

# CONSTRUCTION LAW LETTER

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SPECIAL  
ISSUE

## CONSTRUCTION DELAY CLAIMS



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### ONTARIO'S NEW TRAJECTORY IN THE LAW OF NOTICE FOR DELAY CLAIMS

Since *Corpex (1977) Inc. v. Canada*, proving prejudice from a contractor's delay in issuing a notice of claim has never been an explicit requirement. But until *Ross-Clair v. Canada (Attorney General)*, prejudice did tend to inform and underpin the analysis.

This article briefly reviews three recent Ontario cases in the area of notice law, concludes that the Ontario courts are now moving in the direction of a stricter regime with respect to notice, and suggests that the Ontario courts may be at risk of embarking down a path that is both inequitable and inconsistent with other Canadian jurisdictions.

#### **Prejudice Underpinned *Corpex* and *Doyle***

The seminal case in Canadian jurisprudence on notice in delay claims is *Corpex (1977) Inc. v. Canada*. There, the contract required that notice of a claim be given within 30 days of the delay event, but the contractor did not give notice until some time after the project had been completed, well outside the 30-day window allowed for in the contract. Although the Supreme Court of Canada did not expressly state that prejudice to the owner was required to enforce the clause and bar the claim, two of the state-

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ments from the decision, set out below, make it clear that the Court's belief that the owner had been prejudiced by the delay formed an important part of the rationale of the decision:

In the case at bar, the Contractor knew the actual conditions of the soil in May 1968, but he did not inform the Owner. The latter could accordingly assume that no claim would be made against her in this regard.

and

... once the work is complete, a contractor cannot claim in a court of law benefits similar to those which clause 12 would have guaranteed if he has not himself observed that clause and given the notice for which the clause provides. Otherwise, he would be depriving the owner of the benefits which he is guaranteed by [the contract].

Next in the line of significant cases in this area is *Doyle Construction Co. v. Carling O'Keefe Breweries of Canada Ltd.*

The fact pattern in *Doyle* was much the same as in *Corpex* — the contract required notice within a “reasonable time” and the court found that the contractor's notice was not reasonable. The rationale underlying the denial of the contractor's claim was similar to that of *Corpex*: failure to provide “sufficiently timely notice” deprived the owner of the opportunity to mitigate costs claimed.

### The Modern Ontario Trend: *Technicore, Ross-Clair, Ledore, and Clearway*

The modern period in Ontario's notice jurisprudence started in 2012 with *Technicore Underground Inc. v. Toronto (City)*. As with *Corpex*, the contract at issue required notice to be given within 30 days and, as with *Corpex*, the actual notice was not given until significantly after that period.

Justice Gillese directly addressed the question of prejudice: “*I begin by considering Corpex. Does it stipulate that prejudice must be proven in order for an owner to rely on a notice provision? No, it does not*”. But as discussed above, although the *Corpex* decision did not require prejudice, that decision was inexorably linked to the Court's belief that there was prejudice.

Justice Gillese went on to write, “... had *Clearway* given proper notice in this case, the City could have chosen whether to permit *Clearway* to continue with the work occasioned by the flood and, if so, it could have instituted cost control mechanisms”. In other words: just as with *Corpex* and *Doyle*, cases cited for the proposition that prejudice was apparent but not

required, prejudice was presumed in *Technicore* because the degree of lateness of notice prevented the City from mitigating its damages. Justice Gillese concluded:

Accordingly, there was no onus on the City to lead evidence of prejudice. As owner, the City is assumed to have been prejudiced by a multimillion dollar claim being made years after the Contract permitted and long after the City could consider its position and take steps to protect its financial interests.

Restated: The City did not have to prove prejudice, but the prejudice was so apparent it could be “assumed”.

Spring-boarding off of *Technicore*, *Ross-Clair* angled the law of notice onto a new trajectory. In the decades between *Corpex* and *Ross-Clair*, notice provisions had become more complicated. Rather than a requirement to provide notice within 30 days or a reasonable time as in *Corpex* and *Doyle*, the contract in *Ross-Clair* contained a two-stage notification process: first, a ten-day period to provide initial notice; and second, a requirement for the contractor to give another notice within 30 days of the Certificate of Final Completion providing a “*sufficient description of the facts and circumstances of the occurrence that is the subject of the claim to enable the Engineer to determine whether or not the claim is justified*”.

The contractor in *Ross-Clair* provided the first stage notice within the ten-day window. The contractor also provided a second stage notice, and well within the allotted time. However, although the notice provided detail, it was not supported by any backup documentation and the Engineer rejected the submission on that basis. Two years after its first submission, but still prior to the expiration of the contractual notice window, the contractor submitted another package, which the Engineer again dismissed as having insufficient information to allow for a determination as to whether the claim was justified. The contractor then made a third submission, likely sufficient to

allow the Engineer to evaluate the claim, but not until almost 16 months after the Certificate of Final Completion, well outside of the permissible period for the second stage notice. As the contractor did not make a compliant second stage notice until after the time limit for that notice had expired, its claim was dismissed.

Unlike in previous cases, where courts had cause to worry about the contractor “ambushing” the owner with a claim long after the owner’s ability to mitigate the damages had passed, here the owner had notice within ten days of the delay event that the contractor was going to make a claim and two timely submissions after that explaining in more detail what the claim was about. This was not lost on Justice Epstein, who dismissed the contractor’s claim “*even taking into consideration the application judge’s implicit finding that the Engineer was intimately familiar with the Project*”. In other words, the court seems to have believed that there likely was *no* prejudice, but still dismissed the contractor’s \$1,437,976 claim due to the fact that it was not until its third submission (fourth overall) that the contractor met the subjective standard of “sufficiency” under the contract.

The more recent *Ledore Investments Ltd. (Ross Steel Fabricators & Contractors) v. Ellis-Don Construction Ltd.*, similarly overlooked the rationale underlying the law of timely notices in favour of a hair-splitting approach. In *Ledore*, the general contractor provided notice to its subcontractor of its intention to claim within the contractual period, but the arbitrator and Ontario Court of Appeal barred the claim because it was merely a “written notice of claim” and did not meet the higher standard of a “claim made in writing”. There is no discussion in any of the trial or appellate court decisions as to whether any negative consequences had accrued to the subcontractor from this fine distinction or, in terms of *Doyle*, whether the insufficiency of the notice had pre-

vented the other party from taking “guarding measures”.

In both *Ross-Clair* and *Ledore*, the contractor was deprived of compensation that could have been valid but for a dance by angels on the head of a pin, while the other party was given a windfall.

The more recent decision, *Clearway Construction Inc. v. Toronto (City)*, provides some hope that the sharp edges of *Technicore*, *Ross-Clair* and *Ledore* may be blunted over time. In *Clearway*, Justice Sanfilippo had occasion to consider on summary judgment, the same notice provision that Justice Allen had considered in *Technicore*, but concluded that in *Clearway*, there was a triable issue as to whether the City’s pattern of issuing change directives and change orders notwithstanding the contractor’s lack of strict compliance with the notice provisions of the contract, varied the terms of the contract by conduct.

If Ontario stays the course it seemed to be on prior to *Clearway*, the deviation from other jurisdictions, such as Alberta, will be significant. For example, in the 2003 Alberta Queen’s Bench decision *Banister Pipeline Construction Co. v. TransCanada Pipelines Ltd.*, the court allowed the contractor’s claim where the owner was “*always aware*” of the basis of the contractor’s claim and held that it would be “*unconscionable*” to dismiss the contractor’s claim as a result of a technical non-compliance with the contract.

Alberta’s approach in *Banister*, which considers prejudice to the recipient of technically defective notice, is both fairer and more in line with long standing precedent and the reasonable expectations of parties than the approach adopted in *Ross-Clair* and *Ledore*. The essential commercial justification underlying a notice provision is that it allows the other party the opportunity to consider mitigation measures and to implement them if so desired, as explained decades ago in *Corpex* and *Doyle*. Where the other party is “*always aware*” of the ba-

sis for the contractor’s claim and of its intention to claim, that party cannot reasonably complain that it was denied the ability to mitigate. While prejudice to the recipient from late compliance with a contractual notice requirement might reasonably be presumed, it should be open to the claimant to rebut such presumption, especially in the modern era of increasingly complex and onerous notice requirements.



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## **CONCURRENT DELAYS AS A DEFENCE**

The term “concurrent delay” is frequently raised as a defence to a claim for additional time and delay damages. It is a contentious subject because there is no universal definition of concurrent delay, no established method for determining concurrent delay, and little guidance on the assessment of damages. In this article, I examine some of the controversial issues and difficulties faced by the courts regarding concurrent delays.

Concurrent delays are typically contended by an owner as a defence to a contractor’s claim for additional time and related damages. Owners argue that either the delay was caused by non-excusable events (*i.e.*, events that would not entitle the contractor to either additional time or additional money), or there were concurrent delays caused by non-excusable events and/or non-compensable events (*i.e.*, events for which the contractor would receive additional time but no additional money). The first is a complete defence to the contractor’s claim for time and money. The second is a partial defence to defeat or diminish the claim for damages.

Canadian courts are said to apportion damages in instances of concurrent delays. However, there can

be confusion over the meaning of “apportion”. *Foundation Co. of Canada v. United Grain Growers Ltd.* illustrates how courts handle situations in which multiple delays are alleged. In this case, there had been a delay of four months to substantial performance. Each party argued that different events caused the delay. In his ruling, Justice Brenner posed the following questions:

1. Were any one or more of the alleged acts or omissions of [the defendants, United Grain Growers or Choukalos Woodburn] an effective cause of the delay to the progress of the work?
2. If the answer is yes, was that work on the critical path such that that delay caused loss or damage in the forms asserted by [the plaintiffs, Foundation Company and Cross-town Metal]?
3. If the answer to 1 & 2 is yes, were there any concurrent delays not caused by the defendants?
4. If there were any such concurrent delays, is that a complete defence to the plaintiffs’ delay claims or is it appropriate to apportion fault amongst the parties?

The judge found that the defendants were responsible for three months of the delay, and that one of the plaintiffs, Foundation Company, was responsible for one month of the delay. He set the damages at 75 per cent and 25 per cent, respectively. This is a form of apportionment. The court segregated the delays to determine which ones impacted substantial performance. The judge concluded that there were other concurrent delays but did not apportion damages to account for them.

With regard to the second defence of concurrent delays, there is unfortunately little guidance from the courts on how they define and identify concurrent delays, and how they assess damages where they are found.

## **Definitions of Concurrent Delays**

Two construction industry bodies outside of Canada provide definitions of concurrent delays. The Society of Construction Law provides one definition in its Delay and Disruption Protocol, which is influenced by the English law “prevention principle” and decisions of the English courts. The AACE International’s Recommended Practice on Cost Engineering Terminology provides five definitions, which reflect some of the differing opinions on the subject.

While these publications do not provide precisely the same definitions, they share common themes:

- concurrent delays are two or more delays that occur at the same time caused by different events;
- the delays need not start and finish exactly together, but must overlap in order to be concurrent;
- it is the timing of the delays that is important and not when the events occurred; and
- delays must have had the ability to affect the critical path/completion in the absence of the other delays.

## **Identifying Concurrent Delays**

Establishing the existence of a concurrent delay is another challenge for the parties and the court. A concurrent delay argument is about causation of the loss. The Supreme Court of Canada in the non-construction case of *Resurfice Corp. v. Hanke* reaffirmed the “but for” test as the basic test for determining the loss caused by a particular event.

In the context of concurrent delays on construction projects, the question posed is, “but for the owner’s delay, would completion have been delayed by the contractor’s delay that occurred at the same time?” If the answer is “yes”, then the delay to completion was not caused solely by the owner’s delay, and thus there was a concurrent delay.

This “but for” approach for determining concurrent delays has its flaws. For example, it assumes that, in the absence of the owner’s critical delay, the contractor’s concurrent delay would have occurred unchanged. In other words, the approach wrongfully assumes that the two (or more) concurrent delays were entirely independent.

Construction projects rarely proceed as planned. They are often affected by poor weather, unforeseen ground conditions, design changes and other unexpected events. Contractors react to changing circumstances. They may pace (slow down) work to avoid site congestion and make the best use of their resources. They may also re-sequence and accelerate work to mitigate delays. This can leave limited instances where delays can be said to be truly independent. Therefore, courts must be careful when applying the “but for” test to establish concurrent delays.

### **Assessment of Damages**

If concurrent delays are established, the next issue faced by the courts is the assessment of damages. The general rule is that the party seeking to recover damages has the burden of separating the damages caused by its delays from those caused by the other party’s delays. Therefore, where possible, each party should attempt to demonstrate the losses directly attributable to each delay event. This is not always possible where there are concurrent delays.

Where a project is delayed, both the owner and contractor can incur time-related losses directly attributable to late completion. The contractor’s losses include the costs of maintaining a presence on-site for longer than planned. The owner’s losses are often captured by liquidated damages directly related to a measure of time, usually days from the date for completion.

Where there are concurrent delays, such general time-related losses cannot be attributed to one particular delay. If the “but for” test were to be applied to both concurrent delays separately, it would

indicate that the other delay was responsible for the loss. It would follow that neither party should recover its losses.

The parties could argue that the court should respond as it would in cases of contributory negligence. In the shipping case of *Sunrise Co. v. Lake Winnipeg*, a rule was required that addressed:

- a) one of the two causes of the concurrent loss is responsible (*e.g.*, the “first in time” rule) or
- b) that the concurrent delay should be apportioned between the two causes of the concurrent loss.

The judgment set out the rule for apportionment which included:

To the extent that the repairs are effected concurrently (*i.e.*, the same time is used to effect the two or more sets of repairs) the loss due to detention is equally allotted between the two or more causes. [emphasis added]

This suggests the courts would apportion damages equally to each cause of delay. In a case of two concurrent delays, each party would be equally liable for their own and the other party’s damages. In this situation, the damages could be calculated in different ways.

One way is to aggregate each party’s loss together and then divide the total equally. The net result would make each party liable for the same amount. This would, in effect, be the same as neither party recovering its loss, which therefore is the same as applying the basic “but for” test.

An alternative calculation is for each party to assume liability for 50 per cent of the other party’s loss. Where the parties’ losses are not equal — and they never are, the party that incurred the lowest damages would pay a share of the other party’s loss. In effect, one party would pay some of the other party’s loss that it would have already incurred due to its own delay. This would be contrary to the basic “but for” test.

## CONCLUSION

The analysis of delays on construction projects can be complex. When concurrent delays are alleged as a defence, the court faces further challenges. Although concurrent delays have been considered in a number of cases in Canada, there is still little guidance on what concurrent delay means and how damages will be assessed when they are found.



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## THE ENFORCEABILITY OF “NO DAMAGES FOR DELAY” CLAUSES

A clause purporting to disentitle a contractor to compensation for delay in the performance of a construction contract is an arrangement that pits freedom of contract principles against doctrines of fairness when a dispute arises over owner-caused delay. Such clauses have historically been enforceable, even in the face of some owner-caused delays, but courts have construed them very narrowly or relied on the doctrine of fundamental breach to refuse to enforce them. In 2010, the Supreme Court of Canada, in *Tercon Contractors Ltd. v. British Columbia (Transportation and Highways)*, established a new framework for the interpretation of all exclusion clauses. The result appears to be a more onerous burden for any commercial claimant seeking to avoid an exclusion clause. However, the *Tercon* test permits consideration of the special commercial context of construction contracts and the expectations of the parties in light of all of their obligations to each other. Under this framework, a broadly worded “no damages for delay” clause should not absolve an owner from responsibility for delays

caused by the owner in breach of an obligation under the contract.

The pre-*Tercon* high-water mark for enforcing a “no damages for delay” clause was *Perini Pacific Ltd. v. Greater Vancouver Sewerage & Drainage District*. In that case, the trial judge and Court of Appeal found that the contractor failed to prove that it had suffered any delay damages due to the owner’s breach of its obligation to supply generators. On appeal to the Supreme Court of Canada, the contractor argued that its average daily overhead was the best and only method to calculate its delay damages. The Supreme Court of Canada found that it was not necessary to decide that point, relying instead on a clause excluding liability for delay damages “*occasioned by any cause or event within or without the Contractor’s control, and whether or not such delay may have resulted from anything done or not done by the Corporation under this contract*”. Justice Martland found that this excluded damages for any claim for any delay, whether or not caused by the owner, and therefore precluded the contractor from recovering its overhead costs occasioned by the owner’s delay.

*Perini* made it clear that such clauses are enforceable, but in practice they have been enforced rarely. Prior to *Tercon*, contractors used two arguments to avoid the effects of these clauses: first, that the clauses, properly construed, did not exclude the particular claims, or the breaches of contract leading to the claims, in question. Second, that the owner’s delay was a fundamental breach of contract that rendered the clauses unenforceable.

The American approach to these clauses is somewhat different. They are generally enforceable, but subject to a number of common law exceptions which vary by jurisdiction. Examples include unforeseen delays and interference by the owner. In New York, only reasonably foreseeable delays or delays that arise from the con-

tractor's work or are expressly mentioned in the contract will be subject to a "no damages for delay" clause". Other states' courts consider unforeseen delays to be the very purpose of a "no damages for delay" clause. In Texas, the stated basis for the owner-interference exception is that a contractor can assess potential delaying events when estimating and bidding on the work, but wilful or negligent acts or omissions of the owner cannot be and ought not to be taken into account in pricing the work, and therefore such delays ought to be compensated. To do otherwise would be to incentivize owners' bad conduct. This exception is widespread, although courts disagree on the extent of interference required to defeat the clause.

The Supreme Court of Canada has not had occasion to revisit the "no damages for delay" clause since *Perini*. However, in *Tercon*, addressing a different type of exclusion clause, the Supreme Court of Canada conclusively rejected the defence of "fundamental breach", and set out a framework for interpreting exclusion clauses:

- (1) As a matter of interpretation, does the exclusion clause apply to the circumstances established in evidence?
- (2) If so, was the exclusion clause unconscionable at the time the contract was made (for example, due unequal bargaining power), and therefore invalid?
- (3) If not, has the party seeking to avoid the exclusion clause established an overriding public policy entitling the Court to refuse to enforce the clause (outweighing the very strong public interest in the enforcement of contracts).

In *Tercon*, the owner had awarded the contract to a non-compliant bidder and was sued by another bidder. The clause excluded damages incurred in "participating in this RFP". The Court split on the question of whether, as a matter of interpretation,

the clause applied to the circumstances in evidence, with Justice Cromwell, for the majority, finding that it did not. He held that it is integral to the bidding process that only compliant bids be considered, and clearer language would be required to oust the duty of fairness owed to all bidders. In the circumstances, the phrase "participating in this RFP" meant "participating in a contest among those eligible to participate". If the parties had intended to limit all claims arising from submitting a proposal, they could have said so.

The second and third branches of the *Tercon* test are onerous for the commercial party seeking to set aside the exclusion clause. "Unconscionability" has been defined as "a grossly improvident bargain based on a defendant knowingly taking advantage of a vulnerable plaintiff" rather than an "assessment of the reasonableness or fairness of an exclusion clause". The argument that particularly egregious breaches of contract can be considered at the public policy stage has been rejected on the basis that this would resurrect the doctrine of fundamental breach. Similarly, "technical non-compliance with [a] regulation" is not a public policy objective that overrides freedom of contract. In *Precision Drilling Canada Limited Partnership v. Yangarra Resources Ltd.*, the Alberta Court of Queen's Bench interpreted a contract excluding damages for "negligence ... or any other theory of legal liability" as excluding a claim for gross negligence, rejecting arguments that this would be contrary to public policy. A clause excluding liability for damages arising out of termination was applied to exclude damages for wrongful termination.

There is little post-*Tercon* jurisprudence interpreting "no damages for delay" clauses. Clauses excluding damages for delay ought to continue to be construed very narrowly. First, it is a rule of contractual interpretation that an apparent conflict between a general term and a specific term is to be resolved by permitting the specific to prevail over the general. Where there is a specific con-

tractual obligation placed on the owner, the scope of a general “no damages for delay” clause must be read as not extending to the subject-matter of the specific contractual obligation — to apply to that obligation, the obligation would need to be specifically referenced in the “no damages for delay” clause.

Second, *Tercon* has not over-ruled the test set out in *Canada Steamship Lines Ltd. v. R.*, which provides that an exclusion clause cannot exclude liability for negligence, in the absence of an express reference to “negligence”, unless negligence is the only cause of action that the parties could have intended to exclude. Many “no damages for delay” clauses contain no references to negligence (or breach of contract) and are obviously capable of encompassing other causes of action, most notably breach of contract.

That said, a “no damages for delay” clause ought not to exclude the owner’s liability even for breach of contract unless the clause, read in light of its purposes and commercial context, clearly expresses the parties’ intention to exclude the breach in question. This approach is also consistent with the reasoning in *Tercon*. While the words of the *Tercon* test suggest that the focus of the inquiry is on the time of drafting rather than on the actual conduct of the parties in contributing to the damages in question, it is in the application of the test that Justice Cromwell’s reasoning at the first stage incorporated the reasonable expectations of the parties as to their future conduct, in light of public policy and the context of commercial tendering.

In a construction contract, there is a reasonable expectation that each party will perform its obligations: this is the foundation of the “prevention principle”, which encompasses two duties. The first is not to hinder the other party from performing the contract, and the second is to do anything which may be necessary to enable the other to per-

form its obligations. The result is that a party cannot enforce a contractual term against another party where the enforcing party has prevented the other party from performing.

Because a contractor has agreed to a clause excluding damages for delay, it does not mean that the contractor has agreed to a clause excluding damages for delay caused by the other party to the contract, in breach of that contract. For such a clause to be enforced, a court should be satisfied of two things:

1. That the clause expressly applies to delays caused by the owner (as in *Perini*); and
2. That the parties contemplated that owner’s conduct leading to the delay in question would be caught by the clause, in light of their contractual and implied obligations to each other. These obligations include the prevention principle and the duty of honesty that forms part of every contract under the organizing principle of good faith, according to *Bhasin v. Hrynew*.

It is one thing for the parties to agree that, while the owner is responsible for obtaining a permit, the contractor will bear the risk of the municipality’s delay in issuing a permit. It is quite another for the parties to agree that the contractor will bear the risk that the permit may be delayed because the owner has failed to perform its contractual obligation to obtain the permit. To enforce a “no damages for delay” clause in the face of such conduct amounting to a breach of contract would be contrary to the purpose of a “no damages for delay” clause, which is to put the risk of delay costs in the hands of the party who is best equipped to manage those costs. It would also encourage the owner’s breaches of contract and other poor behaviour by making the owner’s performance obligations practically impossible for the contractor to enforce.

Another example of conduct that would offend the prevention principle is the owner's wrongful refusal to extend the time for completion in the face of its own delays. This conduct, constructive acceleration, forces the contractor to incur acceleration costs and negates the remedy of the extension of time provided to the contractor. Acceleration costs incurred in these circumstances ought to be compensable even where a "no damages for delay" clause expressly covers owner-caused delays.

Given the contextual approach in *Tercon* and the consequences involved where a "no damages for delay" clause may apply, we can expect to see these issues return to the courts. Parties can achieve greater certainty by using more precise language setting out the specific types of delay and causes of delay that they intend the clause to encompass.



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## **DIFFERENTIATING TYPES OF TIME IMPACT CLAIMS: DELAY, ACCELERATION, LOSS OF PRODUCTIVITY**

During the course of a construction project, a contractor may experience certain events, outside of its control, that adversely affect its schedule. In those cases, contractors typically prepare time impact claims to justify their cost overruns (damages) and delays. Contractor claims involving time impact damages are typically caused by several factors, including: design changes, differing site conditions, procurement delays for new/changed material resulting from owner's untimely responses; untimely owner approvals; forced sequence changes, and loss of productivity — to name a few.

Typically, a contractor's claim for damages caused by adverse impacts to the schedule take the form of extended general conditions resulting from critical path delay/extended duration to the completion date; acceleration costs, including directed or constructive acceleration; and loss of productivity including cumulative impact.

To properly evaluate a contractor's time impact claim, an owner, for example, should be in the position to recognize the type of claim submitted by a contractor and, more importantly, objectively understand the events that occurred during the contractor's period of performance. Those facts should then be applied to the premise of the contractor's claim.

For large complex projects, a contractor's claim for time impact damages may include an overall analysis spanning the entire project's performance period and may very well include more than one type of time-related impact. For example, overall claims for project delay may also include elements of acceleration and loss of productivity. In all cases, however, the burden of proof is on the contractor to properly support its time impact claim according to the requirements of the contract.

## **Claims for Delay/Extended Project Duration**

Over the years, methodologies for measuring project delay have taken many forms. Typically, a schedule analysis demonstrating project delays compares planned activities with actual activities within a specific period of time, identifies the cause(s) of delay, and, as appropriate, determines the responsible party. Some common names of these methodologies include: Impacted Plan, Plan versus Actual, Collapsed As-Built, and Windows. Each of these methodologies contain strengths/weaknesses; however, the more accurately prepared delay analyses include a chronological and cumulative approach measuring any project delay as major events unfold or milestones have been achieved.

Project delays result from events that impact (delay) critical path activities (defined as a continuous chain of activities that form the longest path from the project's start to finish), or near critical path activities. Critical path analysis is a vital part of the evaluation of project delays — a delay to an activity along the critical path will increase the overall project duration and delay project milestones. Also, a delay may occur to near critical path activities when the available float (defined as the amount of time an activity can be delayed without delaying the overall project duration) for those activities is exceeded as a result of the delay event.

A proper delay analysis includes references to the schedule's critical path at the inception of the delay event and tracks progress through the completion of the delay event within the time period being evaluated. Also, the delay analysis should accurately reference the project record including, for example, daily reports, meeting minutes, correspondence, owner direction, owner-directed changes, contractor notice, and the contemporaneous monthly schedule updates.

As part of a delay analysis, a contractor should also evaluate its own performance (and its subcontractor's performance, if necessary) as a means to support the notion, for example, that the owner was the sole cause of a delay. When contractors do not address their own performance, owners may identify contractor-caused delays that occurred during the same time period to offset the contractor's delay determination.

A contractor's damages for delay are typically calculated through the contractor's time-related costs, using a daily rate, which is then multiplied by the appropriate number of days of delay determined by the delay analysis.

### **Acceleration-Schedule Recovery**

As a way to recover lost time due to a delay event, a contractor may decide to mitigate (accelerate) all

or part of the current project delay. To accelerate a project, a contractor may work longer hours, add resources (labor and equipment), overlap activities, expedite shipment of materials, or a combination of each.

The actual success of an acceleration effort should be measured at the immediate end of the acceleration period based upon actual progress, *i.e.*, recovered time, as compared with the status at the start of the acceleration period. It is vital to understand that forecasted acceleration does not, by itself, suggest a contractor successfully accelerated.

The schedule analysis for acceleration should evaluate the contractor's acceleration effort including any disruptions caused by factors outside of its control during the acceleration period. In some cases, a contractor's acceleration effort may not recover time even though the contractor increased its resources. The schedule analysis should provide effective support regarding the outcome of the acceleration effort.

Acceleration efforts are typically labeled as "Directed Acceleration", which occurs when an owner specifically directs a contractor to accelerate its work and recover lost time; or, "Constructive Acceleration", which occurs when an owner does not recognize a delay event and requires the contractor to meet the original completion milestone instead of a revised (delayed) completion milestone.

A contractor's damages for an acceleration claim are typically measured through the additional cost to fund the acceleration measures.

### **Loss of Productivity**

A contractor's loss of productivity occurs when the actual rate of performing activities (tasks) falls short of the anticipated rate of performance. Measurements of productivity are usually at the trade level. Loss of productivity is measured in units installed per hour and production is measured in units installed per day. For instance, a contractor

may have planned to install six units of material per hour (48 units per day assuming an eight-hour day), but due to circumstances outside of its control, only installed three units per hour (24 per day assuming an eight-hour day) using the same crew, or a loss of productivity of 50 per cent.

The lower number of units installed per hour may result from many factors including: learning curve, weather, site conditions, over-crowding, cumulative impact of excessive changes, excessive consecutive weekly hours worked and other acceleration efforts, material availability, out of sequence operation and flow of work, and skill level of crews performing the work. Each of these factors may impact the project solely or in combination, within discreet periods of time.

Loss of productivity analyses, similar to delay analyses, include a variety of methods to calculate damages including, as examples: Total Cost Method, Modified Total Cost, and Measured Mile. The selection of the method often depends on the availability and the quality of the data found in the project record.

The Total Cost and Modified Total Cost methods compare a contractor's actual productivity to the contractor's estimate and may include industry factors to justify the extra hours incurred. The Modified Total Cost method also includes adjustments to the total cost by accounting for any inefficiency or impact caused by the contractor. However, the most preferred method to calculate the loss of productivity is the Measured Mile approach that accounts for a contractor's actual on-site performance during an un-impacted period measured against the contractor's actual on-site performance during an impacted period. The advantage of the Measured Mile approach is that it does not rely on a contractor's estimate as the basis, rather, it relies on actual un-impacted performance on the same

project or similar projects with similar scope and conditions, if possible.

A potential component of a loss of productivity claim are damages stemming from an excessive number of changes, frequency of changes, and the timing of changes that cause a departure from the contractor's original plan. Such types of claims are cumulative impact claims and are usually found under a traditional design-bid-build contract delivery, where an owner, for example, provides a contractor with a set of design documents to construct the project and the design documents are either deficient or do not match existing conditions. As a result, a contractor may suffer inefficiencies in its labor force including additional engineering costs as the changed conditions are remedied.

In such cases, a contractor's claim should demonstrate how the contractor's original plan could not be followed as a result of the excessive number of changes and, more importantly, demonstrate a causal link between the number of changes, the loss of productivity, and any impacts to the project schedule. Often times a contractor will create a "measles" chart to specifically locate each of the changes within an area of the project illustrating the disruption to the work over time (from time period to time period) caused by the high volume of changes and provide a reason the contractor was unable to perform its work efficiently in that area according to its plan.

A contractor's damages for loss of productivity include the additional costs, usually in increased labour hours and equipment, excluding any cost overruns caused by the contractor such as an error in the estimate.

In summary, the type of a time impact claim prepared by a contractor should correlate with the type of cost overruns, facts of the project, and, of course, impact to the project schedule.

## WHAT IS “CPM” SCHEDULING AND ITS USE IN DELAY CLAIMS?



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*[Editor’s Note: Roger Bridges passed away shortly after he and Mr. McCain submitted this article to the Construction Law Letter for publication. It is being published here in memoriam, and as a tribute to Roger’s many fine years of service as an engineering consultant to the construction industry.]*

CPM scheduling relies on the “critical path method”. At any given point in time on a project, there is a series of inter-related work activities that must be completed in sequence such that the completion date of the project is not delayed to a later point in time. In the construction industry, along with many other industries, this longest series of necessary activities to reach project completion is referred to as the “critical path”, or sometimes the “longest path”. Any delays that impact activities along the critical path will, by definition, delay project completion. Conversely, activities within the schedule network that are not on the critical path could suffer some delay without impacting the project completion date. The extent to which such activities can be delayed prior to impacting project completion is termed “float” (or sometimes “slack”). If the float or slack in a non-critical activity becomes fully eroded, then that activity becomes critical. In some cases, depending upon the magnitude of the delay, this may result in the “shifting” of the critical path away from its former series of activities to a new series of activities that depend upon the

newly delayed activity. This is termed a “critical path shift”.

Good construction management practice generally includes the production of a “baseline” CPM schedule, which describes the overall plan for the work prior to the start of construction, along with regularly updated (*e.g.*, weekly or monthly) CPM schedules that describe both the “as-built” status of the project (the work that has been completed), as well as the “as-planned” work that remains to be done in order to reach completion of the work at the time of preparation of the schedule update (called the “data date” or “status date”). The schedules prepared by the construction manager during the course of the work are often termed the “contemporaneous schedules”. Schedules are generally presented in a bar-chart format known as a “Gantt Chart” and are usually prepared using computer programs such as Microsoft Project™ or Primavera P6™.

The correct use of CPM scheduling methods allows construction managers to identify the potential impacts of delays on an ongoing or prospective basis (during the currency of the work). In many cases this allows the construction manager to make changes to the remaining planned work in order to mitigate or even negate the impact of the delays on project completion, either through implementing acceleration measures (*e.g.*, working overtime) or altering the future work plan by re-sequencing the remaining work such that more future work can be done concurrently. Unfortunately, such mitigation is not always possible, and a delay to completion of the project is sometimes unavoidable. In these situations, the CPM schedules produced during the course of the work can be used to estimate the magnitude of the delay, either at the time the delay occurs (“prospectively”), or during the preparation of a claim for the additional cost to the contractor relating to the delay after the fact (“retrospectively”).

## How are CPM schedules used in Delay Claims?

Delay claims generally consist of a request for payment on the part of the contractor for additional costs relating to its extended duration on site due to the delay(s). Hence, delay claims are usually concerned with determining the delay to the project completion date, which, when compared with the original or anticipated completion date, can be used to determine the duration of the delay. Once the duration of the delay is known, costs can then be quantified. Because CPM allows the identification of critical or non-critical activities, the delay analyst can determine whether the delay under examination impacted a critical activity (*i.e.*, one that affected the overall end date), or whether the delay in question impacted a non-critical activity (and therefore did not affect the end date). This allows a determination as to whether the delay under examination is relevant to the contractor's extended duration costs (*i.e.*, a determination as to cause and effect).

As previously stated, the analysis can be undertaken either prospectively (at the time of the delay, during the course of the work), or retrospectively (after the fact, sometimes called "forensic delay analysis"). Because prospective analyses occur at the time of the delay, they are necessarily an estimate of the delay to the (future) project completion date, whereas a retrospective analysis seeks to explain the delay to the actual project completion date. It should be noted that some contracts mandate that prospective analyses be undertaken, and hence, consideration of the contract terms is also relevant to delay analysis.

Whether done prospectively or forensically, the first step that the delay analyst should take is called "source validation", which refers to the process of validating the source data that will be used in the analysis (*e.g.*, the available schedules and any other related or relevant data being relied upon). In practical terms, this means checking that the

schedules reflect the status of the work to a reasonable level of accuracy. Ideally, the contemporaneous schedules should be used in the analysis of the delay(s), since they best represent the thinking of the parties at the time that the work was being performed and the delays occurred, and are therefore less susceptible to criticism than an after-the-fact analysis created during claim preparation, which may be seen as subject to manipulation, whether intentional or unintentional. However, in practical terms, this is not always possible. In some instances, there are few or no contemporaneous schedules produced, and in other instances the quality and reliability of the contemporaneous schedules produced is not sufficient for the analysis to return meaningful results. Therefore, in some instances it is necessary for the analyst to make certain modifications to the contemporaneous schedules, or in some instances, to create an as-built schedule from other contemporaneous project records in order to perform the analysis.

With source validation complete, the schedule analyst next moves on to the selection of a schedule analysis methodology. There are several recognized methodologies, but it should be noted that these methodologies are not equivalent, and careful consideration of a host of legal, commercial and technical factors is required before deciding which methodology best applies to the delay claim at hand. Detailed discussion on choosing a methodology is beyond the scope of this article, but the following four major types of analyses are generally recognized:

- 1. As-Planned vs. As-Built** — This type of analysis compares the as-planned or "baseline" schedule to the final "as-built" schedule and seeks to identify the delays and the impact of the delays on the project completion date by comparing the two schedules. This type of analysis can be gross in nature (meaning that it is simply observational, and schedule and critical path logic is not explicitly considered), or it can be enhanced and attempt to

take the critical path into account. This type of analysis is usually simple and easy to understand but may not return reasonable results since it can fail to properly take account of the changing critical path, and may not be suitable for large, complex projects with durations extending over long periods of time.

**2. Contemporaneous Period Analysis** — This type of analysis makes use of both the baseline (as-planned) schedule and the regular contemporaneous schedule updates created during the project. The analyst compares each schedule update to its predecessor in order to examine the delays occurring within each successive period and the impact that such delays had on the critical path at the time of each update. The delays are then accumulated chronologically and summed to explain the overall delay to the completion date. This technique is primarily observational, although logic is considered, but as few logic changes as possible are made to the existing schedules in order to maintain the contemporaneous relevance of the schedules to the greatest degree possible. This type of analysis is often called a “windows analysis”.

**3. Impacted As-Planned** — This type of analysis takes the “baseline” (as-planned) schedule and inserts delays into the schedule to arrive at a theoretical impact to the completion date based upon that delay alone (sometimes this is called a “what-if” analysis – *i.e.*, it asks the question what if the delay was inserted into the original plan?). This is a “modelled” technique, since it inserts delays to the baseline schedule model, rather than an “observational” technique such as Contemporaneous Period Analysis. Impacted As-Planned has the advantage of being relatively quick and easy to understand but has disadvantages for complex projects with changing critical paths, since it assumes that the original, planned critical path is always relevant. This is often not the case with complex projects, in particular projects where re-sequencing is a major

factor in delay, or where acceleration or other work-arounds have been implemented. It is noted that the Impacted As-Planned methodology can also be implemented in a period-wise mode, which can result in greater accuracy. Used prospectively, this is sometimes called a “Time Impact Analysis”.

**4. Collapsed As-Built** — This type of analysis is similar to Impacted As-Planned in that it is modelled rather than observational, but instead of adding delays to the As-Planned schedule, it subtracts delays from the As-Built schedule (that is, the As-Built schedule is used as the model rather than the As-Planned schedule). This “collapsing out” of the critical delays moves the completion date back in time to a (theoretical) earlier date when the project would have finished, but-for the delays. As a result, sometimes this method is called an “As-Built But-For”. This method can be difficult to implement because it is first necessary to build a CPM model of the as-built schedule (by default, logic is no longer relevant prior to the data-date when updating actual schedule data since it is overridden by the entry of actual dates), and hence, the logic must be examined and changed if necessary. These changes are often challenged since they are done by the analyst after the fact and results often do not correspond well to actual delays, much like Impacted As-Planned.

Other factors may also need to be considered within each of the methodologies, including identifying and quantifying concurrent delays (periods when both the contractor and owner were delaying the work at the same time), the effect of mitigation and acceleration measures, and the possibility of pacing one delay to another (intentionally delaying work in one area in response to known delays in another area).

## **SUMMARY**

CPM scheduling methods, while not strictly required for use in preparing delay claims, are preferred in most delay analysis methodologies due to

their ability to allow for the identification of critical vs. non-critical delays, assisting the analyst in determining whether the delay(s) under examination actually affected the project completion date, and hence, whether extended duration costs were in fact caused in whole or in part by the delay(s) under examination. This article further outlined the steps generally taken in preparing a CPM delay analysis and outlined by the four generally recognized types of delay analysis methodologies that may make use of CPM schedules.

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