Breaking Down the Walls: A Series on Construction Delay

In the fast-paced world of construction, delays and disruption can pose significant challenges to project success. In this *Breaking Down the Walls* series, Gary Brummer, a partner at Margie Strub Construction Law LLP, and Jacob Lokash, an associate at the firm, draw upon their extensive legal expertise to explore the complexities of construction delays. They have collaborated with Thomas Certo, a senior director in the Construction Disputes and Advisory Group at Ankura Consulting Group LLC, whose insights into the technical aspects of delay analysis provide a comprehensive perspective on this critical issue.

Together, they simplify the fundamentals of construction delays, providing readers with the necessary tools to proactively identify and assess delays on their own projects in Canada. At the end of this six-part series, we will have explored the following topics:

1. Delay Claim Basics
2. Delay Damages
3. Disruption vs. Delay
4. Concurrent Delay
5. Forensic Schedule Analysis Techniques
6. Construction Delay Best Practices in Canada

Delay vs. Disruption Claims: Understanding the Basics

Parties often find themselves conflating the concepts of delay and disruption while assembling claims. While delay impacts and disruption impacts can coexist on the same construction project, they are fundamentally different and should be distinguished.

As we have seen in Parts 1 and 2 of this *Breaking Down the Walls* series, delay claims are used to recover the time and cost associated with a project's extended duration. The costs contained in these claims are generally limited to the time-related indirect costs, with some exceptions as outlined in Part 2 (Delay Damages). However, a project event may occur which results in additional direct contract costs to perform base scope work, regardless of whether the event causes, or was caused by, project delay. These impacts are often referred to as "disruptions". Disruption claims aim to recover the additional cost to perform a scope of work beyond what was planned and are typically framed as loss of productivity or loss of efficiency claims.

While delay claims focus on the costs of extended performance of the work, disruption claims generally focus on the loss of efficiency on discrete work.

A. *What is a disruption claim?*

The SCL Protocol[1] defines disruption as:

> *Disruption (as distinct from delay) is a disturbance, hindrance or interruption to a Contractor's normal working methods, resulting in lower efficiency. Disruption claims relate to loss of productivity in the execution of particular work activities. Because of the disruption, these work activities are not able to be carried out as efficiently as reasonably planned (or as possible). The loss and expense resulting from that loss of productivity may be compensable where it was caused by disruption events for which the other party is contractually responsible.*

Fundamentally, a disruption claim is for the additional cost resulting from events that impact planned productivity. Disruption claims are therefore often referred to as loss of (or lost) productivity claims.

Productivity is a metric used to define the amount of construction output per unit of input. A contractor will often bid its project based on some productivity rate that it presumes can be achieved on a given project. These rates are generally based on time (e.g., output per hour, day, or shift) or on cost (e.g., output per dollar). These measurements generally relate to labour, but can extend to equipment usage or other quantifiable performance metrics. Examples of productivity measurements include:

- Weld inches per workhour,
- Linear feet of pipe installed per crew per shift,
- Cubic meters of concrete placed per day,
- Cubic meters of excavation hauled per truckload,
- Cost per meter of track installed, or
- Meters of cable pulled per shift.

A disruption is generally viewed as an interruption to base scope work. This differentiates disruption from claims for new or changed scopes (e.g., requiring an additional storey in a new condominium tower) which would typically be put forth as a separate, discrete claim; however, in certain circumstances additional scope may impact (or disrupt) existing or original scope.

While disruption claims, delay claims, and discrete claims are separate concepts, there is the potential for interplay between them on a project:

- A disruption may result in project schedule delay – *Reduced welder productivity extended the critical path pipe installation duration, which delayed substantial completion.*
- Attempts to mitigate a delay may result in disruption – *Adding an overtime shift to mitigate pipe installation delays reduced welder productivity.*
- A discrete change may result in disruption – *Changes to the pipe system design led to tighter workspaces and reduced welder productivity*.

Under some contracts, a contractor may have a responsibility to accommodate or mitigate disruptions as they arise. However, mitigation strategies are not always feasible, or an increased cost may be inevitable. In these cases, a contractor could submit a claim for disruption.

While these concepts are related, best practice dictates that parties segregate their disruption, delay, and discrete costs, where possible. This separation recognizes the different claimed costs (e.g., time-

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[1] The Society of Construction Law's Delay and Disruption Protocol, 2nd edition, February 2017 ("**SCL Protocol**")

related indirect costs versus additional direct costs) and allows for the evaluation of each claim under its own merits and against the differing legal frameworks for each claim. That said, the segregation of claims can lead to duplication, and proper attention should be paid to ensure that claimed damages are not duplicative and result in double dipping of alleged extra costs.

B. ***Supporting a disruption claim***

As with other claims, the contract will ultimately guide how and when a disruption claim can be submitted, if at all. Contractual provisions notwithstanding, a successful disruption claim will generally feature the following four attributes:

I. Identification that a disruption event occurred,
II. Determination that the disruption event is excusable under the contract (i.e., there is causation which permits a party to claim against another),
III. Demonstration of loss of productivity resulting from the disruption event through a comparative analysis, and
IV. Quantification of the increased cost resulting from the lost productivity.

The following sections discuss each of the above aspects in further detail.

I. Identifying a disruption event

Identifying whether a disruption event occurred can be relatively straightforward with the proper documentation and input from the project team. Disruption will often manifest as additional work hours or cost to execute a specific activity and may be evidenced by looking at the contemporaneous documents that measure these metrics. Practically, disruption is often a factual observation made by the project team, and their input will usually commence the process to determine whether there was disruption.

While each project is unique, some common disruption events are:

- Piecemeal, out of sequence, or incomplete site or work area access,
- Late and evolving design,
- Schedule acceleration measures (e.g., trade stacking, additional shifts, extensive overtime, etc.),
- Unforeseen site conditions,
- Availability and quality of labour,
- Defective plans or specifications,
- Poor project management,
- Late or piecemeal supply of material and equipment, and
- Severe or seasonal weather.

Once a disruption event is identified, the next steps involve determining the underlying causation of the event and demonstrating that there was indeed a loss of productivity.

II. Determine Causation

Determining the underlying causation involves investigating the source of a disruption. This can be a relatively straightforward exercise for some impacts. For example, if a piling subcontractor is experiencing lower productivity than planned, it could be the result of encountering unknown subsurface conditions. When planning the piling works, the contractor would likely have relied on geotechnical studies. If it can be determined that geotechnical data failed to identify the substrata experienced, then this could be the likely "cause" of the lower productivity.

Once the cause is determined, a review of the contract may determine which party bears the risk for the geotechnical information provided. Simply, if the contractor bears the risk, then the loss is not excusable, and conversely, if the owner bears the risk, then the loss may be excusable.

Conversely, it can be difficult to establish a causal link between nebulous concepts such as alleged mismanagement or the combined effects of multiple changes to the disruption. In these cases, parties may be more reliant on fact and expert witness testimony or industry studies to evidence the "cause" followed by an analysis of the contract to understand which party bears the risk.

III. Demonstrate Loss of Productivity

Demonstrating a loss of productivity is inherently a comparative exercise; it establishes that there was reduced output compared to a baseline. While there is no single industry standard for measuring lost productivity, various methodologies have been developed to demonstrate this loss, each with varying accuracy and acceptance in the industry. The SCL Protocol provides guidance on the assessment of disruption, and although not authoritative, is commonly used in Canada as persuasive authority in advancing (or defending) a disruption claim.

The SCL Protocol distinguishes between methods that utilize actual or theoretical measurements of comparative productivity (productivity-based methods) and those that are based on analysis of planned and actual expenditure of resources or costs (cost-based methods). The SCL Protocol provides the table shown in Figure 1 below:

Productivity-based methods	Cost-based methods
1. Project-specific studies:	1. Estimated v incurred labour
(a) Measured mile analysis	2. Estimated v used cost
(b) Earned value analysis	
(c) Programme analysis	
(d) Work or trade sampling	
(e) System dynamics modelling	
2. Project-comparison studies	
3. Industry studies	

Figure 1 - SCL Protocol List of Common Methods of Disruption Analysis[2]

Productivity-based methods analyse experienced productivity against a baseline which is either established through the project in question or against outside sources, and only then calculates the loss of productivity and the resulting damages. Conversely, cost-based methods focus on the difference between the planned versus actual cost, without necessarily considering time-unit productivity.

The SCL Protocol considers productivity-based methods more "robust" than cost-based approaches but acknowledges that certain project circumstances may require or favour the use of a cost-based method.[3] In Part 6 of this *Breaking Down the Walls* series, the authors will discuss best practices to maintain documentation which can be used to support the use of these methods.

a) Productivity-based methods

Project Specific Studies

Project-specific studies utilize the data generated during project execution to determine actual productivity levels experienced by the contractor. These actual productivity levels are compared against a baseline productivity level. Each of these methodologies is dependent on the quality and availability of project records. A brief overview of some of the more common project specific study methodologies is contained below.

Measured Mile Analysis:[4] This approach involves comparing the productivity achieved in an unimpacted period or scope of work, the "measured mile", against the allegedly impacted scope or period. The objective of a measured mile approach is to compare "like for like" on the same project to quantify inefficiencies.

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[2] SCL Protocol, Paragraph 18.13
[3] SCL Protocol, Paragraph 18.16 and 18.21
[4] SCL Protocol, Paragraph 18.16(a)

A key aspect of the measured mile approach is identifying the unimpacted comparative area or period of work. At times, it can be difficult to identify this period or scope as there may simply be no one period that was completely unimpacted. In these cases, certain adjustments may be made to isolate and model the unimpacted scope for the most appropriate comparison between unimpacted and impacted work. Care should also be taken to exclude factors that may have impacted productivity that are not necessarily causally linked to the party against whom the claim is being made, such as periods of ramp-up (or learning curve) where productivity may be lower for other reasons.

Further, a measured mile approach can be used as a basis of comparison to a contractor's tender assumptions related to productivity. This comparison may either support or call into question the contractor's assumptions depending on the outcome. In this way, owners and contractors may utilize the measured mile approach to support or defend claims in different ways.

A measured mile approach is more readily apparent on linear or repetitive projects or scopes, such as rail, road, or cable pulling, but can be deployed in nearly any setting if implemented correctly. Regardless of project type, it is important that contemporaneous documentation exists to perform a measured mile analysis.

Earned Value Analysis:[5] This analysis involves comparing the resources required to perform a disrupted task against the planned number of resources contemplated in the bid or proposal. The resource comparison is typically made in work hours as they are most representative of the effort required for a certain task, but if work hour information is not available, the analysis may utilize cost information instead.

This methodology is only as good as the reasonableness of the planned resources for any activity. If the planning or tender assumptions were overly optimistic, then the resultant productivity loss could be exaggerated and subject to scrutiny. The analysis should also account for resource or schedule re-baselines made during the project period, such as owner-directed crew additions or schedule extensions.

Many contracts call for an earned value analysis as part of the project controls process, so if this information is appropriately captured and maintained during the project, the analysis can be performed with relative ease.

Programme Analysis:[6] Well maintained resource-loaded project schedules (or programmes) provide the ability to track planned and actual utilisation of resources on a project within the scheduling software itself, most notably Primavera P6. A comparative analysis of the resource-loaded schedules will result in quantifying inefficiencies. This methodology (as with many of the others) is only as good as the underlying data input to the software.

Project Comparison Studies

Where there are insufficient records to create or carry out a project-specific study, then the records from other analogous projects may be used for comparison. This is referred to by the SCL Protocol as a

[5] SCL Protocol, Paragraph 18.16(b)
[6] SCL Protocol, Paragraph 18.16(c)

project-comparison study. As this analysis is not based solely on the project in question, it will generally carry less weight than a project-specific study.

Industry Studies

Industry studies provide an expected productivity output based on surveys or studies of many projects within an industry.[7] Typically, these are published by industry trade groups such as NECA (National Electrical Contractors Association) and MCAC (Mechanical Contractors Association of Canada), educational instructions, or government agencies. Some industry studies allow an analyst to choose certain "impact factors" to the baseline productivity levels to account for the relative difficulties of various project or field conditions.

A productivity analysis using industry studies would compare the industry productivity levels to the productivity experienced in the project at hand. Similar to the project comparison studies, an analysis based on industry studies may not be considered as strong as one based on a project-specific study, such as a measured mile analysis, if the appropriate project-specific information is available. One further challenge in using industry studies is that they may not account for the unique environmental and other challenges that are faced on the project in question.

b) Cost-based Methods[8]

Cost-based methods, according to the SCL Protocol, provide the least robust support for a construction claim and are generally limited to scenarios where productivity cannot be accurately assessed using productivity-based approaches. A major drawback of using cost-based approaches (according to the SCL) is that a party may need to demonstrate cost reasonableness, particularly in relation to the tender assumptions.

c) Notes on Demonstrating Loss of Productivity

The choice of productivity analysis methodology is largely driven by the underlying records that are available; a measured mile relies on an uninterrupted period of productivity for the same type of work that was disrupted. Sometimes a combination of a productivity-based approach and a cost-based approach may be best for a specific set of circumstances. In short, the contract and particular situation will dictate the most appropriate approach to use as there is no one-size-fits all methodology.

IV. Quantifying Increased Costs

Once the loss of productivity has been demonstrated through a comparative analysis, the resulting damages can be assembled. If the productivity analysis methodology is based on work hours, the quantification will generally be based on applying an appropriate hourly rate to the claimed inefficient work hours. A cost-based approach may simply carry the output of the productivity analysis as the claimed damages.

[7] SCL Protocol, Paragraph 18.18

[8] SCL Protocol, Paragraph 18.21

The method of assessing any quantum will be dictated by the circumstances of a project and the available records.

C. ***Cumulative Impact Claims***

Often discussed alongside disruption claims is the idea of a cumulative impact or "ripple effect" of multiple impacts to the project. This rests on the theory that one or multiple changes on a project can have a ripple effect and disrupt unchanged work (think "death by a thousand cuts"). Contractors may build some buffer into their project costs and schedule to account for minor changes, however, when the volume of changes becomes so great to disrupt unchanged work, a contractor may choose to pursue a cumulative impact claim.

It is often difficult to prove the impact of such changes to productivity of unchanged works. Therefore, cumulative impact claims generally involve a total productivity or cost analysis. A total productivity or total cost analysis will quantify all work hours or costs above the plan and claim the costs for that total overrun.

Total cost (and modified total cost)[9] claims have a reputation as being overly simple to determine damages and are therefore less favoured than other, more analytical, approaches. While the specifics vary by jurisdiction, a total cost or modified total cost claim may be tested to determine the validity of the total cost or total productivity approach, which involves meeting the following four conditions:

1. It would be impractical to prove actual losses directly,
2. The bid was reasonable,
3. The actual incurred costs were reasonable, and
4. The claimant party was not responsible for any added costs (or productivity impacts).

Quantum methodology aside, a cumulative impact claim should demonstrate that the impact of multiple changes resulted in project-wide disruption. Recently in *Walsh Construction v. Toronto Transit Commission et al* 2024 ONSC 2782 [***Walsh***] the court considered the cumulative delay impact caused by changes and RFIs on a project.[10] An observation identified by the court was set out in paragraph 32, which states:

> *[32] Dr. William Ibbs, who was called by TTC and qualified as an expert in loss of productivity and disruption damage claims in the construction context, <u>agreed with the proposition that the greater the change activity over the life of a project, the greater the probability of delay and extra cost</u>. In an article written by him in 2008, marked as Exhibit 1457, he wrote that "<u>[a]lmost every change to a construction project has some effect on the project's cost and schedule</u>" through "[t]he actual direct cost and time of performing the change" and "[t]he impact the change may have on other unchanged or contractual work because of delay, disruption, change of sequence, lack of resources, etc." He further wrote that "<u>[w]hen numerous changes occur, there is a compounding and negative effect commonly called 'cumulative impact</u>.'" In another article from 2013, marked as Exhibit 1458, he wrote that "when the amount of change labor hours approaches 10% of the*

[9] A modified total cost approach attempts to adjust the total overrun by excluding the claimant's own identified overruns from the claimed amount.

[10] While the Walsh decision involves a cumulative impact delay claim, similar principles apply in a cumulative impact lost productivity claim.

original labor budget, warning bells should start to sound." There is no doubt that the change in labour hours greatly exceeded ten percent of the original labour budget for most of the subcontractors.

[emphasis added]

Considering the above, the court found a [Bechtel] report on the number of RFIs and changes on the project compelling evidence of disruption and delays. At paragraphs 35 to 37 the court remarked:

[35] Bechtel, after stating that the status and statistics of RFIs are a good metric for the maturity of the design on most construction projects, concluded that based on the large number of RFIs associated with the design and the processing time for the RFIs, the bulk of the station delays were attributable to the overrun of tunnel boring contracts and the design not being as complete as described at award, resulting in substantial RFIs and CDs as well as excessive response times on RFIs as the primary contributors. The status of the design was identified as a central aspect of the delivery challenges.

[36] Bechtel did its own analysis of the station RFI logs and concluded that the average response time across all stations was 42 days, with 11 percent over 90 days. The response profiles were similar across all stations. It recommended that the cycle times on RFIs be reduced and that the designers' response times be expedited to minimize the number of RFIs remaining open beyond 15 days.

[37] The Bechtel Report concluded that the number of post-issued-for construction design changes reflected in the number of RFIs was in the thousands, rather than the more-typical hundreds, based upon insufficient constructability reviews.

This decision serves as an example where the courts agreed that the cumulative effect of changes can impact project execution. Each project is unique, and a detailed review of the nature and extent of project change documents (such as change orders and RFIs) may be more compelling in a cumulative impact claim than merely presenting the total count of documents.

D. ***Conclusion***

Disruption claims are becoming more common in the industry, but there remains confusion. We hope that this article (read with Part 1 and Part 2) provides readers with a better understanding on the concept of disruption, how to distinguish it from a delay claim, and provides some guidance on the steps required to put forward a well supported disruption claim.

While this article is written primarily from the perspective of a contractor claiming for a loss in productivity, the principles apply equally to other stakeholders. An owner or other party can apply similar principles when defending a disruption claim, or when working with a contractor to mitigate disruption costs arising from project impacts.

Ultimately, a claim for disruption will be guided by project specific factors such as the quality and availability of documentation and evidence, jurisdictional nuances, and the terms of the contract. Forensic scheduling experts, cost consultants, damage experts, and construction lawyers are best placed to identify and support such claims.

In Part 4 of this *Breaking Down the Walls* series, we investigate the concept of concurrent delay and how to navigate concurrency when claiming for delay.



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