RECONCILING CONCURRENCY IN SCHEDULE DELAY AND CONSTRUCTIVE ACCELERATION

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I. INTRODUCTION

Courts and Boards of Contract Appeals have long considered concurrent delays to be excusable. Indeed decisions like *Blinderman Construction Co. v. United States* "memorialized the conceptual rule that '[w]here both parties contribute to the delay neither can recover damage, unless there is in the proof a clear apportionment of the delay and the expense attributable to each party.'"[1] The phrase "time but no money" evolved from this rule, and serves as the standard shorthand to define the practical resolution of concurrent delays on a federal construction project.[2] "This summary approach reflects the reasoned analysis of concurrent delays in the context of [the federal Default clause][3] in government contracts, and balances the risk of these joint delays by dividing the financial burden between the parties."[4] Thus, in the face of delays caused by both the contractor and the Government, the contractor will receive additional time to complete the work, but neither the Government

1. W. Stephen Dale & Kathryn T. Muldoon, *A Government Windfall: ASBCA's Attack on Concurrent Delays as a Basis for Constructive Acceleration*, Procurement Law., Summer 2009, at 4, 4–5 (quoting Blinderman Constr. Co. v. United States, 695 F.2d 552, 559 (Fed. Cir. 1982) (quoting Coath & Goss, Inc. v. United States, 101 Ct. Cl. 702, 714–15 (1944))).
2. *See id.*
3. FAR 52.249-10.
4. Dale & Muldoon, *supra* note 1, at 4.

nor the contractor may recover delay damages.[5] As such, a concurrent delay serves as an excusable, but not compensable, delay.

While the allocation of responsibility for concurrent delays remains well established with respect to damages for delay, its application to constructive acceleration has come under attack. Two recent decisions from the Armed Services Board of Contract Appeals ("ASBCA" or "Board") threaten the notion that concurrent delays qualify as excusable, but not compensable, delays.[6] These decisions rest on the flawed premise that "in a 'Changes' clause analysis, a contractor cannot recover acceleration costs flowing from a concurrent delay, unless the record supports a clear apportionment of the delay and expense attributable to each party."[7] While that premise appears on its surface to comport with the allocation responsibilities inherent in a delay damages calculation, it ignores the rule that concurrent delays are excusable and contradicts the long-held belief that, in the face of concurrent delays to the work, "neither party will benefit from the delay."[8] A contractor that experiences a concurrent delay is entitled to time, but not money, for the costs of the delay. Where the Government refuses to grant additional time and forces the contractor to accelerate, the Government, not the contractor, should bear the costs of acceleration.

This Article provides a brief review of the doctrine on concurrent delay and constructive acceleration. In that context the article discusses the ASBCA's decisions in *Hemphill Contracting Co*. and in *R.J. Lanthier Co*., and the impact of those decisions on a contractor's right to recover increased costs in the event of a constructive order to accelerate. The Article also looks at concurrency in the context of constructive acceleration, and traces the growing importance of apportionment in addressing acceleration damages. Further, to explore the theory of apportionment of concurrent delays, this Article examines schedule delay analysis and highlights how the choice of method can generate disparate outcomes.

II. THE LEGAL FRAMEWORK OF DELAY ANALYSIS

The discussion of either concurrent delay or constructive acceleration begins with a brief look at the broader topic of delay. "Delays generally fall into one of three categories: (1) excusable and compensable; (2) excusable but not compensable; and (3) not excusable."[9] To the extent a delay is not excusable, it

5. *See infra* note 33; *see also* Dale & Muldoon, *supra* note 1, at 8 n.11 (listing cases where the "time but no money" rule has been applied).

6. R.J. Lanthier Co., ASBCA No. 51636, 04-1 B.C.A. (CCH) ¶ 32,481, at 160,668–69; Hemphill Contracting Co., ENGBCA Nos. 5698, 5776, 5840, 94-1 B.C.A. (CCH) ¶ 26,491, at 131,853.

7. *Hemphill*, 94-1 B.C.A. (CCH) ¶ 26,491, at 131,853.

8. *Id*.

9. Dale & Muldoon, *supra* note 1, at 4; *see also* Kirk Bros. Mech. Contractors, Inc., ASBCA No. 43738, 93-1 B.C.A. (CCH) ¶ 25,325, at 126,188 ("Where the delay is caused solely by the

does not qualify for an equitable adjustment either as delay damages or as an element of acceleration damages.[10]

"Concurrent" is generally defined as "operating or occurring at the same time."[11] When used in the context of construction delays, the term refers collectively to two or more delays, some of which are either compensable or excusable, while others are neither compensable nor excusable. These delays are considered "concurrent" because they occur at the same time, or because they occur at different times but produce a common effect.[12] As a result, the concept of concurrency can describe both the cause and the effect of multiple delay events. As noted above and discussed in more detail below, courts and boards have generally considered concurrent delays to fall within the second category of delays, i.e., excusable but not compensable, on the theory that "[w]here both parties contribute to the delay 'neither can recover damage.' "[13]

A. *Compensable Delay: The Doctrine of Clean Hands*

For a delay to qualify as excusable and compensable, the Government must have been "the *sole* proximate cause of the contractor's additional loss, and the contractor [must] not have been delayed for *any other reason* during that period."[14] This obligation thus includes the requirement that "there was no concurrent delay on the part of the contractor."[15] In other words, the contractor must bring a delay claim with clean hands, having borne none of the responsibility for delaying the work.[16] Courts and boards often rely on the Suspension of Work clause for support when justifying the clean hands doctrine embodied in the theory of compensable delay.[17] More specifically, these panels look to the following phrase:

Government, it is compensable; where the delay is caused solely by the [contractor], [the contractor] is responsible.... Where the delay is prompted by inextricably intertwined concurrent Government and contractor causes, the delay is not compensable."); Andrew D. Ness, *Delay, Suspension of Work, and Acceleration*, *in* Federal Government Construction Contracts 413, 424–27 (Bastianelli et al. eds., 2003).

10. *See* Ness, *supra* note 9, at 424. An essential element of any constructive acceleration claim is an excusable delay. *See infra* note 38 and accompanying text.

11. Webster's Ninth New Collegiate Dictionary 273 (1987); *see also* David W. James, *Concurrency and Apportioning Liability and Damages in Public Contract Adjudications*, 20 Pub. Cont. L.J. 490, 491 (1991) (defining concurrent delay).

12. James, *supra* note 11, at 492.

13. Blinderman Constr. Co. v. United States, 695 F.2d 552, 559 (Fed. Cir. 1982) (quoting Coath & Goss, Inc. v. United States, 101 Ct. Cl. 702, 714–15 (1944)).

14. *See* Triax-Pac. v. Stone, 958 F.2d 351, 354 (Fed. Cir. 1992) (citing Merritt-Chapman & Scott Corp. v. United States, 528 F.2d 1392, 1397 (Ct. Cl. 1976)); Jon M. Wickwire et al., Construction Scheduling: Preparation, Liability, and Claims 203–06 (2d ed. 2003).

15. George Sollitt Constr. Co. v. United States, 64 Fed. Cl. 229, 238 (2005); *see* John Cibinic Jr. et al., Administration of Government Contracts 601–03 (2006).

16. *Cf.* Whitesell-Green, Inc., ASBCA Nos. 53938, 53939, 54135, 06-2 B.C.A. (CCH) ¶ 33,323, at 165,259–60 (stating that the contractor's acceleration to overcome its own delays was a valid means of offsetting liquidated damages).

17. *See, e.g.*, *George Sollitt Constr.*, 64 Fed. Cl. at 236–37; Kingston Bituminous Prods., ASBCA Nos. 9964, 10902, 67-2 B.C.A. (CCH) ¶ 6,638, at 30,773.

> However, no adjustment shall be made under this clause for any suspension, delay, or interruption to the extent that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the Contractor, or for which an equitable adjustment is provided for or excluded under any other term or condition of this contract.[18]

Reliance on the Suspension of Work clause, however, can be misleading. Not all compensable delays arise as a result of a suspension of work or constructive suspension. Moreover, as discussed in Part IV, the doctrine of constructive acceleration, the matter at issue in both the *Hemphill* and *Lanthier* decisions, involves a Changes clause analysis.[19]

To comply with the requirement that the Government be "the sole proximate cause of delay," courts and boards have required contractors seeking delay damages to apportion concurrent delays, i.e., to segregate any delays for which the contractor is responsible from those delays for which the Government is responsible.[20] The Court of Federal Claims (COFC) discussed this obligation in the context of both nonsegregable, concurrent delays and sequential, segregable delays as follows:

> [W]here both parties contribute to a delay neither can recover damage[s], unless there is in the proof a clear apportionment of the delay and the expense attributable to each party. Concurrent delays "occur[] where both parties are responsible for the same period of delay, the second where one party and then the other cause different delays *seriatim* or intermittently. If delay is concurrent, apportionment of liability may be impossible, where in the latter, responsibility may be easily demarcated. For example, if both the [G]overnment's late approval of plans and the contractor's delay in ordering material postponed the start of construction by two weeks, responsibility may be concurrent and responsibility simply not apportionable. But if later the [G]overnment delayed the contractor's ability to build an access road to a project because it failed to timely approve its location or the specifications of the underlying aggregate base, and that period of delay necessarily postponed delivery of building materials to a job site which, in turn, led to a separate or sequential delay in the construction schedule of that building, that period would fall into a second, separate, sequential non-overlapping delay for which the [G]overnment would be solely responsible.[21]

This trend to apportion responsibility for delays helps to ensure a causal link between the claimed damages and the delays giving rise to them. The complications raised in the context of constructive acceleration, however, relate to those concurrent delays that the COFC referred to as "simply not apportionable."[22] With respect to those delays, history has provided a simple

18. FAR 52.242-14(b).

19. *See* Cibinic et al., *supra* note 15, at 445–58 (explaining the concept of acceleration).

20. *See*, *e.g.*, Sauer Inc. v. Danzig, 224 F.3d 1340, 1347–48 (Fed. Cir. 2000); Essex Electro Eng'rs v. Danzig, 224 F.3d 1283, 1292 (Fed. Cir. 2000); T. Brown Constructors, Inc. v. Pena, 132 F.3d 724, 734–35 (Fed. Cir. 1998); Commerce Int'l Co. v. United States, 338 F.2d 81, 89–90 (Ct. Cl. 1964).

21. Cumberland Cas. & Sur. Co. v. United States, 82 Fed. Cl. 500, 507 (2008) (internal quotation marks omitted).

22. *Id*.

rule: those delays are excusable but not compensable. The trouble lies in applying that simple rule to cases of constructive acceleration.

B. *Excusable but Not Compensable Delays: Shared Fault or No Fault*

FAR 52.249-10, Default (Fixed-Price Construction), states the conceptual foundation for excusable delay: "The Contractor's right to proceed shall not be terminated nor the Contractor charged with damages under this clause, if (1) the delay in completing the work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor."[23] "Thus, where a contractor does not contribute to the causes of a project delay, the [G]overnment may not assess liquidated damages and must extend the time allowed for performance of the work, 'excusing' the contractor from liability for the delay."[24] The kinds of delays typified under this approach include various events generally beyond the control of either the Government or the contractor. As noted in the Default clause, those "no fault" events can include

(i) Acts of God or of the public enemy,
(ii) Acts of the Government in either its sovereign or contractual capacity,
(iii) Acts of another [c]ontractor in the performance of a contract with the Government,
(iv) Fires,
(v) Floods,
(vi) Epidemics,
(vii) Quarantine restrictions,
(viii) Strikes,
(ix) Freight embargoes,
(x) Unusually severe weather, or
(xi) Delays of subcontractors or suppliers at any tier arising from unforeseeable causes beyond the control and without the fault or negligence of both the [c]ontractor and the subcontractors or suppliers.[25]

This nonexhaustive list illustrates the two requirements of the clause: (1) unforeseeability and (2) the absence of control, fault, or negligence of the contractor. When events that meet these two factors operate to extend overall contract completion, the contractor is entitled to an extension of time.[26] In that circumstance, the contractor must also bear the financial burden of extended performance; however, it retains the right to accelerate its work and finish the project early.[27] This arrangement thus provides the contractor with the choice of how to proceed once it encounters an excusable delay. It may choose to accelerate the work to overcome the excusable delay, or it may phase the work to allow for completion within the extended time allowed.

23. FAR 52.249-10(b); *see also* FAR 52.249-8(c) (Default (Fixed-Price Supply and Service)), 52.249-9(c) (Default (Fixed-Price Research and Development)).
24. Dale & Muldoon, *supra* note 1, at 4.
25. FAR 52.249-10(b)(1).
26. *See* FAR 52.249-10(b)(2); *see also* Cibinic et al., *supra* note 15, at 570 (qualifying that a contractor must prove that the time lost delayed the contract).
27. Dale & Muldoon, *supra* note 1, at 4–5.

"In either circumstance, under an excusable but not compensable delay, the contractor retains the discretion and must bear its own costs of extended performance or acceleration."[28]

C. *What Is a Concurrent Delay?*

The COFC rightly appraised the issue of concurrent delay, noting that "[t]hornier issues are posed by concurrent or sequential delays."[29] As discussed above, concurrent delay generally refers to both delays occurring at the same time as well as delays that occur at different times, but with a common effect.[30] Still a third category of concurrent delay exists that is referred to as "offsetting" delays. Offsetting delays may not occur simultaneously or even affect the same activities, but may interact over the project as a whole to impact the completion date.[31] As a result, the concept of concurrency can describe both the cause and the effect of a delay event. In that context, the COFC in *George Sollitt v. United States* developed the following definition of concurrent delays:

> The exact definition of concurrent delay is not readily apparent from its use in contract law, although it is a term which has both temporal and causation aspects. Concurrent delays affect the same "delay period." *See Tyger Constr. Co. v. United States*, 31 Fed.Cl. 177, 259 (1994) ("In cases of concurrent delay, where both parties contributed significantly to the delay period by separate and distinct actions, justice requires that the cost of the delay be allocated between the two parties proportionally."). A concurrent delay is also independently sufficient to cause the delay days attributed to that source of delay. *See Beauchamp Constr. Co. v. United States*, 14 Cl. Ct. 430, 437 (1988) (noting that a concurrent action "would have independently generated the delay during the same time period even if it does not predominate over the [G]overnment's action as the cause of the delay" (citations omitted)).[32]

Courts and boards have determined that a concurrent delay is an excusable, but not compensable, delay that entitles the contractor to an extension of time.[33] On that point, the COFC in *Morganti National, Inc. v. United States* held:

> [T]he fact that the contractor may also have caused concurrent delay is not fatal to the contractor's claim for additional time due to excusable delay. "If a period of delay can be attributed simultaneously to the actions of both the Government and

28. *Id*.
29. R.P. Wallace, Inc. v. United States, 63 Fed. Cl. 402, 409 (2004).
30. James, *supra* note 11, at 492.
31. *See* PCL Constr. Servs., Inc. v. United States, 53 Fed. Cl. 479, 486 (2002).
32. George Sollitt Constr. Co. v. United States, 64 Fed. Cl. 229, 238 (2005).
33. *See, e.g.*, *R.P. Wallace*, 63 Fed. Cl. at 410–11; Morganti Nat'l, Inc. v. United States, 49 Fed. Cl. 110, 140 (2001); Newport News Shipbuilding & Dry Dock Co. v. United States, 79 Ct. Cl. 25, 36–37 (1934); Acme Missiles & Constr. Corp., ASBCA No. 11786, 69-2 B.C.A. (CCH) ¶ 8057, at 37,445–46; *cf*. United States v. United Eng'g & Constructing Co., 234 U.S. 236, 242 (1913) (refusing to allow liquidated damages for concurrent delay). For a detailed analysis of concurrency, see James, *supra* note 11, at 510; James P. Wiezel, *Refining the Concept of Concurrent Delay*, 21 Pub. Cont. L.J. 161, 161–62 (1992).

> the contractor, there are said to be concurrent delays, and the result is an excusable but not a compensable delay."[34]

Thus, where a concurrent delay exists, the contractor is entitled to an extension of time to accommodate the delay and may not be "charged with damages."[35] Further, the contractor retains the right to control its means and methods, and can evaluate whether to accelerate the work or to use the extended performance period. This approach recognizes the risk allocation of fixed-price contracting and compels each party to bear an equitable portion of the costs of an excusable delay.

III. CONSTRUCTIVE ACCELERATION

Most decisions addressing concurrent delay do so in the context of a claim for delay damages, and not in the context of acceleration to overcome the delays.[36] Concurrent delay represents a commonly used defense by the Government to preclude a contractor from recovering the costs of extended performance, and thus often appears in the context of delay damages.[37] Acceleration, however, embodies a different legal concept and results in different performance costs. While delay damages include extended time-related costs, acceleration involves the addition of labor, premium labor hours, additional equipment, and other means to speed the work rather than extend it.[38]

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34. *Morganti*, 49 Fed. Cl. at 132; *see also R.P. Wallace*, 63 Fed. Cl. at 410 ("Concurrent delay is not fatal to a contractor's claim for additional time due to excusable delay, but precludes the recovery of delay damages. 'If a period of delay can be attributed simultaneously to the actions of both the Government and the contractor,' this court has stated, 'there are said to be concurrent delays, and the result is an excusable but not a compensable delay.' "); Utley-James, Inc., GSBCA No. 5370, 85-1 B.C.A. (CCH) ¶ 17,816, at 89,109 ("If a period of delay can be attributed simultaneously to the actions of both the Government and the contractor, there are said to be concurrent delays, and the result is an excusable but not a compensable delay."); Chas. I. Cunningham Co., IBCA No. 60, 57-2 B.C.A. (CCH) ¶ 1541, at 5483 ("Accordingly, if an event that would constitute an excusable cause of delay in fact occurs, and if that event in fact delays the progress of the work as a whole, the contractor is entitled to an extension of time for so much of the ultimate delay in completion as was the result or consequence of that event, notwithstanding that the progress of the work may also have been slowed down or halted by a want of diligence, lack of planning, or some other inexcusable omission on the part of the contractor.").

35. R.P. Wallace, Inc. v. United States, 63 Fed. Cl. 402, 409 (2004); *see also* Robust Constr., LLC, ASBCA No. 54056, 05-2 B.C.A. (CCH) ¶ 33,019, at 163,649 ("A contractor is entitled to time extensions for government-caused delays and excusable delays, even when they are concurrent with contractor-caused delay."); Cogefar-Impresit U.S.A., Inc., DOTBCA No. 2721, 97-2 B.C.A. (CCH) ¶ 29,188, at 145,207 ("While a contractor cannot recover damages for increased costs resulting from delays during periods in which both it and the Government caused concurrent project delay, the Government is precluded from imposing contract penalties during such a period.").

36. *See, e.g.*, *R.P. Wallace*, 63 Fed. Cl. at 409–10; Newport News Shipbuilding & Dry Dock Co. v. United States, 79 Ct. Cl. 25, 34, 36 (1934).

37. *See, e.g.*, Sauer Inc. v. Danzig, 224 F.3d 1340, 1347–48 (Fed. Cir. 2000); Blinderman Constr. Co. v. United States, 695 F.2d 552, 559 (Fed. Cir. 1982); Commerce Int'l Co. v. United States, 338 F.2d 81, 89–90 (Ct. Cl. 1964).

38. *See generally* Cibinic et al., *supra* note 15, at 445–46 (discussing circumstances constituting acceleration).

In that context, acceleration addresses fundamentally different issues from delay, even if both share common origins.

Generally, for an acceleration effort to be compensable, the Government must, either directly or implicitly, order the contractor to speed up its efforts on the site in an attempt to complete the work in a period shorter than allowed by the contract, as it may be extended.[39] The authority for this premise generally rests in the Changes clause, FAR 52.243-4, and its acknowledgment that the Contracting Officer (CO) may direct "acceleration in the performance of the work."[40] Most disputes, including those in the *Hemphill* and *Lanthier* decisions, arise in the context of constructive acceleration, where the Government implicitly directs the contractor to overcome excusable delays and complete the project within the original completion period, or some period shorter than allowed by the contract.[41] The Court of Appeals for the Federal Circuit described the doctrine of constructive acceleration in *Fraser Construction Co. v. United States* as follows:

> A claim of acceleration is a claim for the increased costs that result when the [G]overnment requires the contractor to complete its performance in less time than was permitted under the contract. The claim arises under the [C]hanges clause of a contract; the basis for the claim is that the [G]overnment has modified the contract by shortening the time for performance, either expressly (in the case of actual acceleration) or implicitly through its conduct (in the case of constructive acceleration), and that under the [C]hanges clause the [G]overnment is required to compensate the contractor for the additional costs incurred in effecting the change.
>
> A claim of constructive acceleration ordinarily arises when the [G]overnment requires the contractor to adhere to the original performance deadline set forth in the contract even though the contract provides the contractor with periods of excusable delay that entitle the contractor to a longer performance period.[42]

Thus, to demonstrate entitlement to increased costs under a theory of constructive acceleration, a contractor must prove five elements:

39. *See id*. at 448–56.
40. FAR 53.234-4.
41. *See*, *e.g*., Fraser Constr. Co. v. United States, 384 F.3d 1354, 1361 (Fed. Cir. 2004).
42. *Id*. at 1360–61 (citation omitted). Another rationale for constructive acceleration arises in the unpublished decision of the U.S. Court of Appeals for the Federal Circuit in *Azure v. United States*, No. 96-5054, 1997 WL 665763, at *3 (Fed. Cir. Oct. 24, 1997) (citation omitted), which stated:

> Under the standard changes clause contained in this contract, the [G]overnment may make a change to the contract, including an order to accelerate work, and make an equitable adjustment for the work. Under normal circumstances, a demand that the contractor complete the work on schedule is simply a demand for plaintiff to meet his contractual obligations. An order to complete the work by a date earlier than that called for by an adjusted contract completion date is an acceleration because it called upon the contractor to exceed the contract terms. However, if the contractor was entitled to an extension of time due to excusable delays and, therefore, an adjusted contract completion date, an instruction to complete the project according to the original contract completion date is a constructive acceleration and therefore within the changes clause of the contract. In this situation, an extension of time after the contract's completion may not resolve the contractor's claim for excess costs. The constructive acceleration claim addresses the timeliness of the grant of an extension.

> (1) that the contractor encountered a delay that is excusable under the contract; (2) that the contractor made a timely and sufficient request for an extension of the contract schedule; (3) that the [G]overnment denied the contractor's request for an extension or failed to act on it within a reasonable time; (4) that the [G]overnment insisted on completion of the contract within a period shorter than the period to which the contractor would be entitled by taking into account the period of excusable delay, after which the contractor notified the [G]overnment that it regarded the alleged order to accelerate as a constructive change in the contract; and (5) that the contractor was required to expend extra resources to compensate for the lost time and remain on schedule.[43]

The initial element required to prevail on a claim for constructive acceleration is proof of an excusable delay. In that context, excusable delays need not be compensable to recover for acceleration costs where the contractor has met the other elements of proof. For example, unusually severe weather and strikes have resulted in recovery for acceleration costs, even though these events are traditionally considered excusable, but not compensable, delays.[44] In each case, the concept outlined in *Fraser*, namely, that the Government has modified the contract by shortening the time for performance, results in finding that the contractor may recover its acceleration costs.[45] In other words, excusable delay entitled the contractor to an extension of time such that the Government's direction to overcome the delays shortened the contractually allowed time of performance. Logically, the same approach should apply to concurrent delay, an excusable but not compensable delay, in which the contract performance period should be extended to accommodate the period of concurrent critical path delay.

IV. IS CONCURRENT DELAY STILL EXCUSABLE: *HEMPHILL CONTRACTING CO.* AND *R.J. LANTHIER CO., INC.*

Two decisions from the ASBCA set the competing objectives of apportionment and excusability at odds. In both decisions, the Board ignored the rule that concurrent delays are excusable and reached the conclusion that acceleration damages required an apportionment of delays.[46] In each case, the Board held that the absence of any apportionment resulted in a denial of accelera-

43. *Fraser*, 384 F.3d at 1360–61; *see also* McNutt Constr. Co., ENGBCA No. 4724, 85-3 B.C.A. (CCH) ¶ 18,397, at 92,279 (five similar elements). *But see* Norair Eng'g Corp. v. United States, 666 F.2d 546, 548 (Ct. Cl. 1981) (three elements). *See generally* Cibinic et al., *supra* note 15, at 446–47 (listing elements of constructive acceleration).

44. *See, e.g.*, *Norair*, 666 F.2d at 547 (weather and strikes); Atl. Dry Dock Corp., ASBCA No. 42685, 98-2 B.C.A. (CCH) ¶ 30,025, at 148,561–62 (weather); William Lagnion, ENGBCA No. 3778, 78-2 B.C.A. (CCH) ¶ 13,260, at 64,841–42 (weather); Pathman Constr. Co., ASBCA No. 14285, 71-1 B.C.A. (CCH) ¶ 8905, at 41,386–87 (strikes).

45. *See, e.g.*, *Pathman*, 71-1 B.C.A. (CCH) ¶ 8905, at 41,387.

46. R.J. Lanthier Co., ASBCA No. 51636, 04-1 B.C.A. (CCH) ¶ 32,481, at 160,668–69; Hemphill Contracting Co., ENGBCA Nos. 5698, 5776, 5840, 94-1 B.C.A. (CCH) ¶ 26,491, at 131,853.

tion costs.[47] These decisions suggest that the Government may, in the context of excusable, concurrent delays, shorten the time allowed for performance with no obligation to provide compensation.

A. Hemphill Contracting Co.

In *Hemphill Contracting Co.*, the contractor entered into a negotiated, fixed-price contract for the clearing and removal of trees from Missouri's Ellis Island in the Mississippi River.[48] That work included the disposal of materials cleared from the site by burning.[49] During performance of the work, the Government shut down burning operations for twenty-one days to review whether to modify the contractor's approach to the burning work.[50] At the end of the suspension period, the Government directed that the contractor use a specific burning method different from that originally employed.[51] During the same suspension period, the Board found that "Hemphill simply decided not to work" on other activities for twelve of the twenty-one days.[52] Despite the delays, the contractor completed the work on time and asserted a claim for constructive acceleration.[53] In correspondence, the Government recognized the contractor's acceleration efforts, noting:

> The Contractor shut down all basic contract work for [six] weeks to get caught up with the burning and then spent [thirteen] weeks performing the remaining clearing and burning. . . . The Contractor was able to finish on time by accelerating the basic contract clearing and by adding personnel and equipment to the burning operation.[54]

The Board reviewed Hemphill's claim and found it lacking with respect to virtually every element of proof required to demonstrate constructive acceleration.[55] With respect to the first element, excusable delay, the Board began with a traditional analysis, stating, "The test for establishing an excusable delay that underpins an acceleration claim is whether the delay flows from causes 'beyond the control and without the fault or negligence of the contractor.'"[56] The Board proceeded to note that Hemphill's own suspension of nonburning operations in the key twenty-one-day period did not result from government action, observing:

47. *R.J. Lanthier*, 04-1 B.C.A. (CCH) ¶ 32,481, at 160,668–69; *Hemphill*, 94-1 B.C.A. (CCH) ¶ 26,491, at 131,853–54.
48. 94-1 B.C.A. (CCH) ¶ 26,491, at 131,842.
49. *Id.* at 131,843.
50. *See id.* at 131,845.
51. *Id.* at 131,846.
52. *Id.* at 131,853.
53. *Id.* at 131,849.
54. *Id.*
55. The Board found that (1) Hemphill had not encountered an excusable delay, (2) Hemphill had not requested an extension of time, (3) the Government had not denied a timely request for an extension of time, and (4) Hemphill had not actually accelerated its work. *Id.* at 131,853–54.
56. *Id.* at 131,853.

> From our review of the record, we are not convinced that any delay to Hemphill's work was occasioned solely by the Government's restriction on burning during the "no burn" period, or other excusable causes. Hemphill's failure to work during the majority of that period either was attributed to rain or wet conditions that did not rise to the level of "unusually severe weather," or was part of Hemphill's consistent pattern of no weekend work. Furthermore, there is nothing in this record by which we can apportion any segment of the delay exclusively to the Government. For these reasons, we conclude that Appellant's partial idleness during the "no burn" period was not exclusively the result of an excusable delay.[57]

Following this analysis, the Board concluded that "a contractor cannot recover acceleration costs flowing from a concurrent delay, unless the record supports a clear apportionment of the delay and expense attributable to each party."[58]

Despite the Board's reliance on the contractor's lack of progress during the twenty-one-day period, the Board's decision references no schedule analysis and contains no discussion of whether the burning or nonburning activities had any impact on the critical path. The opinion appears to conclude that the nonburning work Hemphill did not perform in the twelve days impacted project completion to the same degree as the Government's direction to suspend burning.[59] Nevertheless, based on this information and its presumption that the contractor and government delays qualified as truly concurrent critical path delays, the Board articulated the following rule:

> When a contractor's performance is delayed by multiple causes acting concurrently, and only one cause is excusable, *i.e.*, where other causes lie with the contractor, courts and boards have adopted the approach that neither party will benefit from the delay. *Consequently, in a "Changes" clause analysis, a contractor cannot recover acceleration costs flowing from a concurrent delay, unless the record supports a clear apportionment of the delay and expense attributable to each party*.[60]

This pronouncement appears to impose a heightened requirement on a contractor seeking compensation for constructive acceleration; a contractor may not demonstrate a mere *excusable* delay as required by *Norair Engineering Corp. v. United States*[61] and *Fraser*, but it must prove a *compensable* delay arising solely due to the actions of the Government. This, in turn, places a heavy burden on the contractor to apportion compensable and noncompensable delays.[62]

57. *Id*.

58. *Id*. One paragraph prior, however, the Board made some effort to allocate delays, noting:

> During the 21-day period when Hemphill was unable to burn, it otherwise performed work on only nine days (including one weekend day). Seven days were lost to rain or wet conditions, but the record does not disclose whether the conditions on those days constituted "unusually severe weather," and there is no indication whether or not burning or any other work could have been accomplished on those days. On five weekend days, Hemphill simply decided not to work—a policy that continued throughout the contract term.

Id.

59. *See id*.

60. *Id*. (emphasis added).

61. 666 F.2d 546 (Ct. Cl. 1981).

62. *See supra* note 20 and accompanying text.

Moreover, this holding effectively imposes a penalty on the contractor that could exceed the liquidated damages already disallowed by the Default clause. In that context, regardless of the default provision and precedent instructing the Government to provide an extension of time to accommodate the concurrent delays, the Government's acceleration directive may compel the contractor to overcome the concurrent delays without any financial contribution.

The *Hemphill* holding on concurrency suffers from the facts of the case. The Board rejected the contractor's proof on every element of constructive acceleration, with each basis independently sufficient to deny the claim.[63] Accordingly, the impact of the Board's holding on concurrency will remain in question unless adopted by subsequent panels.

B. R.J. Lanthier Co.

Ten years later, in *R.J. Lanthier Co*., the Board had the opportunity to reach a similar conclusion as it did in *Hemphill*.[64] In *Lanthier*, a supplier sought constructive acceleration costs for electrical switchgear installed on a Navy project in San Diego, California.[65] The supplier claimed that twelve defects in the specifications provided by the Government, namely a conflict between a drawing and accompanying written specifications, resulted in delays to fabrication and installation of certain components.[66] The contractor's failure to notify the Government of the delays, or submit a request for a time extension, complicated the contractor's ability to obtain an extension.[67]

As in *Hemphill*, the Board found the contractor's proof on all the elements of constructive acceleration lacking.[68] More specifically, the Board rejected the contractor's claim that the delays it encountered were excusable.[69] The Board analyzed the basis for the defective specifications delay and found the specifications for seven of the twelve alleged defects clear and unambiguous.[70] The Board further found that to the extent these defective specifications delayed fabrication efforts, those delays were "caused by GSI's [Lanthier's subcontractor's] own refusal to start production until its demands for additional compensation and variances were satisfied."[71] The Board expressed its disappointment with the delay analysis provided and held that the defective specifications "have not been persuasively established as affecting the critical path of overall job performance/completion ...."[72]

63. Hemphill Contracting Co., ENGBCA Nos. 5698, 5776, 5840, 94-1 B.C.A. (CCH) ¶ 26,491, at 131,853–54.
64. R.J. Lanthier Co., ASBCA No. 51636, 04-1 B.C.A. (CCH) ¶ 32,481, at 160,668–69.
65. *Id*. at 160,653–54.
66. *Id*. at 160,654.
67. *Id*. at 160,669.
68. *Id*.
69. *Id*. at 160,668–69.
70. *Id*. at 160,667.
71. *Id*.
72. *Id*. at 160,668.

Having thus disposed of the constructive acceleration claim, the Board nevertheless examined concurrency "arguendo," noting, "There are thus [appellant-caused] delays attributable to items 1, 2, 4, 5, 7–9, 18, and zinc paint that are by [appellant's] own admission fully concurrent with any other alleged government-caused delays during the 22 May 1995–early November 1995 period."[73] Finding no "credible basis in this record that allow[ed] [the Board] to apportion any definable portion of the alleged delay exclusively to excusable government actions or inactions,"[74] the Board turned to the *Hemphill* analysis to resolve any lingering concurrency issues. The Board quoted the language in *Hemphill* that "a contractor cannot recover acceleration costs flowing from a concurrent delay" and concluded: "Appellant/GSI's own delays were fully concurrent with any alleged government delays and were not separable therefrom. Again, appellant has failed to satisfy the first element of proof with respect to recovery for constructive acceleration."[75]

As with *Hemphill*, the authority of *Lanthier* standing alone may be limited. The *Lanthier* opinion, more so even than the *Hemphill* decision, addressed the concurrency issues in dicta, previously having disposed of the claims on other grounds.[76] Nevertheless, taken together, these decisions appear to adopt the position that concurrent delay, if not segregated, no longer qualifies as excusable delay for purposes of meeting the *Fraser* test for constructive acceleration.

V. FINDING THE THREAD: A HISTORICAL LOOK AT CONCURRENT DELAY AND CONSTRUCTIVE ACCELERATION

The result of the *Hemphill* and *Lanthier* decisions appears to set the holding in *Morganti National* against the holding in *Blinderman Construction*, and, in so doing, pits "time but no money" against the obligation to apportion delays. The position set forth in *Morganti National*, and the heritage of "time but no money," contemplates the scenario under which concurrent delays and their effects may not be subject to segregation and, thus, result in excusable but not compensable delays.[77] By contrast, the approach of *Blinderman Construction* focuses on the compensation aspect in holding that "neither [party] can recover damage, unless there is in the proof a clear apportionment of the delay and the expense attributable to each party."[78]

73. *Id*. at 160,669.
74. *Id*.
75. *Id*. (citing Hemphill Contracting Co., ENGBCA Nos. 5698, 5776, 5840, 94-1 B.C.A. (CCH) ¶ 26,491, at 131,853).
76. *Id*. at 160,668; *see Hemphill*, 94-1 B.C.A. (CCH) ¶ 26,491, at 131,853–54.
77. Morganti Nat'l, Inc. v. United States, 49 Fed. Cl. 110, 132 (2001); Dale & Muldoon, *supra* note 1, at 4–5.
78. Blinderman Constr. Co. v. United States, 695 F.2d 552, 559 (Fed. Cir. 1982) (quoting Coath & Goss, Inc. v. United States, 101 Ct. Cl. 702, 714–15 (1944)).

The following section reviews the principal decisions that have addressed concurrent delay in the context of constructive acceleration in an effort to develop an analytical lineage for these types of factual scenarios. This review reveals that, over time, the analysis employed by the courts and boards evolves as their ability to examine project delays improves. Thus, as time proceeds, the courts and boards look more to apportionment of acceleration costs based on the responsibility for delays than on simple all-or-nothing rules. Nevertheless, none of these decisions address the situation in which the Government and the contractor create concurrent, nonsegregable delays to the project.

A. *Find the Controlling Delay:* Kingston Bituminous Products

One of the early decisions addressing concurrent delay in the context of acceleration is *Kingston Bituminous Products Co*.[79] The decision, despite later citations to it as authority, does not address the issue of concurrency as excusable delay. Instead, the ASBCA decision, like most, determines which delays controlled the project completion date and effectively avoids the concurrency issue as it bears on entitlement.[80]

The case arose from the Navy's retention of Kingston Bituminous Products ("KBP") to lengthen the runway at Naval Air Engineering Station Lakehurst, in New Jersey.[81] On appeal the contractor asserted that the Government delayed the work eighty-four days for unreasonable suspensions of work, changed conditions, and late inspections.[82] The contractor also claimed excusable delays related to severe weather.[83] In addition to the delays, the contractor claimed that the Government issued a constructive acceleration order when, at a meeting on delays and project performance, the Government insisted that the "contract be 'completed on time' " and assessed fifty-four days of liquidated damages.[84]

The Board found that the Government delayed the contractor's work for fifty-two days in conjunction with severe weather, changed conditions, and late inspections.[85] At the same time, however, the Board denied the contractor's other claims for delay, noting that the Government's suspensions arose out of the contractor's failure to provide aggregate and sand that met the contract specifications, the contractor's poorly managed quality control program, the contractor's poor workmanship generally, and the contractor's failure to pave sections of the runway as required under the contract.[86] The Board's decision included no analysis of this apparent concurrency or analysis of how the

79. ASBCA Nos. 9964, 10902, 67-2 B.C.A. (CCH) ¶ 6638, at 30,770.
80. *See id*. at 30,758–59.
81. *Id*. at 30,754.
82. *Id*. at 30,757.
83. *See id*. at 30,757–58.
84. *See id*. at 30,757, 30,771.
85. *Id*. at 30,757–59.
86. *See id*. at 30,773–74.

fifty-two days of government-caused delay interacted with the contractor's own delays. Instead, the Board relied on the Suspension of Work clause as a means of addressing the concurrency issue and simply noted the following:

> Assuming arguendo that the respondent's actions or inactions as contended by appellant through the hearing did in part cause the delays and were hindrances to performance, they would be at most concurrent with the several and more serious causes for delays chargeable to the contract and under that situation no recovery can be permitted. We have taken that position on several occasions.[87] Attention is also invited to the suspension of work clause, *supra*, which clearly says that "No adjustment shall be made to the extent that performance by the Contractor would have been prevented by other causes even if the work had not been so suspended, delayed, or interrupted."[88]

This finding, combined with the lack of analysis, makes interpretation of the Board's position difficult. By modern parlance, the Board's broader holding suggests that the contractor-caused delays were controlling such that the government-caused delays did not result in the extended performance period. The Board's more specific findings, e.g., those quoted above, complicate the conclusion since the Board issued conflicting findings. For example, despite having extended the contract completion date fifty-two days due to actions of the Government in what was termed the "First Cause of Action,"[89] the Board noted: "Appellant has not come forth with any convincing proof that the extension of time granted under the First Cause of Action actually delayed or had any material impact on the work in general and but for those delays the contractor would have completed performance on schedule."[90] How the Board found enough merit to extend the contract completion date fifty-two days despite not considering the underlying delays sufficient to impact the work is unclear.

Despite the difficulty navigating the Board's grant of time, the contractor lost its acceleration claim for reasons unrelated to the concurrency.[91] In short, the Board dismissed the acceleration claim based on the lack of an acceleration order from the Government.[92] The Board held that the Government's demand that the "contract be 'completed on time'" did not constitute an order to accelerate.[93] Moreover, the contractor's "several efforts and assurances" about accelerating the work amounted to nothing more than "recogni-

87. One of the citations included by the Board was *Metro-Tel*, which did not address an acceleration claim but rather a delay claim. ASBCA No. 8471, 1964 B.C.A. (CCH) ¶ 4164, at 20,243. *Metro-Tel* noted, "In such a situation, assuming arguendo only that appellant was delayed by excusable causes, the delays for which each contracting party is responsible cancel each other out and appellant is not entitled to any recovery, including an extension of time." *Id*. at 20,248.

88. Kingston Bituminous Prods. Co., ASBCA Nos. 9964, 10902, 67-2 B.C.A. (CCH) ¶ 6638, at 30,774 (citations omitted).

89. *See id*. at 30,757, 30,759.

90. *Id*. at 30,771.

91. *See id*.

92. *See id*.

93. *Id*.

tions of the fact that the performance was behind schedule," not a response to an acceleration order.[94] Despite the Board's rationale on this holding, other ASBCA decisions have relied on *Kingston Bituminous Products* as support for the theory that concurrent delay poses a complete bar to recovery for acceleration.[95]

B. *Jury Verdict:* Koppers-Clough

Kingston Bituminous Products provides little insight into the analysis of concurrent delay as it pertains to constructive acceleration. Between the lack of clarity in connection with delays and the ultimate denial of the claim on other grounds, the decision provides an uncertain starting point at best. The Board's decision in *Koppers-Clough* four years later, however, offers an approach that examines concurrent delays and a means for addressing them.[96]

Koppers-Clough ("K-C") contracted with the Navy for the second and third stages of construction of the U.S. Naval Communication Station in North West Cape, Australia.[97] "The contract provided for the construction of high frequency communications systems, support facilities, family housing and related buildings, along with necessary utilities and roads, at a price of $20,470,000."[98] During the first stage of the project, another Navy contractor encountered differing site conditions and unusually severe weather.[99] As a result, the first-stage contractor accelerated its work and the Navy authorized that contractor to pay premium wages to complete the delayed first-stage work faster.[100]

In its appeal, K-C argued that the acceleration effort from the first-stage contractor resulted in ninety days of delay to K-C's work.[101] The acceleration effort, and the premium wages paid for the work, allegedly diverted labor from K-C's effort to the first-stage contractor.[102] K-C also argued that the Government's demands for additional design work related to K-C's temporary facilities delayed K-C's ability to house, and thus to retain, its own workforce.[103] The Government presented evidence of concurrent delays, noting that during the same ninety-day period, K-C was late in providing

94. *See id.*
95. *See, e.g.*, Essential Constr. Co. & Himount Constructors, Ltd., ASBCA No. 18706, 83-2 B.C.A. (CCH) ¶ 16,906, at 84,114. The ASBCA interpreted *Kingston Bituminous Products* to hold that concurrency disposed of the acceleration claim, stating that *Kingston* "involved a claim of constructive acceleration where there were delays determined to be chargeable to the appellant, and recovery was denied because any delay by respondent would have been concurrent with those delays." *Id.*
96. ASBCA Nos. 12485, 13119, 71-2 B.C.A. (CCH) ¶ 8920.
97. *Id.* at 41,438.
98. *Id.*
99. *See id.* at 41,442.
100. *See id.* at 41,450.
101. *Id.*
102. *See id.*
103. *See id.* at 41,448.

design drawings for reinforcing steel to its fabrication and placement to its subcontractor.[104] Moreover, that subcontractor "was very slow in the preparation of shop drawings, so that the job was delayed for the lack of them."[105] Additionally the concrete supplier running the batch plant that supplied both K-C's base scope work and the first-stage contractor's acceleration effort did not provide material to K-C in a timely manner.[106]

The Board accepted these concurrent delays and did not endeavor to parse the competing delays; instead it found the delays arose from "a number of causes all operating concurrently."[107] The Board accepted K-C's evidence as to the ninety days of delay despite doubt as to the quality of evidence presented.[108] The Board then, with no further explanation, split that delay in half, attributing half of the delay to the Government and half to K-C, noting:

> Although the proof is not certain, we accept the appellant's testimony that the job was delayed [ninety] days from mid-July until the end of 1965. All of the factors mentioned in the foregoing paragraph contributed to the delay. On balance, we find that the Government's acceleration of the H-M-H work and the aftermath of its delays to the temporary facilities created 45 days of this delay.[109]

Having done so, the Board turned to the claimed acceleration costs, holding, "Where the Government requires action by the contractor to overcome an excusable delay, this is considered to be a constructive change for which the contractor may recover if additional costs are incurred."[110] The Board identified the acceleration costs sought by K-C as premium wages paid to workers on Sundays and awarded K-C half of those costs based on its allocation of the delay period.[111] As with the delay analysis, the Board offered no additional insight into the allocation of these acceleration damages.

As a result, the decision in *Koppers-Clough* acknowledges the interest in apportioning both the delays themselves and the acceleration costs attributable to overcoming the delays. In this case, the Board's method of simply dividing the delays and the proven costs in half effectively amounted to a jury verdict. Such an approach presents a more reasoned means of apportioning the costs than simply a blanket denial of recovery, but also one that offers little detailed guidance.

C. *Segregation of Acceleration Based on Delay Analysis:* Fischbach & Moore International Corp.

While *Koppers-Clough* offered the first effort at apportioning concurrent delay and acceleration damages, *Fischbach & Moore International Corp*. provides

104. *See id*. at 41,450–51.
105. *Id*. at 41,450.
106. *Id*.
107. *Id*. at 41,451.
108. *Id*.
109. *Id*.
110. *Id*.
111. *See id*.

a more detailed framework for analysis of concurrency and for apportioning damages based on delay.[112] Fischbach & Moore International Corp. ("F&M") "was awarded a contract to erect a complex of 104 steel radio towers, together with antennas, buildings, auxiliary structures, and site work, in the Philippines, for a fixed price of $16,580,639" for the U.S. Information Agency ("USIA").[113] During performance of the work, problems arose with respect to welding the steel supports for the radio towers.[114] The Government issued a stop work order while it addressed the welding issues.[115] The Board, in an earlier decision, found that the Government's interpretation of the specifications and subsequent stop work order constituted a constructive change.[116] When the contractor and the Government could not reach a resolution on quantum for the contractor's delay, acceleration, and impact claims, the Board issued this subsequent opinion.[117]

The Government argued that any delay caused by the suspension of work and the additional welding resulted from a reasonable use of the Suspension clause, or causes attributable to F&M, thus resulting in no extension of time.[118] F&M, by contrast, argued that the Government's actions related to the welding issues resulted in 253 days of excusable and compensable delay to the project.[119] To resolve these arguments the Board first performed an analysis of the project delays, dividing the delays into two groups: those included in the "delay" claim and those included in the "impact" claim.[120] Since neither F&M nor its subcontractors asserted excusable, but noncompensable, delays, the Board simply determined whether the claimed delays were attributable to the Government or the contractor.[121] In doing so, the Board acknowledged that the parties had presented adequate information on which to analyze the issues:

> With regard to the alleged intertwining of Government-caused and concurrent delays in this case, we have found, in the critical path analysis offered by appellant, a ready and reasonable basis for segregating the delays. If the delays can be segregated, responsibility therefor [sic] may be allocated to the parties. And if there is no basis in the record on which to make a precise allocation of responsibility, an estimated allocation may be made in the nature of a jury verdict.... As will be seen in the discussion that follows, we have no such difficulty in the present case.[122]

The Board found that 102 days of the claimed 253 days resulted from "inefficiencies and poor performance" of F&M's fabrication subcontractor, "for

112. ASBCA No. 18146, 77-1 B.C.A. (CCH) ¶ 12,300.
113. *Id*. at 59,206.
114. *See id*. at 59,207–08.
115. *See id*. at 59,206.
116. *See id.*; Fischbach & Moore Int'l Corp., ASBCA No. 14216, 71-1 B.C.A. (CCH) ¶ 8775, at 40,754.
117. *See Fischbach*, 77-1 B.C.A. (CCH) ¶ 12,300, at 59,206, 59,222–23.
118. *Id*. at 59,207.
119. *Id*. at 59,229.
120. *See id*. at 59,225–26.
121. *Id*. at 59,224.
122. *Id*. (citations omitted).

which [F&M] alone was responsible."[123] The Board deemed the remaining 151 days, however, as compensable delays.[124] That compensable period amounted to sixty percent of the total delay period.[125] The Board carried the sixty percent factor to its analysis of the acceleration damages.[126] The Board held that "this is a case of constructive acceleration for which appellant is entitled to be compensated to the extent of the delays chargeable to the Government during the delay and impact periods, that is, to [sixty percent] of whatever reasonable acceleration costs it can prove."[127] Subsequently the Board reviewed the claimed acceleration costs, and applied the sixty percent factor to those costs it deemed allowable and directly associated with the acceleration effort.[128]

While this analytic process appears reasonable as a means of allocating responsibility for acceleration costs, its treatment of concurrent delays appears to ignore the theory that concurrent delays are also excusable in the context of acceleration. For example, when analyzing the delay claims, the Board addressed the interrelation between the Government's unreasonable suspension and the inability of F&M's subcontractor to perform.[129] In that context, the Board found that the subcontractor's financial difficulties rendered it incapable of performing its duties under the contract during a period of government-caused delay.[130] The Board did not treat one delay or another as controlling, but simply identified a simultaneous delay of the work.[131] More specifically, the Board held:

> Although the action taken by appellant was swift and effective in eliminating [F&M's subcontractor's] financial problems, we consider that before the takeover, [F&M's subcontractor] would have been unable to perform any effective work, whether on the critical path or not, even if the Government's stop work order had not been issued. Accordingly, the [twenty-eight] days from 12 May to 9 June, as well as the [nineteen] days between 9 June and 28 June 1967, represent a concurrent delay for which no compensation is allowable.[132]

In the context of this particular analysis, i.e., delay damages, this conclusion comports with longstanding precedent discussed above.[133] Indeed, the Board in this case noted, "When Government-caused delays are concurrent or intertwined with other delays for which the Government is not responsible, the argument continues, a contractor cannot recover *delay damages*."[134]

123. *Id*. at 59,227.
124. *Id*. at 59,227, 59,229.
125. *See id*. at 59,226–28.
126. See *id*. at 59,228.
127. *Id*.
128. *See id*. at 59,230.
129. *Id*. at 59,206, 59,222–23, 59,225.
130. *See id*.
131. *See id.*
132. *Id*.
133. *See supra* Part II.B.
134. Fischbach & Moore Int'l Corp., ASBCA No. 18146, 77-1 B.C.A. (CCH) ¶ 12,300, at 59,224 (emphasis added).

Although the claim sought acceleration damages, the Board, however, did not revisit this concurrent, but presumably excusable, period of delay when applying the sixty percent factor to the acceleration costs. Had it done so, this factor would have increased in the contractor's favor to nearly seventy-one percent.[135] The Board accordingly relied on a compensability analysis rather than an excusability analysis to address the acceleration costs.[136]

Nevertheless, the decision in *Fischbach & Moore International Corp*. represented a leap forward for analysis of concurrent delays from *Kingston Bituminous Products* and a sophisticated turn on *Koppers-Clough*. The Board was unsatisfied with simply dismissing acceleration in the presence of concurrency. Moreover, the Board developed a means of analyzing a project to allocate responsibility for delay and then apply that result to acceleration damages. This approach, however, ignored the role of truly concurrent delays; the Board based its decision solely on the relative percentages of compensable delays.[137] This effort seems to replace the first element of constructive acceleration with a compensability requirement not stated in *Fraser* or its predecessors. In addition, the damages allocation factor based on delays ignored the fact that acceleration costs may not correlate exactly with the delay. In other words, the cost of accelerating the government-delayed activity may not equate on the same basis with accelerating the contractor-delayed activity. In short, while a giant step forward in analyzing these situations, the *Fischbach & Moore International Corp*. decision stopped short of fully addressing the problem.

D. *More Detailed Analysis:* Utley-James, Inc.

While *Fischbach & Moore International Corp*. advanced the Board's sophistication, the General Services Board of Contract Appeals ("GSBCA") in *Utley-James, Inc*. further developed the analytical framework for concurrent delays.[138] In that decision, the GSA awarded Utley-James a contract for the construction of the Patrick V. McNamara Federal Building in Detroit, Michigan, in 1972 with completion set for July 20, 1975.[139] After time extensions from the GSA for differing site conditions and other design changes during the course of the work, the Government extended the contract completion date to November 5, 1975.[140] Nevertheless, the contractor did not achieve substantial completion until April 16, 1976, some 163 calendar days after the contractually required date.[141]

The GSBCA summarized the contractor's arguments on appeal as follows:

135. *See id*. at 59,225.
136. *See id*. at 59,225, 59,227.
137. *See id*. at 59,225–27.
138. GSBCA No. 5730, 85-1 B.C.A. (CCH) ¶ 17,816.
139. *Id*. at 89,054.
140. *Id*.
141. *Id*. at 89,112.

> (1) A series of events for which it was not responsible, such as the slippage of a foundation tieback, an operating engineers' strike, and the discovery of an unexpected underground spring delayed its progress in the early phases of the work. (2) The Government's computerized CPM (critical path method) schedule was not adjusted for these events and did not accurately reflect what was going on in this time frame. (3) The Government, under the erroneous impression that the delays were appellant's fault, ordered appellant to accelerate, which appellant did, then gave appellant time extensions after it was too late for them to do any good. (4) The Government failed to give appellant the information it needed to do the interior finish work, and otherwise delayed the progress of the job after appellant's acceleration, so that after virtually catching up to the original schedule, appellant again fell behind in the later phases of the work.[142]

The Government responded with allegations that it did not order Utley-James to accelerate, but that any acceleration directive was addressed to the contractor's own delays in concrete placement.[143] Moreover, the Government argued that the contractor never actually accelerated its work, having finished later than the adjusted contract period with no interference from the Government.[144]

The GSBCA, and later the U.S. Court of Claims, found that the Government delayed the work in part, as it related to the delivery of tenant design drawings.[145] Nevertheless, the GSBCA found the contractor's proof of acceleration unpersuasive, and, after a lengthy analysis, determined that the contractor had not actually accelerated its work.[146] Although this finding would have addressed the claim without further discussion, the GSBCA looked at the mechanics of the contractor's purported acceleration effort.[147] After doing so, the GSBCA noted, "A case could be made that even if appellant did accelerate its performance after February 28, 1974, that acceleration had only the effect of offsetting delays attributable to appellant's performance, enabling appellant to complete the job in a timely fashion."[148]

The refreshing aspect of *Utley-James* lies in the GSBCA's willingness to parse the periods of delay and analyze the interrelationships between different work activities rather than simply rely on the fact of concurrent delay to solve the problem.[149] The GSBCA appeared troubled by the timing of the alleged acceleration and the timing of the major delay events. Indeed, it succinctly

142. *Id*. at 89,053.
143. *Id*. at 89,107.
144. *See id*.
145. *See* Utley-James, Inc. v. United States, 14 Cl. Ct. 804 (1988); Utley-James, Inc., GSBCA No. 5730, 85-1 B.C.A. (CCH) ¶ 17,816, at 89,116.
146. *See Utley-James*, 85-1 B.C.A. (CCH) ¶ 17,816, at 89,108.
147. *See id*. at 89,107–09.
148. *Id*. at 89,053.
149. *Cf*. Hawaiian Dredging & Constr. Co., ASBCA No. 25594, 84-2 B.C.A. (CCH) ¶ 17,290, at 86,125 ("We are not charged with sorting through a haystack of documents to locate relevant facts. If we were to engage in such efforts it would cripple our ability to perform our basic function of providing a just, inexpensive and expeditious remedy.").

summed up its overall frustration: "This is as good a place as any to voice a lament about this appeal that perhaps typifies the problems of tribunals trying to decide cases of this sort: Why doesn't anything ever connect to anything else?"[150] To address this problem, the GSBCA posited the following strategy:

> In an effort to make sense of this, we will start with a look at each of the delay periods separately, since appellant presented them separately and never connected them. Next we will try to figure out what to make of them in combination and establish a single delay period attributable to the Government's handling of the tenant layout drawings. Finally we will put this delay in the broader context of other events and try to determine whether it is not only excusable but compensable.[151]

The GSBCA reviewed the evidence presented and reconstructed a timeline of events as it pertained to key delays in the work.[152] Based on this analysis, the GSBCA held that the contractor was in fact delayed by the Government with respect to the tenant layout drawings.[153] Nevertheless, the GSBCA's detailed analysis afforded it the opportunity not only to evaluate the source of the delay, but to parse out whether any acceleration costs were incurred in response to the government-caused delay.[154] In that respect, the GSBCA answered in the negative.[155] Indeed, its analysis indicated that the contractor generally did not accelerate at all, and if it did, that increased effort went to work types that were not impacted by the delayed drawings.[156] The GSBCA accordingly concluded that the acceleration addressed the contractor's own problems rather than those caused by the Government.[157] The GSBCA confirmed this observation through its overall suspicion about how the contractor interacted with its delayed subcontractors, failing to provide them with any acceleration directive or even advise them of the Government's order.[158] Fortunately the parties provided the GSBCA with the factual and analytical information necessary to make the determination.[159]

In *Utley-James* the GSBCA separately analyzed delays in detail as well as the acceleration efforts. The GSBCA's work shows an interest not only in the superficial causes of the delays but also the downstream effect of the delays on the project. A willingness to undertake this kind of analysis would, however, prove unusual.

150. *Utley-James*, 85-1 B.C.A. (CCH) ¶ 17,816, at 89,111.
151. *Id*.
152. *Id*. at 89,054–99; *see also* Craft Mach. Works, Inc., ASBCA No. 47227, 97-1 B.C.A. (CCH) ¶ 28,651, at 143,122.
153. Utley-James, Inc. GSBCA No. 5730, 85-1 B.C.A. (CCH) ¶ 17,816, at 89,116. Notably the assumption of government responsibility for the delay arose in part due to the Government's failure to assess liquidated damages.
154. *See id*.
155. *Id*.
156. *See id*.
157. *Id*. at 89,107–16.
158. *Id*. at 89,115.
159. *See id*. at 89,118.

E. *Introduction of the "Defense of Concurrent Delay":* Essential Construction Co.

The ASBCA decision in *Essential Construction Co. and Himount Constructors, Ltd.*[160] represents a contrast from the detailed analysis undertaken by the GSBCA in *Utley-James. Essential Construction* arose from a 200-unit family housing contract at West Point that began in 1968, was scheduled to finish in February 1970, but persisted until July 1971 before final acceptance.[161] The appeals emerging from the project generated ten ASBCA decisions over several years; the Board finally resolved the outstanding acceleration issues in 1989.[162] Despite the fourteen-year staying power of the litigation, the decision produced no lasting insight into the treatment of concurrent delay as it pertains to acceleration.

In this case, the contractor submitted nineteen claims for delay and a single, separate claim for impact and acceleration arising from the delay.[163] The acceleration claim was predicated on those claims, which included the following government-caused delays to the work: "a sudden unexpected nationwide shortage of lumber material," unusually severe weather conditions, lack of access to the site, utility changes, differing site conditions, and other changes.[164] The contractor complained that the Government directed it to meet a revised completion date that the Government unilaterally decided based on time extensions already provided for the nineteen claims.[165] The contractor believed that the Government failed to allow adequate time for the previously granted extensions, and it should be provided additional time plus compensation for its attempts to meet the Government's revised completion date.[166]

In preceding hearings, the ASBCA denied these individual claims for delay but sustained the time extensions already granted by the CO.[167] Naturally the Government argued in the acceleration appeal that "there can be no entitlement to claims for impact/acceleration costs because appellant has failed to establish the basic element for such a claim, namely a given period of excusable delay."[168] The Government, in reliance on *Kingston Bituminous Products*, also argued that any concurrent delay of the contractor would constitute a complete defense to the acceleration claim.[169] The Board agreed with the Government's strained reading of *Kingston Bituminous Products* but declined to apply it at this phase of the hearing.[170] The Board stated:

160. ASBCA No. 18706, 83-2 B.C.A. (CCH) ¶ 16,906.
161. *Id.* at 84,109–10.
162. *See id.* at 84,112.
163. *Id.* at 84,109.
164. *Id.* at 84,110.
165. *Id.*
166. *Id.* at 84,113.
167. *Id.* at 84,114.
168. *Id.* at 84,113.
169. *Id.* at 84,114.
170. *Id.*

> The defense of concurrent delay is valid only when applied to an actually established delay, not merely an alleged delay. Appellant's citation to *Kingston Bituminous Products*, ASBCA Nos. 9964 and 10902, 67-2 BCA P6638 at 30,774, is inapposite in this regard, since that case involved a claim of constructive acceleration where there were delays determined to be chargeable to the appellant, and recovery was denied because any delay by respondent would have been concurrent with those delays. In the instant appeal there is no period of delay already charged to appellant which could be concurrent with the delays claimed ….[171]

As noted above, the ASBCA in *Kingston Bituminous Products* did not deny the contractor's claim for acceleration due to concurrent delays, but due to the absence of an acceleration order.[172] Nevertheless, the Board in *Essential Construction* adopted the rule, dubbing it the "defense of concurrent delay" in a decision that related exclusively to a claim for impact and acceleration, not delay damages.[173] Moreover, the Board discussed its future treatment of concurrency, noting, "In the event multiple causes were ultimately determined to have contributed to a delay, concurrent delays could be eliminated at that time."[174] In other words, the concurrent period of any delay would presumably be removed from the Board's analysis.

The Board decided that it required additional proof before ruling on the acceleration claim.[175] In the follow-on decision, the Board denied the contractor's claims.[176] Unfortunately the dismissal was summary, and based largely on a lack of evidence.[177] In this respect, the ASBCA did not have an opportunity to conduct the same kind of investigation conducted in *Utley-James*.[178] The Board commented:

> In tracing the development of the claim over time, it is often difficult to ascertain exactly what elements it incorporates at any given juncture….
>
> Appellant's presentation has generally been one of argument rather than one created from specific reference to the record. The summary of argument and argument contain periodic, limited references to the exhibits and transcript and then mostly for general points. Not a single case is cited by appellant in either its opening brief or its reply. Appellant's submissions have been unhelpful in a case shrouded in confusion where more precision than normal is needed. We had been given some glimmer of hope in determining how, if at all, the alleged Government caused problems affected the completion of the project as a whole when appellant offered a [critical path method ("CPM")] chart as its exhibit A-2, but nothing ever came of it. It contained only a CPM layout of appellant's as-planned schedule and

171. *Id*.
172. ASBCA Nos. 9964, 10902, 67-2 B.C.A. (CCH) ¶ 6638, at 30,771.
173. Essential Constr. Co. & Himount Constructors, Ltd., ASBCA No. 18706, 83-2 B.C.A. (CCH) ¶ 16,906, at 84,114.
174. *Id*. at 84,115.
175. *Id*.
176. Essential Constr. Co. & Himount Constructors, Ltd., ASBCA No. 18706, 89-2 B.C.A. (CCH) ¶ 21,632, at 108,837.
177. *See id*. at 108,834.
178. In *Utley-James*, the evidence presented allowed the GSBCA to reconstruct a timeline of events related to key delays. GSBCA No. 5370, 85-1 B.C.A. (CCH) ¶ 17,816, at 89,054–99.

> no analysis was ever made to show what effect, if any, subsequent events had on the overall completion of the job. It is not even mentioned in appellant's briefs.
>
> In sum, we have had virtually no aid and guidance in trying to determine appellant's entitlement in this appeal.[179]

Unlike the GSBCA in *Utley James*, then, the quality of the evidence provided by the contractor caused the Board to refuse openly to conduct further inquiry.[180] The Board noted, "We are not charged with sorting through a haystack of documents to locate relevant facts. If we were to engage in such efforts it would cripple our ability to perform our basic function of providing a just, inexpensive and expeditious remedy."[181]

Thus the legacy of *Essential Construction* is twofold. First, the Board introduced the "defense of concurrent delay" into the acceleration arena, applying rules developed for compensable delays to the first element of a claim for constructive acceleration.[182] Second, the Board refused to undertake an *Utley James*-style investigation since the claimant failed to provide adequate information on schedule.[183] In doing so, the Board failed to follow the simple rule that concurrent delays are excusable. Rather, the Board adopted the opposite approach, and simply denied the claim for lack of proof.[184] Similar to the *Utley James* decision, *Essential Construction* reinforces the contractor's obligation to provide sufficient evidence to allow the board to reach a decision.

F. Lovering-Johnson, Inc.

In *Lovering-Johnson, Inc.*,[185] the ASBCA appeared willing to depart from the "defense of concurrent delay" set forth in *Essential Construction*. In *Lovering-Johnson* the Navy awarded a contract to Lovering-Johnson, Inc. ("LJI") for the design and construction of a housing office/community center, 140 family housing units, and associated site improvements at the Naval Air Station in Glenview, Illinois.[186] The contract called for completion of all work within 915 calendar days of award and imposed a phased schedule on the contractor.[187] The contractor alleged to have encountered delays during performance and increased costs as a result of the Government's changes to the storm water drainage system, the failure of the Navy to disclose an allegedly useful environmental report, differing site conditions, and changes to the site plan.[188]

179. *Essential Constr.*, 89-2 B.C.A. (CCH) ¶ 21,632, at 108,833.
180. *See id.*
181. *Id.*
182. Essential Constr. Co., Inc. & Himount Constructors, Ltd., ASBCA No. 18706, 83-2 B.C.A. (CCH) ¶ 16,906, at 84,113–14.
183. Essential Constr. Co., Inc. & Himount Constructors, Ltd., ASBCA No. 18706, 89-2 B.C.A. (CCH) ¶ 21,632, at 108,833.
184. *Id.* at 108,833–34.
185. ASBCA No. 53902, 06-1 B.C.A. (CCH) ¶ 33,126, at 164,172.
186. *Id.* at 164,154.
187. *Id.*
188. *Id.* at 164,169.

The contractor claimed that these events led to a 267-day delay in the project and forced it to incur acceleration costs in an effort to meet the unadjusted completion date.[189]

The Board denied the contractor's claims except as they related to the site plan changes.[190] For these changes, the board recognized a twenty-day time extension.[191] Despite this extension, the Board denied the contractor recovery of costs, stating, "[M]ultiple concurrent, contractor-caused delays are intertwined with any possible minor delays for which the [G]overnment could be held responsible. Appellant fails to recognize, account for or segregate these other contractor-caused delays. Accordingly, it cannot recover monetary compensation for the periods."[192] Armed with this finding, the Board turned to the acceleration claims.[193] For those claims the result was as expected, but confusing.

The contractor argued, consistent with *Morganti* and *Fraser*, that concurrent delays were excusable, even if not compensable, and thus satisfied the first element of the test for constructive acceleration.[194] Relying on *Fraser*, the Board noted that the first element of a claim for constructive acceleration was "that the contractor encountered a delay that is excusable under the contract."[195] Nevertheless the Board seemed to set aside the excusable delay it found in the previous paragraphs and made the following confusing observation, "The *sine qua non* of acceleration is proof of excusable delay.… Even with the grant of these and all other time extensions (in other modifications), appellant still would not have timely completed the work according to estimates it made contemporaneous with any acceleration."[196]

189. *Id*.
190. *Id*.
191. *Id*. at 164,172.
192. *Id*. at 164,173.
193. *Id*. at 164,174–76.
194. *Id*. at 164,174. More specifically, the Board noted, "The essential premise underlying appellant's acceleration and winter protection costs claims is that it was *at least excusably delayed by events associated with claim items 1 and 8*. With the exception of the time extension of [twenty] days granted for claim item 1, we have rejected that premise." *Id*. (emphasis added); *see also* Contel Advanced Sys., Inc., ASBCA No. 49075, 04-2 B.C.A. (CCH) ¶ 32,664, at 161,680 (describing the contractor's argument that it "was impacted by multiple, concurrent delays imposed upon it by the Navy, such that Acceptance was delayed 122 days until May 10, 1992 … and that all cost impacts of this compensable delay should be fully recoverable from the Navy. Additionally … because of the Navy delays, changes and extra work, [the contractor] would have a justifiable right to a time extension.").
195. Lovering-Johnson, Inc., ASBCA No. 53902, 06-1 B.C.A. (CCH) ¶ 33,126, at 164,174.
196. *Id*.; *see also* Curry Contracting Co., ASBCA No. 53716, 06-1 B.C.A. (CCH) ¶ 33,242, at 164,754–55 ("The claim for constructive acceleration relates to contractor assertions of government-caused delay coupled with the [G]overnment's insistence that [Curry Contracting] comply with the completion date of 15 October 1996. As explained above, we find no compensable delay for which the [G]overnment is responsible. Therefore, the linchpin for appellant's acceleration claim, government-caused delay, is absent.").

Presumably the Board's observation addressed the fact that, even with the time extensions granted by it and the CO, LJI would not have been able to complete the project on time, thus leaving an overwhelming balance of delay attributable to LJI. Accordingly the Board concluded that although LJI may have accelerated the work, on balance, any compensation due for addressing the excusable delay period was consumed by the liquidated damages due the Navy for overall late completion.[197] For purposes of the case before it, the Board did not need to address that point, as it found further that the contractor did not actually accelerate its work, and if it did, its efforts were misguided and did not address critical path work.[198]

As with many other cases, the facts of the *Lovering-Johnson* decision did not allow the Board wholly to address the application of concurrent delay to constructive acceleration. This decision does, at least, accept the argument offered by the contractor, namely that where "it was at least excusably delayed" by concurrent events, it should be allowed acceleration costs where it can demonstrate the other elements of proof.[199] *Lovering-Johnson*, like other cases before it,[200] also teaches the lesson that the contractor's proof of both the delays encountered, as well as the acceleration efforts undertaken, must be clear.

VI. IMPACT OF SCHEDULE ANALYSIS TECHNIQUES ON CONCURRENT DELAY

The increasing interest of courts and boards in apportionment of delay coincides with the development of more sophisticated methods of schedule analysis that allow parties to understand and manipulate project schedule data with greater ease.[201] To paraphrase an experienced member of the U.S. Army Corps of Engineers, the question of entitlement in the face of concurrent delay often becomes a matter of proof.[202] Since the starting point of any claim for constructive acceleration is proof of an excusable delay, presentation of

197. *Lovering-Johnson*, 06-1 B.C.A. (CCH) ¶ 33,126, at 164,175.

198. *See id*. at 164,174–75 ("There is no persuasive evidence that appellant accelerated prior to March 1997.... Moreover, contrary to the phased construction completion schedule specified in the contract, appellant appears to have concentrated on activities that were not proven to be on the critical path to completing the phases in order.").

199. *Id*. at 164,174.

200. *See, e.g.*, Performance Constr., Inc., ASBCA No. 53575, 05-2 B.C.A. (CCH) ¶ 33,027, at 163,692.

201. *See, e.g.*, Essex Electro Eng'rs v. Danzig, 224 F.3d 1283, 1292 (Fed. Cir. 2000) (finding that each party's delays were inherently apportionable).

202. Thomas H. Gourlay, Chief Trial Counsel, U.S. Army Corps of Eng'rs, Remarks at the ABA Section of Public Contract Law Educational Program and Open Council Meeting (Nov. 13, 2009).

proof of delay takes on great significance.[203] Where project schedules were once prepared by hand and assembled by taping sheets of paper together, the ability to investigate the details of a concurrent delay or parse out the cause and effect was limited.[204] With the nearly universal adoption of computer-based programs, both contractors and the Government could more easily manipulate large volumes of data, test hypotheses, and analyze impacts in ways not previously contemplated by courts and boards.[205] Indeed, as these methods develop, and parties to a dispute can present more detailed analyses of the project schedule, reliance on blanket "all-or-nothing" legal rules could prove the exception, not the rule, as fact-finders weigh the detailed analyses presented by the parties.[206] As a result, the concept of entitlement in a delay case may morph into a concept similar to comparative negligence in tort.

These technological tools, however, carry their own problems and complications. Indeed, courts and boards faced with these tools have opined on their relative usefulness as well as their weaknesses.[207] Often selection of a particular method of analysis can in itself impact the quantification and allocation of delay. Professional organizations that opine on schedule analysis methods have begun to recognize this phenomenon and drafted proposed "recommended practices," in part to address the issue; these practices, however, have not yet gained full acceptance by the industry.[208] The following section of this Article examines the primary methods of schedule analysis and how the choice of those methods impacts an analysis of concurrent delay.

A. *Establishing a Hypothetical Project*

To navigate the issue, and illustrate the differences inherent in schedule analysis techniques, the following discussion relies on a hypothetical project.

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203. Lovering-Johnson, Inc., ASBCA No. 53902, 06-1 B.C.A. (CCH) ¶ 33,126, at 164,174; *see* Jackson Constr. Co., v. United States, 62 Fed. Cl. 84, 99 (2004) ("The contractor must do more than allege that its work was delayed by the Government's disruptions or changes—it must present specific evidence of which activities were delayed and how those delays extended the duration of the contract.").

204. *See Lovering-Johnson*, 06-1 B.C.A. (CCH) ¶ 33,126, at 164,174 (noting that absence of required scheduling materials rendered administrative tool useless and frustrated analysis).

205. *See id*.

206. *See*, *e.g.*, James K. Bidgood et al., *Cutting the Knot on Concurrent Delay*, Constr. Briefings, Feb. 2008, at 1, 9 (describing alternatives to the "time but no money" approach in private construction allowed by advanced schedule analysis techniques).

207. *See*, *e.g.*, Titan Pac. Constr. Corp. v. United States, 17 Cl. Ct. 630, 639–40 (1989), *aff'd*, 899 F.2d 1227 (Fed. Cir. 1990) (rejecting use of the "adjusted as-planned" for failing to take certain impacts into account).

208. *See*, *e.g.*, AACE Int'l, Recommended Practice No. 29R-03: Forensic Schedule Analysis § 1.1, at 8 (2009), http://www.aacei.org/technical/rps/29R-03.pdf [hereinafter AACE Int'l Recommended Practice]. AACE International's Recommended Practices have yet to gain broad acceptance by practicing experts. *See*, *e.g.*, Judah Lifschitz et al., *A Critical Review of the AACEI Recommended Practice for Forensic Schedule Analysis*, Constr. Law., Fall 2009, at 15, 23; Letter from Thomas J. Driscoll to Stephen J. Warhoe, President, AAEC Int'l 2 (June 20, 2009) ("The Recommended Practice has come under significant scrutiny and criticism by a number of leading delay experts.").

In progressing through this hypothetical, the article identifies certain delay events, defines them, reviews their impacts, updates and adjusts the schedule, and reviews the different results obtained using different methodologies. While this section explores the impacts of various methodologies, the hypothetical centers on the application of the time impact analysis methodology, which combines the kind of updating and adjustments most helpful for this discussion.

The scenario used in this hypothetical delay case arises from the construction of a government laboratory ("Laboratory") complex. The project includes construction of a separate central utility plant ("Central Utility Plant") to provide utilities to the Laboratory, followed by commissioning and startup activities ("Startup"). The project delivery system is "design-bid-build" and the project is awarded to the low bidder as a single prime construction contract. The contract requires final completion including startup within twelve months,[209] and contains a liquidated damages clause for each month of delay. In short, the key project details are

- Project: Construction of Laboratory Facility
- Value: $100 million
- Scope of work: Laboratory, Central Utility Plant, and Startup
- Contract duration: Twelve months
- Liquidated damages: $1 million per month

This hypothetical project also assumes the common practice of establishing a baseline schedule for the work. In doing so, it relies on an agreed-upon contractor-submitted as-planned schedule that reflected the contractor's plan to perform the work within the twelve-month contract period, as shown in the time-scaled graphic in Figure 1.

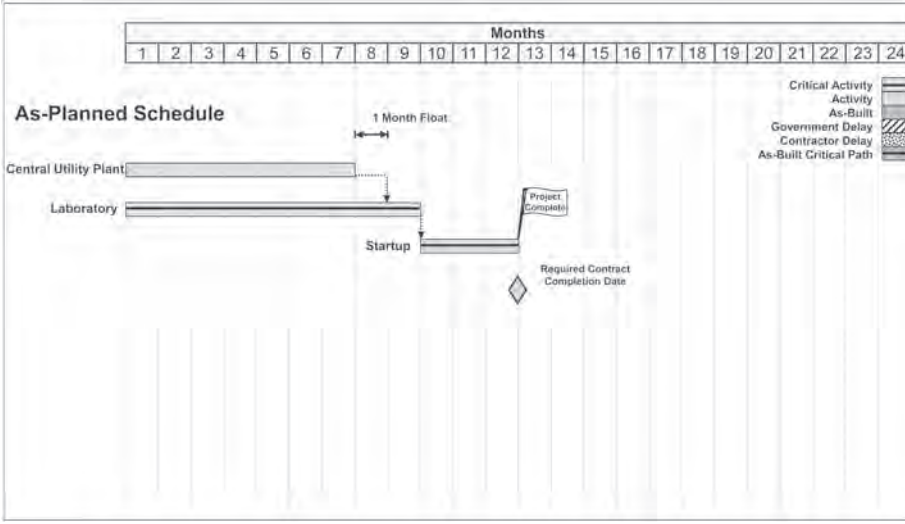
The activities for the Central Utility Plant and Laboratory have been combined for simplicity and summarized as single activities representing different paths of independent work on the project. As noted in Figure 1, the logic constraint on the Central Utility Plant is that it must finish by Month 8 because the Laboratory requires one month to finish construction after utilities are added. After the Laboratory is complete, the schedule allows three months for Startup of the facility.

Certain essential schedule analysis concepts come into play in this hypothetical, including float and critical path. Since the Central Utility Plant has a construction duration of seven months and is not required to be completed in the schedule until the end of month eight, the Central Utility Plant has one month of float in the schedule. Float is the amount of time an activity can slip in the schedule without impacting the next subsequent activity (i.e., "free float"), or the amount of time an activity can slip without impacting project completion (i.e., "total float").[210] The term *float* used independently

209. All time units in this example refer to months.

210. *Accord* Maron Constr. Co., GSBCA No. 13625, 98-1 B.C.A. (CCH) ¶ 29,685, at 147,107–08 (quoting GSA contract provisions defining total float and free float):

Figure 1. Baseline of As-Planned Schedule



generally refers to total float unless otherwise specified in the contract or other reference point. Any delay to activities without any float will impact project completion; these activities are therefore considered "critical" for the project to complete on time. The critical path for the project is the longest sequence of logically connected activities required for project completion.[211] Figure 1 shows the critical path activities with a line running through them. The "as-planned" critical path thus runs through the Laboratory and Startup to project completion.

Total float is defined as the amount of time between the early start date and the late start date, or the early finish date and the late finish date, of any activity in the project schedule. And is further defined as the amount of time any given activity or path of activities may be delayed before it will affect the project completion time. Total float is not time for the exclusive use or benefit of either the Government or the Contractor, but must be used in the best interest of completing the project on time. Extensions of time for performance required under the General Conditions pertaining to equitable time adjustment will be granted only to the extent that the equitable time adjustment exceeds total float in the activity or path of activities affected at the time notice to proceed was issued for the change. The [G]overnment shall not be responsible for any delays or for the contractor's extended overhead if such delay time can be absorbed in total float. Nor shall the [G]overnment be responsible for payment for any delays or for contractor's extended overhead which exceed total float unless the delay is government-caused. The [G]overnment shall only be responsible for government-caused delays to the extent they exceed total float without the presence of any concurrent non-government-caused delay. Free float is defined as the least time between the early finish date of one activity and the early start date of any subsequent activity of which it is a dependency.

211. *See*, *e.g.*, Ace Constructors, Inc. v. United States, 70 Fed. Cl. 253, 294 (2006) ("The 'critical path' is the longest path through a project and thus defines the total duration of the project.").

For simplicity in presenting this hypothetical delay analysis, responsibility for each delay event has been predetermined and attributed to either the contractor or the owner. The sequence of events occurring in this particular example represents those typically encountered by contractors and addressed in delay analyses. The delay events in this example are discussed in chronological order as follows:

- Delay absorbing float
- Concurrent delay
- Owner delay
- Contractor delay
- Offsetting delay
- Contractor re-sequencing
- Acceleration

In order to understand this delay scenario and the ways in which analysis techniques can impact perception of the delay, the following sections proceed through the project chronologically and review each of the above events and incorporate their impact into the schedule on a "real-time basis." In other words, the examples below proceed as if the parties agreed to entitlement and an adjustment or quantum of delay as the project progressed and, accordingly, adjusted the approved project schedule to reflect all time impacts.[212] Moreover, the logical relationship ("logic ties") that shows the precedence and dependence among future work activities accurately reflects the then-current plan to perform that work as of the data date for the update. Many schedule practitioners would argue that this procedure reflects how a project should be scheduled.[213] As a result, a properly adjusted and updated schedule incorporates all appropriate time extensions to the required contract completion date.[214] In this scenario the contractor has an as-planned schedule, schedule updates, and an as-built schedule available for delay analysis.

B. *Understanding the Types of Delay*

1. Noncritical Delay or Delay Absorbing Float: Figure 2

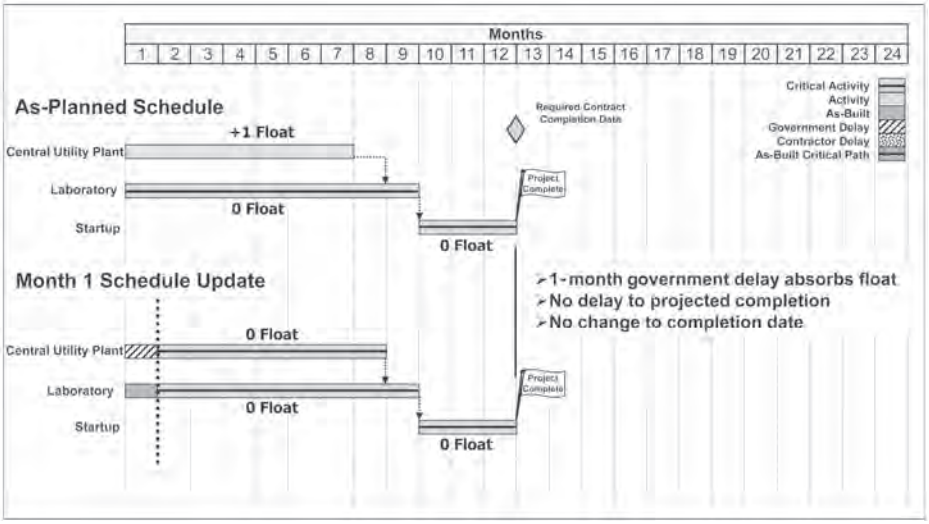
A delay that absorbs positive float in the schedule does not result in any change to the required contract completion date since it does not actually

212. *See* Blinderman Constr. Co. v. United States, 39 Fed. Cl. 529, 585 (1997) ("[A]ccurate, informed assessments of the effect of delays upon critical path activities are possible only if up-to-date CPM [critical path method] schedules are faithfully maintained throughout the course of construction."); Fortec Constructors v. United States, 8 Cl. Ct. 490, 505 (1985), *aff'd*, 804 F.2d 141 (Fed. Cir. 1986) ("[I]f the CPM is to be used to evaluate delay on the project, it must be kept current and must reflect delays as they occur.").

213. *See* Wickwire et al., *supra* note 14, at 37–88.

214. The figures use separate terms to distinguish between anticipated or predicted completion of the work (the project completion flag or "projected" completion) and the contractually required project completion date ("contract completion" or "project completion").

Figure 2. Noncritical Delay Absorbing Float



affect completion of the overall work.[215] A delay that absorbs float is a noncritical delay.[216] In other words, in this scenario, a contractor would not be able to claim traditional delay damages nor would the Government be able to seek liquidated damages since both the contract completion date and the projected completion remain unchanged.[217] Consequently a delay that absorbs float becomes an important issue, but not a controlling factor, in a case of constructive acceleration.

To illustrate this phenomenon, Figure 2 compares the baseline (i.e., as-planned) schedule on the top half of the graphic with the project schedule update as of Month 1 on the bottom half. The end of Month 1 is referred to as the "data date" for the Month 1 schedule update, identified by the vertical status bar at Month 1. The float values for each activity are shown with the associated bar on the graphic. At the start of the project, a government-responsible site turnover delay causes a one-month delay to the start of the

215. Fru-Con Constr. Corp. v. United States, 44 Fed. Cl. 298, 314 (1999) ("It is not sufficient to establish that some work was prevented; the work prevented must be work that will delay the overall completion of the job.") (internal quotation marks omitted).

216. In fact, even some activities on the critical path of work may have float due to activity constraints such as calendar restrictions, but a delay to that activity may not affect the projected completion date of the project. *See* Robert M. D'Onofrio, *Can There Be Float on the Critical Path?* Under Constr., Aug. 2009, at 1.

217. This hypothetical does not address any rights the contractor may have to seek the increased direct costs of the delayed or changed activities but looks exclusively at indirect costs associated with project delay.

Central Utility Plant. The Month 1 update incorporates the as-built sequence of events on the project to the left of the data date as they actually happened.

When evaluating the impact of the delay on the schedule, a comparison is made between (1) the schedule prior to the delaying event and (2) the properly updated schedule after the delaying event is incorporated. In the bottom half of the graphic, the Month 1 schedule contains the remainder of the planned schedule activities to the right of the data date as of the end of Month 1. In Figure 2 the one-month government site turnover delay is absorbed by the one-month positive float position on that activity from the baseline schedule. Comparing the baseline schedule to the Month 1 schedule update shows that the government-caused delay absorbed the available float in the Central Utility Plant and did not cause any delay to the projected completion date. As of the Month 1 status update, both the Central Utility Plant and Laboratory are critical to project completion. Since all available float in the alternate path of work was absorbed, there are multiple critical paths, or co-critical paths, on the project. Further delay to either the Central Utility Plant or the Laboratory would impact project completion.

2. Concurrent Delay: Figure 3

Concurrent delay, as noted earlier in the article, can refer to both simultaneous delays and simultaneous impacts. In this hypothetical, Figure 3 illustrates concurrent delays as simultaneous delay events. Figure 3 compares the Month 1 schedule update from Figure 2 (top half of figure) to the Month 4 schedule update (bottom half of figure).

Two delays occurred in Months 3 and 4 of the project: a two-month-long delay to the Central Utility Plant caused by the Government and a two-month-long delay to the Laboratory caused by the contractor. The two delays both lie on separate critical paths to the project, are independent of each other, and occur at or around the same time period and thus are considered to be concurrent. Moreover, a delay to either path of work would have independently caused a delay to project completion. Consequently the two months of delay are not only concurrent in the sense that they are simultaneous, but they are also concurrent delays in the sense that both cause the same impact. Under the concepts espoused in *Blinderman Construction*, in lieu of specific contract provisions stating otherwise, concurrent delay is an excusable, but noncompensable event to either party.[218] Accordingly, the effect of the concurrent delay in Figure 3 is a two-month excusable, but noncompensable, delay, resulting in a two-month extension to the contract completion date.

3. Government-Caused Delay: Figure 4

Figure 4 illustrates the government-caused delays used in this hypothetical. Unlike the delay absorbing float example, the following two categories

218. *See supra* notes 1–5 and accompanying text.

Figure 3. Concurrent Delay

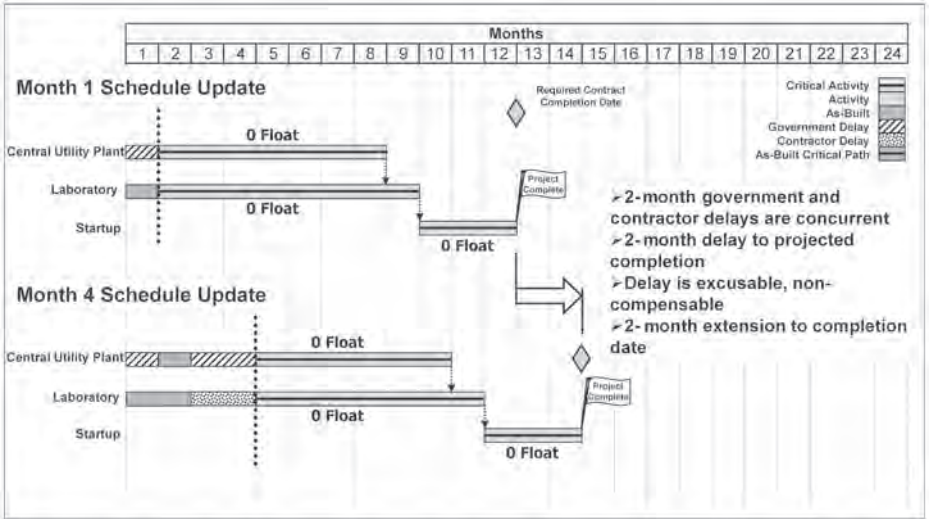
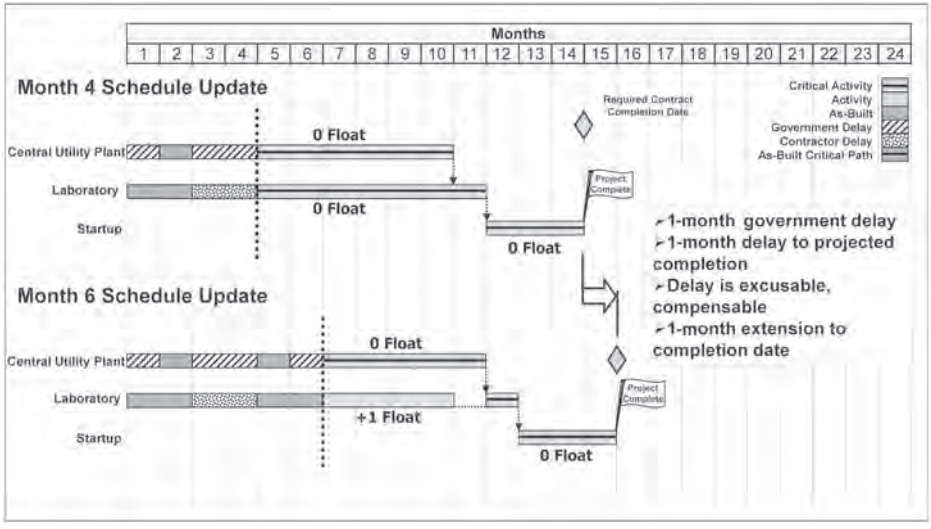


Figure 4. Government Delay



of delay both involve circumstances in which the delays extend the projected completion date beyond the contract period. As shown in Figure 4, the government-caused Central Utility Plant delay results in a one-month excusable, compensable delay to the contractor that entitles the contractor to a one-month time extension to the contract completion date and allowable

extended overhead costs. A comparison of the Month 4 to the Month 6 schedule updates shows that the Government caused a one-month delay to the Central Utility Plant path of work. As of the Month 4 update, both paths of work are still critical. Because the Central Utility Plant is critical, the one-month government-caused delay to the activity corresponds to a projected one-month delay to project completion. Thus, both excusability and compensability for a government delay can be determined directly through a properly updated and adjusted schedule. An isolated government delay on the critical path identified in a properly adjusted project schedule will result in a project delay that is both excusable and compensable.[219]

4. Contractor-Caused Delay: Figure 5

The mirror image of government-caused delay is contractor-caused delay. Figure 5 illustrates contractor-caused delay on the hypothetical project. During the period between the Month 6 schedule update and the Month 10 schedule update, four months of contractor-caused delay impacted the Laboratory path of work. This example also incorporates the concept of float. Because of the positive float position created by the previous government-caused delay to the Central Utility Plant path of work at the end of Month 6, the first month of delay to the Laboratory absorbs float in the schedule and does not result in delay to projected completion, but it does cause that path of work to become critical. The next three months of delay to the Laboratory affect the critical path and result in a delay of three months to projected completion.

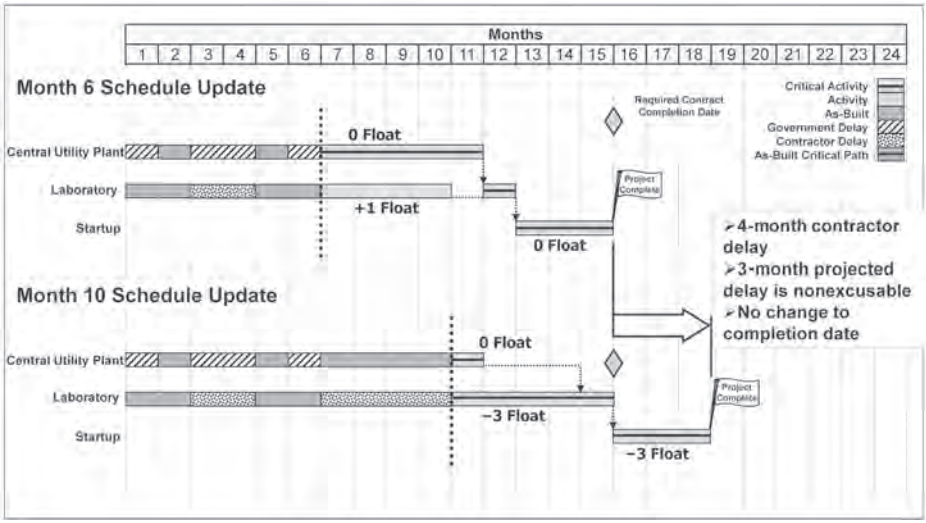
This example also raises the concept of negative float. A negative float path of work in a properly adjusted schedule means that the contractor has fallen behind or deviated from the schedule.[220] During a project, when the completion date is not adjusted as a result of contractor delay to a critical path of work, the float on that path of work becomes negative.[221] Since the contractor may elect to recover these delays, no additional float is created on other paths of work. As of the Month 10 schedule update, as shown in Figure 5, contractor-caused delays between Month 6 and Month 10 created a negative float position of three months on the Laboratory path of work. If the project were to finish the same way the current, Month 10 schedule projects completion, then the contractor would finish three months after the adjusted contract completion date and the Government could seek three months of liquidated damages from the contractor.

219. *See supra* note 6 and accompanying text; *see also* Triax-Pac. v. Stone, 958 F.2d 351, 354 (Fed. Cir. 1992).

220. Barry B. Bramble & Michael T. Callahan, Construction Delay Claims § 1.01 (3d ed. Supp. 2010) ("Proponents of the negative float theory advance the position that all CPM schedule logic paths that have a negative float value are 'critical' because 'but-for' the delay on the longest path of the schedule, any path with negative float would have delayed the project completion date.").

221. *Id.*

Figure 5. Contractor Delay



5. Offsetting Delay: Figure 6

Offsetting delay is a derivation of concurrent delay in that it offsets or nullifies contractor delay for any government delay that would have independently caused a delay to the contract completion date but for a more critical path.[222] Offsetting delay is delay to work that is critical, but not on the longest path to completion of the work.[223] For example, a government delay to a critical path of work that has no available float, and subsequently would project delay past the properly adjusted contract completion date, may entitle the contractor to an excusable time extension that can offset liquidated damages for the period of delay.[224] In *Framlau Corp.*, the ASBCA addressed the notion of offsetting

222. *See, e.g.*, Framlau Corp., ASBCA No. 14479, 71-2 B.C.A. (CCH) ¶ 9082. *See also* Barry B. Bramble & Michael T. Callahan, Construction Delay Claims § 11.09, at 11-79 (3d ed. 2000) (defining "offsetting delays" as "delays that have the same effect on project completion but do not occur within the same general time period").

223. In some aspects, the concept of offsetting delays as used here arises from the way a project is scheduled. In that method, as shown in Figure 6, a properly updated and adjusted schedule indicates an offsetting, government-caused delay to the work on a zero-float path. Accordingly, even if the delay is not on the longest path to completion of the overall work, it still delays the contract completion date, offsetting some of the contractor-caused delay for that period of delay.

224. *See* Sauer Inc. v. Danzig, 224 F.3d 1340, 1345 (Fed. Cir. 2000) ("In addition, the unforeseeable cause must delay the overall contract completion; *i.e.*, it must affect the critical path of performance."); *see also* Contel Advanced Sys., Inc., ASBCA No. 49075, 04-2 B.C.A. (CCH) ¶ 32,664, at 161,680 (requiring that the entire project must be delayed in order for the contractor to recover on government-caused delay of one project segment).

delays and articulated the concept by focusing on the costs allowed under different claims as follows:

> The Government does not deny that it took some additional time to perform the extra work. It denies the request for an extension of time only on the ground that the work could be performed concurrently with items of uncompleted work under the basic contract. The Government's position fails to recognize a distinction between requests for time extensions to support claims for relief from assessment of liquidated damages, and to support claims for upward price adjustments. In assessing liquidated damages, a contractor will not be charged for its delays which are concurrent with Government-caused delays. Since the Government directed a change and has assessed liquidated damages, appellant should not be charged for the number of days it took to perform the additional work, even though the work was performed concurrently with other work. On the other hand, appellant may not use these days for computing an equitable adjustment in price for the increased time of performing the contract if the work was performed concurrently with other work required by the contract or during an extended period of performance resulting from delays caused by appellant.[225]

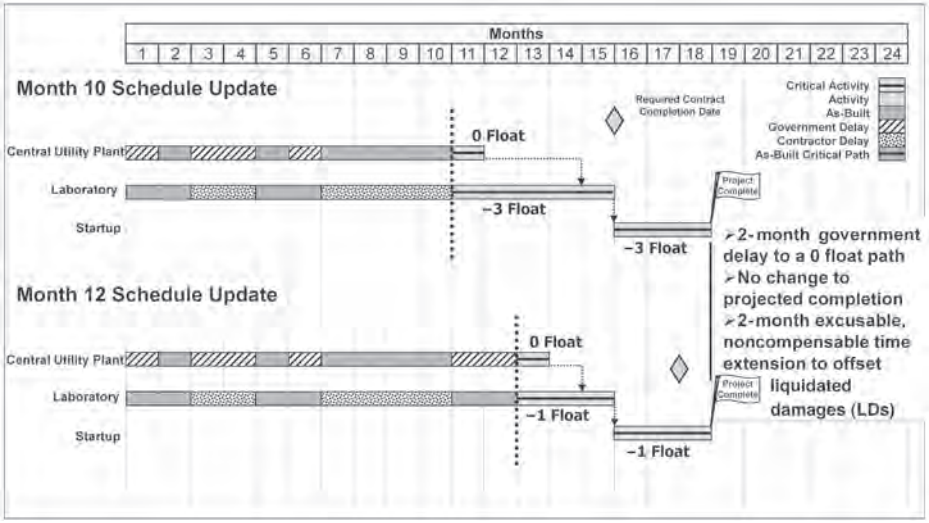
When the contractor is behind schedule and no float is available to absorb an activity's delay, that activity is critical because a delay to that work would delay the adjusted contract completion date even if it is not necessarily on the longest path of work. This stems from the definition of float and the way a project is scheduled with the end date constrained to the required contract completion date, creating negative float in the schedule from contractor-caused delay as outlined in the previous section.[226]

For this hypothetical, Figure 6 shows the Month 10 schedule update, where the longest path of work runs through the Laboratory and Startup activities with a float position of negative three months. The Central Utility Plant alternate path of work also has no float on it. Between Month 10 and Month 12, a two-month government issue causes two months of delay to the Central Utility Plant path of work. The longest path of work runs through the alternate path of work; therefore, the government delay does not delay the anticipated and projected contract completion date. The government-caused delay does affect a path of work with no float available; thus, any delay would independently prevent the contractor from achieving the properly adjusted

225. *Framlau*, 71-2 B.C.A. (CCH) ¶ 9082, at 42,106 (internal quotation marks omitted) (emphasis added); *see also* Cibinic et al., *supra* note 15, at 571 ("When the Critical Path Method of schedule control is used, it is held that the delay must be on the critical path .... This requirement does not mean that each event must delay the contractor past the scheduled completion date. As long as time is lost, the contractor is entitled to an excusable delay.") (citation omitted).

226. *See* Fire Sec. Sys., Inc., VABCA No. 5559-63, 02-2 B.C.A. (CCH) ¶ 31,977 (holding that all activities that would delay completion of the project past the adjusted contract completion date are critical). By comparison, where the contract specification does not allow the end date to be constrained, it prevents negative float from occurring and creates positive float after the expiration of contract time, meaning float is created even by a contractor delay that a government delay can later absorb. *See generally* Santa Fe Eng'rs, Inc., VABCA Nos. 1943, 1944, 1945, 1946, 84-2 B.C.A. (CCH) ¶ 17,341 (holding that available float time absorbed delay from a change order).

Figure 6. Offsetting Delay



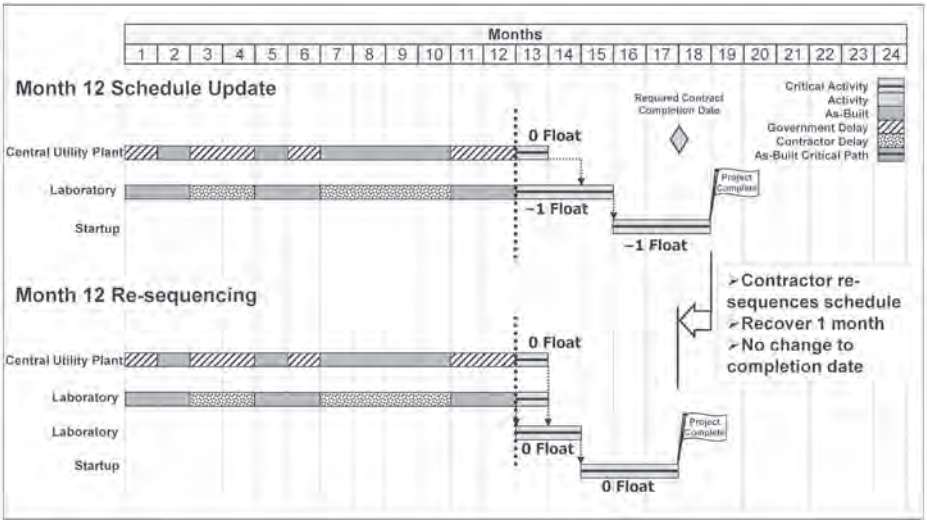
contract completion date. In Figure 6 the longest path as of Month 10 and Month 12 is unchanged by the government delay, but delay to a different path with zero float caused a two-month delay past the adjusted contract completion date independent of the longest path.

The entitlement for offsetting delay is excusable but not compensable and merely prevents the Government from an assessment of liquidated damages during a period when the Government is making its own changes while the contractor is trying to complete the project.[227] The genesis for this concept arises in the "take them where you find them" theory, since application of the offsetting delay theory generally arises only where the contractor has already been delayed.[228] A critical caveat inherent in the concept of offsetting delays accordingly is that at the time of the offsetting delay, the work must be behind in a properly adjusted schedule. In other words, and as outlined in *Fraumlau*, if the work is behind schedule, such as during an extended performance period when liquidated damages would have been charged, any

227. Although not directly addressed in *Fraumlau* or other decisions dealing with the role of subcritical government-caused delay, presumably the contractor could seek other increased costs of the subcritical delay under the doctrine of constructive changes. *See*, *e.g.*, CIBINIC ET AL., *supra* note 15, at 456–58 (stating that acceleration costs are recoverable).

228. *Cf.* Bruce Constr. Corp. v. United States, 163 Ct. Cl. 97, 101 (1963) ("[T]he standard of reasonable cost 'must be viewed in the light of a *particular* contractor's costs,' and not the universal, objective determination of what the cost would have been to other contractors at large.").

Figure 7. Contractor Re-sequence



government changes, even to a lesser, but also critical, path, would operate to offset an assessment of liquidated damages for the period of government change.[229] Accordingly, as discussed in the "Government-Caused Delay" section,[230] any analysis of offsetting delays requires a properly adjusted schedule that reflects excusable time extensions resulting from third-party, force majeure events, and government delays.[231] A schedule that is not properly adjusted to reflect excusable time extensions will improperly show more work behind schedule, i.e., negative float, than actually exists, depriving the project of float available to absorb delay and potentially affecting the treatment of government delays and offsetting delay.

6. Contractor Re-sequencing: Figure 7

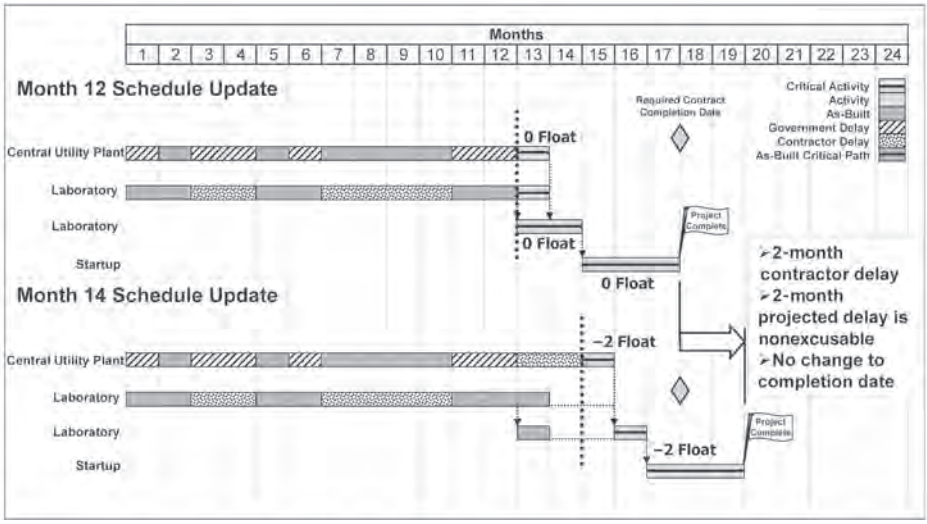
As one means of acceleration, Figure 7 shows the contractor re-sequencing the work as of the same Month 12 status date in order to recover one month

229. An exception exists where the schedule specification requires that the project end date is not constrained to the contract completion date, meaning there is no negative float, and float would be created in the schedule as a result of contractor delay. *See* Santa Fe Eng'rs, Inc., VABCA Nos. 1943, 1944, 1945, 1946, 84-2 B.C.A. (CCH) ¶ 17,341 (disallowing contractor recovery where a sophisticated CPM procedure was used that reflected available float time, and the contractor offered insufficient evidence that change orders extended its performance period).

230. *See supra* Part VI.B.3.

231. *See, e.g.*, Lovering-Johnson, Inc., ASBCA No. 53902, 06-1 B.C.A. (CCH) ¶ 33,126, at 164,174.

Figure 8. Contractor Delay



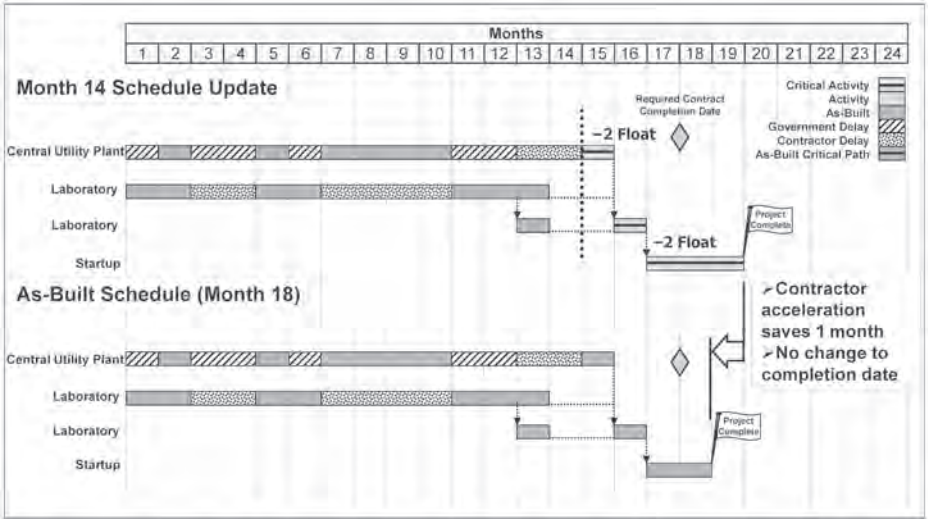
of time. The contractor is able to mitigate delay by splitting the Laboratory work into two different Laboratory tasks working in parallel.[232] The projected completion date remains unchanged at Month 17. After re-sequencing the scheduled work, both the Central Utility Plant and Laboratory paths of work have zero float and are critical. The project is back on schedule to complete by the adjusted contract completion date.

7. Contractor-Caused Delay: Figure 8

To illustrate further the proper adjustment to the schedule, Figure 8 shows two months of contractor-caused delay on the Central Utility Plant between Month 12 and Month 14. The Month 14 schedule update (bottom half) shows that the Laboratory progress stopped after Month 13 because one month of the Laboratory progress was dependent on the Central Utility Plant's completion. The remaining critical path of the project runs through the Central Utility Plant to the Laboratory, followed by the Startup activity. From comparison of the Month 12 and the Month 14 schedule updates, the two-month contractor-caused delay extended the projected completion date two months. The delay is contractor-caused; thus, it is considered nonexcusable and the contract completion date is unchanged. As a result, the remaining work as of Month 14 has float value of negative two months.

232. While the same quantity of work is being performed, this re-sequence may still result in higher costs due to higher peak quantities for completing the work out of sequence than can be attributed to acceleration.

Figure 9. Contractor Acceleration



8. Acceleration: Figure 9

Figure 9 highlights the schedule impact of a contractor's acceleration. In this example, the contractor accelerates work on the three-month Startup activity so that it takes only two months to complete, thus saving one month in the schedule. Shortening the duration of an activity in this way, often by adding a shift, is sometimes referred to as "crashing" the activity. In Figure 9 the contractor is two months behind schedule and voluntarily accelerates work in order to save one month in the schedule. The voluntary acceleration in Figure 9 does not change the contract completion date, but results in a one-month recovery of time to projected completion.

C. *Analysis Methods*

Several conceptual means of analyzing the schedule exist, including the following most commonly used methods:[233]

- Time impact analysis (properly adjusted) [Figures 2 through 10]
- Total time/as-built critical path [Figures 11 and 12]
- Impacted as-planned [Figure 13]
- Impacted as-planned (AACEI 29R-03 Compensability Option) [Figure 14]

233. For further discussion of available methods, see AACE Int'l Recommended Practice, *supra* note 208; Ness, *supra* note 9, at 413, 428–33.

- Collapsed as-built (or but-for analysis) [Figure 15]
- Prospective time impact analysis [Figures 16 through 21]
- Windows/time impact analysis [Figures 22 through 30]
- Windows with wide periods [Figures 31 through 35]

In the following sections, we apply the same exact identical delay scenario described above to eight common schedule delay analysis methodologies and compare the results in Figure 36. As noted previously, the delay scenarios are fixed, so the subjectivity regarding responsibility is removed by predetermining the causation of each delay issue to the Government or contractor.[234] Any differences between results of the methodologies, therefore, are due to the fundamental differences in the way each treats different types of delay. In addition both government-caused and contractor-caused delays are included in each methodology, even where they might not normally be identified, as a conservative measure to show that they do not affect the results of any methodology application. Where the methodologies referred to here are consistent with methodologies outlined in Association for the Advancement of Cost Engineering International ("AACEI") Recommended Practice No. 29R-03, Forensic Schedule Analysis ("AACEI 29R-03"),[235] the appropriate AACEI 29R-03 section(s) is listed.

1. Time Impact Analysis (Properly Adjusted): Figures 2 Through 10

Among the methods currently preferred by practitioners is time impact analysis ("TIA"). This method chronologically and cumulatively evaluates the events retrospectively on a project utilizing the contemporaneous schedule updates and adjusts the completion date to reflect as-built progress and delays the same way a project is scheduled, as outlined in Figures 2 through 10. TIA is a generally accepted method of examining and proving delay[236] and a form of TIA is often specifically referenced in the contract terms.[237] This analysis requires a properly adjusted schedule, but because constructive acceleration often arises on a project when parties cannot agree on entitlement to or the extent of delay events, the schedule is not properly adjusted contemporaneously.

The TIA summary in Figure 10 shows the results of a contemporaneous, chronological review of the delay events discussed in the above sections. The contractor is entitled to a five-month time extension to the contract completion date, one month of which was compensable; the government-caused delay in Month 6 is shown in Figure 4. Based on the adjusted contract completion date,

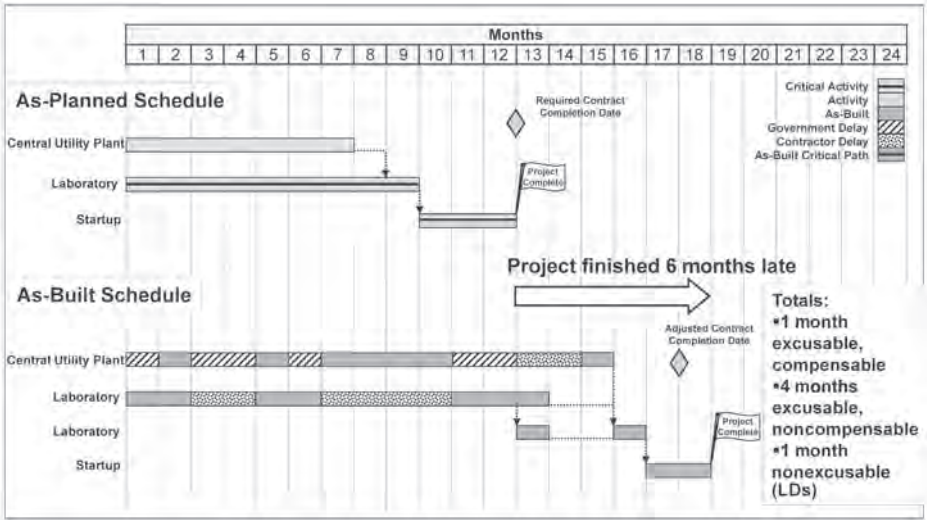
234. *See* discussion *supra* Part VI.A.

235. AACE International's Recommended Practice No. 29R-03 was originally released on June 25, 2007. A revised version of 29R-03 was released on June 23, 2009. AACE Int'l Recommended Practice, *supra* note 208.

236. *See*, *e.g.*, George Sollitt Constr. Co. v. United States, 64 Fed. Cl. 229, 240 (2005); FruCon Constr. Corp., ASBCA Nos. 53544, 53794, 05-1 B.C.A. (CCH) ¶ 32,936, at 163,144.

237. *See* Bell BCI Co. v. United States, 81 Fed. Cl. 617, 621 (2008) (noting the contractor was required to submit a time impact analysis (TIA) within seven days of encountering a delay).

Figure 10. Time Impact Analysis Summary



the Government is entitled to assess one month of liquidated damages for the remaining month of nonexcusable delay. Because the delays are incorporated into the schedule chronologically, float is properly reflected in the analysis in that it is absorbed by delays and created by excusable time extensions.

2. As-Planned versus As-Built/As-Built Critical Path: Figures 11 and 12

The "As-Planned versus As-Built" and "As-Built Critical Path" methodologies of schedule analysis generally refer to a comparison between the planned period of performance and the actual period of performance.[238] These methods have sometimes received acceptance from courts and boards depending on the circumstances under which each has been applied. For example, where no schedule updates exist, where delays are of relatively short duration, or where they are combined into other more complex methods, the approaches have gained general approval from some courts.[239] Where the approach begins to resemble a "Total Time" approach, however, courts and boards often reject the analyses as failing to correlate delay events to delay quantification.[240]

238. For a detailed description of how to implement this methodology, see AACE Int'l Recommended Practice, *supra* note 208, at 31, 37.

239. *See, e.g.*, Sunshine Constr. & Eng'g, Inc. v. United States, 64 Fed. Cl. 346, 369 (2005) (lauding an expert report using this methodology for its "clarity, comprehensiveness, and reliability"). *But see* PCL Constr. Servs., Inc. v. United States, 53 Fed. Cl. 479, 489–90 (2002) (rejecting an expert's testimony using this method due to flawed assumptions and an incorrect interpretation of underlying events).

240. *See, e.g.*, Blackhawk Heating & Plumbing Co., GSBCA No. 2432, 75-1 B.C.A. (CCH) ¶ 11,261, at 53,685–86, *reconsideration denied*, 76-1 B.C.A. (CCH) ¶ 11,649 (rejecting total time

Figure 11. Total Time/As-Built Critical Path

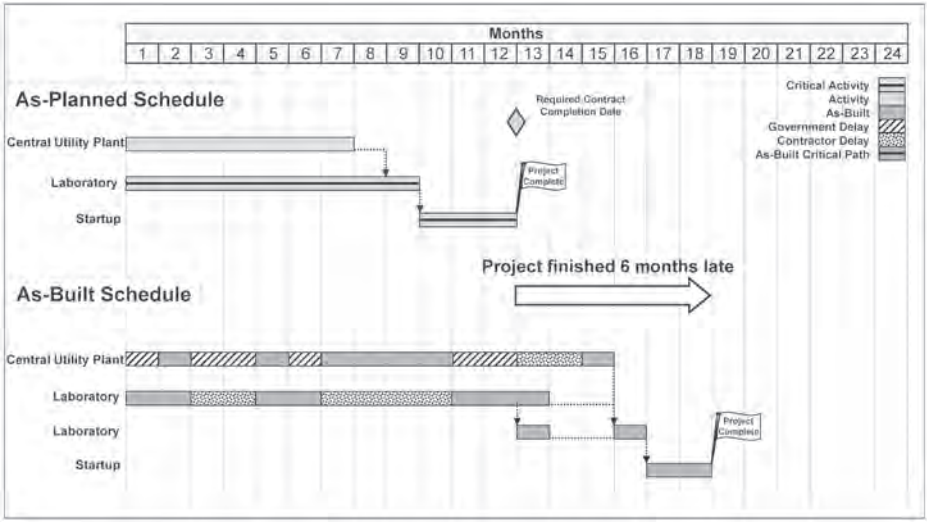


Figure 12. Total Time/As-Built Critical Path

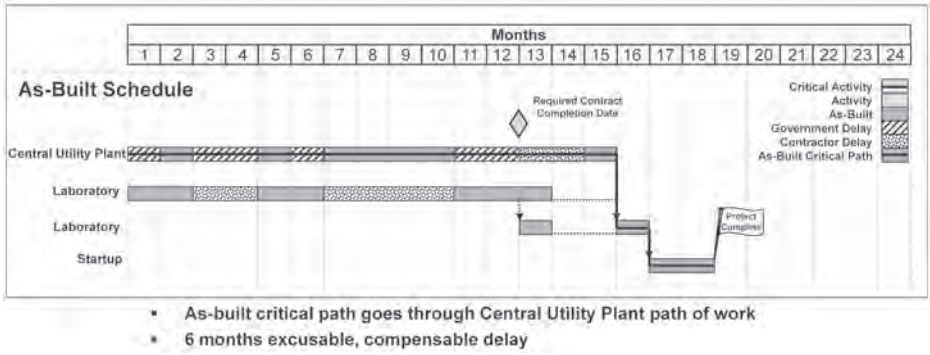


Figure 11 illustrates these approaches; the as-planned schedule on the top half of the figure is compared with the as-built schedule on the bottom half of the page by looking at the change in duration of the work. The as-built critical path is typically determined by looking at the as-built record in order to judge how the project was actually built (Figure 12) and how late the project actually was completed. Because six months of excusable delay are shown on

approach). *But see* Ingalls Shipbuilding Div., Litton Sys., Inc., ASBCA No. 17579, 78-1 B.C.A. (CCH) ¶ 13,038, at 63,667, *reconsideration denied*, 78-1 B.C.A. (CCH) ¶ 13,216 (allowing use of total time approach).

the alleged as-built critical path of work and the project finished six months late, the entire six-month delay is considered excusable and compensable.

This method is sometimes criticized for presenting only one party's delays. Typically the methodologies in this section applied to this scenario would only highlight government-caused delay, and contractor delays are shown as simply normal work progress. However, both parties' delays are included in Figure 11 to show that even if the opposite party delays were identified, it would not change the analysis results. This phenomenon of ignoring or not including both parties' delays in the analysis has been considered the single most significant drawback to the approach. Indeed, as it pertains to concurrent delay, the approach can understate or even mask the presence of concurrent delay on the project. The COFC has noted regarding the as-planned versus the as-built approach:

> [The contractor's] analysis is in essence a "total time" approach, which is of virtually no value. [The contractor's expert] "simply takes the original and extended completion dates, computes therefrom the intervening time or overrun, points to a host of individual delay incidents for which defendant was allegedly responsible and which 'contributed' to the overall extended time, and then leaps to the conclusion that the entire overrun time was attributable to defendant." It is well settled that this "total time" theory of proving delay is insufficient to meet the contractor's burden to prove that government[-]caused delay actually delayed the overall completion of the project. The "total time" approach to proving delay is "as unsatisfactory as the 'total cost' method of proving damages," because it assumes that the [G]overnment is responsible for all of the delay.[241]

Likewise, the as-built critical path, Figure 12, while an accurate representation of what happened on the project, may not provide any insight into what was supposed to happen at each point in time during construction. The ASBCA noted some of these issues in *Santa Fe Engineers* as follows:

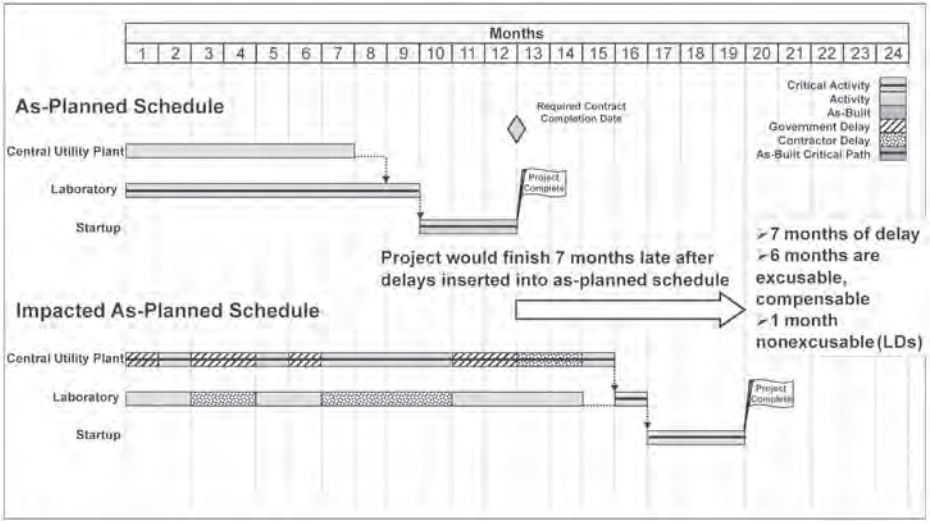
> Appellant's expert's as built schedule is a graphical, day to day, history of what occurred on the project based upon the project documentation of both parties.
>
> ....
>
> In the absence of a schedule or other standard for performance, the as built does not depict a critical path, float, or critical delay. It does not depict how much work was done only that some was done on the date entered. It does not depict the contract completion date. It does not list the original contract schedule, the revised contract schedule, or any dates upon which work was planned in the CPM schedules ....[242]

As a matter of project history, a number of activities that absorbed float in the schedule, or were not on the schedule's critical path at a point early in the project, can ultimately fall on the as-built critical path of the project. As a result, looking only at the as-built critical path may distort the significance of historical events. Thus, depending on the contract requirements and the

241. Morganti Nat'l, Inc. v. United States, 49 Fed. Cl. 110, 134 (2001).

242. Santa Fe Eng'rs, Inc., ASBCA No. 24578, 94-2 B.C.A. (CCH) ¶ 26,872, at 133,744 (citations omitted).

Figure 13. Impacted As-Planned



circumstances of the project, an analysis of the as-built schedule alone may not produce the information needed to evaluate delays.

3. Impacted As-Planned: Figure 13

The impacted as-planned methodology, sometimes referred to as "Plan plus Impacts," uses the baseline, or as-planned, schedule and incorporates changes and delaying events into the as-planned schedule.[243] In Figure 13, the as-planned schedule is shown on the top half of the graphic. The delays that occurred on the project are then inserted into the as-planned schedule, in this case the six months of government-caused delay and the eight months of contractor-caused delay. The impacted as-planned schedule then shows where the project would have finished had the changes and delays been known at the start of the project and worked into the baseline schedule. In this case, the schedule is projected to finish seven months after the required contract completion date. The critical path for the impacted as-planned schedule runs solely through the Central Utility Plant to the last month of work on the Laboratory and then Startup. Consequently the only critical path delays in

243. In an impacted as-planned analysis, all project delays are typically inserted at once. A variation of impacted as-planned is to enter the delays one at a time and see the effect of a projection of each one in the schedule as it is inserted. That method, while similar to impacted as-planned in that it only uses the planned schedule, has features similar to prospective time impact analysis. See *infra* Part VI.C.6 for further discussion, as well as a discussion of the addition of as-built data required for the prospective time impact analysis methodology.

this case are the delays that fall on the Central Utility Plant, where six months of government-caused delay are excusable and compensable, and the remaining month of delay is nonexcusable.

Impacted as-planned analysis has been attacked on various bases,[244] including its theoretical approach, its heavy reliance on the contractor's plan for the work, and not always accounting for the delays of both parties.[245] The schedule logic and durations are essentially frozen at the start of the project; for that reason, any changes in float or critical path during construction also are not generally reflected in this analysis. Further, as shown in Figure 13, the technique masks concurrent delay because only the projected critical path affects projected completion. Changes in planned production rates, such as acceleration, also are not accounted for. Indeed, based on the results portrayed in Figure 13, the contractor could assert entitlement to six months of excusable, compensable delay on the project. Based on the results in Figure 10, however, the events on the project do not support that calculation. As a result, when applied as set forth herein, the impacted as-planned analysis can overstate a party's delay. Moreover, the impacted as-planned method assumes that the initial plan sequence, durations, and critical path never change during the project—an assumption that may suffer when compared to the actual, completed project. As a result, it can be extremely difficult to determine float, concurrency, and offsetting delay in an impacted as-planned schedule.

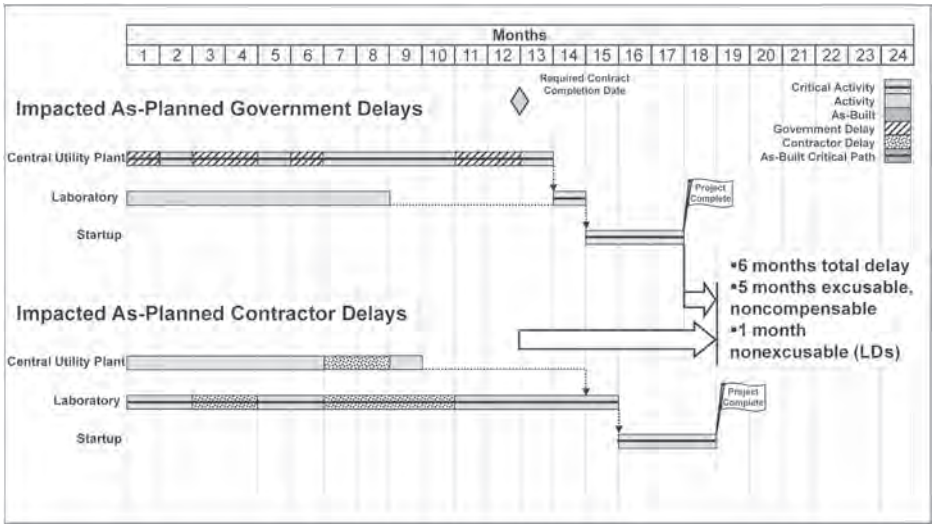
4. Impacted As-Planned: The AACEI 29R-03 Compensability Option: Figure 14

An alternate version of impacted as-planned analysis is outlined in AACEI 29R-03 method 3.6, presumably as a way to determine concurrency and differentiate between compensable and noncompensable excusable delay. This alternative version of the methodology, shown in Figure 14, compares two different impacted as-planned schedules: one version where only government delays are inserted and one version where only contractor delays are

244. *See*, *e.g.*, Ness, *supra* note 9, at 430–31; Richard F. Smith & John M. Cook, *Obtaining Time Extensions*, *in* Construction Law Handbook 805, 850–51 (Cushman et al. eds., 1999) (discussing "Adjusted As-Planned" analysis); *see also*, *e.g.*, Titan Pac. Constr. Corp. v. United States, 17 Cl. Ct. 630, 639–40 (1989) (rejecting the "like time" theory for not comparing plan to actual progress); John T. Jones Constr. Co., ASBCA No. 48303, 98-2 B.C.A. (CCH) ¶ 29,892, at 147,975; Ealahan Elec. Co., DOTBCA No. 1959, 90-3 B.C.A. (CCH) ¶ 23,177, at 116,325 (noting failure of the method to consider actual performance); Freeman-Darling, Inc., GSBCA No. 7112, 89-2 B.C.A. (CCH) ¶ 21,882, at 110,101; Gulf Contracting, Inc., ASBCA Nos. 30195, 32839, 33867, 89-2 B.C.A. (CCH) ¶ 21,812, at 109,758, *aff'd on reconsideration*, 90-1 B.C.A. (CCH) ¶ 22,393.

245. Typically, and as a matter of practice, only the opposing party's delays are inserted into the impacted as-planned schedule. Because it is generally established that any analysis that ignores one party's delays is not accepted, however, a version of an impacted as-planned methodology that includes and takes account of all delays is shown here in order to be conservative. *See* discussion *infra* Part VI.C.4.

Figure 14. Impacted As-Planned AACEI 29R-03 Compensability Option

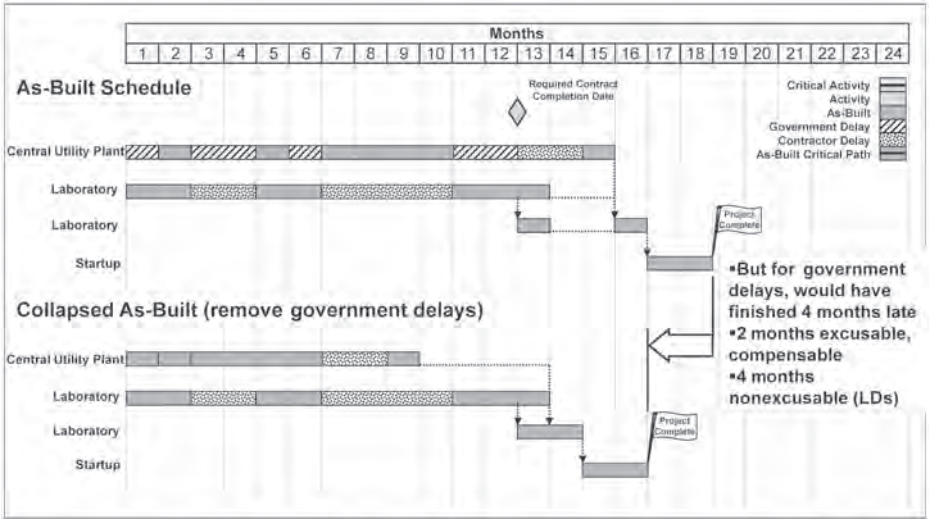


inserted.[246] Figure 14 displays the impacted as-planned schedule with only government-caused delays inserted into the planned schedule on the top half of the graphic, projecting completion for Month 17. The bottom half of Figure 14 shows the impacted as-planned schedule with only contractor-caused delays inserted into the planned schedule, projecting completion for Month 18. The practical effect of this change method is theoretical, competing delay. The five months of time both schedules extend past the contract completion date of Month 12 are considered excusable, noncompensable delay. The impacted as-planned with contractor delays finishes one month later than the government-delay model; thus, that one month of delay is nonexcusable. The conclusion drawn from this method differs from that of the traditional impacted as-planned analysis in Figure 13. Despite the adjustments to account for both parties' delays, the AACEI version of the analysis still relies on the accuracy of the original plan for quantifying delay that arises from actual performance and is subject to similar criticism as impacted as-planned. This methodology compares responsibility in two separate, independent analyses that ignore the sequence of delay occurrence and do not reflect proper adjustment to the completion date, affecting float, offsetting delay, and any possible concurrent delay.[247]

246. Force majeure impacts, which are absent from this scenario, also would be combined with government-caused or contractor-caused delays depending on implementation to create additional variations. AACE International provides a more detailed explanation of how to implement this method. AACE Int'l Recommended Practice, *supra* note 208, at 59–63.

247. Letter from Thomas J. Driscoll, *supra* note 208, at 5.

Figure 15. Collapsed As-Built



Because concurrency results from two party delays occurring at the same time that are not reflected in separate analyses independent of impact on projected completion, at best this method reflects theoretical offsetting delay.[248]

5. Collapsed As-Built (or But-For Analysis): Figure 15

The collapsed as-built methodology is shown in Figure 15. The methodology focuses on a detailed as-built CPM schedule constructed from contemporaneous project records. Once constructed, one party's delays are removed to show when work would have finished without the other party's delays, thus "collapsing" the schedule. This method is described in detail in AACEI 29R-03 methods 3.8 and 3.9.[249] The method is also commonly referred to as the "but-for" method because "but-for" one party's delays, the method attempts to show when the other party would have finished.[250]

The top half of Figure 15 shows the as-built schedule, with completion in Month 18. The bottom half of Figure 15 reflects the removal of all the government-caused delays from the as-built record, collapsing the schedule. But-for the government-caused delays, the contractor would have finished in month 16, saving two months in the schedule. As a result, the two months

248. *Id.* at 6.

249. AACE International's method 3.9 is a similar after-the-fact analysis to method 3.8, the difference being that delays are pulled out piecemeal in periods moving backwards on the project. AACE Int'l Recommended Practice, *supra* note 208, at 68–84.

250. *See* Lovering-Johnson, Inc., ASBCA No. 53902, 06-1 B.C.A. (CCH) ¶ 33,126, at 164,172.

are presumably excusable and compensable. Because the contractor would have finished four months later than the contract completion date even in the collapsed as-built schedule, four months are allegedly nonexcusable during which the Government could ordinarily assess liquidated damages.

The collapsed as-built methodology can suffer from criticism similar to that lodged against the impacted as-planned method. It rests almost exclusively on the as-built schedule, which can ignore which activities were critical during the project, and may ignore other events during performance.[251] Thus, in relying on the as-built schedules alone, the method can pose the danger of ignoring contemporaneous activities including float, the contemporaneous critical path, and the current plan, potentially leading to an after-the-fact analysis rejected in decisions by the COFC.

6. Prospective Time Impact Analysis: Figures 16 Through 21

A prospective time impact analysis is a version of TIA generally used during construction of a project to estimate time for changed work before performing the work. When a change occurs on the project, such as a differing site condition or change in scope, the contractor can estimate the cost and time duration required to complete the changed work prospectively. If the Government disagrees with the estimate or the parties cannot come to an agreement, the parties can wait until the changed work is finished and use actual values in lieu of the estimates. TIA is thus used prospectively to estimate the time impact of a change before the work occurs.[252] That change, once agreed upon, would then be reflected in the schedule to determine the required adjustment to the contract completion date.

Figures 16 through 21 show implementation of a prospective TIA. In Figure 16, TIA #1 shows the Government's site turnover delay being inserted

251. *See*, *e.g.*, Metric Constr. Co. v. United States, 81 Fed. Cl. 804, 821 (2008) (failure to account for contractor problems during the work deemed inadequate); *see also* PCL Constr. Servs., Inc. v. United States, 53 Fed. Cl. 479, 489 (2002) (" 'The required nexus between the government delay and a contractor's failure to complete performance at some unspecified earlier date cannot be shown merely by hypothetical, after-the-fact projection.' Part of one's understanding that an activity belongs on the critical path of a project is also an understanding of how that activity affects the other activities. 'A general statement that disruption or impact occurred, absent any showing through use of updated CPM schedules, logs or credible and specific data or testimony, will not suffice to meet the plaintiff's burden.' ") (quoting Interstate Gen. Gov't Contractors, Inc. v. West, 12 F.3d 1053, 1060 (Fed. Cir. 1993)); Preston-Brady Co., VABCA Nos. 1892, 1991, 2555, 87-1 B.C.A. (CCH) ¶ 19,649, at 99,520; Santa Fe Eng'rs, Inc., ASBCA No. 24578, 94-2 B.C.A. (CCH) ¶ 26,872, at 13,745 ("[T]he as built does not depict a critical path, float, or critical delay. It does not depict how much work was done [sic] only that some was done on the date entered.") (citations omitted).

252. In after-the-fact analysis, when evaluating delays after the changed event has occurred, typically actual, as-built data are used in the schedule. Remaining work is projected to the right of the data date in a TIA, as per the TIA in Figures 2 through 10. A prospective TIA, when done after the fact as a schedule delay analysis, includes projections of the delay at each update based on what was known at the time or actual delay events. *See* AACE Int'l Recommended Practice, *supra* note 208, at 63.

Figure 16. Prospective Time Impact Analysis

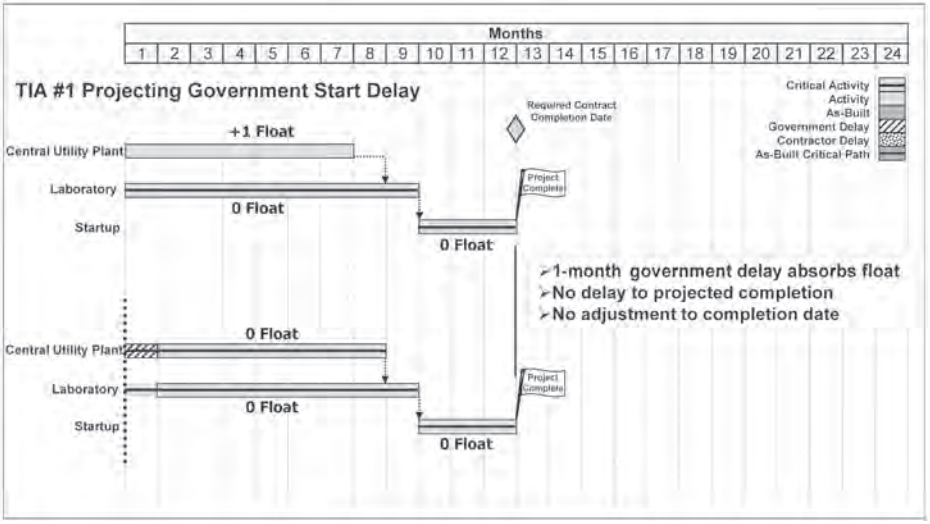
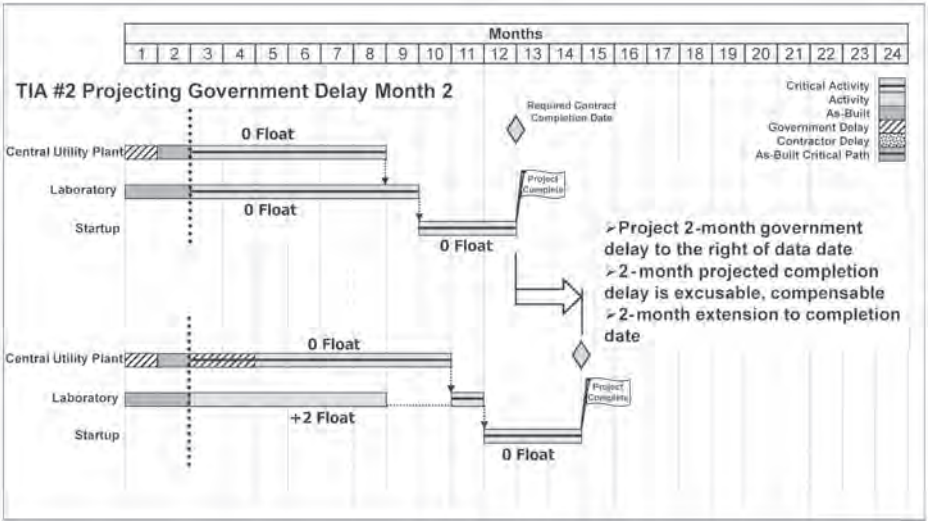


Figure 17. Prospective Time Impact Analysis



into the planned schedule to the right of the data date. The one-month-delay projection absorbs available float and does not project delay to the schedule or result in any extension of the contract completion date. In Figure 17, TIA #2 shows the two-month government delay identified at the start of Month 2, and inserted into the schedule as a projection to the right of the data date.

Figure 18. Prospective Time Impact Analysis

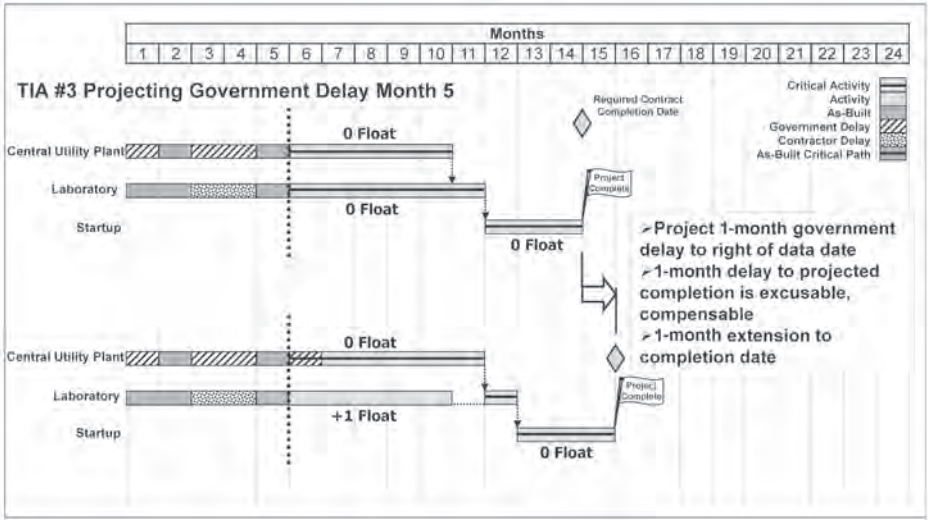
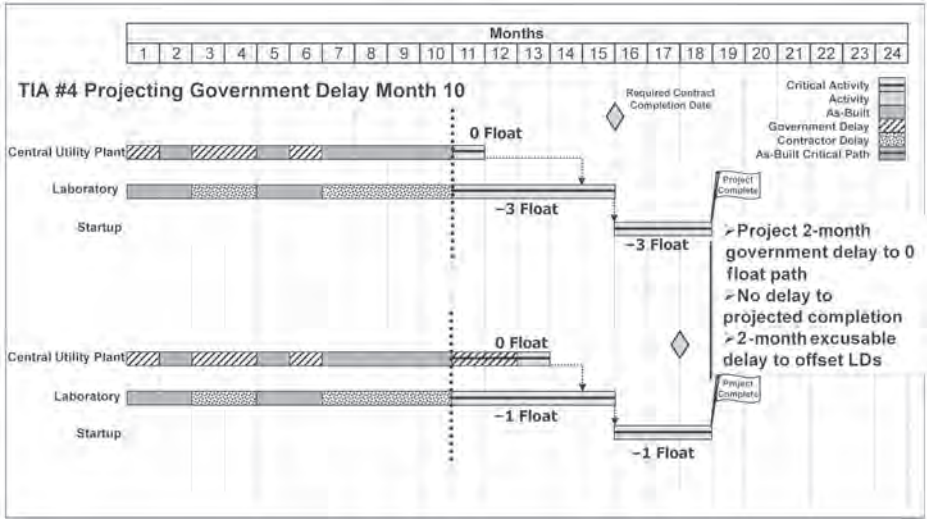


Figure 19. Prospective Time Impact Analysis



The resulting schedule shows that the two-month government delay causes two months of delay to projected completion that is excusable and compensable. The contract completion date is thus extended two months. At this point in time, the contractor delay that starts just after Month 2 may not be taken into account because the government delay was projected into the schedule

Figure 20. Prospective Time Impact Analysis

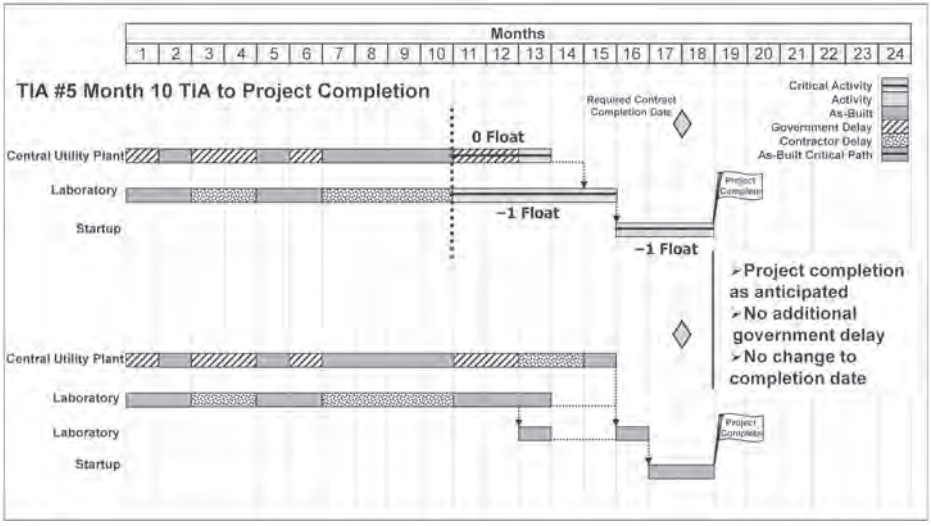
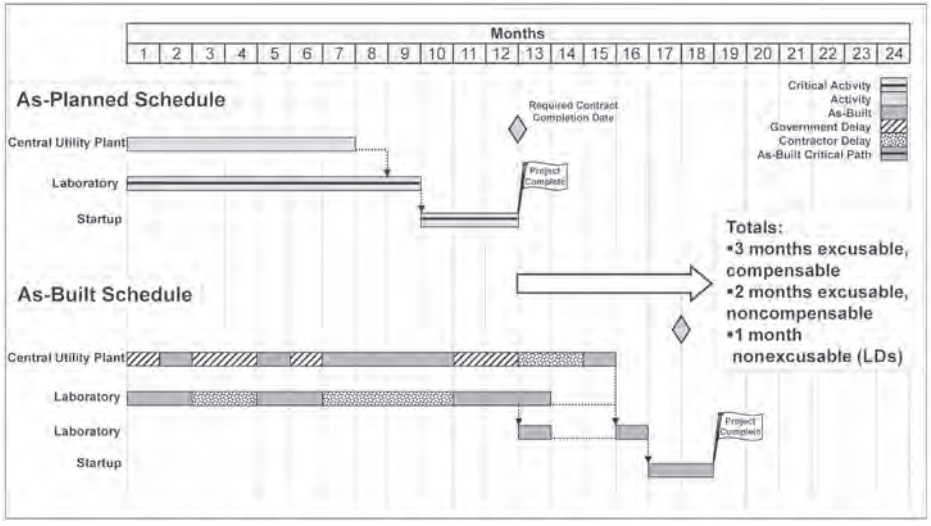


Figure 21. Prospective Time Impact Analysis



first. In fact, the contractor delay could be starting at the same time, but if its duration is unknown or anticipated to be less than that of the government delay, it would not affect the critical path due to float created by the projected government delay that was inserted first chronologically. In Figure 18, TIA #3 shows the one-month government delay projected into the schedule as of

the Month 5 schedule update, entitling the contractor to a one-month excusable, compensable time extension and a one-month extension to contract completion.

Contractor delays are nonexcusable and do not result in adjustment to the contract completion date; progress continues, but the next prospective TIA is not needed until the next government-caused or third-party-caused excusable delay at the Month 10 schedule update. Figure 19 shows that occurrence, as TIA #4 shows the two-month government delay to the Central Utility Plant inserted into the schedule to the right of the data date as of the Month 10 schedule update. The event does not extend the projected completion date. Nevertheless, because the activity has no float, and a two-month critical delay would cause delay beyond the adjusted contract completion date even though it does not affect the longest path of work, the contractor is entitled to a two-month excusable, but noncompensable, time extension. This two-month offsetting delay results in a two-month adjustment to the contract completion date.

In Figure 20, TIA #5 shows the projected schedule from TIA #4 through actual project completion, with no change between the projected completion date and the actual completion date. The changes from the planned sequence to the way the project was actually built are reflected in the as-built schedule on the bottom half of the graphic. In the prospective TIA, as the project progresses, actual data replace earlier projections to keep the analysis in line with actual performance, but the entitlement and durations remain already determined as of the time at the start of the delay event. Figure 21 shows the summary of the prospective TIA methodology. In this case, projecting certain government delays caused extra excusable, compensable time in the schedule. In this project, using the prospective TIA methodology allegedly results in three months of excusable and compensable delay, two months of excusable but noncompensable delay, and one month of nonexcusable delay.

Like a properly adjusted TIA, the prospective TIA, when implemented correctly, takes into account the effect on the contract completion date, but may result in variances between projected delay inserted into the schedule and actual delay observed later.[253] Also, if third-party and contractor delays

253. The GSBCA has opined on the difficulty in reconciling delays projected at the time of the delay and the actual impact of the delays seen in hindsight through actual as-built information:

> We do concede, however, that the amount of delay granted can well depend on the point in time at which the delay claim is analyzed and acted upon. A contractor could be granted a time extension because of delay in an apparently critical activity when later evidence might show the activity noncritical and the time extension therefore unwarranted. The real point, as indicated in page 22 of our original opinion, is "that time extensions must be granted on the best evidence available." We had before us evidence as to how the project was actually built, evidence which did not exist at the time Appellant filed its claims. This evidence compelled us to find that the sixth floor ductwork delays were noncritical. Appellant has come forward with nothing to persuade us of any error in such finding.

Blackhawk Heating & Plumbing Co., GSBCA No. 2432, 76-1 B.C.A. (CCH) ¶ 11,649, at 55,578 (citations omitted).

are not identified at the time a particular delay is inserted in the analysis, it will affect the float values of other work. Further, delays perceived as critical at the time of analysis may later become noncritical as performance unfolds. Thus, effective use of a prospective TIA may hinge on whether (1) the change order was agreed to, and used to incorporate any excusable time extensions contemporaneously on the project, or (2) if the delay analysis is being done as an after-the-fact analysis, where full as-built information is available.

7. Windows/Time Impact Analysis: Figures 22 Through 30

Windows is a type of retrospective TIA that moves incrementally from the as-planned schedule to the as-built schedule using time periods or windows to isolate delaying events on the project.[254] Although the windows analysis is implemented in a fashion similar to TIA, it is fundamentally different with respect to schedule adjustment, particularly as it pertains to the contract completion date. These methods are consistent with AACEI 29R-03 methods 3.3 and 3.4.[255] The windows version of TIA often utilizes the contemporaneous project schedule updates. The as-built schedule is used to determine the critical path and delays between status updates. Forward of the status date, the schedule updates should reflect any changes to the critical path and the effect of delay in the previous window being analyzed. After analysis, the excusable, compensable, and noncompensable delays from each window are added together to total the delay to the project. The impetus behind this approach is summarized by the COFC as it addressed concurrent delay in *George Sollitt Construction Co. v. United States*.[256] In discussing a "complication with concurrent delays," the court urged the parities to consider the kinds of effort included in a windows analysis as follows:

> [A]ccurate and updated CPM (critical path method) schedules are essential tools in the court's concurrent delay analysis. As this court stated in *Blinderman*, "the only way to accurately assess the effect of the delays alleged … on the … project's progress is to contrast updated CPM schedules prepared *immediately* before and *immediately* after each purported delay."[257]

Figures 22 through 30 reflect the application of this theory. In Figure 22, the first "time slice" or "window" for the analysis is referred to as Window/

254. *See, e.g.*, AEI Pac., Inc., ASBCA No. 53806, 08-1 B.C.A. (CCH) ¶ 33,792, at 167,269 (urging caution on selection of windows duration); SAE/Americon-Mid Atl., Inc., GSBCA Nos. 12294, 12523, 12690, 12710, 12841, 12842, 12907, 98-2 B.C.A. (CCH) ¶ 30,084, at 148,899 ("The methodology used 'marches through the project, [and] measures where the project stood during certain milestones.'"); Cogefar-Impresit U.S.A., Inc., DOTBCA No. 2721, 97-2 B.C.A. (CCH) ¶ 29,188, at 145,199 (rejecting windows analysis that did not take concurrent delay into account).

255. *See also* John J. Ciccarelli & Mark W. Cohen, *Window Analysis: The Method and the Myth*, *in* AACE International's Professional Practice Guide to Forensic Schedule Analysis 05.1 (2005).

256. 64 Fed. Cl. 229 (2005).

257. *Id.* at 243 (quoting Blinderman Constr. Co. v. United States, 39 Fed. Cl. 529, 585 (1997)).

Figure 22. Windows/Time Impact Analysis

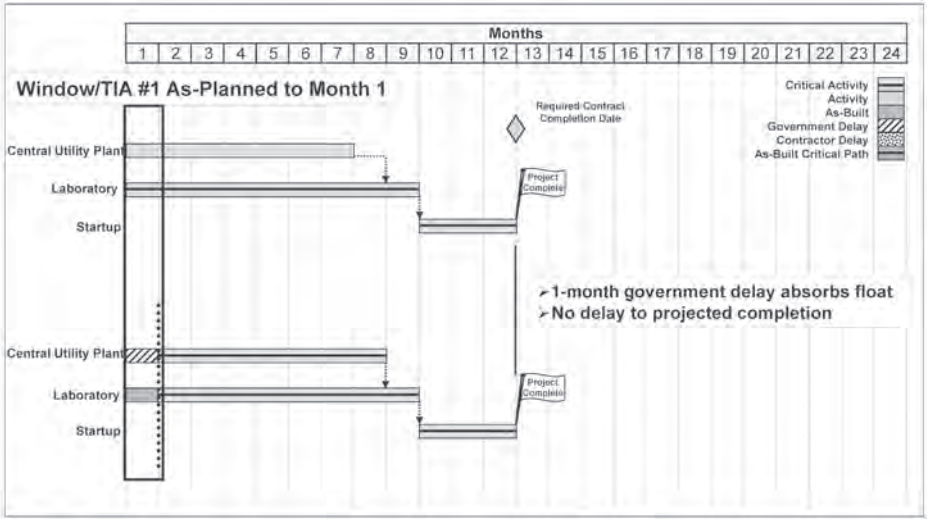
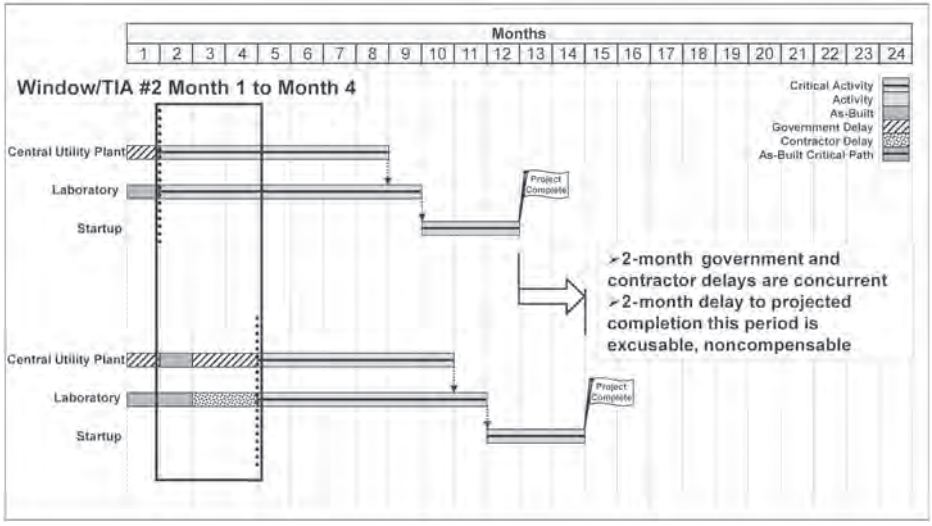


Figure 23. Windows/Time Impact Analysis



TIA #1; this figure examines the planned start and compares it to the actual progress to show that the one-month government delay that absorbs float does not delay projected completion and therefore causes no delay. In Figure 23, Window/TIA #2 shows analysis of the concurrent delay event. Both the Central Utility Plant and the Laboratory are critical as of the Month 1

Figure 24. Windows/Time Impact Analysis

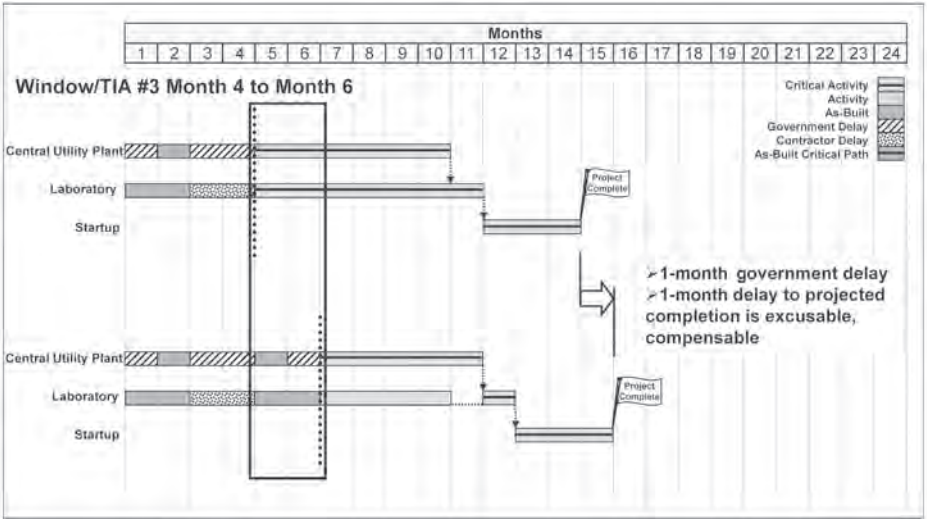
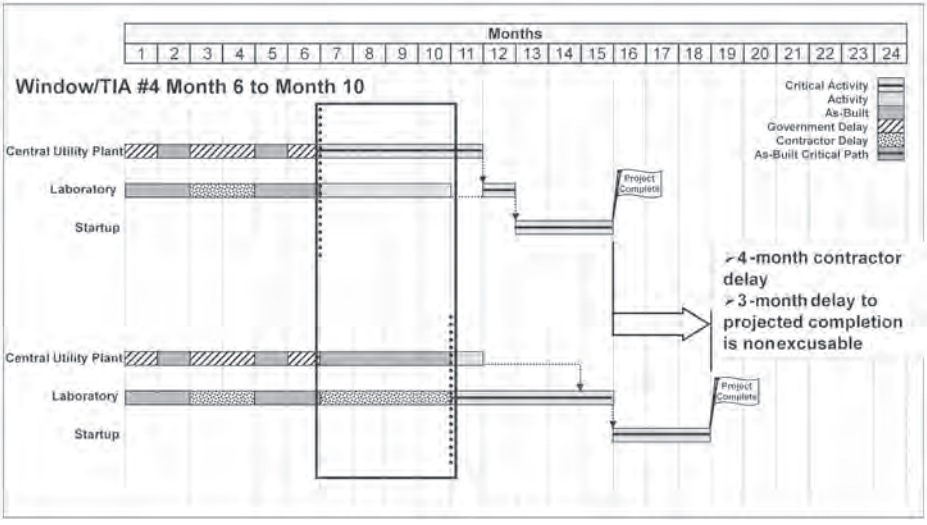


Figure 25. Windows/Time Impact Analysis



schedule on the top half of the figure, and two-month government and two-month contractor delays occur at the same time, causing two months of delay to projected completion. This concurrent delay results in a two-month excusable, noncompensable time extension for Window/ TIA #2.

In Figure 24, Window/TIA #3 shows the effect of the government delay to the schedule, resulting in one month of project delay that is excusable

Figure 26. Windows/Time Impact Analysis

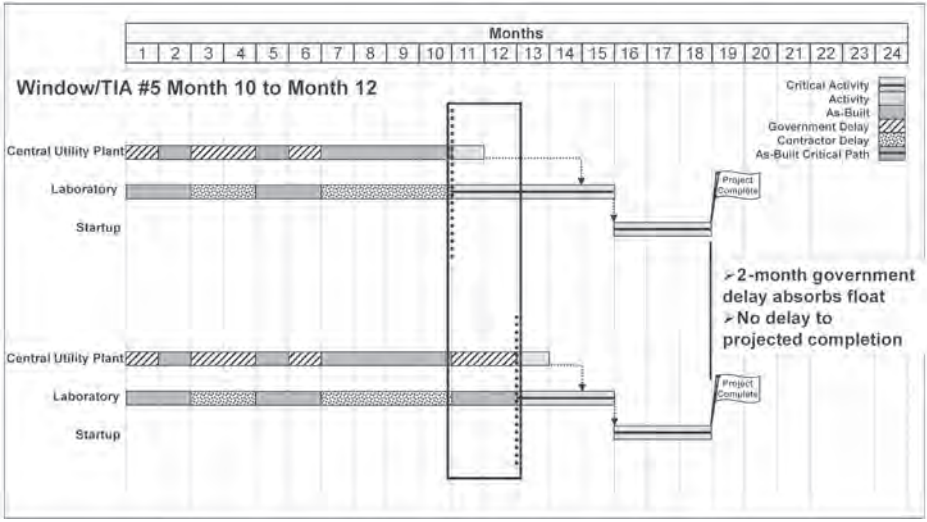
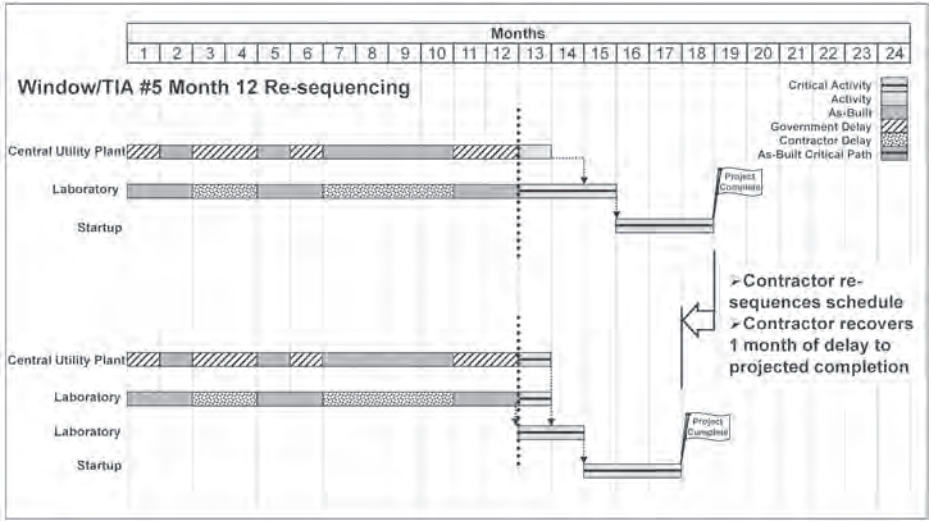


Figure 27. Windows/Time Impact Analysis



and compensable. In Figure 25, Window/TIA #4 shows the four months of contractor-caused delay to the schedule. The net effect from comparison of the Month 6 schedule on the top half with the Month 10 schedule update on the bottom half shows that the four-month contractor delay causes three months of delay to projected completion that is nonexcusable. In Figure 26, Window/TIA #5 shows the two-month government delay to a critical path of

Figure 28. Windows/Time Impact Analysis

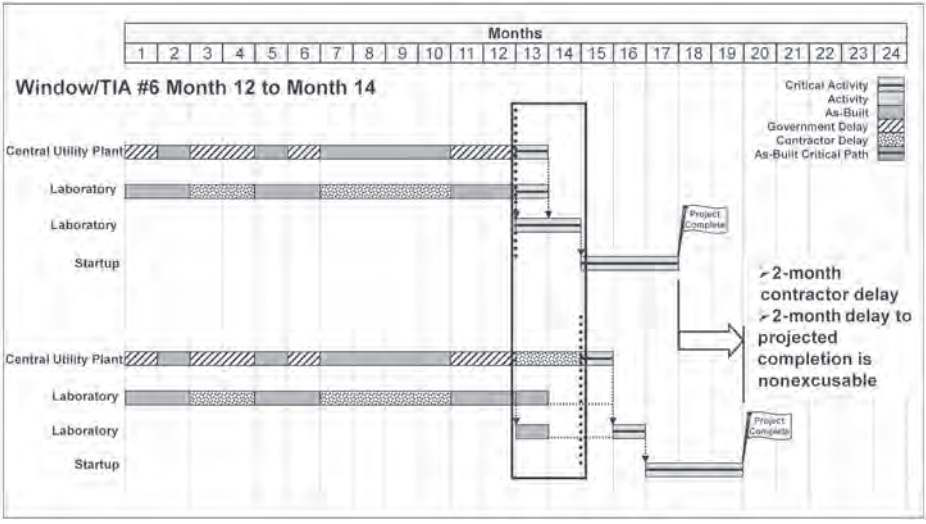
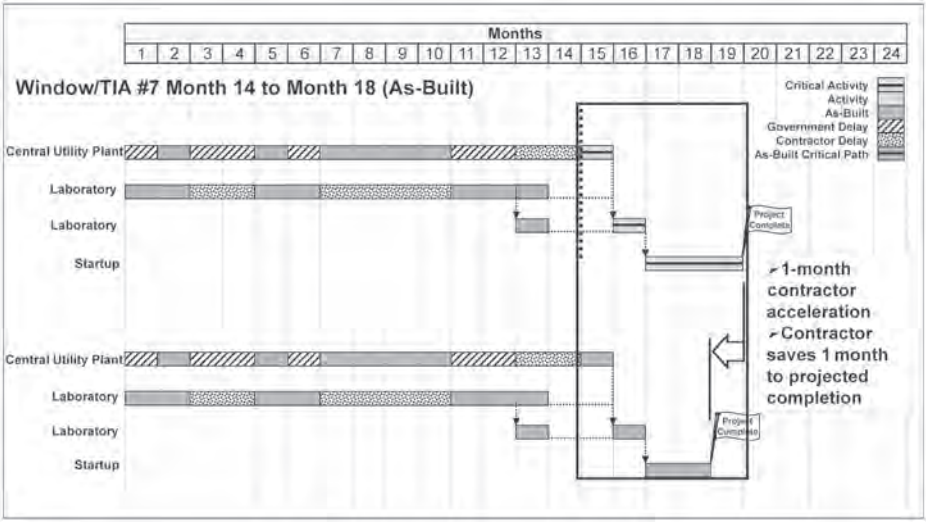


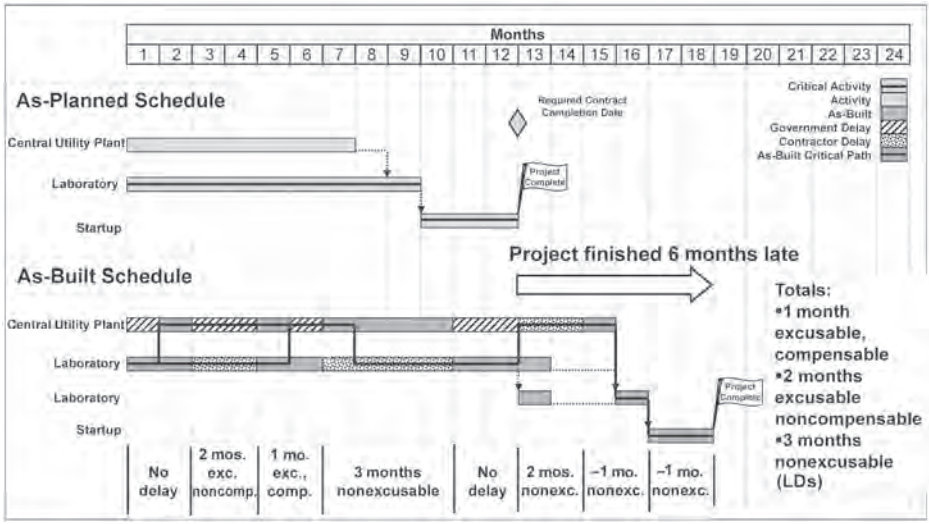
Figure 29. Windows/Time Impact Analysis



work that is not the longest path. In this case, because the projected completion date remains unchanged, the two-month government delay absorbs float and does not result in any delay to projected completion.

In Figure 27, an adjustment to Window/TIA #5 is updated to reflect the contractor re-sequencing of the scheduled work that saves one month in the schedule based on the projected completion. As a result, the contractor

Figure 30. Windows/TIA Summary



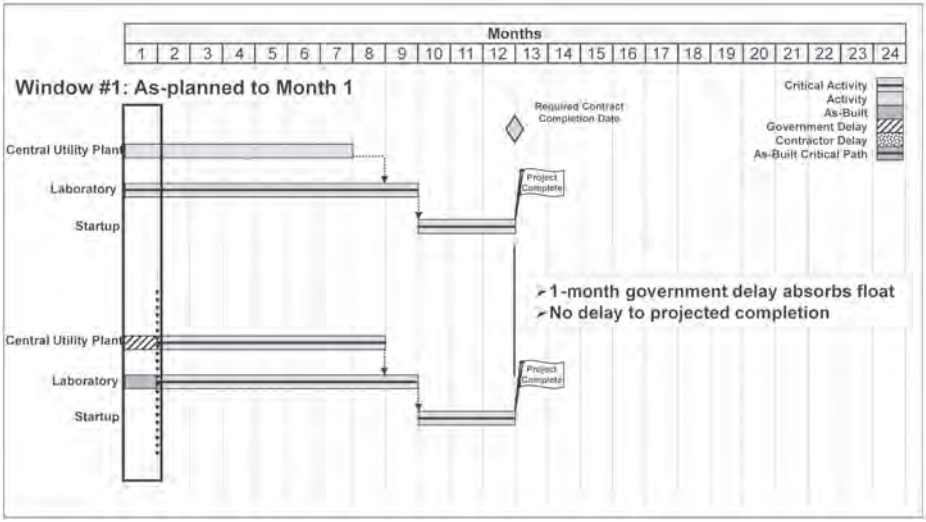
would be entitled to subtract one month of nonexcusable delay this period. In Figure 28, Window/TIA #6 shows the two-month contractor delay to the schedule, causing two months of delay to the project. The contractor delay results in two months of nonexcusable delay to the project this window. In Figure 29, Window/TIA #7 shows the contractor acceleration. The acceleration of the Startup activity saves one month of project delay in the schedule as the project actually finishes. This acceleration results in savings of one month that can be subtracted from nonexcusable delay in this window.

A summary of the windows/TIA methodology is shown in Figure 30. The project finished six months late, and the delay from each window, plus the re-sequencing effort, is shown at the bottom of the graphic. These delays each fell on the longest path shown in the graphic. As shown in Figure 30, the sum total of the delays from each window results in one month of excusable, compensable delay; two months of excusable, noncompensable delay; and three months of nonexcusable delay. In this example, the windows/TIA methodology does not properly adjust the contract completion date to account for excusable time extensions, and as a result only delays to the longest path and not other critical work are analyzed in this methodology. As a result of not properly adjusting the schedule, the windows/TIA methodology would typically not account for offsetting delay.

8. Windows with Wide Periods: Figures 31 Through 35

The windows with wide periods is a type of windows/TIA, as explained, but instead of looking at schedules around each delay event, several schedule updates are skipped to show larger "windows" or "periods" in the analysis,

Figure 31. Windows with Wide Periods



particularly when the critical path remains unchanged during the window. This method is consistent with AACEI 29R-03 methods 3.3 and 3.4.[258] In other respects, implementation is very similar to the windows/TIA method in Figures 22 through 30. Figures 31 through 35 show the windows-with-wide-periods methodology.

In Figure 31, Window #1 shows a delay-absorbing float that does not cause any delay to projected completion but makes both paths of work critical at the end of the window. This is the same result as in Window/TIA #1. In Figure 32, Window #2 shows the two-month concurrent delay caused by the Government and the contractor and determines that it is excusable, noncompensable. This is the same result as in Window/TIA #2. In Figure 33, Window #3 compares the time between the Month 4 and Month 12 schedule updates. Window #3 incorporates a one-month government delay, four months of contractor delay, two months of government delay, and one month of savings from contractor re-sequencing. The net effect of these delays is three months of government delay and three months of contractor delay, after the re-sequencing is taken into account. Both the Central Utility Plant and the Laboratory are critical in the Month 4 schedule update before Window #3 and the Month 12 schedule update after Window #3. Consequently both paths are determined to be critical during the window. The equal government and

258. AACE Int'l Recommended Practice, *supra* note 208, at 43–55.

Figure 32. Windows with Wide Periods

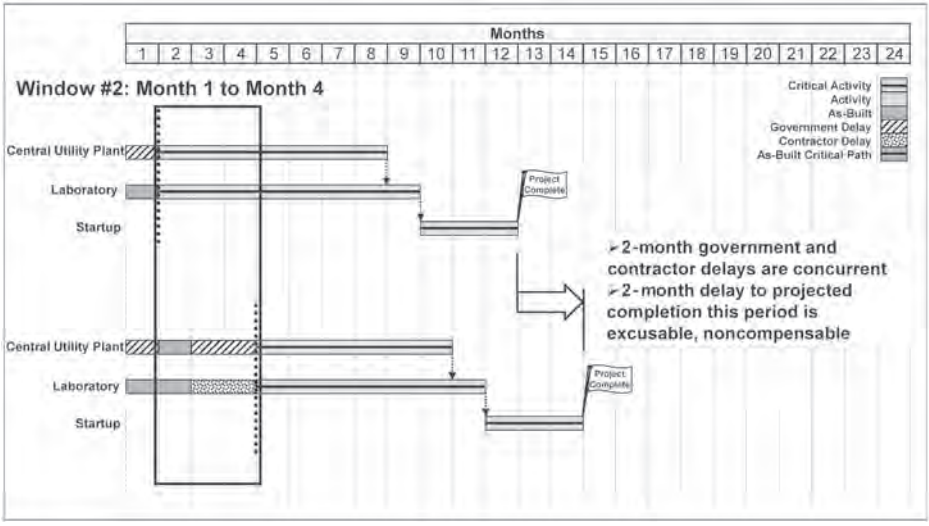
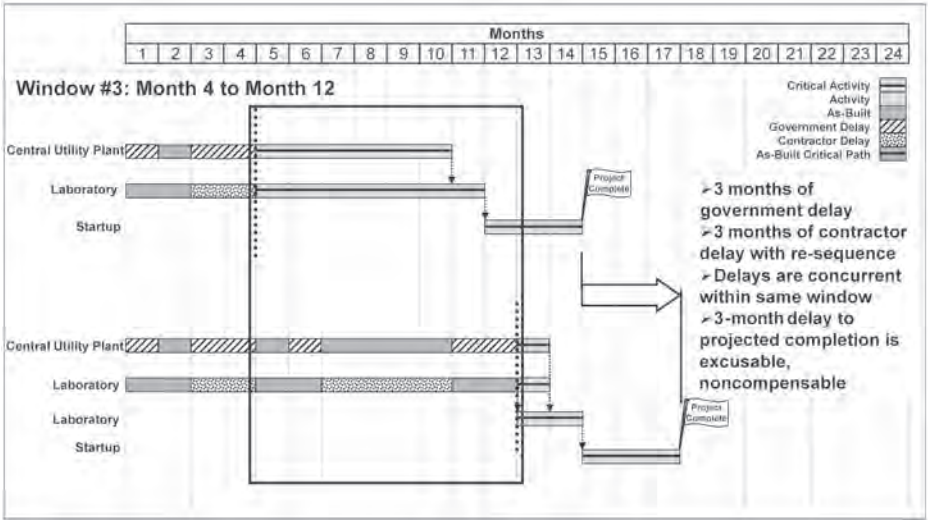


Figure 33. Windows with Wide Periods



contractor delays occurring within Window #3 are determined to be concurrent. In the windows analysis, delays are determined to be concurrent if they occur within the same window. The selection of Window #3 covers several delays; the resulting concurrent delay entitles the contractor to a three-month excusable, noncompensable time extension during the window.

Figure 34. Windows with Wide Periods

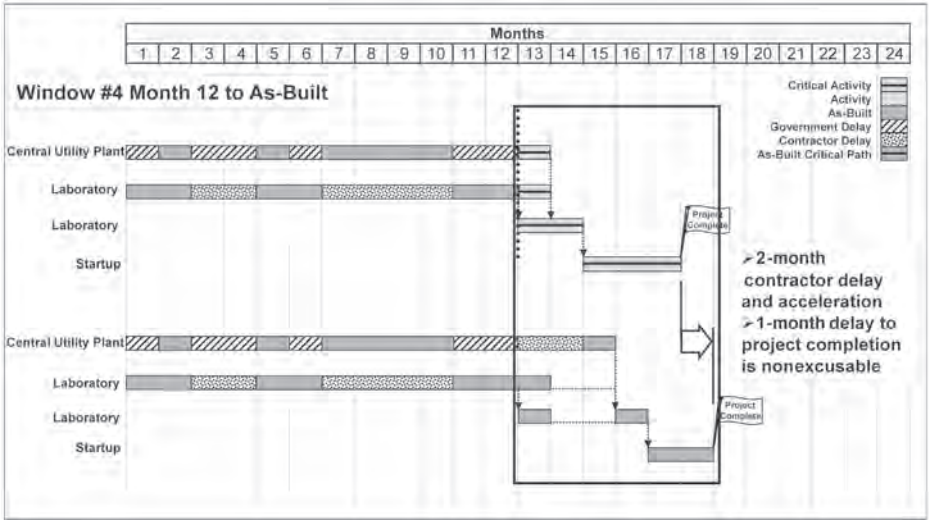
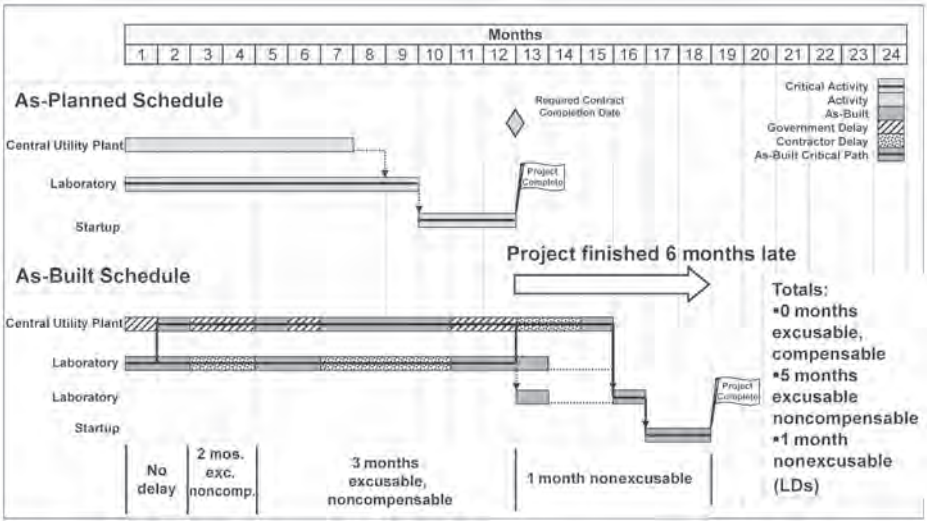


Figure 35. Windows with Wide Periods



In Figure 34, Window #4 shows the Month 12 schedule update through the as-built schedule as of project completion in Month 18. Window #4 incorporates the two-month contractor delay and contractor acceleration that recovers one month in the schedule. The net effect is a one-month delay to projected completion that is nonexcusable for Window #4. Figure 35 shows

Figure 36. Method Summary

Analysis Methodology	Excusable Compensable	Excusable Noncompensable	Nonexcusable (LDs)	Total Delay
Time impact analysis (properly adjusted)	1	4	1	6
Total time/ as-built critical	6	0	0	6
Impacted as-planned	6	0	1	7
Impacted as-planned (comp)	0	5	1	6
Collapsed as-built	2	0	4	6
Prospective TIA	3	2	1	6
Windows/TIA in periods	1	2	3	6
Windows/TIA wide periods	0	5	1	6

the summary of the windows-with-wide-periods method used in this project. The delays from each window are added together, as shown across the bottom of the graphic, and result in no excusable and compensable delay, five months of excusable but noncompensable delay, and one month of nonexcusable delay.

The use of wide windows in a windows analysis will often include multiple delays within the same window period, masking them in concurrency. The danger in combining delays within the same window period is that one can lose the chronology of the delay and identification of the concurrency.[259] Thus, users of the technique must be cognizant of adjusting the window periods.

D. *Summary of Schedule Delay Analysis Methodologies*

Figure 36 compares the results of the different schedule delay analysis methodologies and highlights the analytical issues inherent in apportion-

259. In this example, an eight-month window is not required to mask delays in concurrency. Even if a window of only two months was used covering Month 5 to Month 7, the window would ignore the excusable, compensable delay entitlement created by the earlier government delay to claim concurrency with the subsequent contractor delay.

ment of delays when a variety of delay analysis methodologies are used. To some, this result accords with the observation of the Veterans Affairs' Board of Contract Appeals in *P.J. Dick Inc.:*

> Despite both parties' excellent efforts in their trial presentations and briefs to explicate the intricacies of the CPM and the application of scheduling techniques according [to] the [c]ontract terms, our seemingly simple task, given the facts and the parties' arguments requires us to apply the evidence to what seems to be more the "art" of computerized, critical path method scheduling than an objective computer driven exercise providing the answer to the question of whether the [c]ontract completion date should be extended.[260]

In a simplistic delay scenario with only one critical path of several activities, where the project is built as planned with only one major critical path delay to construction, the different schedule delay analysis methodologies all likely would result in the same conclusion. Direct variation, complexity, and uniqueness of each construction project often make comparison of schedule delay analysis methodologies extremely difficult. Frequently no more than two or three schedule delay analysis techniques are applied to a construction delay dispute by different parties, and even then the analyses often differ in their assessment of responsibility for major delays where causation can be argued or even intertwined in a form of contributory negligence.

This study takes the subjectivity out of the analysis by predetermining the responsibility for each delay in a complex project scenario and simplifying delay analysis down to its most basic elements. It seeks to demonstrate and compare how each analysis methodology determines entitlement to delay. Debate over duration and argument over location or schedule effect of each delay are eliminated, as is argument over planned activity durations versus as-built durations.

If all schedule delay analysis methodologies are acceptable, then when applied to the same exact scenario, where delay responsibility is predetermined, all methodologies should yield the same result. This scenario fails to achieve that congruence due to fundamental differences in the way each method treats delay. The summary chart in Figure 36 shows results that are as varied as one methodology concluding six months of compensable delay for the contractor while another methodology concluding no compensable delay plus the right to charge liquidated damages against the contractor. In this delay scenario, a properly adjusted TIA is a preferred way to determine entitlement for delay based on how a project should be scheduled, equitable adjustment, and legal precedent. Further, none of the other seven methodologies shown in this scenario are consistent with the results of a properly adjusted TIA. While a schedule delay expert may employ different methodologies on

260. P.J. Dick Inc., VABCA Nos. 5597, 5836–5850, 5951–5965, 6017–6031, 6061–6075, 6080–6082, 6483, 01-2 B.C.A. (CCH) ¶ 31,647, at 156,343, *rev'd on other grounds*, 324 F.3d 1364 (Fed. Cir. 2003) (emphasis omitted).

different cases to produce the best result for his or her client, this vast discrepancy in outcome shows that more than simple schedule manipulation can lead to significant differences in results. These fundamental differences flow from the ways that various methodologies treat basic delay concepts.

VII. RECONCILIATION

With the variation inherent in using different schedule delay methodologies in what *P.J. Dick* calls the "art" of schedule analysis, the apportionment question and the outcomes in *Hemphill* and *Lanthier* pose a challenge to the theory of "time but no money." Moreover, taken together, these issues reawaken the debate over annulment and whether courts and boards should espouse blanket theories related to concurrency.[261]

Looking specifically to the challenge posed by *Hemphill* and *Lanthier*, these cases attack the basic notion that concurrent delay constitutes excusable delay. Indeed, both decisions expressly reject the contractor's attempt to meet the first element of constructive delay, and do so by concluding that concurrent delay does not rise to the level of excusability.[262] This determination undermines the clear conclusion of decisions, such as *Morganti National*, that have deemed concurrent delay excusable.[263] In both of these recent decisions, the boards ignored *Morganti National* and instead analyzed the contractor's claim as a claim for delay damages requiring proof that the contractor had not contributed to the delay.[264]

In addition to the conflict created between *Hemphill* and *Lanthier* and existing law, the decisions also contain internal inconsistencies that undermine their rationale. Both *Hemphill* and *Lanthier* rest on the statement made by the Board in *Hemphill* that in the face of truly concurrent delay, "neither party will benefit from the delay."[265] Despite that proposition, the framework created by *Hemphill* and *Lanthier* allows the Government the exclusive benefit from jointly caused delay by simply denying the contractor an extension of time. In the context of these decisions, the Government's refusal to extend the performance period would compel the contractor to accelerate its work

261. *See*, *e.g.*, PCL Constr. Servs., Inc. v. United States, 53 Fed. Cl. 479, 487 (2002) (noting that "the rule against apportionment would appear to remain viable in the Federal Circuit"); Acme Process Equip. v. United States, 347 F.2d 509, 535 (Ct. Cl. 1965) ("[W]here delays are caused by both parties to the contract the court will not attempt to apportion them, but will simply hold that the provisions of the contract with reference to liquidated damages will be annulled.").

262. *See* R.J. Lanthier Co., ASBCA No. 51636, 04-1 B.C.A. (CCH) ¶ 32,481, at 160,668–69; Hemphill Contracting Co., ENGBCA Nos. 5698, 5776, 5840, 94-1 B.C.A. (CCH) ¶ 26,491, at 131,853.

263. Morganti Nat'l, Inc. v. United States, 49 Fed. Cl. 110, 132 (2001).

264. *See R.J. Lanthier*, 04-1 B.C.A. (CCH) ¶ 32,481, at 160,669; *Hemphill*, 94-1 B.C.A. (CCH) ¶ 26,491, at 131,853.

265. *Hemphill*, 94-1 B.C.A. (CCH) ¶ 26,491, at 131,853.

to overcome the delay and further to bear the cost associated with that effort as well as the threat of liquidated damages. Under *Hemphill* and *Lanthier*, the contractor's acceleration effort would remain uncompensated, since "in a 'Changes' clause analysis, a contractor cannot recover acceleration costs flowing from a concurrent delay."[266] As a result, the Government would receive a windfall.

Nevertheless, *Hemphill* and *Lanthier* grow from an unsettled set of legal principles addressing concurrent delay in the context of constructive acceleration. That legal heritage spans the spectrum, establishing a "defense of concurrent delay" at one end and contemplating application of the "time but no money" theory at the other. The boards' sole equivocation included in the *Hemphill* and *Lanthier* decisions, and in the other decisions included in this article, rests on the notion that "a clear apportionment of the delay and expense attributable to each party" is possible.[267] In the context of true concurrent delay, where the actions of both parties intertwine to delay project completion, apportionment of the delay may be impossible. Indeed, courts and boards have recognized that some concurrent delays are not subject to apportionment.[268]

Whether computer-driven schedule analysis can accurately apportion concurrent delays remains uncertain. As highlighted in Figure 36, small adjustments in delay analysis methodology result in significant changes in the delay calculation. While many courts and boards have noted approval of the TIA method, there are a number of different methods referred to as TIA in addition to the four outlined in this article and the nature of a dispute involving concurrency places severe limits on producing a properly adjusted schedule for TIA purposes. Even if modern schedule delay analysis is used for apportionment, it is extremely difficult to perfectly apportion delay solely to one party or the other. Schedule analysis frequently results in a finding of concurrency for intertwined delays or offsetting delay that may not be sufficient to discard the "time but no money standard." Although much of the discrepancy arises in methods that are less well received under current legal standards, other methods do not lack for their own obstacles.

At the heart of the apportionment problem, however, lies more than a debate about analysis technique. The apportionment instruction itself rests on the flawed premise that the contractor must effectively demonstrate a compensable rather than excusable delay in order to recover acceleration costs.[269] Thus, the *Hemphill* and *Lanthier* decisions stand at odds with exist-

266. *Id.* at 131,853; *accord R.J. Lanthier*, 04-1 B.C.A. (CCH) ¶ 32,481, at 160,669.

267. *R.J. Lanthier*, 04-1 B.C.A. (CCH) ¶ 32,481, at 160,669; *Hemphill*, 94-1 B.C.A. (CCH) ¶ 26,491, at 131,853.

268. *See, e.g.*, Cumberland Cas. & Sur. Co. v. United States, 82 Fed. Cl. 500, 507 (2008); *Morganti Nat'l*, 49 Fed. Cl. at 132.

269. *See* Hemphill Contracting Co., ENGBCA Nos. 5698, 5776, 5840, 94-1 B.C.A. (CCH) ¶ 26,491, at 131,853.

ing precedent on both concurrent delays and constructive acceleration. They undermine the conceptual framework behind the concept of excusable but not compensable delay, and threaten the notion of "time but no money" as it pertains to concurrent delay. Further, these decisions effectively deny the fixed-price contractor the right to control its own means and methods in the face of excusable delays.