation is the extended duration of the works during which costs are incurred as a result of a delay.

resource
Expression used to describe any variable capable of definition that is required for the completion of an activity and may constrain the project. This may be a person, item of equipment, service or material that is used in accomplishing a project task.
**resource levelling**
Expression used to describe the process of amending a schedule to reduce the variation between maximum and minimum values of resource requirements. The process removes peaks, troughs and conflicts in resource demands by moving activities within their early and late dates and taking up float. Most project planning software offers an automated resource-levelling routine that will defer the performance of a task within the imposed logical constraints until the resources assigned to the tasks are available.

**Risk Event**
See Employer Risk Event and Contractor Risk Event.

**schedule**
Another name for the programme.

**slack**
Another name for total float.

**sub-network**
A group of activities or durations, logically linked. In the Protocol it is to be used to illustrate the work flowing directly from an Employer Risk Event.

**Substantial Completion**
See Practical Completion.

**time impact analysis**
Method of delay analysis where the impacts of particular delays are mapped out at the point in time at which they occur, allowing the discrete effect of individual events to be determined.

**total float**
The amount of time that an activity may be delayed beyond its early start/early finish dates without delaying the contract completion date.

**Updated Programme**
In the Protocol the Updated Programme is the Accepted Programme updated with all progress achieved. The final Updated Programme should depict the as-built programme.

**works**
What the Contractor is obliged to construct is referred to as the works.
APPENDIX B

Model specification clause

The following model clause has been drafted to be included in the specification section of a project’s tender documents. The requirements are intended to be suitable for large complex projects. However, the principles of the requirements represent good practice and should be applied to smaller projects where practicable. The words in the model clause will need to be reviewed and amended to ensure that the terms and terminology used are consistent with the conditions of contract and/or agreement for the project.

1. Generally

1.1 This clause describes the requirements for the preparation, submittal, update and revision of the Contractor’s programme. The requirements are in addition to or expand upon the requirements set out in Clauses [ ] of the Conditions of Contract/Agreement. [Delete that which does not apply.]

1.2 The Contractor’s programme shall be used by the Contractor to plan and execute the Works. The programme will also be used by the CA to monitor progress and be the basis for the assessment of extensions of time and the effect of delay on the progress of the Works.

1.3 The programme shall be produced by the Contractor in the following phases:

1.3.1 Initial Programme. An initial programme for the first three months of work. [On smaller projects the Initial Programme may be omitted.]

1.3.2 Accepted Programme. A programme (incorporating the Initial Programme) for the totality of the Works, which shall be submitted to the CA for its acceptance. If the CA does not accept it, this programme shall be revised and resubmitted for acceptance as set out in the Contract. [In some standard forms of contract it is called the Approved or Master Programme.]

1.3.3 Updated Programme. The Accepted Programme shall be updated with actual progress and saved on at least a monthly basis for record purposes. The Contractor may submit for acceptance by the CA other revisions to the Accepted or Updated programmes.

1.4 Acceptance by the CA of any phase of the Contractor’s programme does not make the programme a contract document, or mandate that the Works shall be constructed strictly in accordance with the
programme. The Contractor at all times remains responsible for the construction of the Works in accordance with [the clause of the conditions of contract that sets out the Contractor’s basic obligations].

1.5 If at any time there is a dispute or difference between the Contractor and CA over any matter concerning the Contractor’s programme, then immediate steps should be taken by either party to have the dispute settled in accordance with [the clause of the conditions of contract that sets out the contract dispute resolution provisions].

2. Submission of programme

2.1 Within two weeks of the award of the Contract [or such other time as may be specified in the Contract], the Contractor shall submit to the CA for its information an Initial Programme showing the order in which the Contractor proposes to carry out the works anticipated in the first three months following the award of the Contract. The Initial Programme shall have regard to the contract completion dates and any other milestones, and/or restraints set out in the Contract.

2.2 Within four weeks of award of the Contract [or such other time as may be specified in the Contract], the Contractor shall submit to the CA for its review and acceptance a programme for the whole Contract (incorporating the Initial Programme) showing the order of procedure in which the Contractor proposes to carry out the Works. This programme becomes the Accepted Programme upon acceptance by the CA. The Accepted Programme shall have regard to the contract completion dates and any other milestones, and/or restraints set out in the Contract. Thereafter, if the actual progress does not conform with the Accepted Programme, the CA is entitled to require the Contractor to submit to the CA for acceptance a revised programme showing the order of procedure and periods necessary to ensure completion of the Works by the contract completion dates.

2.3 The Contractor shall furnish the Method Statement and such other details and information as the CA may reasonably require to accept the Accepted Programme.

2.4 The Contractor shall supply the CA with an electronic copy of each programme, together with a print out bar chart or tabular report in a pre-agreed format. All programmes shall be prepared and submitted using the specified or agreed project planning software. The software shall be capable of producing programmes and information that complies with the requirements of this clause and shall be in a format that can be read by commercially available proprietary planning software. [The CA and the Contractor should use the same project planning software. If the software is named in the Contract the Contractor should be required to use it in preference to its own software. If the Contractor is allowed to use its own software it
should be required to provide a copy to the CA. The Contractor could be required to provide a computer loaded up with its software and items included in the Bills of Quantity for the provision of this equipment, including all up-dates and licences, and the costs of complying with the programme and monitoring requirements.]

2.5 Within 10 working days of the Contractor submitting a programme complete with all the information required by this clause to the CA for acceptance, the CA will accept the programme or give its reasons for not accepting the programme. If such reasons are given, the Contractor shall take account of the reasons and resubmit the programme within a period of 10 working days. If the CA does not accept or reject the programme within 15 working days, the CA shall be deemed to have accepted the programme as submitted.

2.6 By agreement, the Contractor and the CA may dispense with print-outs of the various forms of the Contractor’s programme, but under no circumstances may they dispense with the submission of the required electronic copies.

3. Default in submission of programmes

The following are example default clauses in the Protocol’s descending order of preference. The clauses might best be included in the conditions of contract but, if included in the specification or elsewhere, the clauses in the conditions of contract should be reviewed to ensure consistency with these example clauses:

- Should the Contractor fail to submit a programme for acceptance as the Accepted Programme in accordance with paragraph 2.2 above, or not regularly update the Accepted Programme as an Updated Programme, the CA shall be entitled to reduce by one quarter the amount due to the Contractor in interim payment certificates until the Contractor has complied with its obligations in respect of the programme.

- In the event that the Contractor does not submit to the CA a programme for acceptance as the Accepted Programme in accordance with paragraph 2.2 above or does not regularly update the Accepted Programme as an Updated Programme, the Contractor shall become immediately liable to pay to the Employer liquidated damages at the rate(s) stated in the Contract. [The liquidated damages should be pre-estimated to represent the likely cost to the Employer of doing what the Contractor should have done in relation to the preparation and updating of the programme - this may be difficult, but the fact that it is difficult makes it less likely that a bona fide estimate would be treated as a penalty.]

- Failure by the Contractor to submit a draft programme for acceptance by the CA as the Accepted Programme in
accordance with paragraph 2.2 or to update the Accepted Programme as an Updated Programme shall constitute an event of default justifying termination of the engagement of the Contractor after notice in accordance with [the clause of the conditions of contract that sets out the matters dealing with Contractor defaults and termination].

4. **Preparation of Programmes**

The Initial Programme

4.1 The Initial Programme shall show the first three months’ work in the same level of detail as is required for the Accepted Programme set out in paragraph 4.3 below, but only insofar as it applies to the first three months of the Contract Period.

4.2 The Initial Programme shall also be presented as a programme in bar chart form showing the detailed activities in the period covered by the network diagram, together with the major activities and milestones in the remainder of the period of the Contract. The Initial Programme shall be presented as or be accompanied by the schedules referred to in paragraph 4.4 and, if necessary, paragraph 4.5 below.

The Accepted Programme

4.3 The programme submitted by the Contractor in accordance with paragraph 2.2 above becomes the Accepted Programme upon acceptance by the CA. The Accepted Programme shall form the Contractor’s basic strategy for the completion of the Works by the contract completion date. The programme to be accepted may either be at the direction of the CA in a linked bar chart format or precedence network format prepared using techniques acceptable to the CA and shall show as far as reasonably practicable:

4.3.1 The activities in all work packages including those by the principal sub-contractors and suppliers, statutory undertakers, those contractors and suppliers directly employed by the Employer and others.

4.3.2 The earliest and latest start and finish dates for every activity in each work package. Activities shall include all scope activities and any activities or time durations expected in addition to scope activities.

4.3.3 Access dates for each phase or section.

4.3.4 The earliest and latest start and finish dates for each phase or section, including dates when the Contractor plans to complete work to allow the Employer and others to do their work.

4.3.5 Milestone and Key Dates.

4.3.6 Holiday periods.

4.3.7 Dates by which design work or drawings to be produced by the Contractor or sub-contractors or suppliers will be
submitted to the CA for acceptance and dates by which acceptance of such design work or drawings will be required by the Contractor, allowing time for submittals, re-submittals and reviews.

4.3.8 Dates by which samples to be produced by the Contractor will be submitted for approval by the CA and dates by which approval of such samples will be required by the Contractor, allowing time for submittals, re-submittals and reviews.

4.3.9 Procurement periods and delivery dates for the major items of goods, plant and materials.

4.3.10 Dates by which work will be ready for testing by the CA/Employer.

4.3.11 Details and dates of any information required from the Employer.

4.3.12 The work contained in defined Provisional Sums.

4.3.13 Activities representing the likely work content of undefined Provisional Sums, complete with logic links but with durations set to zero (unless specified otherwise).

4.3.14 Commissioning periods.

4.3.15 Provisions for float, time risk allowances, quality control procedures, health and safety requirements \([and any other requirements that may be set out in the Contract]\).

4.4 The Accepted Programme shall also be presented as schedules showing an analysis of the network including:

4.4.1 A schedule of all activities tabulated in order of earliest starting date and showing for each activity:

4.4.1.1 Activity number and brief description;

4.4.1.2 Preceding and succeeding activity numbers;

4.4.1.3 Duration;

4.4.1.4 Earliest and latest starting and finishing dates;

4.4.1.5 Total and Free float.

4.4.2 A schedule of leads and lags with (if requested by the CA/Employer) reasons for them. Excessive leads and lags, negative lags or open/hanging activities, use of fixed dates and any other programming activities that can have the effect of creating false criticality or inhibiting the programme from reacting dynamically to change should be avoided.

4.4.3 A schedule of all activities lying on the paths containing the least float, namely the critical activities.

4.4.4 A schedule identifying the days of working per week, shifts per working day and holidays. Where multiple calendars are used, this information shall be provided for each of the calendars, accompanied by a schedule indicating the calendar applicable to each activity.

4.4.5 A schedule giving details of the Contractor’s resource requirements in terms of manpower, gang sizes, tradesmen, work rates, items of plant or equipment and materials and quantities of work allowed for in sufficient detail to explain the Contractor’s activity durations. Activities that may be
the Contractor’s activity durations. Activities that may be expedited by use of overtime, additional shifts or any other means shall be identified and explained.

4.5 The Accepted Programme shall also be presented with or be accompanied by the following schedules:

4.5.1 A schedule of all submittals and material procurement activities, including time for submittals, re-submittals and reviews and time for fabrication and delivery of manufactured products. The interdependence of procurement and construction activities shall be included in the schedule.

4.5.2 A schedule giving the monetary value of each activity for cash flow purposes. The sum of the monetary values shall total the Contract amount. The schedule shall also give the payment items applicable to the activity monetary values.

4.5.3 A schedule giving the information stated in paragraph 4.6 below.

4.6 The Accepted Programme shall be prepared in sufficient detail to ensure the adequate planning, execution and monitoring of the work. Activities should generally range in duration up to 28 calendar days (single trade activities with uniform rates of progress might be excepted) and the number of activities with duration of less than seven calendar days should be kept to a minimum to make progress monitoring on larger projects more manageable.

4.7 The Accepted Programme shall take into account all time risk allowances, including time for the weather conditions (rain, wind, frost and snow) reasonably to be anticipated by the Contractor. The Contract time has been defined on the assumption that the weather conditions will conform to at least a 10 year average of the conditions prevailing at the Site. The Contractor shall provide this data and a summation of the assumed number of adverse weather days per month to the CA with the programme.

4.8 The CA is entitled to withhold its acceptance of a programme showing the work completed earlier than the contract completion date if that programme is reasonably considered by the CA to be not achievable.

5 Methods of construction and temporary works

5.1 At the same time as the Contractor submits the programme in sub-clause 2.2 [or such other time as may be specified in the Contract], the Contractor shall submit to the CA for its acceptance a general description of the arrangements and methods of construction and Temporary Works designs the Contractor proposes to adopt for the carrying out of the Works (‘the Method Statement’). The Method
Statement should be fully cross-referenced to the activities in the programme.

5.2 The Contractor shall submit to the CA sufficient information as may be considered reasonably necessary by the CA to interpret, evaluate and give acceptance to the Method Statement.

5.3 The Contractor shall, whenever required by the CA, furnish for its information further and more detailed particulars of the Contractor’s Method Statement.

5.4 Should the Contractor wish to change a Method Statement or should the CA subsequently consider it necessary to change a Method Statement to which acceptance has previously been given, then the Contractor shall submit a revised Method Statement to the CA for its acceptance.

5.5 Acceptance by the CA of the Contractor’s Method Statement does not make the Method Statement a contract document, or mandate that the Works shall be constructed strictly in accordance with the Method Statement. The Contractor at all times remains responsible for the construction of the Works in accordance with [the clause of the conditions of contract that sets out the Contractor’s basic obligations].

6 Cash flow estimates

6.1 Within four weeks of the award of the Contract [or such other time as may be specified in the Contract] the Contractor shall submit to the CA for its information a detailed cash flow estimate, in quarterly periods, of all payments to which the Contractor considers it will be entitled to under the Contract. The Contractor shall subsequently submit such revised cash flow estimates at quarterly intervals based on the Updated Programme, if required by the CA.

7 Revising and updating the programmes

The Accepted Programme

7.1 The Accepted Programme (or, if the Accepted Programme has already been updated, the Updated Programme) and the corresponding Method Statement if required by the CA shall be revised by the Contractor within 10 working days of the Contractor changing its methods and/or sequences of working or, if the changes are frequent, revised at least every month. The programme shall also be revised within 10 working days of the grant by the CA of an extension of time, or whenever circumstances arise that in the opinion of the CA affect the progress of the Works. Each revision to the programme shall be submitted to the CA for its review and
acceptance Once a revised programme is accepted by the CA, it replaces the previously Accepted or Updated Programme.

7.2 Each revised programme submitted for acceptance shall be presented as or be accompanied by the schedules referred to in paragraph 4.4 and, if necessary, paragraph 4.5 above, together with any amendments to the Method Statement.

The Updated Programme

7.3 The Accepted Programme shall be updated for actual progress at least once every month and the updates shall be archived as separate electronic files for record purposes. The updates shall be to all scope activities and any additional activities carried out or time durations experienced in addition to the scope activities. Actual progress shall be recorded by means of actual start and actual finish dates for activities, together with percentage completion and/or remaining duration of currently incomplete activities. Any periods of suspension of an activity should be noted in the Updated Programme. Each Updated Programme shall be submitted to the CA for its acceptance as a record. It is possible (if the Works have been delayed) that these Updated Programmes will show completion later than the contract completion dates. In this event the CA’s acceptance of such programmes will not constitute acceptance of the delay(s).

7.4 The Updated Programmes will be used by the CA to monitor the Contractor’s performance against the Accepted Programme, forecast work to be performed in the subsequent period and to assess extensions of time at the time the cause of delay occurs. In order to provide effective monitoring of performance, the Contractor shall also provide to the CA the progress reports as described in Clause [ ] of the Specification [see Appendix C of the Protocol] and the cash flow estimates described in paragraph 6.1 above.

[The Updated Programmes are often prepared on a rolling basis showing the first three months of work in detail, with the remainder of the programmes showing the major activities and milestones only. The final Updated Programme may be used as the as-built Programme.]
APPENDIX C

Model records clause

The following model clauses have been drafted to be included in the specification section of a project’s tender documents (or in the contract conditions if the parties choose). Clause 1 is intended to be suitable for small projects and clause 2 for medium to high value or medium to highly complex projects. Clause 2 could also be used in part on smaller projects, and the Employer could treat the list as a menu of potential documents that it would like to be submitted, depending on its level of risk, administrative staff and facilities.

1. Simple records clause

The Employer and the Contractor agree that there shall be [daily] [weekly] records kept [by the Contractor] identifying generally the activities on site, labour on site, plant on site, sub-contractor work on site, delivery of material to the site, list of any instructions given, weather conditions encountered, and any delays encountered which shall be submitted regularly to the CA or the Employer on a [weekly] [monthly] basis.

2. Records clause for medium to high value or medium to highly complex projects

2.1 The Contractor shall maintain and submit current records of activities, including the work of sub-contractors and suppliers.

2.2 The records shall be in a form as agreed between the parties and shall include:

2.2.1 identification of contractor/sub-contractor working and their area of responsibility;
2.2.2 operating plant/equipment with hours worked, idle or down for repair;
2.2.3 work performed to date giving the location, description and by whom, and reference to the contract programme;
2.2.4 test results and references to specification requirements. List deficiencies identified, together with the corrective action;
2.2.5 material received with statement as to its acceptability and storage;
2.2.6 information or drawings reviewed with reference to the contract specifications, by whom, and action taken;
2.2.7 job safety evaluations;
2.2.8 progress photographs;
2.2.9 a list of instructions given and received and any conflicts in 
plans and/or specifications;
2.2.10 weather conditions encountered;
2.2.11 the number of persons working on-site by trade, activity and 
location;
2.2.12 information required from and by the Employer/CA;
2.2.13 any delays encountered.

2.3 The parties should agree the intervals at which each of these types of 
records should be delivered to the CA.

2.4 The daily reports shall be delivered to the CA at the end of the 
working week to which they relate [or as otherwise agreed].

2.5 A report shall be submitted for each day of work performed and shall 
be numbered sequentially.

2.6 The report shall be signed and dated by the CA.

2.7 Any deficiency in the work shall be identified. As deficiencies are 
corrected, such corrections shall be acknowledged on the daily report.

2.8 The CA shall notify the Contractor of any non-compliance with the 
reporting requirements. All the deficiencies cited and verbal 
instructions given to the Contractor by the Employer/CA shall be 
entered on the daily report.

2.9 A weekly report shall be delivered by the Contractor to the 
Employer/CA within 2 working days of the end of the week to which 
it relates [or as otherwise agreed]. The weekly report shall be in a 
form as agreed between the parties and shall include:
2.9.1 summary of the work performed; 
2.9.2 summary of the works performed as referenced on the agreed 
programme;
2.9.3 summary of the list of deficiencies; 
2.9.4 summary of any delays encountered.

2.10 A monthly report shall be delivered by the Contractor to the 
Employer/CA within 5 days of the end of each agreed monthly period 
[or as otherwise agreed]. The monthly report shall be on a form as 
agreed between the parties and shall include:
2.10.1 summary of the work performed; 
2.10.2 summary of the works performed as referenced on the agreed 
programme; 
2.10.3 summary of the list of deficiencies; 
2.10.4 summary of any delays encountered.
APPENDIX D

Graphics illustrating points in this Protocol

Illustrations of principles and practice set out in the Protocol are contained in the following figures 1 to 9.

Figure 1: Accepted Programme (prior to any delay)

Figure 2: Non-critical Employer Risk Event on path 1 while programme with float

Figure 3: Critical Employer Delay on path 1 while programme has float

Figure 4: Critical Employer Delay on path 2 while programme has float

Figure 5: Employer Delay on path 1 while Contractor in critical delay on path 1

Figure 6: Employer Risk Event while Contractor working after Contract Completion Date

Figure 7: Employer Risk Event while Contractor in critical delay

Figure 8: Employer Risk Event on path 2 while Contractor in critical delay on path 1

Figure 9: Employer Risk Event on path 2 while Contractor in unrecoverable critical delay on path 1
Figure 1: Accepted Programme (prior to any delay)
Figure 2: Non-critical Employer Risk Event on path 1 while programme with float
Figure 3: Critical Employer Delay on path 1 while programme has float
Figure 4: Critical Employer Delay on path 2 while programme has float
Figure 5: Employer Delay on path 1 while Contractor in critical delay on path 1
Figure 6: Employer Risk Event while Contractor working after Contract Completion Date

EoT = 4 days
Compensation for Prolongation = 4 days
Figure 7: Employer Risk Event while Contractor in critical delay
Figure 8: Employer Risk Event on path 2 while Contractor in critical delay on path 1
Figure 9: Employer Risk Event on path 2 while Contractor in unrecoverable critical delay on path 1
"The object of the Society is to promote the study and understanding of construction law amongst all those involved in the construction industry"

MEMBERSHIP/ADMINISTRATION ENQUIRIES
Jackie Morris
67 Newbury Street
Wantage, Oxon OX12 8DJ
Tel: 01235 770606
Fax: 01235 770580
E-mail: admin@scl.org.uk

Website: www.scl.org.uk