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When the Crew Is Ready and the Site Is Not:
Measuring Productivity Loss and Workforce Disruption

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When the Crew Is Ready, and the Site Is Not Measuring Productivity Loss and Workforce Disruption

Every construction project rests on two fundamentals: the workforce that builds it and the materials they build with. The GCC construction industry is currently confronting disruptions to both, simultaneously. What makes this moment particularly difficult to navigate is that the two disruptions are analytically distinct, each with its own cause, its own measurement methodology, and its own contractual entitlement. Treating them as one problem will cost contractors more than the disruption itself. This article provides a practical framework for capturing, measuring, and claiming both.

Two disruptions, not one

Supply chain disruption manifests at the procurement and logistics interface: delayed deliveries, diverted routes, vendor substitutions, and specification changes that arrive on site as a constraint on what can be built and when. Workforce disruption is a different problem. It is the reduction in the efficiency of labour actually deployed on site, measured as a loss in output per man-hour against the rate that was planned, and arising from idle time, resequencing, rework, unfamiliar materials, or the dilution of supervision that follows when a gang is broken up and redeployed elsewhere.

The two disruptions are analytically distinct. Supply chain disruption speaks to what could not be delivered; workforce disruption speaks to what could not be built efficiently with what was available. Both may arise from the same event, or either may arise independently of the other. That distinction determines the methodology used to measure the loss, the records needed to substantiate it, and the contractual basis on which it can be recovered. The scenarios playing out on GCC projects today illustrate why that separation matters in practice.[1]

Take a structural steel erection crew that arrives on site mobilised and ready, only for the steel delivery to be delayed. The contractor records what it sees: a three-week delay on the erection programme. What has been recorded is one event, but what has actually occurred is two: a programme delay caused by the supply chain failure, and a productivity loss caused by a workforce standing idle or being redeployed at reduced efficiency. These are not the same entitlement; they do not share the same methodology, and one undifferentiated claim will not recover both.[2]

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[1]Society of Construction Law, Delay and Disruption Protocol (2nd edn, February 2017) Core Principle 18.1: “Disruption (as distinct from delay) is a disturbance, hindrance or interruption to a Contractor’s normal working methods, resulting in lower efficiency.” See also AACE International Recommended Practice No. 130R-23, Demonstrating Entitlement to Cumulative Impact Claims in Construction (2023), s.1.1: “productivity loss can be described as a loss of efficiency with respect to a contractor producing less than its planned output per work hour of input.”

[2]H. Randolph Thomas, ‘Quantification of Losses of Labor Efficiencies: Innovations in and Improvements to the Measured Mile’ (2010) 2(2) Journal of Legal Affairs and Dispute Resolution in Engineering and Construction 106: “a schedule delay analysis and a loss of labor efficiency analysis are not the same. Different analysis methodologies are applied, and the cause-and-effect relationships are very different.”

Change one fact: the same steel delivery is delayed, but this time the contractor immediately redeploys the crew to another productive work front, and the workforce remains productive throughout. The supply chain disruption caused a programme impact only, with no workforce dimension arising at all. The contractor who treats these two situations identically will either overclaim in the second or underclaim in the first.

The third situation is the one most frequently left unrecovered. Substitute materials arrive on time but with different specifications than planned, and while there is no delivery delay, the workforce must now adapt to unfamiliar dimensions, carry out additional quality checks, and revise installation sequences until output per man-hour drops measurably. This is a productivity loss caused entirely by a supply chain substitution, with no programme delay attached to it, no obvious trigger for a delay claim, and therefore no natural prompt to begin quantifying. The loss is real, measurable and recoverable, but only if it is recognised for what it is.[3]

A fourth situation deserves equal attention. Materials needed for a future activity are delayed but are not yet on the critical path, with no idle workforce, no productivity loss, and no programme impact visible today. The documentation obligation, however, arises the moment the delay is known, because if those materials do not arrive before the programme reaches that activity, the causal chain must be traceable back to today, not to the day the impact eventually becomes visible on site.

A contractor whose structural steel is sitting at Jebel Ali waiting for port operations to normalise is in the second or third scenario depending on whether his crew was redeployed or handed substitute specifications. A contractor whose crew absorbed shelter alerts through March while materials arrived with changed specifications from alternative suppliers is in all four simultaneously. The window for contemporaneous records is open now and will not reopen later.[4]

Measuring the loss

The choice of methodology is not made when the claim is prepared. Lost productivity is, all too often, calculated at the end of a project during the preparation of a claim, at which point only a gross approximation can be made. Courts and tribunals are consistently more persuaded by damage calculations supported by contemporaneous project documentation than by retrospective reconstruction.[5] The methodology must be selected now, because it determines which records need to be kept, and those records can only be created at the time.

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[3]SCL Protocol (n.1) paras 7–9. On the global claim risk: SCL Protocol Core Principle 17: “the not uncommon practice of contractors making composite or global claims without attempting to substantiate cause and effect is discouraged.” On double recovery: Thomas (n.2): “it is not considered double recovery to receive compensation for both types of damages.” SCL Protocol (n.1) Core Principle 18.2: “Disruption events can have a direct effect on the works by reducing productivity (such as... design changes).” See also AACE 130R-23 (n.1), s.1.1: “Loss of productivity is caused by a detrimental change in or disruption to planned resource usage, working conditions, or work method.” Derek Nelson, The Analysis and Valuation of Disruption (HKA), citing Borcherding and Alarcon: the major components of productivity loss include “doing ineffective work, and doing rework.”

[4]SCL Protocol (n.1) Core Principle 4 (contemporaneous analysis): “Do not ‘wait and see’ regarding impact of delay events.” AACE 130R-23 (n.1) s.2.2.2 (Adherence to Contract Change Notice Requirements). Nelson (n.3): “most claims for disruption are dealt with retrospectively and the claimant is forced to rely on contemporary records to try and establish a causal nexus.”

[5]AACE International Recommended Practice No. 25R-03, Estimating Lost Labor Productivity in Construction Claims (2004), s.A: “lost productivity is, all too often, calculated at the end of a project during preparation of a claim or request for equitable adjustment. As a result, often times only a gross approximation or a total cost estimate can be made.” AACE 25R-03, s.C.2: “courts, Boards of Contract Appeals and other legal forums are

The measured mile is the most widely accepted approach for calculating lost productivity.[6] It compares the level of productivity achieved during an unimpacted period of the works against that achieved during the impacted period, with the difference, properly attributed, constituting the recoverable loss.[7] For projects that were running before February 2026, that unimpacted baseline exists in the pre-conflict production records already on file, for example, the weekly output reports, the foreman's daily logs, the progress payment applications from the fourth quarter of 2025. The practical task is to pull those records now, calculate the productivity rates achieved in that period, and document the comparison point before it recedes further. The baseline period selected must be sufficiently long to serve as a reliable sample of non-impacted performance.[8]

Where no unimpacted period can be identified, that is,on projects that commenced during the conflict or on projects so thoroughly impacted that no clean baseline exists, anearned value analysis is the fallback: planned man-hours per unit in the tender allowance are compared against actual man-hours being expended.[9] The vulnerability of this approach lies in the baseline. Original tender assumptions should not automatically be treated as a realistic and achievable benchmark, and if the tender allowance is challenged as overoptimistic, the analysis loses its foundation.[10] The practical answer is to document the least-disrupted periods on the project as they occur. It may be preferable to identify such a period and use it as the

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more favourably impressed by damage calculations related directly to the project in dispute and supported by contemporaneous project documentation." See also Long International (Richard J. Long and Rod C. Carter), Cumulative Impact Claims (2013), s.8.1: "a consistent record of problems documented contemporaneously through daily reports, RFIs, change requests and correspondence is of much greater value than any analysis or expert opinion that can be offered after the project is completed"; CDR-1256 (AACE International Transactions, 2013): "rarely will a contractor have the ability to foresee that a tracking system is necessary before it is too late to develop such a tracking system."

[6]SCL Protocol (n.1) para 18.16: "the measured mile analysis is the most widely accepted method of calculating lost productivity." See also Long International (n.5) s.5.6: "most industry experts, panels, courts and boards would agree that employing the measured mile method is the contractor's best chance of proving and recovering loss of productivity costs"; Barry B. Bramble and Michael T. Callahan, Construction Delay Claims (7th edn, 2022) s.5.08: "the measured mile approach avoids the need to prove the reasonableness of estimated productivity because it is not used as the basis for comparison."

[7]SCL Protocol (n.1) para 18.16(a): "Measured mile analysis: This compares the level of productivity achieved in areas or periods of the works impacted by identified disruption events with productivity achieved on identical or like activities in areas or periods of the works not impacted by those identified disruption events." H. Randolph Thomas (n.2) 106: "The measured mile concept involves a comparison of actual labor performance between two time periods, a normal one called the measured mile and an impacted period." Long International (n.5) s.6: "the measured mile method utilises the contractor's actual performance on a portion of the work to determine what the full scope of work should have cost, absent any owner-caused impacts."

[8]SCL Protocol (n.1) para 18.16(a): "the baseline period selected must be sufficiently long to serve as a reliable sample of non-impacted performance." AACE 25R-03 (n.5) s.C.2: "there is general agreement among cost professionals that a comparison to unimpacted work on the project is generally preferred when there is sufficient data available." Long International (n.5) s.6: "detailed cost, man-hour, and installed quantity data is required to perform the calculation accurately."

[9]SCL Protocol (n.1) para 18.16(b): "Earned value analysis: This identifies the amount of man-hours reasonably included in the tender allowance for completing certain work activities and compares this with the actual man-hours for completing those work activities." AACE 25R-03 (n.5) s.C.2: where insufficient contemporaneous documentation exists to support a measured mile study, recommended practice is to use project comparison methods and, where those too are unavailable, cost-basis methods. Philip D. Barnard, 'Assessing Labor Productivity' (HKA): earned value analysis identified as one of the commonly used methods to measure disruption.

[10]SCL Protocol (n.1) para 18.9: "Original tender assumptions should not automatically be considered as a 'realistic and achievable' baseline." Bramble and Callahan (n.6) s.5.08: "The reluctance to completely embrace this method stems from the assumption that the contractor's estimated labor productivity and other elements of its bid are without error."

measured mile, to show minimum likely additional loss during periods of greater disruption.[11] Those weeks become the closest available approximation to an unimpacted baseline and lend credibility to any earned value calculation that follows.
Neither methodology can be retrospectively assembled without records. What differs is which records each one requires.[12]

When the disruptions compound

Throughout March and into April 2026, GCC construction sites were not disrupted once but repeatedly, by different causes, in short succession, over several weeks. An emergency alert issued at midday stopped a concrete pour, sent crews to shelter, and cost hours that were not recovered when the all-clear sounded. Debris from an intercepted missile caused physical damage to a storage area adjoining the live works, and reconstruction was inserted into an active programme. Through all of this, materials from diverted supply chains continued to arrive with substituted specifications, and the same crew absorbed every one of these events.

That pattern produces three analytically distinct layers of loss, each requiring its own claim structure and its own documentation.

The first layer is the most straightforward. Each emergency alert generated a discrete work stoppage: a measurable number of hours lost, on a measurable number of resources, on an identifiable date. That calculation is available to any contractor who recorded which crew was on which activity when the alert was issued and when work actually resumed. The loss is direct, dateable, and separable.

The second layer is where most of what was lost will go unrecovered. Between alerts, the same workforce was not operating at planned productivity. Resequencing after each stoppage, the anticipatory slowdown before the next, and the sustained effect of working through weeks of repeated disruptions all depressed output during nominal working periods. This is compound disruption in the technical sense: the synergistic effect of multiple events producing a net loss greater than the sum of the individual stoppages, and it is a recognised head of claim in its own right.[13] Unlike the alert-based stoppages, this layer leaves no automatic record. It is visible only in output data, and only if that data was being tracked.

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[11]SCL Protocol (n.1) para 18.16(a): “It may be preferable instead to identify a period of least disruption and, using this as the measured mile, to show minimum likely additional loss and expense during periods of greater disruption.” John R. Koontz (MCAA), ‘How to Apply the Measured Mile Method of Productivity Analysis’: where no unimpacted period exists, the contractor should “identify those areas or time frames that are the least impacted” and use those as the comparative baseline.
[12]AACE 25R-03 (n.5) s.A: “lost productivity is frequently not discretely tracked on construction projects in a contemporaneous manner. Unless a contractor uses some sort of structured earned value system for tracking output units and input units, there is no way to measure productivity contemporaneously.” Pramod Oommen, Performing Disruption Analysis for Construction Projects (HKA): “the key to any successful disruption claim is records, records and records”; “the failure to keep records for actual hours (or costs) expended to perform the works with reduced productivity could prove detrimental to a disruption claim.” Long International (n.5) s.8.1: “Absent these records, the contractor will find it difficult to recover on any cost overruns, much less those caused by the cumulative impact of changes.”
[13]AACE 130R-23 (n.1): “Cumulative impact is defined as the net impact of two or more undifferentiated changes... being much greater than the sum of the effect of the individual parts.” See also Reginald M. Jones, ‘Lost Productivity: Claims for the Cumulative Impact of Multiple Change Orders’ (2001) 31 Public Contract Law Journal 1: “the issuance of an unreasonable number of change orders creates a synergistic disruptive impact such that the total disruption caused by the changes exceeds the sum of the disruptive impacts caused by the

The third layer arises where debris caused physical damage. When reconstruction is inserted into a live construction programme, it generates crowding, resequencing, and dilution of supervision across activities that were never directly hit, reducing productivity on work that had nothing wrong with it.[14] That loss is recoverable, but only as a separately identified head of claim with its own cause-and-effect chain traced back to the debris event.

Presenting all three layers as one undifferentiated claim is the most reliable path to recovering nothing.[15] Each layer must be claimed separately, with its own causation established from its own trigger event.

The records that make the claim

The practical question for a contractor currently on a GCC site is not whether these claims exist but whether the evidence to support them is being created right now. Contemporaneous records serve a function that no retrospective analysis can replace: the causal chain for each layer of loss must be traceable to a datable trigger event, and that chain is built forward in time, not backwards from a quantum figure.[16]

The records required for each of the three layers are different. For the alert-based stoppages, the essential document is a daily log recording crew composition, the activity on which each crew was deployed at the time of the alert, the time the alert was issued and the time work actually resumed, and the units of output planned but not achieved in that shift. For the compound between-alert productivity loss, what is needed is a periodic output-per-man-hour

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individual change orders when looked at independently." Long International (n.5): "the construction industry, courts, and arbitration panels generally agree that the theory of cumulative impact is reasonable, and that multiple change orders and other types of delays and disruption can negatively impact the performance of unchanged work such that a contractor expends additional time, man-hours and costs." Emelyn Warde Martinez, 'Dealing with Cumulative Impact Claims' (2010 AACE International Transactions, CDR.12): "when changes in a certain project become numerous and act concurrently, it creates a compounding effect in the life cycle of the project."

[14]SCL Protocol (n.1) para 18.2: "Disruption events can also lead to secondary consequences on the execution of the works, for example through crowding of labour or stacking of trades, dilution of supervision through fragmented work gangs." See also HKA Nelson (n.3): Phase 4 of project change — costs incurred after the changed work has been performed — "are indirect and are often referred to as impact costs"; Mechanical Contractors Association of America, Factors Affecting Productivity, Bulletin No. 58 (1976): identifies 'Stacking of Trades', 'Dilution of Supervision', and 'Reassignment of Manpower' as discrete, quantifiable factors affecting labour productivity; Theodore J. Trauner et al., Construction Delays (2nd edn, Elsevier 2009) ch.11: delays that force resequencing and insertion of additional activities into live programmes generate compounding inefficiency in resources that were never directly delayed.

[15]SCL Protocol (n.1) Core Principle 17: "the not uncommon practice of contractors making composite or global claims without attempting to substantiate cause and effect is discouraged by the Protocol." Long International (n.5) s.4.2: cumulative impact claims most commonly fail for three reasons — failure to reserve rights, flawed damages methodology, and lack of causation; the last is fatal where multiple disruption events are bundled without attribution. AACE 130R-23 (n.1) s.2.2.4: "Demonstration of Causation" is a standalone element of entitlement; the claimant must establish a causal link between each identified event and the resulting productivity loss. Jones (n.13): cumulative impact claims require separate establishment of liability, causation, and resultant injury for each disruption event relied upon.

[16]SCL Protocol (n.1) Core Principle 4: "Delay and disruption should be dealt with as close in time to the causative event as possible. Do not 'wait and see' regarding impact of delay events." AACE 25R-03 (n.5) s.A: "lost productivity is frequently not discretely tracked on construction projects in a contemporaneous manner. Unless a contractor uses some sort of structured earned value system for tracking output units and input units, there is no way to measure productivity contemporaneously." Long International (n.5) s.8.1: "Absent these records, the contractor will find it difficult to recover on any cost overruns, much less those caused by the cumulative impact of changes." Nelson (n.3): "the failure to keep records for actual hours (or costs) expended to perform the works with reduced productivity could prove detrimental to a disruption claim."

measure taken against the pre-conflict baseline, sufficiently frequent to show the declining trend and the dates over which it occurred.[17] For the reconstruction disruption, the record is a revised programme showing the insertion of reconstruction works and the resources drawn from live works to complete them, together with output records for those live works in the weeks before and after the insertion.

The notice obligations under the applicable contract will have their own requirements, and each clause will say something different about timing, form, and consequence of non-compliance. The documentation obligation, however, is broader than the notice obligation and arises at the same moment: a contractor who issues a notice and then files nothing further has preserved the right to claim without preserving the claim itself.[18]

For any project that was running through March and April 2026, the unimpacted baseline, the alert log, the output records, and the programme narrative are all still within reach. That window will not remain open indefinitely. Once the project moves past these weeks, the contemporaneous period closes, and with it the most reliable opportunity to recover what this disruption actually cost.

[17]AACE 25R-03 (n.5) s.C.2: “courts, Boards of Contract Appeals and other legal forums are more favourably impressed by damage calculations related directly to the project in dispute and supported by contemporaneous project documentation.” AACE 130R-23 (n.1) s.2.2.4: “Demonstration of Causation” — requires contemporaneous documentation establishing the causal link between each identified event and the resulting loss. Oommen (n.12): “the key to any successful disruption claim is records, records and records.” Thomas (n.2): the measured mile “involves a comparison of actual labor performance between two time periods, a normal one called the measured mile and an impacted period.” Barnard (n.9): output-per-man-hour tracking as the fundamental measure of productivity against which impacted performance is compared.

[18]SCL Protocol (n.1) Core Principle 17: “the not uncommon practice of contractors making composite or global claims without attempting to substantiate cause and effect is discouraged by the Protocol.” AACE 130R-23 (n.1) s.2.2.2 (Adherence to Contract Change Notice Requirements): compliance with contractual notice requirements is a standalone element of entitlement, separate from the documentation of loss. Long International (n.5) s.4.2: cumulative impact claims most commonly fail for three reasons — failure to reserve rights, flawed damages methodology, and lack of causation; notice and documentation serve different functions and both must be addressed independently. CDR-1256 (n.5): “rarely will a contractor have the ability to foresee that a tracking system is necessary before it is too late to develop such a tracking system.”