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Welcome

In this edition of the *ADR Digest*, James Longbottom considers the Civil Engineering Standard Method of Measurement for bored piling and the interesting case of Sam Woo Bored Pile Foundations Limited and China Overseas Foundation Engineering. This case was considered by the Hong Kong Court of Appeal in 2006 but possibly raises more questions than it answers.

We are pleased to have Anthony Caletka, Managing Director of International Operations with Greyhawk as our guest writer. Some of our readers may remember that Anthony's excellent co-authored book *Delay Analysis in Construction Contracts* was featured in our Winter 2008/9 book review. In his article, Anthony considers the American equivalent of the Society of Construction Law's *Delay and Disruption Protocol* (SCL Protocol), known as the *Forensic Schedule Analysis* (FSA). Most interestingly, the FSA guidance is in direct contradiction to the SCL Protocol and UK case law regarding issues such as float ownership, the notion of dominant delay and a contractor's right to early completion.

Patrick O'Neill considers the quantification of acceleration costs which are not necessarily an easy matter to resolve and can provide significant challenges as regards how the amounts are eventually determined.

Our *ADR Analysis* series follows up on a previous analysis and considers some more rules which can be used to assist in the interpretation of contracts.

Finally, in *ADR News* we include some photographs of our annual cocktail reception at the China Club. More photographs of the evening can be viewed at **www.adrpartnership.com/news.html**.

David S Longbottom
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Sam Woo Bored Pile Foundations Limited & China Overseas Foundation Engineering Limited – More Questions than Answers?

*By **James B Longbottom** BSc(Hons) LLB(Hons) PgD(Law) FRICS FHKIS FCIArb RPS - Managing Director, ADR Partnership Limited*

Introduction

Foundation disputes and the interpretation of measurement provisions are not unusual in Hong Kong. *Sam Woo Bored Pile Foundation Limited and China Overseas Foundations Engineering Limited (CACV 113/2006)* is one such case that went all the way to the Hong Kong Court of Appeal but potentially raises more questions than it answers. Some of these questions ended up being the topic of conversation on the ADR table at a recent Lighthouse Club charity dinner.

In the case, Sam Woo had subcontracted with China Overseas to construct cast in-situ bored piles with permanent steel liners on the Lantau Expressway. A dispute arose between Sam Woo and China Overseas as to what should be paid for *"extra over for toeing-in to bedrock"*.

What is Toeing-in?

End bearing piles require the bored pile shaft to be excavated through soil until bedrock is reached. The excavation through soil is normally carried out using a grab. Intermediate rock obstructions and any final lengths of the pile bore shaft to be formed in rock are excavated using a grab and chisel. The

toe of the pile is usually specified to be excavated some distance into the top of the bedrock – called the rock head - and this operation is known as toeing-in. The piles are normally toed-in to bedrock to the specified length using a Reverse Circulation Drill. In this subcontract, the rock head or the line of the top of bedrock was defined as, inter alia, Grade II to III or better rock with a continuous 5m rock core, and the Contract Drawings showed the bored piles had to be toed-in to such bedrock to a minimum depth of 1.50m (see **Figure 1**).

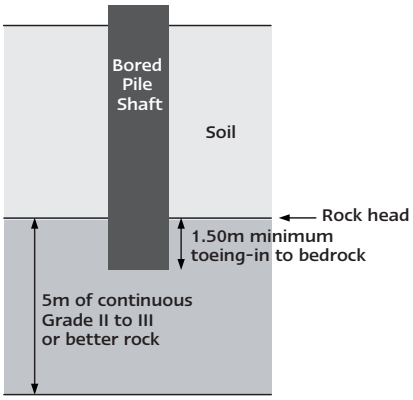

Figure 1: *Toeing-in to Bedrock*

The Standard Method of Measurement

Toeing-in to bedrock is slower and more expensive than excavating through soil and is, therefore, itemized in the *Standard Method of Measurement for Civil Engineering Works, 1992 Edition* (the SMM) as *"extra over for toeing-in to bedrock"*.

The SMM provides at paragraph *9.09(iii) (Units)* that each pile is measured as enumerated items for *"extra over for toeing-in to bedrock"*; i.e.

> *"9.09 The units of measurement shall be:*
>
> *(i) pile shafts, empty bores, extra over for permanent linings.....linear metre*
>
> *(ii) extra over for breaking out obstructions.....cubic metre*
>
> *(iii) extra over for enlarged bases, extra over toeing-in to bedrock.....number"*

The SMM provides at paragraph *9.14* that:

> *"Separate items shall be provided for cast-in-situ concrete piles in accordance with General Principles paragraphs 3 and 4 and the following:*

Group		*Feature*
I	*1*	*Pile shafts*
	2	*Empty boxes*
	3	*Extra over for breaking out obstructions*
	4	*Extra over for enlarged bases*
	5	***Extra over for toeing-in to bedrock***
	6	*Extra over for permanent linings of specified thickness*
IX	***1***	***Extra over for toeing-in not exceeding 0.50m in depth***
	2	***Extra over for toeing-in exceeding 0.50m but not exceeding 1.00m in depth and so on in steps of 0.50m*** *"*

Sam Woo Bored Pile Foundation Limited & China Overseas Foundations Engineering Limited (CACV 113/2006) is one such case that went all the way to the Hong Kong Court of Appeal but potentially raises more questions than it answers.

The General Principles at paragraphs 3 and 4 of the SMM provide that each feature required to comprise the Works must be provided for in the bills of quantities by its own discrete item.

Therefore, typical item descriptions for toeing-in to bedrock in the bills of quantities, measured as *"Number"* or *"nr"*, might be:

- Extra over 1500mm diameter vertical pile shaft for toeing-in to bedrock not exceeding 0.50m;
- Extra over 1500mm diameter vertical pile shaft for toeing-in to bedrock exceeding 0.50m but not exceeding 1.00m depth; and
- so on in steps of 0.50m.

The Case Facts

In the Sam Woo case, the priced bills of quantities included:

	Description	Qty	Unit	Rate HK$	Amount HK$
3	1500mm diameter vertical pile shaft & extra over 1500mm diameter vertical pile shaft for permanent steel lining of approved thickness.	1,968	M	9,900	19.48m
4	Extra over 1500mm diameter vertical pile shaft for toeing-in to bedrock, 1.50m in depth (min.).	48	Nr	36,000	1.73m

There were, therefore, some immediate departures from the SMM because the seperate items required by SMM paragraph 9.14 were not provided. Instead, the descriptions in the priced bills of quantities (i.e. *"1.50m in depth (min.)"*) specifically addressed the requirements on the Contract Drawings; i.e. the piles were shown on the Contract Drawings toed-in to the bedrock with a minimum depth of 1.50m.

The actual length of the toeing-in, as determined by the Engineer, exceeded 1.50m in almost every case, with some piles being toed-in to a depth of 11.0m. It is not clear from the judgment why the piles were excavated to a deeper depth.

However, it was presumably because Sam Woo had to excavate through stratified layers of rock to reach a depth with a 5m continuous core.

Both parties categorized all of the rock excavation as toeing-in. An alternative approach might have been to claim any such rock above the rock head as "*extra over for breaking out obstructions.*" This approach is consistent with the SMM that any rock above the rock head (that is, rock encountered above the bedrock as defined) should be measured and valued as obstructions.

What Sam Woo actually argued was that the subcontract was a re-measurement contract and any excess rock excavation beyond 1.50m would attract a pro-rata additional payment in steps of 0.50m for toeing-in. China Overseas, on the other hand, argued that the words *"1.50m in depth (min.)"* meant that the *"extra over toeing-in"* was fixed at HK$36,000 per pile regardless of the extent to which any relevant pile exceeded the minimum toeing-in length of 1.50m. In other words, China Overseas argued that Sam Woo took the risk of the toeing-in lengths being in excess of 1.50m and even to depths of 11.0m.

Sam Woo's case was that the description in the priced bills of quantities merely reflected Sam Woo's obligation to toe-in to bedrock to a minimum depth of 1.50m; i.e. if Sam Woo elected to excavate deeper to ensure that the correct founding depth was achieved then that was at its own risk but this risk did not extend to the Engineer instructing deeper depths.

Special Condition Clause 1(j) of the subcontract provided:

> *"j. All the quantities set out in the tender are approximate figures. The quantities of the finally completed works shall be actually re-measured from the drawings to calculate the price for the works in accordance with the unit rates set out in the tender. Regarding the method of measurement and the items included in the unit rates,* ***save expressly stated otherwise****, the calculation shall be in accordance with the method fixed by the provisions of the Hong Kong Government Standard Method of Measurement for Civil Engineering Works (1992 Edition) and its revised edition attached to the Original Contract ..."*

At this point it is worth noting that no reference is made in the judgment to paragraph 10 of the *Rules for Preparing Bills of Quantities (Part III)* of the SMM which provides that amendments to the SMM should be made in the Particular Preamble; i.e. if it was China Overseas' intention to vary the method of measurement for the toeing-in to bedrock to exclude measurement in excess of 1.50m, then arguably, clear words should have been included within the Particular Preamble to this effect.

Court of First Instance

Justice Reyes in the Court of First Instance (HCCT 76/1996) preferred China Overseas' interpretation of the words *"1.50m in depth (min)"*. His reasoning was as follows:

> *"Special Condition Clause 1(j) provided that quantities were to be re-measured to calculate the price for works in accordance with the unit rates set out in the bills of quantities as tendered by Sam Woo. The quantities stipulated in the bills of quantities were numbers ("nr") of piles. There was no change in the total number of piles excavated. Applying the unit rate of HK$36,000 per pile stated in the bills of quantities, Justice Reyes arrived at China Overseas' figure as the amount due to Sam Woo for extra over for toeing-in to bedrock, irrespective of the actual depth excavated."*

The SMM did not enter into the picture as far as Justice Reyes was concerned. By Special Condition Clause 1(j) the SMM applied *"save expressly stated otherwise"*. The bills of quantities which were prepared on the basis of a unit rate per pile of 1.5m in minimum depth (not length of pile) was in effect an express statement that SMM Item 9.14 (which concerns an amount payable per unit length) was not intended to apply.

Court of Appeal

The Court of Appeal (CACV 113/2006) supported Justice Reyes and also noted that there appeared to be some internal inconsistency between paragraph 9.09 (iii) and paragraph 9.14 (IX) of the SMM; one was looking at a unit of measurement by reference to *"number"* and the other by reference to *"linear metre"*. The Court added that the appropriate unit of measurement for *"extra over toeing-in"* in the priced bills of quantities was by number only. In the face of that clear provision, there was no scope for the application of paragraph 9.14 (IX), particularly as almost all its provisions appeared to be diametrically opposed to what the description in item 4 in the bills of quantities expressly provided. The Court held that it was plain that the bulk of the provisions of paragraph 9.14 (IX) could have no application.

Discussion

The first point to note in reading both cases is the apparent absence of expert evidence regarding measurement principles and how the SMM operates in such situations. Perhaps measurement experts were consulted by the legal teams but such evidence is not evident from either judgments which seem to be confused as regards the technical application of the SMM.

In this respect, paragraph 9.09 (iii) and paragraph 9.14 (IX) of the SMM are not, as the Court of Appeal found, "*diametrically opposed*". Piles are itemized and measured numerically in the SMM according to their depth of the toeing-in, in 0.50m increments. The SMM does not, as the Courts contend, concern an amount payable per length for toeing-in. The SMM actually provides for an amount payable on the basis of a unit rate per pile in 0.5m increments. Therefore, contrary to the Court of Appeals findings, the provision of paragraph 9.14(IX) could have application.

Furthermore, other rules in the SMM, such as the requirement to amend the bill of quantities in the Particular Preamble and the classification of rock as *"extra over for breaking out obstructions"* rather than *"toeing-in"* do not appear to have been considered.

The consequence is that both the judgment of the Court of First Instance and the Court of Appeal raise potentially more questions than answers.

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Forensic Scheduling Analysis – Recommended Practice or Protocol: What's the Difference?

By **Anthony Caletka** - *Managing Director, International Operations, Greyhawk*

The UK's Society of Construction Law's *'Delay and Disruption Protocol'* (SCL Protocol) was published in October 2002 and has been the source of considerable debate in the industry ever since. It has achieved judicial recognition in the recent case of *Mirant v Ove Arup*[1] and succeeded in raising awareness and prompting serious debate in the wider construction law community. This awareness has resulted in clearer contract conditions regarding float ownership, concurrent delay and the determination of compensation for prolongation.

Now the US organization, the Association for the Advancement of Cost Engineering International (the AACEI), has issued its own guide which deals with the same topics and issues as the SCL Protocol. The *Recommended Practice for Forensic Schedule* was described as a "how-to" manual on forensic schedule analysis when it was first launched. While the FSA addresses the same topics as the Protocol it is not written with the intention of reducing delay and disruption disputes, which is one of the stated objectives of the SCL Protocol. Rather, the FSA provides guidance on how one should carry out forensic delay analysis, something the SCL Protocol only addresses in passing *"if the recommendations for the Protocol are not followed"*. In that sense, the FSA is complementary to the SCL Protocol. There are recommendations that are however not reconcilable and will be seen as incompatible with the recommendations in the Protocol, particularly in respect of issues concerning float ownership[2] and compensation for non-critical delay.

The main objective of the SCL Protocol is to:

> *"... provide useful guidance on some of the common issues that arise on construction contracts, where one party wishes to recover from another 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[3]..."*

Regarding its use, the SCL Protocol states:

> *"... The protocol exists to provide guidance to all parties to the construction process when dealing with time delay matters. It recognises that transparency of information and methodology is central to both dispute prevention and dispute resolution."*

The FSA is of similar size and detail to the SCL Protocol but acknowledges that the SCL Protocol had a *"wider scope[4]"*. The FSA is primarily focused on the terminology and application of forensic analysis and is admittedly a much more technical document than the SCL Protocol. Specifically, the stated purpose of the AACEI's FSA is:

> *"to provide a unifying technical reference for the forensic application of critical path method (CPM) scheduling"*

and to

> *"reduce the degree of subjectivity involved in the current state of the art."*

Whereas the SCL Protocol provided guidance to contract administrator and forensic analysts alike, the FSA has an expressed emphasis on *"minimizing procedural subjectivity"* in forensic scheduling. The FSA focuses on the process of carrying out a quantifying delay analysis, using forensic techniques. The strengths and weaknesses of each approach are explained and would steer even the novice programming analyst towards the as-built methods of analysis.

According to the FSA, while both the Impacted As-Planned and Time Impact Analysis methods are the only methods recommended when asserting constructive acceleration, these are also the only two methods determined to be inappropriate for use when assessing *"Compensable Delay"* or *"Right to Early Compensable Delay"*. There are proponents of the SCL Protocol that would argue that point on its face value. However, in the US at least, it is recognized that the process is different when carrying out TIA prospectively, as opposed from a TIA that is carried out forensically.

The FSA describes each technique using *"taxonomy"* which relies on 5 layers of classification (Timing, Basic Methods, Specific Methods, Basic Implementation, and Specific Implementation). These are broken down into two primary branches of analysis, Observational, and Modelled, as set out in **Figure 1**[5].

The FSA provides both action steps and fundamental points which the analyst must consider when carrying out eight different approaches to forensic delay analysis. These are called *"Method Implementation Protocols"* (MIP) and are provided for five Observational Methods and three Modelled

Figure 1: *Classification of Delay Analysis Techniques*

Taxonomy	**1**	**RETROSPECTIVE**											
	2	**OBSERVATIONAL**						**MODELLED**					
	3	**Static Logic**			**Dynamic Logic**				**Additive**				**Subtractive**
	4	3.1 Gross	3.2 Periodic		Contemporaneous Updates (3.3 As-Is or 3.4 Split)		3.5 Modified/ Reconstructed Updates		3.6 Single Base[2]		3.7 Multi Base[1]		3.8 Single Simulation
	5		Fixed Periods	Variable Windows	All Periods	Grouped Periods	Fixed Periods	Variable Windows	Global Insertion	Stepped Insertion	Fixed Periods	Variable Windows or Grouped	Global Extraction	Stepped Extraction
Common Names		As-Planned vs As-Built.	Window Analysis.		Contemporaneous Period Analysis. Time Impact Analysis. Window	Contemporaneous Period Analysis. Time Impact Analysis. Window Analysis.	Contemporaneous Period Analysis. Time Impact Analysis.	Window Analysis. Time Impact Analysis.	Impacted As-Planned. What-If.	Time Impact Analysis. Impacted As-Planned.	Time Impact Analysis.	Window Analysis. Impacted As-Planned.	Collapsed As-Built.	Time Impact Analysis. Collapsed As-Built.

Methods. *"Observational"* methods are those which do not require the computer software to calculate a delay by *"hitting a button"*. Observational may sound like a passive term, but it entails in-depth analysis, evaluation, and comparison of CPM programmes and underlying data. Many of these methods rely on frequently updated programmes, or at a minimum, a base programme as well as a properly prepared as-built programme. *"Dynamic"* methods are those which rely on programming software to calculate, or simulate, certain scenarios using a fully linked Critical Path Method programmes which considers the additive effect of delays on a base model (as-planned) or the deductive effects of delays on an as-built model. In the Modelled methods, the analyst compares the same model in its *"before"* and *"after"* states to quantify the impact of culpable (Contractor Risk) events or entitling (Employer Risk) events. The FSA provides Method Implementation Protocols for the following approaches:

1. Observational/Static/Gross;
2. Observational/Static/Periodic;
3. Observational/Dynamic/As-Is;
4. Observational/Dynamic/Split;
5. Observational/Dynamic/Modified or Recreated;
6. Modelled/Additive/Single Base;
7. Modelled/Additive/Multiple Base; and
8. Modelled/Subtractive/Single Base.

The titles are actually quite intuitive and precise at the same time. For example, the *"Modelled/Additive/Single Base"*, despite sounding relatively scientific and a complex name, is better known as an Impacted As-Planned approach. Like the SCL Protocol, the FSA also provides guidance on the factors one should consider when choosing the most appropriate methodology, or methodologies, depending on the purpose of the analysis.

The FSA also provides MIP's for determining both concurrent delay and near-critical delay. These are all technically sound methods of carrying out programme analysis, however, while the bulk of the FSA is written in highly technical terms, targeted at competent programmers, it veers into contentious contractual/legal territory when it addresses the effect of concurrency, pacing, float ownership, early completion programmes and acceleration. These are relevant and fundamental to the purpose of any delay analysis. However, the FSA guidance is in direct contradiction to the SCL Protocol and UK case law regarding issues such as Float Ownership, the notion of dominant delay and a contractor's right to early completion. I will address these very briefly.

Float Ownership

The FSA states that:

> *"Project Float is the time between the last schedule activity on the baseline schedule and the contractual completion date ... in the absence of contrary language, project float is owned solely by the contractor."*

This interpretation of float ownership is not consistent with the SCL Protocol's recommendation that project float is a shared resource, to be detemined on a 'first-come, first-serve' basis in the absence of express provisions in the contract stating otherwise. The SCL Protocol does recognize that direct costs related to delays to non-critical activities may be compensable, but not time related costs typically quantified as 'prolongation'. The FSA approach is consistent with both the NEC2 and NEC3 form of contract which bases EOT and compensable delay upon the contractor's *"planned"* completion date, which may include a period of 'project float'.

Dominant Delay and Pacing

Pacing is an issue which has not hit the UK or Hong Kong shores as hard as it has in the US. Pacing is effectively a delay to a non-critical chain of events as a result of a conscious decision to *"pace progress against"* a pre-existing dominant delay. While Pacing is often argued by both owners and contractors, in an attempt to demonstrate their delay was not the dominant or controlling delay, pacing is often seen as simply another form of concurrent delay. Pacing is not treated as such by the FSA, which holds that when pacing is present, concurrently with a compensable delay, that the period in which the contractor was pacing could be treated as a compensable delay, as if there were no concurrent contractor delays in that period. This is consistent with those who successfully argue the dominant delay, or Devlin approach to concurrent delay. In order to demonstrate pacing however, the FSA requires proof of:

- The existence of a Parent Delay;
- The contemporaneous ability to resume normal Pace; and
- Evidence of contemporaneous intent to Pace.

Concurrency

The FSA recognizes that *"this is the most contentious technical subject in forensic schedule analysis"* and that the analysts appointed by both sides should *"agree on the theory employed in the identification and quantification of concurrency."* Such agreements are rare. The FSA recognizes several types of concurrency, but importantly, states that if the contract does not specify that concurrent delay can be a critical delay, then *"absent such contract definition, non-critical delays can be used to offset compensable delay on a day-for-day basis, after the expenditure of relative float against the critical path"*. Even the staunchest supporters of the Boot-Malmaison approach would have a hard time finding favour with Tribunals in attempting to argue this definition of concurrent delay. In the UK the most acceptable and salient definition of concurrent delay I've come across is *"a period of project over-run which is caused by two or more effective causes of delay which are of equal causative potency."* [6]

Due to the difficulty, and rarity, of demonstrating two events of *"equal causative potency"* the Technical Construction Court (TCC) has tended to award time based on the dominant delay, identified by one or both of the parties' programming experts, or by apportioning delay along the critical path, as in the recent case of *City Inn v Shepherd Construction (2007)*. The underlying principle is simply;

> *"... concurrent delay theory is that neither the employer nor the contractor can recover damages from one another when they contribute to the delay ..."*

While the TCC has historically applied a good dose of common sense to its awards for time and money, many feel that concurrent delay is still a topic that has not been sufficiently dealt with to date. For further information see *Delay Analysis in Construction Contracts, Wiley/Blackwell 2009*, or contact the author directly.

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Footnotes:

1 See Mirant [2007] EWHC 918 (TCC)
2 The FSA defines network float as a shared resource, with project float being owned solely by the Contractor.
3 *Society of Construction Law Delay and Disruption Protocol*, page 3 - *Introduction*.
4 AACEI RP-FSA 29R-03, footnote/acknowledgement, page 9.
5 Ibid, page 11 of 105.
6 *Concurrent Delay*, John Marrin QC, February 2002. A paper given at a meeting of the Society of Construction Law on February 5th 2002.

Quantifying Acceleration Costs

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Introduction

Accelerating construction work can be performed in one of two ways – either critical work activities are performed more quickly and/or construction sequences must be changed to permit concurrent working of critical activities (i.e. compression). The quantification of those acceleration measures is part art, part science and must be treated as both a project specific and situation specific quantification exercise. However, quantifying acceleration costs is not as straightforward as quantifying prolongation loss and expense, since acceleration brings with it losses in productivity and which can be a far more difficult issue to quantify.

Contractors can either be expressly instructed to undertake acceleration measures in order to reduce or extinguish excusable delay, or, more usually, are forced into taking measures in order to avoid the imposition of liquidated damages in the absence of extensions of time having been granted in a timely manner.

Albeit Architects and Engineers should normally grant extensions of time when that time becomes due, the tendency, more often, is for extensions of time not to be granted in a timely manner and for the Contractor then to be faced with the threat of liquidated damages being levied for what is perceived to be late completion. In such situations the Contractor is effectively forced into implementing acceleration measures in order to avoid liquidated damages.

Irrespective of how the need for acceleration comes about, the quantification of acceleration costs is not necessarily an easy matter to resolve and can provide significant challenges as regards how the amounts are eventually determined, if the quantification exercise is to be carried out accurately.

What Costs?

Acceleration costs are the costs associated with executing the outstanding contract works within a shorter time period than that originally planned. In order to justify reimbursement of the additional costs involved, a Contractor must prove that it has incurred additional costs as a direct result of the acceleration efforts undertaken. In reality, however, that quantification process can be complex and a failure to satisfactorily prove the costs incurred might lead to the failure of what might otherwise be a valid acceleration claim.

Changed Methods of Working

A Contractor may incur additional costs for acceleration in respect of changing the method of working, where the change is capable of bringing savings to on-site activity durations. For example, revising in-situ concrete components to pre-cast concrete components is likely to significantly reduce on-site activity durations and can have the added benefit of freeing-up areas of the site for other trades in the absence of falsework and formwork being present. However, what may on the face of it represent a simple change in construction method may, from a cost perspective, have a far more wide ranging effect such as the need for additional design work together with the additional logistical costs in re-sequencing, transportation, craneage and providing revised access provisions which might then impact on the timing, durations and sequences of adjacent works. The costs associated with what at first might appear to be simple changes to methods of working can therefore be far greater than merely the net additional cost of the changed material or construction method itself.

Extended Working Hours

Extended working for labour and plant resources can be an effective way of accelerating the completion of an activity, since increasing the resource hours that are needed into a condensed period should have the effect of completing that activity sooner than would otherwise have been the case.

Overtime working and weekend working can come at a significant premium cost. However, given the reductions in productivity associated with extended hour working, the loss in efficiency caused by continued declines in productivity associated with continued extended working arrangements is an added cost factor over and above the enhanced overtime working premium. The inefficiency factor should not be overlooked and will likely contribute to further significant costs involved in extended hour working.

Increasing Resources

Increasing resources, and not just labour resources but plant and temporary works materials, can be a further effective method of accelerating works, thus permitting concurrent working on numerous work-fronts and permitting the overlapping of work activities. As with overtime working, the increasing of resources into a condensed period should have the effect of completing that work sooner, however, quantifying the costs associated with the increasing of resources can be extremely difficult. Factors such as the loss of production due to the deployment of non-optimised resource numbers, the dilution of supervision, trade stacking and re-sequencing must also be taken into consideration. The fact that a Contractor's accounting and project records do not automatically isolate the costs associated with productivity losses separately, means that those costs have to be somehow isolated and quantified as part of the acceleration cause and effect analysis. The costs associated with the increasing of resources should therefore be viewed, once again, as being more complex than a simple summation of the direct costs associated with the provision of those additional resources.

Expediting Material and Equipment Deliveries

Performing on site activities more quickly and/or undertaking the working of critical activities concurrently can only be performed successfully if the materials and equipment are physically on site when they are needed. Any change in the sequence of site installation may dictate the need for expediting material and equipment deliveries to site, and this might be viewed as a relatively simple cost to quantify, constituting nothing more than the extra-over cost of air freight charges.

However, expediting material and equipment deliveries needs to be viewed in a much wider context from a cost perspective and should take into account matters such as:

- the inflationary impacts of procuring materials and equipment at an earlier point in time;
- additional temporary storage facilitates either on or off site;
- double handling equipment and materials to and from temporary storage including additional temporary protection measures;
- additional insurance protection for goods brought into site storage earlier or stored off site;

- knock-on effects on adjacent trades for working in and around stored plant and materials on congested sites; and
- reductions in productivity outputs associated with fit out trades, for example, completing works out of sequence once E&M materials and equipment have, themselves, been installed out of sequence.

Reductions in Productivity

When construction activities are accelerated, the pace with which work is performed is effectively speeded up in an attempt to decrease the amount of time needed to complete the project. This process of speeding up the pace of work brings with it inefficiencies that must be taken into account as part of any quantum assessment. Arguably, the reductions associated with labour and plant productivity are the greatest single head of cost due to accelerated working and is also the most difficult to quantify with any degree of certainty.

In the preparation of a tender, a Contractor will attempt to establish the optimum levels of both resource numbers and productivity levels needed to build the project as economically as possible and in the time available. However, from a client's perspective, there is usually scepticism directed at both the tender baseline resource levels and the planned productivity outputs, such that the accuracy of the tender assumptions as a baseline are called into question as to their reasonableness for use as a baseline. Without an agreed baseline, the effects of accelerated working on labour and plant productivity becomes an even more difficult exercise to quantify, let alone agree. The establishment of a realistic fully particularised baseline is therefore the starting point for any acceleration quantum assessment associated with productivity and the quantification of acceleration costs can be made all the more easier if this baseline is agreed as early as possible.

From an as-built perspective, the as-built records concerning which resources were doing what, where and when, are vital if the quantum exercise is to be performed with any degree of accuracy. Whether it is quantifying the reduction in productivity associated with overtime worked for E&M trades, for example, or quantifying the inefficiencies associated with having increased the number of steel fixers on site, the accuracy of detailed as-built site records cannot be over emphasised. The same can be said in respect of cost records. Quantifying the cost of acceleration becomes all the more easier if the method of documenting, recording and storing those costs is capable of identifying, separately, actual labour, material and plant utilisation levels for the acceleration measures as implemented. A comprehensive and detailed record system is therefore essential if a Contractor is to maximise his recovery of the costs incurred, particularly given that quantum negotiations may be carried out months or even years after the accelerated works were actually carried out and when the management and supervisory resources may have left the project for other work.

Albeit those losses in productivity can be quantified using a variety of methods, including the measured mile analysis, industry standards, total cost or modified total cost approach, the common denominator for the quantification process is a consistent and comprehensive resource and cost record system, since the Contractor must be able to demonstrate the difference in cost before and after the acceleration was implemented.

Summary

Arguments as to a Contractor's right to extensions of time are commonplace on construction contracts. However, where a Contractor is able to demonstrate that costs from a compensable event, which, but for the acceleration measures implemented, would have caused excusable delay, then the Contractor should be entitled to additional payment for the additional costs incurred in accelerating.

The above examples merely go to show that the quantification of those acceleration measures could extend considerably further than one might initially have thought, albeit the burden of proof in respect of quantum is on the Contractor in any event to demonstrate, that as a result of the acceleration, he has suffered quantifiable loss.

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Books

Construction Delay Claims

By Barry B Bramble and Michael T Callahan

One prominent Hong Kong lawyer recently described *Construction Delay Claims* as the American equivalent of Kieth Pickavance's *Delay and Disruption in Construction Contracts*, and as the title suggests, this book, which is now in its 3rd Edition, focuses on matters concerned with delay. Updated on a periodic basis with supplements (currently the 2009 Cumulative Supplement extends to over 450 pages) the book keeps abreast of important changes, providing comprehensive coverage of delay issues.

Within the 16 chapters, the authors explain, in detail, the different types of delays, how delays occur and the effects of such delays. The book also discusses disruption and lost productivity, acceleration, analysis of claims, concurrent delays, and the use of schedules to prove claims, to name but a few of the topics.

This book is written *"for everyone involved with delay and impact construction claims"*. With the authors being US-based, there is definitely an American view of developments in delay claims and this provides a useful reference as regards issues further developed by American Law, such as 'pacing delays', than our own. However, the matters covered in the book are by no means limited to American developments in delay and include recent advancements in English Law such as the 'Malmaison approach' to apportioning concurrent delays, thus making it relevant to all. To this end, many of the subjects addressed in the book will be familiar to those in Hong Kong and are relevant to day-to-day issues concerning both delay and time.

In summary, this book is an excellent, readable reference source, which provides a deep analysis into various areas of both delay and time, and is thoroughly useful in assisting in the formulation, understanding and presentation of construction claims.

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ADR | Analysis

Interpretation of Contracts

Courts sometimes are required to determine how a Statute or Ordinance should be enforced and this often requires the use of statutory construction. These rules of construction can equally apply to tribunals dealing with matters of construction of construction contracts. In this *ADR Analysis* two such rules of statutory construction are examined - the Literal Rule and the Golden Rule.

The Literal Rule

The Literal Rule is a type of statutory construction which determines that unless a term is explicitly defined otherwise, statutes are to be interpreted using the plain ordinary and literal meaning of the language used. The rule stipulates that if the words are clear, they must be applied, even though the intention of the drafter may have been different or the result of the interpretation is harsh or undesirable.

To this end, in order to avoid ambiguity, Statutes (and contracts) often include a "definitions" section which defines the most important terms used. However, some Statutes and contracts fail to include a definitions section, or omit to define a particular term. When this is the case, and faced with a dispute that turns on the meaning of an undefined term, the Literal Rule is used by the Courts as a guide to construction.

The Golden Rule

Notwithstanding the above, if applying the Statute's plain meaning will lead to an absurd result, Courts will normally impose a limit on this rule; this is referred to as the Golden Rule. If a word has more than one meaning, the Golden Rule allows the tribunal to choose its preferred meaning. However, this rule is applied most frequently in a narrow sense where there is some ambiguity or absurdity in the words themselves.

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Annual Cocktails at The China Club, 4th June 2009

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Forthcoming Events 2009

2 Sep	*British Chamber of Commerce breakfast briefing - "Managing Innovation – Meeting 21st Century Challenge", The Hong Kong Club*
3 Sep	*Chartered Institute of Arbitrators (East Asia Branch) - 4th Winnie Whittaker Memorial Lecture presented by Andrzej Cierpicki, The Hong Kong Club*
8 Sep	*Hong Kong Institute of Surveyors – Civil Justice Reform and Case Law Update, Gilbert Kwok, Yeung Man Sing*
9-10 Sep	*Hong Kong International Arbitration Centre MIP / Asia Law 6th Annual Asia-Pacific IP Forum 2009, Sheraton Hotel*
15 Sep	*Hong Kong International Arbitration Centre - ADR in Asia Conference 2009, Four Seasons Hotel*
13 Oct	*Chartered Institute of Arbitrators (East Asia Branch) - Talk on "The Role of Media Relations in ADR" presented by Richard Barton*
22 Oct	*Chartered Institute of Arbitrators (East Asia Branch) - Talk on "Future Trends and Innovations in Dispute Resolution" presented by Nicholas Longley*

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