



Measuring loss of productivity: A dark art?

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AT THE RISK OF STRAYING INTO HOGWARTIAN MYTH, of all the mysterious arts allegedly practiced by claims consultants, those dark wizards of contractual and commercial affairs, none can have caused as much controversy, consternation and debate amongst the various contracting parties in our industry over the decades as the, now infamous, disruption claim.

“It is a maxim of cryptology that what one man can devise, another can unravel. This principle keeps armies of tax lawyers and accountants employed, but adds nothing to our national productivity.”

So said the late chairman of Citicorp, Walter Bigelow Wriston. Unfortunately the principle can just as easily apply to the murky world of productivity disruption. The law in relation to contractual damages demands high standards of proof in order to establish such loss claims. The complexity of construction, engineering and technology claims is such that demonstrating and measuring productivity loss typically requires us indeed to unravel and disentangle a farrago of events, matters and effects.

Disruption has become an over-used and somewhat inaccurate byword for loss of productivity. Depending upon your standpoint, claims for loss of productivity can sometimes be regarded as a panacea for the ills of a project or an over inflated and often crude attempt by an unscrupulous contractor to claim additional monies to which it is not rightfully entitled, more often than not so as to compensate for deficiencies either in its own tender or in its performance of the contract. Both perceptions are invariably wrong and, as usual, the true reasoning behind the development of this line of claim lies somewhere in between.

Loss of productivity claims fall within the wider ambit of what have become generically known in construction as loss and/or expense claims. The legal basis for these claims has been, more or less, established as equivalent to damages for breach of contract¹. Most of the standard forms tend to have two things in common in their approach to dealing with contractor’s claims for additional monies:

They require, and more often than not make it a condition precedent to entitlement, that prompt notice is given if a claim entitlement arises (in other words if any of the events occur and loss is suffered).

They stipulate that contemporaneous records must be kept to assist in evaluating any entitlement.

The failure rate in loss of productivity claims is spectacularly high. There is a very simple reason for this. The burden and standard of proof require record keeping of a quality that is significantly higher than all but the largest and most sophisticated projects can muster. Contracting organisations very often hate to hear this and refuse to acknowledge the problem. Roy Pickavance, in his paper² on the *SCL Delay and Disruption Protocol*, highlighted this problem succinctly when commenting on a client’s negative response after he had implemented record keeping and progress tracking systems for them on a complex M&E project:

“I was once faced with the comment at the end of the job: ‘What a waste of time and cost – we finished the job on time and there was no dispute’.”

Talk about missing the point! This failure to properly implement measuring and recording systems has been the catalyst for the imprecise presentation of the fabled global claim, which has spawned a whole raft of additional caselaw on both sides of the Atlantic, focusing on the thorny nexus of cause and effect. The current uncertainty caused recently by the apparently conflicting decisions in *Petromec Inc v Petroleo Brasileiro SA* (2007) EWHC 1589 (Comm) and *London Underground Ltd v Citylink Telecommunications Ltd* (2007) EWHC 1749 (TCC) has done nothing to quell the controversy over the applicability of global claims. It seems obvious that the best way of avoiding the dilemma is to ensure that the project has efficient and well organised systems for production data capture and systematic analysis so that, should it become necessary, you can establish the causes of lost productivity and the direct and indirect effects in as much detail and probity as possible.

Employers’ professional teams all too often hide behind the cloak of evidential shortfalls and lack of records as an excuse for evading liability. Ironically, the technical complexity of projects these days is such that for each productive resource on a project there could be an equally unproductive ‘time and motion’ man tagging along recording the minutiae of the working day.

The simple truth is that the proper recording, capturing and analysis of production data and its use in establishing the nexus is a task which requires a full appreciation of the use to which those records will ultimately be put.

Like any other form of forensic investigation, it requires an inquisitive nature, an enquiring mind (and a thick skin), an understanding of the technical complexities of the project, appreciation of the potential effects on production of interruptions, hindrances and delays, an ability to see the bigger picture and understand how disruption to one activity or workforce can impact on other areas of the project and the job as a whole. How many projects have we encountered, for example, where the sheer volume of changes and the relentless drip feeding of design changes have led to a collapse in morale?

I recall my own father, a carpenter in his time, whilst working on a new stand in one of the finest stadiums in the old first division, complaining bitterly that despite asking the section engineer whether all the services were completed in a particular bulkhead area before he closed it in, ended up dismantling and re-erecting the bulkhead five times because of subsequent changes. After the third change he refused to do it again unless he was paid on daywork... I can't say I blame him! His subsequent perception was that the project was out of control and being run by headless chickens who 'didn't know what they were at'. Right or wrong, his opinion was not radically different from the other 200-300 tradesman on that job. It doesn't take a genius to visualise how that would affect production.

At MBM, when we encounter a shortfall in evidential records (which, frankly, is more often than not!), we have always advocated optimising the use of the available evidence and particularising the disruption to the fullest extent possible; a semi-global approach. Whilst by no means certain to succeed, this approach has been given some tacit judicial approval in the Scottish case *Laing Management (Scotland) v John Doyle Construction Ltd* (2004) BLR 295 which was approved in *London Underground v Citylink*. The key words of the judgment are:

"The global claim may fail, but there may be in the evidence a sufficient basis to find causal connections between individual losses and individual events, or to make a rational apportionment of part of the global loss to the causative events for which the defender has been held responsible."

The extent to which particularisation of a claim and establishment of the nexus of cause and effect can be achieved will be largely dependant upon the extent to which we can measure loss of productivity — the shortfall between the productive output which was actually achieved and the output which would have been achieved but for the occurrence of the events which are the risk of the employer.

The traditional contractor's approach tends to be to assume that the output which would have been achieved is that upon which the contract price is based. Employer's professionals are often quite right in criticising this approach as little more than a glib formula: cost – recovery = loss.

This has been discredited so often in money claims that it is now an anathema. In order to defeat such an argument, the respondent merely needs to show the occurrence of one of the multitude of the claimant's culpable losses which are so often subsumed in such inarticulate calculations; errors in computation or rates, incorrect labour or plant constants, inability to procure productive resources, failure to properly resource the project et al.

We were involved in the preparation of a loss of productivity analysis on a road project in Ireland some years back, which relied predominantly on site diaries for evidence of causation and effect. The diaries were day-a-page. On one day, the first entry was something like:

"RE issued revised drawings and bending schedules for steel reinforcement to structure 12. This will cause delay and disruption as steel requires procurement of 2-3 weeks, current steel stock redundant."

The improved accuracy might also cure us of our propensity to entrenchment; drawing battle lines and turning what ought to be an exercise in measurement into a war of attrition.

All very well, perfectly obvious that the labour involved in that operation would be disrupted. However, further down the page another entry read:

"Carpentry crew for structure 9 failed to show up – no production achieved..."

...as they might say in Ireland, *sín-é!*³ Bang goes any prospect of proving a productivity loss from the former event unless you can disentangle the effects from that of the latter or show that it was the dominant event.

Even allowing for the latitude which may have been created by *Laing v Doyle*, the measurement of productivity loss still requires a high degree of accurate record keeping. If a contractor can implement an efficient productivity data capture system at project commencement and use this to monitor and record deviations from the norm then, provided the data capture system can provide sufficient detail to directly link productivity losses to specific events, this is by far the most cogent method of measuring productivity loss —

although it falls short in relation to the assessment of indirect effects on productivity, the intangible effects of excessive overtime, trade stacking, multiple workfaces, fatigue and morale.

Various authorities including the Society of Construction Law recommend the measured mile method of measuring productivity in relation to loss claims where there is no detailed data capture system. This is best used where the work concerned is of a repetitive or consistent nature and when a project can be shown to have a clearly defined unimpacted portion which can be used to set the benchmark for unaffected work. Affected work is then assessed and compared with the benchmark unaffected work to derive a measurement of lost production. To some extent, this method still has its difficulties. The claimant will still need to show that the events which caused the period of disruption were employer's risk events and that no other culpable losses were incurred concurrent with the affected work. However, absent detailed productivity records, the method affords the best chance of a contractor establishing a case for recovery of productivity loss.

In the US, there has been judicial approval⁴ of the use of empirical industry-wide data (usually coupled with expert witness testimony) as a method of establishing the benchmark for unaffected work. This has yet to be given any real credence amongst the judiciary in the UK, but nevertheless has some merit. We have utilised industry-wide data where it is available⁵, however it is notable that the UK construction industry has little in the way of established statistical data relating to lost production on construction projects. Back in the post-war construction period, many of the larger contracting organisations and nationalised industries employed work study techniques to monitor productivity and provide statistical feedback for estimating purposes. This also provided useful evidence for the causes of inefficient productivity. Perhaps it is time to consider adopting and adapting the older practiced management techniques of work study into the construction environment again. Perhaps there are still contractors undertaking such analyses... if there are, they seem to be keeping it to themselves!

A technique which has gained recent popularity is a variation on the total cost or global claim approach which is, in effect, another version of the semi-global claim. Known as a top-down method of assessment, this starts with the total differential between hours expended and hours recovered, then subtracts

as many discrete events and their corresponding effects as can be properly evidenced, whether those events are employer's risk events or contractor's risk events. The balance is then attributed to generic causes of disruption where this can be shown, with reasonable probability, to have occurred. This method is akin to the delay analysis technique known as collapsed-as-built and affords a reasonable prospect of success provided, again, that the project records are of sufficient quality to collapse out the bulk of the losses.

The ECC/NEC contractual arrangements which have gained popularity in recent years, clearly advocate systematic record keeping and data capture as the correct method for determining the impact of compensation events and indeed promote a strong ethos of early determination to avoid such events accumulating into a dispute. This of itself compels the careful and methodical recording of production information.

Given my own limitations on the IT front, I hesitate to mention, in conclusion, that in this modern age of information technology, we are yet to

see the widespread use of handheld or palmtop technology for the purposes of collating and disseminating production information into a usable format. There must be scope for the introduction of such technology across the board. The improved accuracy that such systems would bring might also cure us of our propensity to entrenchment; drawing battle lines and turning what ought to be an exercise in measurement into a war of attrition.

Ultimately Max Abrahamson's acclaimed (and often paraphrased) quotation holds true. It is all about records⁶. At the risk of becoming cliché ridden, the problem very often is that it is not about the quantity but about the quality. In order to produce records of sufficient quality, one needs to understand fully the underlying principles of evidence and how to ensure that your records meet those principles. Aristotle, as usual, summed up the problem succinctly:

"Quality is not an act... it is a habit."

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¹ *Alfred McAlpine Homes North Ltd v Property and Land Contractors Ltd* (1995) 76 BLR 59

² *A Review of the Society of Construction Law Delay and Disruption Protocol*, Roy Pickavance 2002, p3

³ Irish Gaelic: 'That's it!'

⁴ For example, *Hensel Phelps Construction Co v General Services dmin* (2001) WL 43961 GSBGA 01-1BCA

⁵ The most popular example of such statistical analysis is *The Effects of Accelerated Working, Delays and Disruption on Labour Productivity*, Horner RMW and Talhouni BT, (1995), Chartered Institute of Building

⁶ "A party to a dispute, particularly if there is an arbitration will learn three lessons (often too late) the importance of records, the importance of records and the importance of records." Max Abrahamson, *Engineering Law and the ICE Contracts*