# PRINCIPLES AND METHODS OF CALCULATION OF IMPACT DAMAGES: 

THE AUSTRALIAN POSITION *

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Editor's Note

We are privileged this year to have two articles from our newest Honourary Fellow, Professor Doug Jones. Professor Jones was inducted into Honourary Fellowship at the College's 10th Annual Conference at Predator Ridge, Kelowna, in June of 2007.

In our inaugural Journal, we published an important paper by R. Bruce Reynolds (with S. G. Revay) entitled "Concurrent Delay: A Modest Proposal", initiating what we hoped would be a series of articles treating the area of delay damages in some depth. The present article by Professor Jones continues this theme. The following paper was presented at our College's 10th Annual Conference. As its title indicates, the article deals in a most helpful and practical way with the seemingly intractable issue of the calculation of impact damages. The comparative law approach taken by Professor Jones is particularly instructive.

In Canada, contractors typically claim and may be entitled to some measure of recovery for off-site overheads and loss of profit-earning capacity, as well as reimbursement of specific on-site overheads during the legitimate period of schedule extension. The contractor may also be entitled to related increases in the cost of labour, materials and loss of productivity. In Canada, a contractor's damages for delay may also include overhead recovery. Every dollar of contract price is usually burdened with some component of head office overhead. Courts here and abroad have searched for years for a rational basis upon which to fairly allocate such overheads over a lengthy period of delay. In the United States, the Eichleay formula was developed, which is treated in detail in Professor Jones's article. Another formula permitting the same kind of rough and ready calculation is the so-called "Hudson" formula, derived from a leading United Kingdom text writer of the same name.

[^0]None of these formulae has received unqualified support from our courts, and each case is decided on its own facts.

Professor Jones treats this subject in two parts: first, by discussing the five forms of loss due to delay (time-related direct costs; work-related direct costs; inflation; off-site overheads; and loss of profit) caused by delay ("prolongation" in the parlance of the Australian courts); and, second, by addressing the issue of quantification. The treatment in each part is detailed and authoritative. Interestingly, Professor Jones also comments on the relationship between such claims and Australia's new security of payment legislation.

In the second substantive part of the paper, Professor Jones addresses the issue of quantification with particular attention to causation issues involving proof of loss of productivity, off-site overheads and loss of profit claims. Here, Professor Jones provides a critique of the Hudson and Eichleay formulae and observes that the blind use of formulae does not prove damage, but rather substitutes for proof of damage. The formulae give only a theoretical approximation of commercial reality. Australian courts have made the same observation and do not accept blind use of these well-known formulae as a substitute for proof of damage and evidence of causation.

Throughout the paper, Professor Jones introduces the reader to concepts from the Society of Construction Law's important October 2002 "Delay and Disruption Protocol", which has to date received little or no serious attention by Canadian construction lawyers.

Professor Jones concludes with a fascinating analysis of the treatment of "global claims" under Australian law; these are what we refer to in Canada as "total cost claims". According to the Australian analysis of such claims, while ascertainment of quantum may be supportable on a "global claims" basis, this approach will not excuse a claimant from its burden of proving both cause and effect. An approach taken in Scotland, but not yet widely adopted even in Australia, is the following three-pronged approach:

1. Where causation can be proved it should be proved, even if this means extracting individual claims and sorting them into categories as to their susceptibility to proof of causation.
2. The standard of proof is one of common sense, not absolute certainty. If the defendant is the dominant cause of a delay, then the Court will ignore concurrent events that are not the responsibility of the defendant when assessing loss or damage.
3. Where proof of "dominant" cause is not achieved, for whatever reason, losses are to be apportioned between and among causes, albeit on a "rough and ready" basis, as the author refers to it, citing

## the Court of Session case John Doyle Construction Ltd. v. Laing Management (Scotland) Ltd.**

While not adopted in Australia, the approach of the Scottish Court of Sessions in John Doyle has resonated somewhat in recent cases discussed in detail in the paper.

Professor Jones has a wide international practice both as a barrister and as an arbitrator. He is Chair of the Board of Trustees of the Chartered Institute of Arbitrators (London) and President of the Asia-Pacific Council of the London Court of International Arbitration, among many other distinctions and similar responsibilities. In addition, Professor Jones co-edits the International Construction Law Review and is on the editorial board of the India Business Law Journal and the Global Arbitration Review. Most notably, he was made a Member of the Order of Australia in 1999 in recognition of his service to construction law and dispute resolution in Australia and worldwide.

We are very proud to publish Professor Jones's paper.

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## 1. INTRODUCTION

Where construction work has been affected by a delaying event, the contractor will frequently claim not only an extension of time, but also additional payment. ${ }^{.}$This becomes necessary because delay, of itself, causes loss. Ideally, a contractor would wish to recover all loss consequent upon a delaying event. The purpose of this paper is to outline the legal and factual limitations to such recovery by a contractor in Australia.
The losses suffered by a contractor, consequent upon a delaying event, can broadly be divided into the following categories: ${ }^{2}$
(a) Time-related direct costs: some costs are a "direct function of the time involved". ${ }^{3}$ Examples include the costs of renting equipment, insurance premiums and onsite supervision.
(b) Work-related direct costs: the costs of materials and labour are generally directly related to the amount of work done. As such, they should not normally figure in prolongation claims, although they are of course a key issue in the quantification of variation claims. However, where a delay causes a loss in labour productivity, there will be an increase in labour costs directly related to the delay.
(c) Inflation: where, because of a delaying event, a contractor purchases materials and/or labour later than it otherwise would have, rises in the cost of such materials and/or labour will adversely impact the contractor's cash flow.
(d) Off-site overheads: this includes items such as head office expenses, which are paid for by revenue from the contractor's construction work. Where a delay denies a contractor the opportunity to carry out such work, it can be said to have caused loss to the contractor.
(e) Loss of profit: by the same logic, delays deny contractors the chance to profit from taking on new projects.
This paper will deal with the topic in two parts. First, which of the forms of loss occasioned by prolongation are recoverable? Second, how are these to be quantified? In so doing, reference will be made to the Delay and Disruption Protocol published in October 2002 by the Society of Construction Law in the United Kingdom. This Protocol aims to provide guidance to all parties in

[^2]dealing with disputes relating to time and delay, both in interpreting provisions in standard form contracts and in the proper preparation and determination of claims. ${ }^{4}$ It is not intended to operate as a binding document, but to give balanced and useful suggestions for dealing with delay and disruption. However, as will be seen, while it clarifies methods of proving causation of prolongation claims, the Protocol does not assist in quantifying the cost of off-site overheads.

## 2. BASIS OF ENTITLEMENT TO DAMAGES

There are four possible legal bases for the recovery of losses consequent on prolongation of a project:
(a) specific contractual provisions;
(b) contractual damages at general law for preventive acts;
(c) tortious damages at general law for breach of duty; and
(d) statutory damages (Trade Practices and Fair Trading Acts).

### 2.1 Specific Contractual Provisions

Many claims are based on the specific provisions of the contract, which can be divided into two categories:
(a) those that may be termed "pure prolongation clauses" and give an entitlement to payment for delay consequent on an extension of time; and
(b) other clauses providing compensation for events that will inevitably or could well involve delay, of which the major examples are variations, suspension of work and unforeseen ground conditions. Some of the entitlements in this latter category are limited by the "pure prolongation clauses" themselves.
The various formulations used in the major Australian standard form contracts can have quite different effects on the substance of the entitlement.

[^3]
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### 2.1.1 The Australian Standard Forms of Contract

## (a) AS 2124-1992 and AS 4300-1995

Under Clause 36, where the contractor has been granted an extension of time for any delay (or disruption for AS 4300) caused by any of the specified events, the contractor is entitled to "extra costs" that are "necessarily incurred" by the contractor by reason of the delay. Clause 36 also allows the parties to negotiate other events of delay for which extra costs might be payable. Under these contracts, delay costs are unpredictable for both owner and contractor. The contractor is required to prove its actual delay costs, which places an unnecessary burden on the contractor and deprives the owner of the capacity to predict and then manage the end cost of the project.

If the contractor incurs extra costs for delay or disruption arising out of a variation, the extra payment may include a reasonable amount for overheads but will not include profit or loss of profit. ${ }^{5}$ This is also the case for:
(a) payment for costs incurred as a result of suspension caused by the principal, provided the costs incurred are greater than those that would have been incurred but for the suspension; ${ }^{6}$ and
(b) payment for extra costs incurred as a result of latent conditions, provided the contractor could not have reasonably anticipated the cost at the time of tendering. ${ }^{7}$

## (b) PC-1-1998

If an extension of time is granted due to a breach of the contract by the owner, the contractor is entitled to payment of "agreed damages" in the amount set out in the contract particulars for each day of the extension, unless the parties have excluded the operation of this clause. ${ }^{8}$ This amount is a limitation on the liability of the owner to the contractor for any delay or disruption that the contractor encounters or that arises out of or is connected to any breach of the contract by the owner; the contractor is precluded from making any other claim in these circumstances. The advantages of setting damages at an agreed amount rather than requiring the contractor to prove its loss will be discussed further below at section 3.4.

If the owner orders a suspension for a cause other than the contractor's failure to carry out its obligations, the contractor is entitled to the "extra costs"

[^4]reasonably incurred by it as a result of the suspension. ${ }^{9}$ In relation to variations, the contractor will be paid any "reasonable costs and expenses" incurred by the contractor arising from the variation delaying the contractor, plus the percentages specified in the contract particulars for non-time-related on-site overheads and preliminaries and off-site overheads and profit. ${ }^{10}$ If a latent condition is encountered, the contractor is entitled to be paid any "extra costs reasonably incurred" arising from the latent condition after the giving of a notice under Clause 7.3. ${ }^{11}$

## (c) Defence Head Contract

As under PC-1, the contractor is entitled to "agreed damages" for each day by which the date of completion is extended due to a breach of contract by the principal. ${ }^{12}$ The amount claimable is specified in the annexure to the contract and is a limitation upon the owner's liability to the contractor for any delay or disruption that the contractor encounters and arises out of, or in any way in connection with, the breach of the contract by the owner. The parties may exclude the operation of this clause.

The contractor's entitlements to latent conditions, suspension and variations are as under PC-1. ${ }^{13}$

## (d) FIDIC General Conditions of Contract $1999{ }^{14}$

The FIDIC conditions do not contain a single pure prolongation clause entitling the contractor to costs arising out of delay. Instead, a number of provisions allow the contractor to claim for additional "cost" incurred as a result of various events. For example, if the contractor encounters unforeseeable physical conditions and suffers delay and/or incurs "cost" due to these conditions, the contractor is entitled to payment of such cost. ${ }^{15}$ These additional costs may be reduced to the extent that the contractor has encountered more favourable conditions than could reasonably have been foreseen in other parts of the site. Similarly, if the contractor suffers delay and/or incurs costs as a result of complying with the engineer's direction to suspend work, the contractor is entitled to payment of such cost. ${ }^{16}$

[^5]Notice to the employer within the required time period, as well as compliance with the procedure set out in Clause 20.1, is a pre-condition to any claim.

The contract defines "cost" as "all expenditure reasonably incurred (or to be incurred) by the Contractor, whether on or off site, including overhead and similar charges, but does not include profit". ${ }^{17}$ The provisions define circumstances in which the contractor may claim for profit as well; for example, if the employer unduly delays tests on completion, the contractor is entitled to be paid "cost plus reasonable profit". ${ }^{18}$ However, the deficiency in this definition is that while finance charges are included in the definition, loss of investment is not, so the contractor will not recover if it has funded the performance of additional or varied work itself. ${ }^{19}$

### 2.1.2 The Significance of the Words Used in the Contract

Two aspects of these provisions call for comment.
Firstly, "double dipping" is prohibited. Where a contractor has recovered in respect of a particular event (e.g. a variation order), this recovery may have included a component for prolongation. If so, this amount will not be recoverable again.

Secondly, the distinction between "costs" and "damages" is very important. In Brierley, Ex p; Elvidge, Re, ${ }^{20}$ Jordan C.J. said:

The word "cost" may be used in various senses. It may, in the case of manufacture, be used to mean the price paid for the raw material plus the wages paid for turning it into finished articles; and, in the case of trading, the price paid for what is re-sold. Or, in either case it may include all the other expenses incurred in bringing into existence or obtaining, and then selling a vendible article what are generally described as "overheads".
There would not appear to be any distinction to be made between "costs" and "expenses", and in United Merthyr Collieries Co., Re, ${ }^{21}$ Sir James Bacon V.C. concerning the words "actual costs and expenses" said:
. . . the principle of the decision is that the Plaintiff, although he has suffered a wrong, shall not have any more than he would have had if that wrong had not been committed. That I take to be the clear and plain principle.

The words "extra costs", as used in the Australian Standards contracts and certain provisions of the Defence and PC-1, appear to exclude any

[^6]element of profit. ${ }^{22}$ This is because a contractor seeking to recover lost profit is not seeking to recover moneys that flowed out of its coffers as a result of the delaying event, but merely moneys that failed to flow in because the contractor was unable to take on any new work. In this sense, lost profit is an "opportunity cost", but not a "cost".

Similarly, despite the reference to "overheads" in Brierley, Ex p, ${ }^{23}$ it is strongly arguable that "Head Office" or "off-site" overheads may not fall within the meaning of "extra costs" (except where expressly included, as in the FIDIC contract) though they may form part of the damages suffered by the contractor. While there is little difficulty in recovering additional on-site overhead under "extra costs" during a period of prolongation, the same cannot necessarily be said for off-site overheads. While it cannot be denied that there are certain costs of running a business that must be recouped from the work undertaken by the business, there is doubt as to whether such costs can constitute "extra costs". For example, it may be said that fixed overheads are not incurred because of the delay, as the contractor would have had to pay them even if the delay had not occurred; rather, the claim is for the loss of opportunity to earn money out of which to pay those costs.

Three caveats should be placed on this. First, if the claim is referable to breaches of contract, such costs may be recoverable damages, which will be considered shortly. Second, the contractor may be able to establish certain costs or expenses in the nature of overheads that would not have been incurred but for the delay which may come within the meaning of "extra costs". Finally, it is possible that a contractor could frame its claim for off site overheads in a manner that would be accepted as an "extra cost" by the courts.

On the other hand, "damages", as used in the pure prolongation clauses in Defence and PC-1, is a broader expression, which probably includes all loss causally related to the delay in a "but for" sense. Thus, while the word "damages" probably contemplates all of the items of loss, "costs" does not. Of course, this is also affected by the fact that the "damages" are an agreed amount in Defence and PC-1, but the "costs" must be proven in the Australian Standards.

### 2.1.3 Security of Payment Legislation

The NSW Court of Appeal has recently confirmed that "delay damages" and "contractual interest", which are permitted to be claimed in progress claims under a construction contract, can be claimed under the Building and

[^7]Construction Security of Payment Act 1999 (NSW). ${ }^{24}$ JM Hargreaves had attempted to argue that the amounts for delay damages and contractual interest were not amounts "for construction work" and could not be claimed in a payment claim under the Act, notwithstanding that they could be claimed properly in a progress claim under the construction contract. Whether amounts "for construction work" in substance "represent the increased cost or price of construction work actually carried out" will at times involve questions of fact and degree. For instance, Justice Hodgson stated that "any amount which is truly payable as damages for breach of contract is generally not an amount due for that construction work." Thus, even if a construction contract permits such a claim to be made under the contract, it does not necessarily follow that this amount can be recovered under the Act. Here, Justice Hodgson was satisfied that the "delay damages" were not damages for breach of contract per se, but "rather are additional amounts which may become due and payable under the contract". Any questions of fact and degree of this nature, according to Justice Hodgson, are for the adjudicator to determine having regard to section 9(a) of the Act, other provisions of the Act and the contract.

### 2.2 General Law of Contract

Where a preventive act is committed that amounts to a breach of contract by the principal, damages (as opposed to costs) consequent upon that breach will, it is suggested, be recoverable. In Commonwealth of Australia v. Jennings Construction Ltd., ${ }^{25}$ the Supreme Court of Victoria held that a claim under a prolongation clause was quite distinct from a claim for damages for breach of contract.

A contractor may claim damages for breach of an express term of the contract. Where that breach has resulted in damage arising from delay, the costs arising from the breach are recoverable. ${ }^{26}$ If claiming on the basis of breach of an express term of the contract, the contractor must specify the term and the nature of the breach, such as failure to give possession of the site on the agreed date, or lateness in delivery of plans or materials where the obligation exists for the head contractor to do so by a time stipulated in contract.

The principles governing the amount of damages recoverable for breach of contract are derived from the decision in Hadley v. Baxendale, ${ }^{27}$ where it was said:

[^8]Where two parties have made a contract which one of them has broken the damages which the other party ought to receive in respect of such breach of contract should be such as may fairly and reasonably be considered either arising naturally, i.e. according to the usual course of things, from such a breach of contract itself, or such as may reasonably be supposed to have been in the contemplation of both parties, at the time they made the contract, as the probable result of the breach of it.
As was pointed out by Bray C.J. in Taylor Woodrow International Ltd. v. Minister of Health, ${ }^{28}$ recovery of damages at law differs from recovery under express terms of the contract. The principal differences are:
(a) to recover damages for breach of contract, a test of foreseeability applies. This requires that the parties would have reasonably foreseen, at the time they entered into the contract, that the delay would cause damages of the kind complained of.
(b) damages for loss of profit for breach of contract are recoverable as a head of damage where proved either on the basis of reasonable foreseeability or as loss arising naturally from the breach of contract itself.
Sometimes, in the absence of the breach of an express term, it is necessary for a contractor to base a delay claim upon an implied term, for example, to grant an extension within "a reasonable time". The High Court decision in Codelfa Construction Pty. Ltd. v. State Rail Authority of N.S.W. ${ }^{29}$ indicates the reluctance of the courts to imply a term. The contractor seeking to base its claim on the implied term theory faces the difficulty of satisfying the test adopted by the courts as laid down in BP Refinery (Westernport) Pty. Ltd.v. Shire of Hastings, ${ }^{30}$ where the pre-conditions for implication of a term were set out as follows:
(a) it must be reasonable and equitable;
(b) it must be necessary to give business efficacy to the contract, so that no term will be implied if a contract is effective without it;
(c) it must be so obvious that "it goes without saying";
(d) it must be capable of clear expression; and
(e) it must not contradict any express term of the contract.

Where the alleged implied term relates to a duty that corresponds with a duty of care under the general law of negligence, the courts will probably not

[^9]imply a term, and the claim should be framed as one for damages in negligence. ${ }^{31}$

There appear to be two other possible limitations to the recovery on a prolongation claim at general law. First, the terms of the contract may expressly exclude it. Second, the relevant clause may be held to be a contractual "code" that defines rights and obligations to the exclusion of those normally afforded by the general law. ${ }^{32}$

### 2.3 Tortious and Statutory Claims

These form possible bases for claims in respect of delay. For example, if the principal is negligent in providing information as to site conditions, which makes excavation more difficult and causes delay, the contractor may be able to claim the losses flowing from the negligence.

The contractor must show that:
(a) the defendant owed the contractor a duty of care in relation to the compilation and communication of the information relating to the site conditions;
(b) the duty was breached because reasonable care was not taken in the preparation or presentation of the information relating to the site conditions; and
(c) the contractor has relied upon the information supplied to it and so suffered loss or damage.
It is clear from a number of decisions of the High Court that a duty of care may be owed to the contractor by the principal and/or professionals in relation to the compilation and provision of information relating to site conditions. ${ }^{33}$

However, whether or not such a duty of care exists in fact will involve a detailed consideration of all the relevant facts and circumstances. These include the pre-contractual relationship between the principal and the contractor during the invitation to tender, post-tender, and pre-award periods; whether the professionals involved in the preparation of the site information were aware of the purpose for which the information was required; the nature of the project; the special knowledge of the principal about such matters as ground conditions at the site; the respective resources and opportunities of

[^10]the principal and the tenderers to carry out site investigations; and the general conduct of the various parties.

As the law does not impose upon suppliers of information (short of contract) a warranty of accuracy, in order to establish a cause of action it must be shown that there was a lack of reasonable care in the preparation of the tender information. Notwithstanding that a duty may have been established, proving a breach of that duty may often be difficult as the information provided by principals to tenderers will usually be prepared by engineering consultants only after making the necessary tests.

Further, notwithstanding proof of breach, most construction contracts contain disclaimers of liability for the accuracy or sufficiency of any information provided to tenderers. Such disclaimers, however, have not met with great success in the Australian courts. ${ }^{34}$

Finally, the contractor's claim in negligence will usually be for a loss that is purely economic and unrelated to any personal injury or damage to property. Traditionally, economic loss was only recoverable where it was suffered in conjunction with physical injury or damage to property; difficulties were encountered if it were the only loss sought to be recovered. However, this is no longer the position in Australia as the High Court has allowed recovery of economic loss as a separate head of recovery. ${ }^{35}$

The Commonwealth Trade Practices Act 1974 (and the corresponding State Fair Trading Acts) provide another source of possible liability of the principal and/or the professionals involved in the preparation of site information. That legislation creates a norm for commercial dealings and in so doing creates liability (independent of fraud or negligence) for engaging in misleading or deceptive conduct. If this conduct causes delay, the contractor may be able to claim for the resulting loss.

Section 52(1) of the Trade Practices Act 1974 provides (as do corresponding provisions in the State legislation): "A corporation shall not, in trade or commerce, engage in conduct that is misleading or deceptive or likely to mislead or deceive."

An action for misleading conduct is attractive as it does not require that a contract come into existence between the complainant and the person making the misleading or deceptive statements. Consequently, the lack of privity of contract between the contractor and the professionals involved in the preparation of the site information will not of itself prevent the contractor from suing those professionals under the Act.

Perhaps most interestingly, a number of cases decided in relation to section 52 clearly support the proposition that a failure to disclose relevant information can be misleading or deceptive conduct for the purposes of that

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provision. ${ }^{36}$ However, those cases say that the failure to disclose (whether it be silence or a half-truth) will only constitute misleading conduct if the circumstances give rise to a reasonable expectation that a relevant fact will be disclosed if it exists.

If the failure to disclose information is misleading, it is then necessary to show that the non-disclosure was a real inducement to the tenderer to enter into the contract on the terms (and for the price) upon which it has tendered. This was emphasized by the Full Court of the Federal Court in Farrow Mortgage Services Pty Limited (In Liquidation) v. Edgar. ${ }^{37}$

In relation to inducement, the decided cases have made it abundantly clear that exclusion clauses alone cannot operate to defeat claims under section 52. However, the current position is that both exclusion clauses and disclaimers can effectively operate in this way if they break the nexus between the misleading conduct and the making of the agreement in question. The way in which they must do so is by depriving the conduct of its misleading quality or by removing inducement, thus breaking the causal connection between the conduct and the loss. ${ }^{38}$ Whether it has that effect in a given case is a question of evidence and not of law.

## 3. QUANTIFICATION OF CLAIMS

Even if a contractor is entitled to claim impact damages, it will face considerable difficulty in proving that employer-caused delay led to its losses and in quantifying those losses. Of the five categories of loss outlined at the beginning of this paper, there are three that call for comment here: loss of productivity, off-site overheads and profit.

Loss of labour productivity, at least legally speaking, will normally be recoverable. However, it is extremely difficult to prove. A common technique is to compare the actual time taken to complete a task with the planned time. As noted above, where a contractor is entitled to damages (as opposed to costs) consequent upon prolongation of the project, this entitlement will include reimbursement for off-site overheads incurred during the prolongation period. It is very difficult to point to a causal link between the prolongation of a construction project and the incurring of off-site costs, such as head office rent and secretaries' wages, because these expenses are incurred at a constant rate over time. The causal link sought to be shown in the making

[^12]of a claim for off-site overheads is that "but for" the prolongation of the project, the contractor would have been able to take on new projects, which would contribute to the funding of the contractor's off-site overheads. As such, the off-site overheads claim is by nature a hypothetical one. It cannot be quantified with precision because assumptions and "educated guesses" need to be made as to what would have happened if the project had not been prolonged. The SCL Protocol requires the contractor to demonstrate that it has failed to recover the overheads it could reasonably have expected during the period of prolongation and that it has been unable to recover such overheads because its resources had been tied up by the delaying events. ${ }^{39}$

The calculation of loss related to on-site overheads is more directly provable. It will include all costs necessarily incurred in the project in consequence of the delay. In the calculation of the standing time of an unproductive plant, it is acceptable to use hire rates for such plant. However, this is only the case where it can be shown that there existed a profit opportunity which was forgone. In the absence of such evidence, only depreciation and maintenance costs can be recovered.

The claim for profit is conceptually similar to that for overheads in that it is based on the contractor's lost opportunity to earn extra profit, due to its being prevented from taking on extra work by the prolongation of the current project.

The SCL Protocol emphasizes that in calculating prolongation compensation, unless otherwise provided in the contract, compensation should only be paid for actual work, time, loss and/or expense; the objective is to put the contractor in the same financial position it would have been in had the delaying event not occurred. ${ }^{40}$ The Protocol advises that the contractor is not disentitled to compensation for prolongation just because it made inadequate allowance for site overheads in its tender; rather, recoverable compensation requires the ascertainment of the actual cost of remaining on site for the additional time, for which the tender allowances are of little assistance. ${ }^{41}$

Various methods have been used to attempt to prove and quantify the contractor's claim, and it is necessary to evaluate these.

### 3.1 Formulae

In view of the difficulty of proving that the delay caused the incurring of these categories of costs, formulae are often used in the quantification of overheads claims. For example, the "Hudson" formula is as follows:

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$\frac{\text { offsite overheads }}{100} \times \frac{\text { contract sum }}{\text { contract period }} \times$ delay period $=$ amount claimed,
where offsite overheads $\%=\frac{\text { total overheads for contract period }}{\text { gross turnover for contract period }} \times 100$
Although the formula is frequently used by parties in dispute for calculating off-site expenses, it has been criticized because of the assumptions upon which it is based and the fact that it leaves unclear the particular percentage return to be used.

The contractor or principal may in particular cases take issue with the use of the formula as it will sometimes work to the advantage of the other party. For example, with a large contractor, where the delay affects only a small part of the total resources, it may well be that the extra time on site will not cause the contractor to sacrifice other contracts available and thus not adversely affect the total overhead return and profit-or at least not to the extent claimed by the formula. Alternatively, inflation during the period of delay may increase overhead costs and not be reflected in the formula.

An alternative formula is that used in Federal Government Contract cases and by some States in the United States. This is called the Eichleay formula, deriving its name from a case involving the Eichleay Corporation. The application of the formula was approved in the United States in Capital Elec. Co. v. U.S. ${ }^{42}$ This formula computes the daily overhead rate of the original contract adjusted to reflect the number of days of actual contract performance. The daily overhead rate is then multiplied by the number of delays to compute the reasonable unabsorbed overhead. "Unabsorbed overhead" is the head of damage for the loss of the opportunity to earn money out of which to pay overhead costs. The Eichleay formula can be expressed as follows:

[^14]Then:

$$
\frac{\text { overhead allocatable to contract }}{\text { actual days of contract performance }}=\text { overhead allocatable to contract per day }
$$

[^15]Thus:
daily overhead $\times$ number of days for compensable delay $=$ unabsorbed overhead
This formula also has potential for inaccuracies, although it is a more refined formula than the Hudson formula in providing the additional step to determine the fixed overhead contribution percentage. Some distortion is still possible because the period used to calculate the daily overhead rate includes the period of delay. Also, the basic premises of the formula can be criticized for assuming that all overhead costs are fixed, when total overhead figures on a contractor's balance sheet may include significant variable costs. Both formulae may be criticized as not quantifying the actual loss caused.

As David Byrne, Q.C. (as he then was) put it:
The strength of the formula approach is that it removes from the contractor the obligation to prove the unprovable: what would have been his profit from the project for which he has not tendered and which he might not have won if he had tendered? It overcomes this by making an assumption that a standard profit ratio can be derived from the accounts of previous years, verified by industry experience, and that this profit will be obtained during the period of prolongation if the contractor had obtained new work. ${ }^{43}$
Although the use of formulae may, in many ways, simplify the contractor's task of showing damages, the legal difficulty of using formulae such as the Hudson's formula was highlighted in the South Australian Full Court decision in State of South Australia v. Fricker Carrington Holdings Pty. Ltd. ${ }^{44}$ The Court held that the Hudson's formula cannot be employed in quantifying this head of damage in the absence of agreement by the parties to use the formula unless there is evidence that its use is appropriate in a particular case. The Full Court said: ${ }^{45}$

I am sure that parties in dispute frequently use the formula. Often they will agree to its use. But if they do not agree to its use I think that evidence must be called to prove that its use is appropriate.

Likewise, in Thiess Watkins White Construction Ltd v. Commonwealth of Australia, ${ }^{46}$ Giles J. stated that the share of the off-site overheads attributed to the contract must be justified and it must be otherwise shown that a true loss has been suffered. ${ }^{47}$ However, it is not necessary that expert evidence be

[^16]called to justify the use of the Hudson formula..$^{48}$ The Eichleay and other formulae have not been the subject of judicial comment in Australia.

It is evident that the underlying assumptions of the formulae will need to be scrutinized in light of each particular fact situation. For example, the formulae assume that the contractor would have taken on additional work in the absence of the prolongation. In a severe economic downturn, this assumption may not hold true. Another assumption made is that the prolongation of the current project has actually prevented the contractor from taking on any new work. The validity of this assumption will depend in each case on the extent to which the contractor's resources were stretched at the time of the project delay. ${ }^{49}$

The formula approach may also be suitable for claims for profit. This would entail assuming some constant profit margin and awarding damages accordingly.

Ultimately, the formulae are only theoretical approximations and are not calculations of actual costs. For this reason, the SCL Protocol recommends that the contractor make all reasonable efforts to use its records to document the claim and only use a formula as a last resort. The Protocol takes a cautious approach to formulae, stating that the contractor must still prove that it has unabsorbed overheads; the formula is merely a tool for the quantification of the loss. The Protocol does not support the use of the Hudson formula because it is dependent on the adequacy of the tender and involves double counting. The Protocol also stipulates that the contract administrator should retain flexibility in the use of formulae and not be absolutely bound by the results where they are anomalous; cross-checking is recommended. ${ }^{50}$

### 3.2 Methods of Delay Analysis

There are a number of different methods of delay analysis that aim to analyze causation and effects of delay and disruption, and thus assist in the assessment of entitlements to extensions of time and additional costs. These methods can broadly be divided into two categories: ${ }^{51}$
(a) Theoretical-based methods, which involve demonstrating the theoretical impact of the consequences of delaying events; and
(b) Actual-based methods, which attempt to demonstrate what actually occurred.

[^17]All methods rely, to varying extents, on assumptions and subjectivity as well as depend on the accuracy of the information used. Ultimately, they are ways of describing facts rather than proving entitlement.

### 3.2.1 Theoretical-Based Methods

Examples of theoretical-based methods include:

- As-planned impacted method: takes the as-planned program and analyzes the theoretical effect of delaying events on the program and the completion date. Although it is cheap and quick, as it does not require analysis of actual records, it does not demonstrate what actually caused the delay. Further, the original program is generally unhelpful as it does not take into account changes to sequencing and schedules.
- As-planned but for method: impacts the as-planned program with delaying events caused by the contractor and then compares the impacted completion date with the actual completion date. The difference is then characterized as the period of principal-caused delay; that is, the method purports to indicate when the project could have been completed but for the delaying events caused by the principal. This method suffers from the same defects as the as-planned impacted method.
- As-built but for method: takes the as-built program and, working backwards, removes the impact of delaying events to simulate what the as-built program could have been but for the delaying events. However, this does not reflect the actual progress of the works as it was in reality.
Each of the theoretical methods suffers the deficiency of resulting in an artificial analysis that does not reflect what actually happened.


### 3.2.2 Actual-Based Methods

The most common of these is the "as-planned vs. as-built" method, which, if adequate site records have been kept, allows a comparison of the as-planned and as-built programs. This comparison should take into account any changes in the resources applied to the work, which will affect the time required to perform the work.

This technique may be unconvincing if the original program was created by the contractor for its own benefit and not submitted to the superintendent. It will be slightly more convincing if the program was submitted to the superintendent for the purpose of enabling him or her to monitor the progress
of the work. ${ }^{52}$ However, if the superintendent has not only seen the program, but has also approved it-and possibly even retained the right to order variations to it-it may be possible for the contractor to turn the tables on the principal. The contractor could use the program as convincing evidence for its prolongation claim. ${ }^{53}$ In any case, analyses comparing "as-planned" with "as-built" programs are unable to take into account concurrency, re-sequencing, mitigation or acceleration. Proper use of an "as-planned" program to conduct delay analysis should involve the program as updated from time to time by the contractor's intentions and expectations. ${ }^{54}$ The simplicity of this method means that it is less suited to complex projects.

Another yardstick against which the actual time for construction can be compared is an expert assessment as to the amount of time that would normally be taken to carry out the relevant works. This may be preferable in the case where the construction program is essentially for the benefit of the contractor only. In the absence of any better method, it is not unusual to base the claim upon an arbitrary percentage of total labour or plant expenditure during the period of reduced productivity.

More advanced versions of the "as-planned vs. as-built" method are the "windows/snap-shot/update" method and the "impact/update" method. The first employs critical path analysis to evaluate criticality, delay and mitigation. It breaks the project into time periods and for each time period imposes onto the as-planned program the actual duration and progress of the work carried out in that time period. It then uses this to project an end date as viewed from that time period. The result is that the projected end dates for each time period can be used to trace the delay as it occurred. The "impact/update" method adds an assessment of causation by contrasting the delay as worked out above with the contractor's actual performance in the time period, measured in terms of the amount of production. This enables an analysis of concurrency, dominant causes and mitigation.

The SCL Protocol recommends that this type of method should be used in almost all projects, although it recognizes that it is the most time-consuming and costly due to its thoroughness. ${ }^{55}$ The effect of this recommendation will be to increased the burden of record-keeping that the contractor must undertake. The cost of this may, however, be preferable to the cost of proving a claim without good records.

Similarly, in establishing disruption, such as loss of productivity or interruption to progress, the SCL Protocol advocates the use of the "Measured Mile" technique. ${ }^{56}$ This involves comparing the productivity achieved on an

[^18]unimpacted part of the project with that achieved on the impacted part. Thus, it is not necessary to make adjustments for unrealistic programs and inefficient work as they are already included in the comparison. Failing the existence of adequate records, other projects executed by the contractor or model productivity curves developed by various institutions may be used for guidance. The Protocol maintains that only those issues for which the employer is liable may be taken into account; the contractor has an obligation to manage its own change efficiently.

Methods that are based on what actually happened are much more useful in quantifying cost because they assist the contractor in demonstrating, for example, what resources were actually applied in a given period. However, these methods only go so far. While they assist in establishing causation and the effects of delay, these methods do not actually suggest ways to quantify the loss. Although the contractor may use them to point to the effect of delay on productivity, for example, which could then more easily be quantified, the assessment of costs such as off-site overheads remains difficult. All that may be established is that the principal caused the delay and the period of delay the principal caused; these methods do not assist with quantifying lost opportunity to recoup the cost of off-site overheads or lost profit. The Protocol suggests that lost profit may be assessed using the contractor's audited accounts for the three previous financial years closest to the delaying events for which audited accounts have been published. ${ }^{57}$

### 3.3 Global Claims

The difficulties associated with proving and quantifying loss have led some contractors to make global claims for payment. ${ }^{58}$ In a global claim, the contractor argues that all project delays and disruption are attributable to the owner without demonstrating causation between individual events and periods of delay. Global claims are thus tied to pleading practice and associated issues.

Global claims were initially based on statements in Crosby (J.) \& Sons Ltd. v. Portland Urban District Council ${ }^{59}$ and the following passage of the judgment of Vinelott J. in London Borough of Merton v. Stanley Hugh Leach Ltd.: ${ }^{60}$

If application is made for reimbursement of direct loss or expense attributable to more than one head of claim and at the time when the loss or expense comes to be ascertained it is impracticable to disentangle or disintegrate the part directly attributable to each head of claim, then, provided of course that

[^19]the contractor has not unreasonably delayed in making the claim and so has himself created the difficulty the architect must ascertain the global loss directly attributable to the two causes, disregarding, as in Crosby, any loss or expense which would have been recoverable if the claim had been made under one head in isolation and which would not have been recoverable under the other head taken in isolation. To this extent the law supplements the contractual machinery which no longer works in the way in which it was intended to work so as to ensure that the contractor is not unfairly deprived of the benefit which the parties clearly intend he should have.

It has, however, been observed that this passage refers only to ascertainment of the quantum by way of global loss and does not support a failure to analyze cause and effect. ${ }^{61}$ These statements were also treated with caution by the Privy Council in Wharf Properties Ltd. and Another v. Eric Cumine Associates and Others (No. 2), ${ }^{62}$ where Lord Oliver stated:

Those cases establish no more than this, that in cases where the full extent of extra cost incurred through delay depends upon a complex interaction between the consequences of various events, so that it may be difficult to make an accurate apportionment of the total extra costs, it may be proper for an arbitrator to make individual financial awards in respect of claims which can conveniently be dealt with in isolation in a supplementary award in respect of the financial consequences of the remainder as a composite whole. This has, however, no bearing upon the obligation of a plaintiff to plead his case with such particularity as is sufficient to alert the opposite party to the case which is going to be made against him at the trial. ECA are concerned at this stage not so much with quantification of the financial consequences-the point with which the two cases referred to were con-cerned-but with the specification of the factual consequences of the breaches pleaded in terms of periods of delay. The failure even to attempt to specify any discernible nexus between the wrong alleged and the consequent delay provides ... "no agenda" for the trial.

The statements in Wharf Properties may be somewhat reconciled with those in the previous cases when it is recognized that Wharf Properties was concerned with the plaintiff's pleading whereas the others were not. ${ }^{63}$ In any case, the current approach is probably somewhere between these two positions.

Global claims will, therefore, be allowed only in very limited circumstances where the complexity of the case and the multiplicity of events during performance of the contract have combined to make it virtually impossible for the claimant to calculate the loss with certainty. Theoretically, the claimant

[^20]must show that it bears no responsibility for the overrun; of course, in reality this will rarely be the case. In practice, however, the contractor will be required to show that the overrun is the contractual responsibility of the contractor insofar as the overrun relates to compensable events.

Global claims can be used as a device to mask a weak case. Of course, this does not mean that those who fail to keep good records may use such claims to advantage. Unfortunately, a defendant presented with a global claim will tend to regard such claims with scepticism. However, as a means of reducing the costs involved in particularizing losses, global claims in the right circumstances are a unique possibility.

The Extra Division, Inner House of the Court of Session, in the case of John Doyle Construction Ltd. v. Laing Management (Scotland) Ltd. ${ }^{64}$ recently considered whether a global claim could succeed where the defendant was only liable for part of the delay and disruption. This decision may lead to a widening of the boundaries where a global claim may be recognized in other jurisdictions.

Prior to this decision, the claimant was required to establish that it was unable to determine the extent of each individual event as well as its contribution to the delay and the cost. Further, the claimant also had to establish that it was not itself responsible for any of the loss and that the defendant was responsible for all of the loss.
In its decision, the Court of Session suggested the following three-pronged approach when considering whether a global claim is successful.
(a) Where particular events can be directly linked to individual loss, then they should be extracted from the global claim and argued separately. This is unlikely to be very common as the nature of a global claim is that the loss cannot be directly linked to an individual event.
(b) The question of causation must be treated by the application of common sense to the logical principles of causation. If it can be proven that the defendant is the "dominant" cause of the delay, then the concurrent events that are not the responsibility of the defendant can be ignored when assessing the loss or damage payable to the claimant.
(c) Where the claimant cannot or fails to prove that the defendant is the "dominant" cause of the loss, the loss shall be apportioned between each cause, dependent on responsibility. While this method is similar to that adopted in assessing contributory negligence, it is a very rough and ready approach.

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The Court also held that causation must be treated with common sense. That is, it should be reasonably obvious that a particular event caused the loss, notwithstanding that other events played a part in its occurrence.

The Australian courts are yet to endorse the decision of the House of Session. The Supreme Court of Victoria previously considered the issue of global claims in John Holland Construction \& Engineering Pty. Ltd. v. Kvaerner RJ Brown Pty. Ltd., ${ }^{65}$ where it was held that a global claim may be relied upon:

> where it is impractical to disentangle that part of the loss which is attributable to each head of claim, and this situation has not been brought about by delay or other conduct of the claimant. . . [and] the proprietor's breaches represent the only causally significant factor responsible for the difference between the expected cost and the actual cost.

The Court emphasized that the global claim would fail if the defendant contributed in any material way to the causation of the loss.

More recently in Thiess Contractors Pty. Ltd. v. Murchison Zinc Co. Pty. $L t d .,{ }^{66}$ the Supreme Court of Western Australia considered the issue of a global claim. Thiess was engaged for the excavation and construction of a decline. The Superintendent (acting on behalf of Murchison Zinc) directed Thiess to depart from the original design. Consequently, Thiess adopted a different work method and claimed a variation, an extension of time, and loss and damage. The defendant sought to have Thiess's claim struck out on the basis that no adequate particulars relating to the loss and damage were provided in the Statement of Claim. The defendant relied on the same reasoning in John Holland Construction v. Kvaerner set out above. While it was held that there was no global claim as Thiess's claim related to one variation arising from different contractual provisions, Justice Templeman stated that the particulars were clear enough as they allowed the defendant to identify "what work was performed and material supplied, and the amount claimed in respect of those items". Further, it was held that the evidentiary burden of reasonableness begins with the claimant, which needs to establish that it acted reasonably in the circumstances when it incurred the additional costs. Once the claimant establishes this, the burden shifts to the defendant to prove that the quantum of the additional costs is not reasonable.

Similarly, in John Holland Pty. Ltd. v. Hunter Valley Earthmoving Company Pty. Ltd., ${ }^{67}$ the Supreme Court of NSW held that the success of applications to strike out claims on the basis that the plaintiff pleads a global claim depends on the capacity of a plaintiff to provide the necessary particulars of its claim. The Court emphasized that "a plaintiff who has a claim will not be denied the opportunity to prosecute that claim only because there may be

[^22]difficulty in identifying with precision each individual element of the claim". Regardless of whether the claim is labelled a "global claim", if the evidence allows a conclusion that the plaintiff has suffered a quantifiable loss, then it is open to the tribunal determining the matter to bring in a verdict for the plaintiff for the sum that it is satisfied is appropriate.

The Scottish case appears to take the issue of global claims further than currently considered by the Australian courts as the Scottish decision does not require the loss to be totally caused by the contract. Further, it is likely that the detail required in the particulars is less onerous. Nonetheless, Australian courts are prepared, depending on the particular facts and pleadings, to allow global claims to be made. The SCL Protocol advises against submitting global claims, claiming, perhaps incorrectly in light of the above, that they are rarely accepted by the courts. ${ }^{68}$

Contractors should be aware of the risks associated with pleading a global claim. The contractor is relying on being unable to disentangle the separate causes; however, if the principal is able to demonstrate that a majority of the causes of delay did not in fact support the claim, then the contractor's claim will fail as the contractor has pleaded that the causes cannot be severed. As Lord MacFadyen stated in John Doyle Construction Ltd. v. Laing Management: ${ }^{69}$

Failure to prove that a particular event for which the defender was liable played a part in causing the global loss will not have any adverse affect on the claim, provided the remaining events for which the defender was liable are proved to have caused the global loss. On the other hand, proof that an event played a material part in causing the global loss, combined with failure to prove that that event was one for which the defender was responsible, will undermine the logic of the global claim. Moreover, the defender may set out to prove that, in addition to the factors for which he is liable founded on by the pursuer, a material contribution to the causation of the global loss has been made by another factor or other factors for which he has no liability. If he succeeds in proving that, again the global claim will be undermined.

The plaintiff must still plead in enough detail so that the defendant knows the case it must meet, and the plaintiff bears the ultimate burden of proof, This does not mean, however, that the claim will fail entirely as the evidence led may enable the plaintiff to prove causation in relation to individual events and losses.

On the other hand, global claims present various practical and tactical difficulties for defendants. ${ }^{70}$ The defendant may be faced with the task of constructing the plaintiff's case in order to answer it. Similarly, while the choice to request particulars may force the plaintiff to provide the detail

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required for the defendant to meet the case, it may also make the plaintiff realize the flaws in its case and give it an opportunity to rectify them, precluding the defendant from arguing that the claim is not supported by the particulars.

### 3.4 Agreed Damages Provisions: A Solution?

The quantum recoverable in a prolongation claim is one of the major areas of disputation in the industry. Following similar developments in relation to escalation arising from increased wages and damages for delay, attempts have been made in some contracts to reduce the area of disputation by providing for agreed fixed amounts for delay costs pertaining to defined delaying events. In Australia, for example, the PC-1 and Defence contracts allow the parties the option of specifying agreed damages for delay in order to avoid disputes and the difficulties of proof. ${ }^{71}$ Operating in a similar manner to liquidated damages clauses, such clauses have the advantage of relieving the contractor of the difficulties of proving and quantifying its damages as well as providing the principal with a possible basis for limiting its liability for delay. Where there is such a clause in the contract providing compensation for specific causes of delay at various stages of the project, the contractor will prima facie be entitled to recover that amount, but only that amount, upon proof of delay without an enquiry into the actual loss suffered. The agreed damages approach is advocated in the SCL Protocol, which also suggests specifying different amounts for each stage in the project. ${ }^{22}$

An issue that needs to be considered when delay costs are fixed is whether the contractor should be reimbursed its actual costs of delay or whether there should be a sharing of risk between the owner and the contractor in relation to delay costs. Particularly in private sector projects, owners take the view that a contractor's motivation to control and deal with the effects of delay will be significantly increased by the contractor accepting at the commencement of the contract an agreed compensation for delay less than its actual cost. This issue is complicated by the fact that in many instances it is the owner or the owner's agents who cause delay. It is difficult for a contractor to price or manage the risk where the delaying events, the subject of compensation, are solely within the control of the owner.

To attempt to deal with this sharing of risk, provisions may provide for a fixed and less than full compensation for delay for defined events with an upper limit upon a period of delay for which an owner is responsible (including delay arising from breaches of contract).

Notably, apart from the Defence and PC-1 contracts, none of the other Australian standard forms described in the first section provide for fixed

[^24]delay costs. Neither do they provide an alternative method of quantification of the claim. Clearly, in the interest of certainty, it would be preferable for parties to expressly set out in the contract the basis for and method of proof of the claim, whether it be as an agreed amount or otherwise.

## 4. CONCLUSION

The difficulty of prolongation costs claims is that the contractor's entitlement and its quantification are rarely the only issues in dispute, usually bound up with a claim for an extension of time and disagreement about when the delay occurred. This means that proving and quantifying loss become extremely complex. Although a number of approaches are possible, none has proven to be free from potential criticisms or disadvantages. There is no perfect way to analyze delay and quantify costs.

In this context, it would be wise for parties to set out in the contract more detailed mechanisms for dealing with claims for delay costs and their proof and calculation.


[^0]:    * The author gratefully acknowledges the assistance provided in the preparation of this paper by Catherine Mann, Legal Assistant, Clayton Utz.

[^1]:    ** Doyle Construction Ltd. v. Laing Management (Scotland) Ltd., [2004] C.I.L.L. 2135 (IH (Ex Div)).

[^2]:    - Known by many phrases including impact damages or prolongation costs.
    ${ }^{2}$ Some of this typology is due to D. Byrne, "The Prolongation Costs Claim" (1988) 4 BCL 181 at 184-92.
    ${ }^{3}$ Ibid., at 184.

[^3]:    4 Copies of the protocol are available online at: [http://www.eotprotocol.com](http://www.eotprotocol.com).

[^4]:    5 Clause 40.5 .
    ${ }^{6}$ Clause 34.4.
    7 Clause 12.3.
    ${ }^{8}$ Clause 10.11.

[^5]:    9 Clause 10.12.
    ${ }^{10}$ Clause 11.3.
    11 Clause 7.4.
    12 Clause 10.11.
    ${ }^{13}$ Clauses 7.4, 10.12, 11.3.
    ${ }^{14}$ General Conditions of Contract for Construction for Building and Engineering Works Designed by the Employer, First Edition, 1999.
    ${ }^{15}$ Clause 4.12.
    16 Clause 8.9.

[^6]:    ${ }^{17}$ Clause 1.1.4.3.
    ${ }_{18}$ Clauses 9.2, 10.3.
    19 See P. Lane, "Disruption and Delay: Fair Entitlement and the Regulation of Rise" (2006) 22(2) Construction Law Journal 92 at 94-5.
    ${ }^{20}$ (1947), 47 SR (NSW) 423 (S.C.) at 427.
    ${ }^{21}$ (1872-73), L.R. 15 Eq. 46 (Ct. of Chancery) at 49.

[^7]:    ${ }^{22}$ See Crosby (J.) \& Sons Ltd. v. Portland Urban District Council (1967), 5 BLR 121, per Donaldson J; SC Molineaux \& Co. Pty. Ltd. and Board of Trustees of Sydney Talmudical (1965), 83 WN (Pt 1) NSW 458 (S.C.).
    ${ }^{23}$ Brierley, Ex p; Elvidge, Re (1947), 47 SR (NSW) 423 (S.C.) at 427.

[^8]:    ${ }^{24}$ Coordinated Construction Co. Pty. Ltd. v. JM Hargreaves (NSW) Pty. Ltd. (2005), 63 NSWLR 385 (C.A.).
    25 (1985), 1 BLC 252.
    ${ }^{26}$ See H. \& S. Alexander v. Housing Commission of Victoria (1985), 4 ACLR 85.
    ${ }_{27}$ (1854), 9 Ex. 341 (Ct.) at 354.

[^9]:    ${ }^{28}$ (1978), 19 SASR 1.
    29 (1982), 149 CLR 337 (H.C.A.), earlier proceeding of 150 CLR 29 (H.C.A.).
    ${ }^{30}$ (1977), 52 ALJR 20 (P.C.) at 26.

[^10]:    ${ }^{31}$ Hawkins v. Clayton (1988), 164 CLR 539 (H.C.A.), per Deane J.
    32 See Turner Corporation Ltd. (Receiver \& Manager Appointed) v. Austotel Pty. Ltd. (June 2, 1994), Cole J. (N.S.W. S.C.) where it express words were not required to exclude the principal's right to common law damages for breach.
    ${ }^{33}$ See, for instance, the decision in Shaddock \& Associates Pty. Ltd. v. Parramatta City Council [No. l] (1981), 55 ALJR 713 (H.C.A.).

[^11]:    34 Morrison-Knudsen International Co. Inc. v. Commonwealth(1972),46 ALJR 265 (H.C.A.); Commonwealth of Australia v. Chitra Constructions Ltd. (1986), 2 BCL 235.
    ${ }_{35}$ Hawkins v. Clayton (1988), 164 CLR 539 (H.C.A.).

[^12]:    36 See Grubic v. Commonwealth Bank of Australia, (1993) ATPR (Digest) 46-111; Farrow Mortgage Services Pty Limited (In Liquidation) v. Edgar (1993) ATPR (Digest) 46-104; Warner v. Elders Rural Finance Limited (1993) ATPR 41-238; Winterton Constructions Pty Ltd v. Hambros Australia Limited (1993) ATPR 41-205; Demagogue Pty Limited v. Ramensky (1993) ATPR (Digest) 41-203; Franich v. Swannell (1994) ATPR (Digest) 46 115).
    ${ }^{37}$ (1993) ATPR (Digest) 46-104.
    ${ }_{3 x}$ See Kewside Pty Limited v. Warman International Limited (1990), ATPR 46-059.

[^13]:    ${ }^{39}$ Para. 1.16.4.
    ${ }^{40}$ Core Principle 16, Para. 1.8.2.
    ${ }^{41}$ Para. 1.9.3.

[^14]:    contract billings $\times$ total overhead incurred during contract period
    $=$ allocable to the contract

[^15]:    42729 F. 2 d 743 (C.A., 1984.), on remand to GSBCA No. 5317 (G.S.B.C.A., 1984).

[^16]:    ${ }^{43}$ Byrne, supra note 2, at 191.
    44 (1987), 3 BCL 72.
    ${ }^{45}$ (1987), 3 BCL 72 at 84.
    46 (1992), 14 BCL 61.
    ${ }^{47}$ See also Bulk Materials (Coal Handling) Pty. Ltd. v. Compressed Air \& Packaging Systems (NSW) Pty. Ltd. (July 17, 1997), Giles C.J. (N.S.W. S.C.); Stuart Bros. Pty. Ltd. v. Posei Pty. Ltd. (November 9, 1993), Giles J. (N.S.W. S.C.) at 18.

[^17]:    ${ }^{48}$ Alucraft Pty. Ltd. (in liquidation) v. Grocon Ltd. (April 22, 1994), Smith J. (Vic. S.C.) at 41.
    4) Byrne, supra note 2 , at 186-90.
    ${ }^{50}$ Paras. 1.16.5-1.16.9.
    51 For this categorisation and a description of the methods, see T. Farrow, "Delay Analysis Methodology and Mythology" (2001), published by the Society of Construction Law, U.K., and available online at: www.scl.org.uk/papers.

[^18]:    52 As under AS 2124.
    ${ }^{53}$ Byrne, supra note 2, at 185-6.
    54 See T. Farrow, "Assessing extensions of time" (2006) 18(4) Australian Construction Law Bulletin 37 at 39 .
    ${ }_{55}$ Paras. 4.8, 4.16.
    56 Para. 1.19.7.

[^19]:    57 Para. 1.17.1.
    58 Also known as "total cost claims" or "rolled up claims".
    ${ }^{59}$ (1967), 5 BLR 121.
    60 (1985), 32 BLR 51 at 102.

[^20]:    61 J. Brown, "Prolongation and Disruption - Problems of Causation in Building Contracts. Is Arbitration the Answer?" (1996) 15 The Arbitrator 113 at 114.
    62 (1991), 52 BLR 1 at 20.
    ${ }^{63}$ See the Hon. Mr. Justice Byrne, "Total Costs and Global Claims" (1995), 11 BCL 397 at 402.

[^21]:    ${ }^{64}$ [2004] C.I.L.L. 2135 (IH (Ex Div)).

[^22]:    ${ }^{65}$ (1996), 8 VR 681 at 689.
    ${ }^{66}$ [2000] WASC 71.
    ${ }^{67}$ [2002] NSWSC 131 at [15].

[^23]:    ${ }^{68}$ Core Principle 19.
    ${ }^{69}$ [2002] BLR 393 at 407-8.
    ${ }^{70}$ See A. Mansour, "Global Claims: Maze or Motorway?" (1994) IO(5) BCL 314 at 316.

[^24]:    71 See supra, section 2.1.
    72 Para. 1.8.5.

