

# BRIEFING PAPERS® SECOND SERIES

PRACTICAL TIGHT-KNIT BRIEFINGS INCLUDING ACTION GUIDELINES ON GOVERNMENT CONTRACT TOPICS

## The “Measured Mile” Method For Proving Disruption

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Disruption on a construction project results when a contractor performs the contracted work in a manner different from and less efficiently than originally planned. When planned productivity is disrupted and the contractor is prevented from achieving its planned production rates, the disrupting party may be liable for the resultant inefficiency.<sup>1</sup> The “measured mile” is a well-accepted method for proving disruption on a construction project.<sup>2</sup> Indeed, some have referred to it as the “gold standard” among methods of quantifying productivity impacts.<sup>3</sup> As to methodology, the measured mile approach compares unit productivity for discrete tasks in an unimpeded (or unimpacted) time period or physical area to that achieved during a disrupted time period or physical area.<sup>4</sup> It has also been referred to as a “good period versus bad period analysis.”<sup>5</sup>

By comparing the contractor’s actual achieved productivity rate in an “unimpacted” or “least impacted” period with that in the “impacted” period, the measured mile approach attempts to take into account project specific conditions rather than rely on the contractor’s bid estimate as a baseline for measurement.<sup>6</sup> As a result, use of the measured mile eliminates the need to prove accuracy of the bid or whether the contractor’s plan was reasonable.<sup>7</sup> Likewise, a properly performed measured mile can provide the best estimate of the rate the contractor would have achieved in the same project conditions but for the impact.<sup>8</sup> Because a measured mile compares achieved progress to would-have-achieved progress, if a contractor was beating its bid productiv-

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This BRIEFING PAPER is based on Chapter 19 of the latest edition of Messrs. Dale’s and D’Onofrio’s treatise, CONSTRUCTION SCHEDULE DELAYS (Thomson Reuters 2021 ed.), available in print and on Westlaw. For further information, visit [legalsolutions.thomson-reuters.com](http://legalsolutions.thomson-reuters.com).

## IN THIS ISSUE:

Implementation Of A Measured Mile Analysis	2
Preference For Using The Measured Mile Method For Proving Disruption	3
Selection Of Measured Mile Periods	4
Reasonably Comparable Impacted & Unimpacted Periods	4
Causal-Based Rather Than Result-Based Selection	5
Exactness Not Required	5
Positive Treatment Of The Measured Mile Method	5
Negative Treatment Of The Measured Mile Method	6
Guidelines	7



ity on the project before it was interfered with, a measured mile analysis may provide for recovery that exceeds total cost.<sup>9</sup>

Because the measured mile method can isolate the productivity loss during an impacted period from all other project factors via achieved progress in an unimpacted period, it is the only method for proving disruption that touches on causation. The effect may be limited, but a properly applied measured mile will contrast work including specific impacts with work that lack the impacts. The filtering effect of the exercise isolates the impacts that cause disruption and that thereby corroborate other causation evidence. In that regard, it may be able to assist in making the evidentiary connection between an impacted period and a loss of productivity. By contrast, other methods for proving disruption, such as methods in the comparison to bid category (for example, modified total cost and total cost),<sup>10</sup> the use of productivity factors from a published industry or academic study,<sup>11</sup> and reliance on visual observation or judgment,<sup>12</sup> make less effort to isolate a specific impact and focus more on other elements.

This BRIEFING PAPER discusses how a measured mile analysis is implemented, the preference for using the measured mile method, the selection of measured mile periods, and positive and negative treatment of the measured mile method by the courts and boards of contract appeals.<sup>13</sup> The

PAPER concludes with a series of practical guidelines designed to reinforce the concepts addressed.

## Implementation Of A Measured Mile Analysis

Implementation of a measured mile analysis involves comparing the productivity of a contractor for similar work during an unimpacted or least impacted time period to the productivity of the same contractor during the impacted period resulting from the causal event or changed circumstance. Productivity in specific geographic areas of a project (impacted and unimpacted areas) has been substituted for time in a measured mile. Examples of productivity metrics<sup>14</sup> used in measured mile analysis include comparison of pounds of duct work per hour,<sup>15</sup> man hours per electrical circuit installation,<sup>16</sup> and cubic meters of excavation per crew per day.<sup>17</sup>

Typically, the productivity rate used in a measured mile comparison is not weighted within the periods based on the quantity of work or progress performed within that period. However, when converting back to lost labor hours, the quantity of work or progress in the impacted period is applied to the difference in productivity rate. For example, the table below shows a hypothetical data set for average pounds of ductwork installed per hour per week on a 10-week project, along with the total pounds of ductwork installed in that given week.

Week	Pounds of Ductwork Installed Per Week	Hours Required To Install Ductwork Per Week	Average Pounds/Labor Hour
1	390	17	22.9
2	430	16	26.9
3	410	20	20.5
4	400	18	22.5
5	250	15	16.7

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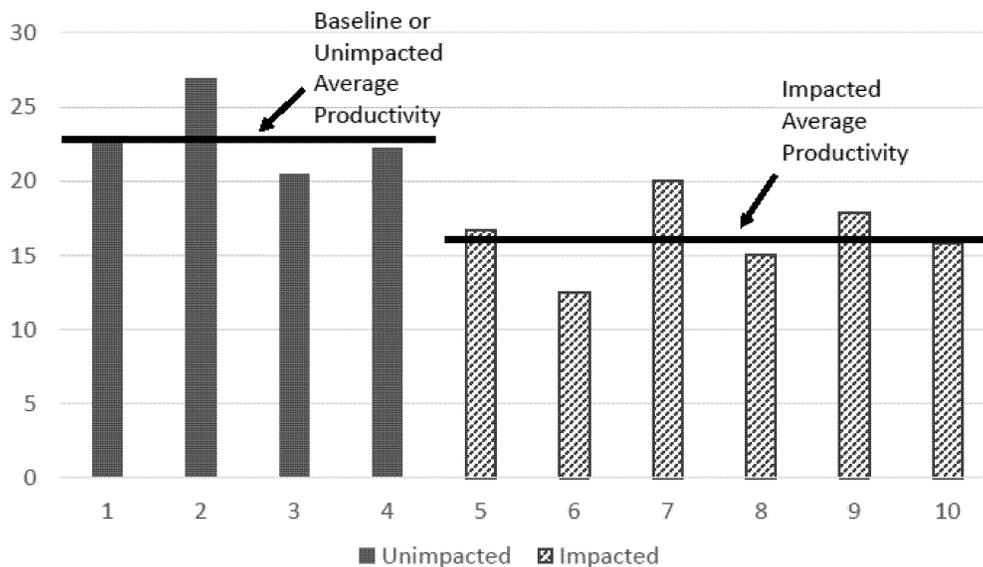
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Week	Pounds of Ductwork Installed Per Week	Hours Required To Install Ductwork Per Week	Average Pounds/Labor Hour
6	200	16	12.5
7	260	13	20.0
8	270	18	15.0
9	215	12	17.9
10	205	13	15.8
<b>Total</b>	<b>3030</b>	<b>158</b>	

In the example, weeks one through four are considered unimpacted, then circumstances change on the project in week five due to an outside impact and the impacted period continues through week 10. A graph plotting out the impacted and unimpacted periods is shown in the figure

below. Ordinarily, due to variability of data and to constitute a representative data set, continuous periods are selected for impacted and unimpacted or least impacted periods.<sup>18</sup> However, in some cases, the selection of period data may not be continuous.<sup>19</sup>

**Pounds per Labor-Hour of Ductwork per Week**



After isolating or accounting for any other factors that may have impacted the productivity, such as lower progress due to learning curve at the beginning of the project<sup>20</sup> and slowdown due to closeout at the end of the project, the average of the unimpacted period is compared with the average productivity of the impacted period. In the example in figure, the average productivity during the four-week unimpacted period is 23 pounds per labor hour, as compared with an average productivity of 16 pounds per labor hour during the impacted period. The difference between the two is a productivity reduction of seven pounds per labor hour resulting from the impact, or a productivity loss of 30% during the impacted period. The number of pounds of ductwork installed during the impact period, or 1,400 pounds, divided by the unimpacted period rate of 16

pounds per labor hour shows that the contractor should have expended 61 hours during the impacted period. Subtracting the 61 should-have-spent hours from the 87 actual hours spent results in 26 hours lost due to the impact. The resultant damage due to the lost productivity calculated via the measured mile is the cost of 28 additional labor hours to perform the same amount of work.

**Preference For Using The Measured Mile Method For Proving Disruption**

The measured mile is the preferred method for proving disruption.<sup>21</sup> As the board of contract appeals in *P.J. Dick Inc.* opined:

We, as most other courts and boards, recognize that

quantifying the loss of labor productivity is difficult and that the determination of the dollar amount of damages for labor inefficiency with exactitude is essentially impossible. In recognizing this fact, we expect that measurement of the amount of inefficiency would usually be supported by expert testimony. The use of a “measured mile” analysis developed by a qualified expert is recognized as the most reliable, though not exact, methodology to quantify labor inefficiency.<sup>22</sup>

In *James Corp. v. North Allegheny School District*, the contractor sought acceleration damages for completing a project on time despite school district-caused delays.<sup>23</sup> The contractor used the “measured mile” approach to establish inefficiency costs due to acceleration. On appeal, the school district argued that measured mile method was too imprecise because the calculations were based on estimates based on flawed assumptions.<sup>24</sup> The appellate court rejected the school district’s arguments, ruling that “[w]hen a contractor alleges a loss of productivity, the measured mile is the preferred method of computing damages.”<sup>25</sup>

The measured mile is well enough entrenched as a method that courts and board of contract appeals have found that to pursue an alternative to the measured mile, an expert must show that a measured mile analysis could not have been performed.<sup>26</sup> Put differently, a claimant must justify its failure to employ a measured mile approach when quantifying losses of productivity. Even where an expert makes a showing that a measured mile analysis was not feasible, tribunals will weigh the showing and may reject the alternative analysis if a measured mile approach was feasible.<sup>27</sup>

## Selection Of Measured Mile Periods

### Reasonably Comparable Impacted & Unimpacted Periods

The key element in a measured mile analysis lies in the selection of reasonably comparable impacted and unimpacted periods. In addition to reflecting the same type of work, the periods selected also need to be of adequate length or sample size to be representative.<sup>28</sup>

The measured mile is intended to tie specific cause and effect between an impacted period and subsequent loss of productivity. The way to ensure that a measured mile accurately identifies, isolates, and eliminates claimant factors that affect loss of productivity is to make the impacted

and unimpacted (or least impacted) periods as similar as possible. As the board in *MCI Constructors, Inc.* summarized:

The “measured mile” method (also variously called “yardstick” or “benchmark”) is one form of a would-have-cost analysis where the productivity that the contractor achieved in an undisrupted work period is compared to the contractor’s productivity on identical or similar tasks during a disrupted work period. As a generalization, the difference in productivity or labor costs between the disrupted and undisrupted periods represents the loss of productivity or efficiency costs. The more comparable the project conditions during the two periods (other than the disruption), the more persuasive the analysis.<sup>29</sup>

The more similar the project conditions between the impacted and unimpacted periods, the better the measured mile is able to segregate out the impacting condition and tie it to the resultant loss of productivity. A general preference order for a measured mile analysis comparison is (most preferable to least):

1. Same exact work and same labor
2. Same type of work, similar labor
3. Reasonably alike work, same labor
4. Reasonably alike work, similar labor

Common features of work for similarity comparison include size, specification, type of material, difficulty of placement, difficulty of access, means of installation, and amount of congestion.<sup>30</sup> Ideally, the same crews or as an alternative similar crews are preferred for comparison in a measured mile.<sup>31</sup>

When that effort fails, the application of the method can fail as well. For example, in *J.A. Jones Construction Co.*, the board noted that the expert’s measured mile “made no attempt to isolate specific impacts/disruptive effects [and] does not consider the nature of any specific changes, or what locations/areas and work activities they directly affected. Nor does his analysis consider the timing of changes and whether the contractor had adequate notice.”<sup>32</sup> Similarly, the measured mile presented in *MCI Constructors, Inc.* was disregarded because it suffered from—

lack of reasonable detail as to (1) the work activities which were disrupted and rendered inefficient, and (2) the causal connection between the District’s disruptions and [the contractor’s] increased labor costs. [The contractor’s] presentation on causation—often no more than general state-

ments that it suffered inefficiencies resulting from out of sequence work, work delays and suspensions, and accelerations—failed to reasonably specify what work activities were rendered inefficient and how the disruptions made those activities more difficult and expensive.<sup>33</sup>

### Causal-Based Rather Than Result-Based Selection

The selection of periods for a measured mile analysis should be based on the factors that contributed to the inefficiency rather than to the achievement of a certain result. For example, in *Lee Masonry, Inc. v. City of Franklin*, the city argued that the contractor determined the unimpacted period by identifying the days with the highest productivity—criticizing essentially a results-based selection of periods as opposed to a causal based selection from issues identified in the daily reports on specific days.<sup>34</sup> By contrast, the contractor testified that the selection was made as best as possible based on when the contractor determined it had the most space with which to work—or based on project conditions, not the highest productive days.<sup>35</sup> The appellate court ultimately acknowledged the complexity of segregating unimpacted and impacted days, deferring to the trial court’s determination of factual findings with regards to period selection.<sup>36</sup>

Courts have found the opposite to apply as well. In *Dae-woo Engineering & Construction Co. v. United States*, the U.S. Court of Federal Claims rejected the contractor’s measured mile after finding that it was intended to produce a specific result.<sup>37</sup> Similarly, in *Flatiron-Lane v. Case Atlantic Co.*, the district court concluded that the expert’s methodology was designed to make the production rates seem as bad as possible for certain periods, regardless of whether the alleged causal impact was affecting productivity in those periods or not.<sup>38</sup>

### Exactness Not Required

Even though the more similar the periods in a measured mile analysis, the more persuasive the analysis, exact similarity in type and circumstance of work is not required.<sup>39</sup> In *Clark Concrete Contractors, Inc. v. General Services Administration*, the board of contract appeals stated that despite lack of precision in the comparison periods, it “will accept a comparison if it is between kinds of work which are reasonably alike, such that the approximations it involves will be meaningful.”<sup>40</sup> The board reached the same conclusion in *P.J. Dick Inc.*, finding “no

basis to conclude that either the productivity of the same crew or that exactly the same work is a prerequisite for a valid measured mile analysis to establish the amount loss of productivity.”<sup>41</sup>

Similarly, in *Safeco Insurance Co. v. County of San Bernardino*, the measured mile still presented a reasonable estimate of lost productivity damages, and the fact that some subjectivity in the determination of low productivity unimpacted days or inexactness did not preclude recovery.<sup>42</sup> However, even though exactness is not required, there is a point where a measured mile is not feasible because impacts affect all areas.<sup>43</sup>

### Positive Treatment Of The Measured Mile Method

Selecting the proper periods of analysis can pose fatal risks to the measured mile, but some tribunals have taken to heart the idea that the measured mile is at best an estimate of damages and not a perfect quantification. In *Clark Concrete Contractors*,<sup>44</sup> the contractor entered into a contract for the Federal Bureau of Investigation field office in Washington, D.C. During performance of the work, the government issued “massive changes to the building’s design” that included “comprehensive alterations to the design and quantity of rebar in the beams and the slab.”<sup>45</sup> In addition to the design changes, the owner’s architect provided “unreasonably slow response to the contractor’s submittals and requests for information.”<sup>46</sup>

At the board of contract appeals, the contractor presented a measured mile analysis. The government challenged the analysis as being nothing more than a total cost claim and for not having appropriate comparable periods.<sup>47</sup> The board was not troubled and opined:

The purpose of a measured mile analysis is to permit a comparison of the labor costs of performing work during different periods of time, so as to show the extent to which costs increased from a standard during periods impacted by certain actions. [The government] is correct in asserting that the work performed during the periods compared by [the contractor] was not identical in each period. We would be surprised to learn that work performed in periods being compared is ever identical on a construction project, however. And it need not be; the ascertainment of damages for labor inefficiency is not susceptible to absolute exactness.<sup>48</sup>

By the end of the decision, however, the tables were

turned, with the government advocating a measured mile analysis for impacts to mechanical work resulting from the concrete changes. On this issue, the board followed the contractor's lead again, but this time by rejecting the measured mile as applied. The board found that the government had compared work on the impacted penthouse with work on unimpacted lower floors with differing layouts and components.<sup>49</sup> Thus, taken together, the *Clark Concrete* decision stands for the proposition that, when properly supported, minor deviations in impacted and unimpacted periods can be tolerated, but material differences that render the period incomparable cannot.

The board's decision in *P.J. Dick Inc.*<sup>50</sup> provides another example of a tribunal addressing comparisons that, while not identical, were deemed sufficiently similar for comparison purposes. The case involved the construction of a clinical addition to the Department of Veterans Affairs (VA) Medical Center at Ann Arbor, Michigan. The contractor was faced with "a total of 439 [orders] modifying the Contract." These drawing revisions of mostly branch circuit work, coupled with acceleration, resulted in a claim by the contractor for inefficiency.<sup>51</sup>

The contractor submitted a measured mile analysis, although in doing so, it compared productivity on the impacted branch circuits to work on main feeder circuits. The government challenged the measured mile, arguing that the two types of work were sufficiently different that the entire method should be rejected or at least reduced. Relying on the same logic as the board in *Clark Concrete*, the board found "no basis to conclude that either the productivity of the same crew or that exactly the same work is a prerequisite for a valid measured mile analysis to establish the amount loss of productivity."<sup>52</sup> In that vein, the board identified the ways in which the comparison period differed and then proceeded to hold that the two types of work were "reasonably similar enough to branch circuit work to permit a valid comparison."<sup>53</sup> The board concluded therefore that the contractor's approach was "a reasonable approximation of the effect of the VA-caused inefficiencies under the *Clark Concrete* Contractors standard."<sup>54</sup>

## Negative Treatment Of The Measured Mile Method

Although the most favored method for proving impact damages or damages resulting from lost productivity, the

measured mile still may suffer from criticism from courts and boards on its implementation. That criticism can range from problems selecting the periods analysed to challenges to the credibility of the witnesses opining on events.

For example, in *Daewoo Engineering & Construction Co. v. United States*,<sup>55</sup> the contractor asserting a claim supported by the measured mile had difficulty in gaining acceptance of its measured mile calculation. In that case, the contractor, which had entered into a contract with the U.S. Army Corps of Engineers for work on a road intended to connect several islands in Palau, claimed to have encountered unusual weather and difficulty with soil compaction.

*Daewoo* tends to generate commentary for the discussion of the certification and false claims findings and the large penalties ultimately levied against the contractor. Those findings certainly color the court's analysis of the measured mile presented by the contractor.<sup>56</sup> On that front, the analysis remained highly unfavorable, with special concern voiced for the credibility of the experts. The court noted:

The measured mile approach to damages is a form of total cost calculations that requires subjective judgment calls by the expert, who estimates damages by comparing periods of production that are unaffected by the contractor's alleged government-caused delay, with periods during which delays affected its production adversely . . . .

Contract Boards have accepted the Measured Mile method on occasion. We assume that a finder of fact faced with such a method of estimating damages would want to have confidence in the experts' ability and objectivity. A court would be particularly concerned to know how the experts picked periods of productive and non-productive construction for comparison. We did not have such a level of confidence in plaintiff's experts. Cross examination showed their choices of productive and non-productive periods to be arbitrary at best. More likely, they were chosen to achieve a pre-determined result.<sup>57</sup>

The court reached this conclusion despite also observing that the measured mile "reduced the amount of the certified claim by approximately \$22 million. In other words, plaintiff asked an expert to review its claim and make recommendations. The expert used a different method of calculating the claim and reduced it by almost one-third."<sup>58</sup>

While the court had grave misgivings as to the credibility of the contractor's overall presentation in *Daewoo*, the U.S. Court of Appeals for the Federal Circuit's decision in *P.W. Construction, Inc. v. United States*<sup>59</sup> provides

an example of the more fundamental and typical concerns raised in connection with the measured mile. In this case, the contractor entered into a fixed-price contract for the installation of natural gas pipe, valves, meters, and pressure stations at Vandenberg Air Force Base and encountered unexpected underground obstructions during performance. The contractor used a measured mile to quantify its lost productivity in connection with the obstructions. The court observed: “The primary problem with the productivity rates is that they do not compare equivalent types of work.”<sup>60</sup> Having identified its concern, the court found that the contractor’s unimpacted period did not include the same work—including different materials and methods—as its impacted period.<sup>61</sup> Rather than deny the claim, however, the Federal Circuit remanded the matter for resolution of the conflicting periods.

While comparing two periods that contain different work can lead to rejection of a measured mile quantification, so too can selecting a comparison that relates to the work of another company entirely. *Southern Comfort Builders, Inc. v. United States*,<sup>62</sup> involved a National Aeronautics and Space Administration (NASA) contract for heating, ventilation, and air conditioning work on mobile launch platforms for the NASA space shuttles at Kennedy Space Center, Florida. The contractor submitted many requests for information and ultimately asserted that the design resulted in inefficiencies to the work. The government disagreed, claiming that the lack of coordination on the contractor’s part led to any inefficiencies in the work. At trial, the contractor presented two distinct analyses of the damages: a modified total cost calculation and a “modified” measured mile analysis.<sup>63</sup> On the measured mile, the court highlighted that the contractor compared its work to another contractor:

[The contractor’s] measured mile calculation is deficient in that it does not adequately represent a comparison between [the contractor’s] unimpacted work with [the contractor’s] impacted work. Instead, [the contractor’s] calculation compares [the contractor’s] work with the work performed by another contractor [ ]. Although the two companies conducted similar work, even [the contractor’s] own expert, [ ] indicated that, under a measured mile analysis, comparing two separate companies is fundamentally flawed. Also, since [the contractor] did not provide a basis of its work unimpacted by government actions, the court cannot properly conclude what [the contractor’s] unimpacted work would have been.<sup>64</sup>

In addition, the court noted that the measured mile

calculation overstated the damages, as well as the actual costs incurred, in comparison to the modified total cost method. Specifically, the court observed:

Another flaw in [the contractor’s] measured mile analysis is that in its calculations, plaintiff’s final average labor costs under the measured mile analysis is greater than the total cost calculations. This presents a fundamental problem because, as [the contractor’s expert] admitted, a total cost analysis represents the maximum amount a contractor could possibly receive. It, therefore, is unreasonable for [the contractor’s] measured mile calculations to be higher than its total cost calculation, perhaps a result of comparing [the contractor’s] costs with [the other contractor’s] costs.<sup>65</sup>

As a result, *Southern Comfort Builders, Inc.* provides a lesson in developing the proper comparison period, but also a lesson in the pitfalls of using multiple methods.<sup>66</sup>

## Guidelines

These *Guidelines* are intended to assist you in understanding the use of the measured mile method for proving disruption claims on construction projects. They are not, however, a substitute for professional representation in any specific situation.

**1.** Recognize that disruption occurs when a contractor must perform work differently and less efficiently than originally planned and typically leads to increased labor and equipment costs rather than extended time on site. Disruption can occur even when a construction project is completed on time and involves a different set of increased costs from those associated with delays.

**2.** Be aware that the measured mile method, which compares the contractor’s productivity in one area with achieved productivity on similar work on the same project—sometimes referred to as a “good period versus bad period analysis”—is the generally preferred method for proving loss of productivity. Rather than relying on the contractor’s bid estimate as a baseline for measurement, the measured mile approach attempts to take into account project specific conditions.

**3.** Keep in mind that even where an expert makes a showing that a measured mile analysis was not feasible, tribunals will weigh the showing and may reject an alternative analysis if a measured mile approach was feasible.

**4.** Remember that the key element in a measured mile analysis is the selection of reasonably comparable im-

pacted and unimpacted periods. To ensure that a measured mile accurately identifies, isolates, and eliminates claimant factors that affect loss of productivity, the impacted and unimpacted (or least impacted) periods should be as similar as possible.

5. Bear in mind that even though the more similar the periods in a measured mile analysis, the more persuasive the analysis, exact similarity in type and circumstance of work is not required.

6. Be aware that although the measure mile is the most favored method for proving impact damages or damages resulting from lost productivity, courts and boards have criticized implementation of the method, for example, due to problems related to the selecting the periods analysed and challenges to the credibility of the witness testimony about events.

## ENDNOTES:

<sup>1</sup>See Dale & D’Onofrio, *Construction Schedule Delays* § 18:1 et seq. (Thomson Reuters 2021 ed.); Dale & D’Onofrio, “Disruption, Inefficiency & Loss of Productivity on Construction Projects,” 16-10 Briefing Papers 1 (Sept. 2016).

<sup>2</sup>See, e.g., *Bell BCI Co. v. United States*, 81 Fed. Cl. 617, 641 (2008), aff’d in part, vacated in part, remanded, 570 F.3d 1337 (Fed. Cir. 2009) (“[The] ‘measured mile’ approach for measuring productivity is an accepted method to prove a cumulative impact claim. See *U.S. Indus., Inc. v. Blake Constr. Co., Inc.*, 671 F.2d 539, 547 (D.C. Cir.1982) (noting that the ‘comparison of the cost of performing work in different periods is a well-established method of proving damages.’)”; *States Roofing Corp.*, ASBCA No. 54860, 10-1 BCA ¶ 34,356 (“The measured mile approach provides a comparison of a production period that is impacted by disruption with one that is not. See *DANAC, Inc.*, ASBCA No. 33394, 97-2 BCA ¶ 29,184 at 145,152, aff’d on recon., 98-1 BCA ¶ 29,454. We have accepted the measured mile approach as an appropriate method of determining impact to productivity. E.g., *Bay West, Inc.*, ASBCA No. 54166, 07-1 BCA ¶ 33,569 at 166,302–03.”).

<sup>3</sup>See Toomey, Marks, Zhao & Dungan, “Calculating Lost Labor Productivity: Is There a Better Way?,” 35-SPG CONSLAW 27, 31 (Spring 2015).

<sup>4</sup>See, e.g., *Bay West, Inc.*, ASBCA No. 54166, 07-1 BCA ¶ 33,569 (“The measured mile approach provides a comparison of a production period that is impacted by a disruption with a production period that is not impacted.”); *Clark Concrete Contractors, Inc. v. Gen. Servs. Admin.*, GSBGA No. 14340, 99-1 BCA ¶ 30,280, dismissed, 230 F.3d 1372 (Fed. Cir. 1999) (“The purpose of a measured

mile analysis is to permit a comparison of the labor costs of performing work during different periods of time, so as to show the extent to which costs increased from a standard during periods impacted by certain actions.”); *MCI Constructors, Inc.*, DCCAB No. D-924, 1996 WL 331212 (June 4, 1996) (“The measured mile method. . . is one form of a would-have-cost analysis where the productivity that the contractor achieved in an undisrupted work period is compared to the contractor’s productivity on identical or similar tasks during a disrupted work period.”).

<sup>5</sup>See, e.g., *P.J. Dick Inc., VABCA No. 5597 et al.*, 01-2 BCA ¶ 31,647, aff’d in part, vacated in part, rev’d in part, 324 F.3d 1364 (Fed. Cir. 2003) (“A measured mile (or good period versus bad period) analysis compares the actual labor costs or labor productivity of performing work during a time period in which the work was not impacted by the actions causing labor inefficiency to the actual labor costs or actual productivity rate for performing work during a period that was so impacted. Such an analysis generally presumes that the labor costs or productivity rates being compared are for the same work and, ideally, results in a standard (the actual, unimpacted productivity of a contractor’s labor) against which the effect of the Government-caused change to working conditions can be measured.”); *DANAC, Inc.*, ASBCA No. 33394, 97-2 BCA ¶ 29,184, on recons., 98-1 BCA ¶ 29,454, dismissed, 168 F.3d 1318 (Fed. Cir. 1998) (“For labor inefficiency claims, a ‘good period vs. bad period’ analysis, comparing the cost of performing work during periods both affected and unaffected by disruptive events ‘is a well-established method of proving damages.’”).

<sup>6</sup>See, e.g., *Angelo Iafrate Constr. Co. v. Commw. of Pa.*, Docket No. 3654, 2006 WL 2585021 (Pa. Bd. Claims June 13, 2006) (“A ‘measured-mile’ analysis of damages is one that compares the work productivity achieved in a minimally affected section of a roadway construction project with the work productivity achieved in sections of the project that were affected by disruptions, work changes or delay.”).

<sup>7</sup>See, e.g., *U.S. Indus., Inc. v. Blake Constr. Co.*, 671 F.2d 539 (D.C. Cir. 1982) (finding that a measured mile comparison of labor efficiency before and after the breach did not constitute the disfavored total cost method which relies on an accurate bid and that contractor did not contribute to disruption).

<sup>8</sup>See, e.g., *Lamb Eng’g & Constr. Co.*, EBCA No. C-9304172, 97-2 BCA ¶ 29,207.

<sup>9</sup>See, e.g., *Tony DePaul & Son v. City of Philadelphia*, 24 Phila. Co. Rptr. 405, 1992 WL 1071420 (Pa. C.P. 1992), aff’d and remanded, 436 Pa. Super. 670, 648 A.2d 1239 (1994) (questioning use of measured mile method generally because it produced a value greater than total cost and limited recovery to total cost).

<sup>10</sup>For an in-depth discussion of the comparison to bid methods for proving disruption, see Dale & D’Onofrio, *Construction Schedule Delays* § 20:1 et seq. (Thomson Reuters 2021 ed.).

<sup>11</sup>For an in-depth discussion of the use of productivity

factor studies to measure disruption, see Dale & D’Onofrio, *Construction Schedule Delays* § 21:1 et seq. (Thomson Reuters 2021 ed.).

<sup>12</sup>For an in-depth discussion of the use of visual observation or judgment to prove loss of productivity, see Dale & D’Onofrio, *Construction Schedule Delays* § 22:1 et seq. (Thomson Reuters 2021 ed.).

<sup>13</sup>See Figure 19–2 summarizing measured mile cases in Dale & D’Onofrio, *Construction Schedule Delays* § 19:9 (Thomson Reuters 2021 ed.); see also Dale & D’Onofrio, *Construction Schedule Delays* § 23:1 (Thomson Reuters 2021 ed.) (noting that the measured mile has been accepted in 60% of the cases it has been used, the highest acceptance rate of any disruption method).

<sup>14</sup>For an example listing of productivity metrics see Dale & D’Onofrio, *Construction Schedule Delays* § 18:1, “Construction productivity” (Thomson Reuters 2021 ed.).

<sup>15</sup>See, e.g., *Bell BCI Co. v. United States*, 81 Fed. Cl. 617, 635 (2008), aff’d in part, vacated in part, remanded, 570 F.3d 1337 (Fed. Cir. 2009).

<sup>16</sup>See, e.g., *P.J. Dick Inc., VABCA No. 5597 et al.*, 01-2 BCA ¶ 31,647, aff’d in part, vacated in part, rev’d in part, 324 F.3d 1364 (Fed. Cir. 2003).

<sup>17</sup>See, e.g., *Daewoo Eng’g & Constr. Co. v. United States*, 73 Fed. Cl. 547 (2006), judgment aff’d, 557 F.3d 1332 (Fed. Cir. 2009).

<sup>18</sup>See, e.g., *N. Am. Mech., Inc. v. Walsh Constr. Co. II, LLC*, 132 F. Supp. 3d 1064, 1079–80 (E.D. Wis. 2015) (measured mile not accepted because it extrapolated an extremely small sample size of less than 1% of total hours for unimpacted period).

<sup>19</sup>See, e.g., *Lee Masonry, Inc. v. City of Franklin*, No. M2008-02844-COA-R3-CV, 2010 WL 1713137, at \*14–16 (Tenn. Ct. App. 2010) (measured mile accepted that selected individual days of unimpacted or least impacted performance, as opposed to an unimpacted continuous period).

<sup>20</sup>But see *Bakers Constr. Servs., Inc. v. Greeneville-Greene Cty. Airport Auth.*, No. E2014-01395-COA-R3-CV, 2015 WL 2258423 (Tenn. Ct. App. 2015) (accepting a measured mile with an unimpacted period of relatively small sample size in the first month of the work).

<sup>21</sup>See, e.g., *Angelo Iafrate Constr. Co. v. Commw. of Pa.*, Docket No. 3654, 2006 WL 2585021, at \*21 (Pa. Bd. Claims June 13, 2006) (“The measured-mile analysis is the preferred industry standard for analyzing loss-of-productivity claims.”); *James Corp. v. N. Allegheny Sch. Dist.*, 938 A.2d 474, 495–96 (Pa. Commw. Ct. 2007) (“When a contractor alleges a loss of productivity, the measured mile approach is the preferred method of computing damages.”); *Central Ceilings, Inc. v. Suffolk Constr. Co.*, No. SUCV200604129A, 2013 WL 8721044, at \*12–13 (Mass. Super. Ct. 2013), aff’d, 91 Mass. App. Ct. 231 (2017) (measured mile is “preferred method” for proving loss of productivity).

<sup>22</sup>*P.J. Dick Inc., VABCA No. 5597 et al.*, 01-2 BCA

¶ 31,647, aff’d in part, vacated in part, rev’d in part, 324 F.3d 1364 (Fed. Cir. 2003); see also *Clark Concrete Contractors, Inc. v. Gen. Servs. Admin.*, GSBICA No. 14340, 99-1 BCA ¶ 30,280, dismissed, 230 F.3d 1372 (Fed. Cir. 1999); *W.G. Yates & Sons Constr. Co.*, ASBCA 49398 et al., 01-2 BCA ¶ 31,428; *U.S. Indus., Inc. v. Blake Constr. Co.*, 671 F.2d 539 (D.C. Cir. 1982); *Luria Bros. & Co. v. United States*, 177 Ct. Cl. 676, 369 F.2d 701 (1966).

<sup>23</sup>*James Corp. v. N. Allegheny Sch. Dist.*, 938 A.2d 474, 495–96 (Pa. Commw. Ct. 2007).

<sup>24</sup>*James Corp. v. N. Allegheny Sch. Dist.*, 938 A.2d 474, 495–96 (Pa. Commw. Ct. 2007).

<sup>25</sup>*James Corp. v. N. Allegheny Sch. Dist.*, 938 A.2d 474, 495–96 (Pa. Commw. Ct. 2007).

<sup>26</sup>See, e.g., *Fire Sec. Sys., Inc., VABCA No. 5559-63 et al.*, 02-2 BCA ¶ 31,977 (alternative method only considered “to estimate the extent of impact on labor productivity in the absence of better evidence, such as a ‘measured mile’ analysis”); *States Roofing Corp.*, ASBCA No. 54860, 10-1 BCA ¶ 34,356 (alternative modified total cost accepted based on expert’s testimony that a better method such as a measured mile could not be performed because no unimpacted baseline existed); *Angelo Iafrate Constr. Co. v. Commw. of Pa.*, Docket No. 3654, 2006 WL 2585021 (Pa. Bd. Claims June 13, 2006) (alternative methods accepted conceptually based on expert’s testimony that because disruptions occurred throughout project a measured mile could not be used); *Central Ceilings, Inc. v. Suffolk Constr. Co., Inc.*, No. SUCV200604129A, 2013 WL 8721044, at \*12–13 (Mass. Super. Ct. 2013), aff’d, 91 Mass. App. Ct. 231 (2017) (measured mile is preferred method for proving loss of productivity, but because it was impossible to segregate costs via the measured mile method, alternative analysis was accepted). But see *DuBaldo Elec., LLC v. Montagnano Constr., Inc.*, 119 Conn. App. 423, 445–46, 988 A.2d 351, 365–66 (2010) (court declined to adopt measured mile standard on appeal when measured mile was never brought up at trial).

<sup>27</sup>See, e.g., *Flatiron-Lane v. Case Atl. Co.*, 121 F. Supp. 3d 515, 558–59 (M.D.N.C. 2015) (The court highlighted the following on developing a measured mile: “[The expert]. . . further opined that [the contractor] could not have employed the measured mile approach to determine loss of productivity because that method requires there to be an unimpacted period, that is, a period during which [the contractor’s] productivity was not meaningfully impacted by the changes Case complains of. . . . To establish impracticability, [the contractor’s] counsel at closing argument relied entirely on [the expert’s] opinion. . . . It appears that the actual reason that it was ‘impracticable’ for [the contractor] to use the measured mile method is that it would show [the contractor’s] low production rates were its own fault. [The contractor] had bid the Project by estimating that it would take about 11 hours to complete each shaft. It took [the contractor], on average, about 44 hours to complete each of the northbound shafts on bent 8. Extrapolating [the contractor’s] production rate on bent 8, which ‘went beautiful,’ it would be expected that [the

contractor] would take about 45 weeks just to complete Bridge 2. In fact, it took almost that long: [the contractor] finished Bridge 2 in 44 weeks. This evidence strongly suggests that [the contractor] likely could have used a measured mile analysis to determine its productivity losses—the only problem is that such an analysis would have precluded recovery. That is not the kind of ‘impracticability’ contemplated by the modified total cost method. [The contractor’s] failure to show impracticability is altogether fatal to [the contractor’s] reliance on the method, since impracticability must be met before the three reduction factors are considered.” (citations omitted)); *Safeco Ins. Co. v. Cty. of San Bernardino*, No. EDCV 05-194-VAP(OPx), 2006 WL 5112598 (C.D. Cal. 2006) (accepting a measured mile and rejecting expert’s arguments that a measured mile could not have been performed because all areas were impacted); *Aetna Cas. & Sur. Co. v. George Hyman Constr. Co.*, No. Civ. A. 93-4750 (E.D. Pa. May 15, 1998) (although expert claimed there was no unimpacted period with which to perform a measured mile, court found that one could have been performed given the similar repetitive construction activities taking place in similar areas at different times).

<sup>28</sup>See, e.g., *N. Am. Mech., Inc. v. Walsh Constr. Co. II, LLC*, 132 F. Supp. 3d 1064 (E.D. Wis. 2015) (measured mile not accepted because it extrapolated an extremely small sample size of less than 1% of total hours for unimpacted period). But see *Int’l Bhd. of Teamsters v. United States*, 431 U.S. 324, 340 n.20 (1977); *Farmer v. DirectSat USA, LLC*, No. 08 CV 3962, 2013 WL 1195651, at \*7 (N.D. Ill. 2013).

<sup>29</sup>*MCI Constructors, Inc.*, DCCAB No. D-924, 1996 WL 331212 (June 4, 1996) (citations omitted).

<sup>30</sup>For example, when comparing concrete productivity in cubic yards per labor hour, similarity factors include type of pour: slabs versus columns versus walls, quantity or difficulty of rebar placement, and location of the pours. Slabs typically involve fewer labor hours for pour preparation and a higher productivity comparing volume of concrete per labor hour than do columns or walls. As a result, a measured mile comparing slab pours to slab pours at similar level of installation would be more accurate than combined productivity for all types of concrete pours at all different levels over time.

<sup>31</sup>See, e.g., *N. Am. Mech., Inc. v. Walsh Constr. Co. II, LLC*, 132 F. Supp. 3d 1064 (E.D. Wis. 2015).

<sup>32</sup>*J.A. Jones Constr. Co.*, ENGBCA No. 6348 et al., 00-2 BCA ¶ 31,000.

<sup>33</sup>*MCI Constructors, Inc.*, DCCAB No. D-924, 1996 WL 331212 (June 4, 1996).

<sup>34</sup>*Lee Masonry, Inc. v. City of Franklin*, No. M2008-02844-COA-R3-CV, 2010 WL 1713137, at \*14–16 (Tenn. Ct. App. 2010) (“The City accuses [the contractor] of calculating its unimpacted time during its most productive days, which it claims is contrary to the daily reports. The City insists that [the contractor’s president], changed the days designated as unimpacted between his first and second reports in order to maximize [the

contractor’s] damages.”).

<sup>35</sup>*Lee Masonry, Inc. v. City of Franklin*, No. M2008-02844-COA-R3-CV, 2010 WL 1713137, at \*14–16 (Tenn. Ct. App. 2010) (recounting contractor’s president’s testimony on inability to find unimpacted period: “[Mr. Lee testified:] ‘And quite honestly, you know, it was hard to find unimpacted work on this project. It was just unbelievable.’ Later, during cross-examination, Mr. Lee testified, ‘I would state that almost every single day on that project was impacted.’ Mr. Lee admitted at trial that [the contractor] made a mistake in assessing days in the first report, but nothing in the record suggests that [the contractor] or Mr. Lee purposefully manipulated the unimpacted days. Mr. Lee was questioned on the matter during cross-examination: ‘Q: Now, when I look at the impacted versus unimpacted, you didn’t just run these numbers and pick the five best, did you? A: I did not do that.’”).

<sup>36</sup>*Lee Masonry, Inc. v. City of Franklin*, No. M2008-02844-COA-R3-CV, 2010 WL 1713137 (Tenn. Ct. App. 2010).

<sup>37</sup>*Daewoo Eng’g & Constr. Co. v. United States*, 73 Fed. Cl. 547, 580–81 (2006), *aff’d*, 557 F.3d 1332 (Fed. Cir. 2009).

<sup>38</sup>*Flatiron-Lane v. Case Atl. Co.*, 121 F. Supp. 3d 515, 544–45 (M.D.N.C. 2015) (“Clearly, [the contractor’s] methodology was designed to make [the contractor’s] production rates seem as bad as possible for certain periods, regardless of whether [the subcontractor] harmed [the contractor’s] production rates.”).

<sup>39</sup>See, e.g., *S. Comfort Builders, Inc. v. United States*, 67 Fed. Cl. 124 (2005); *Safeco Ins. Co. v. Cty. of San Bernardino*, No. EDCV 05-194-VAP(OPx), 2006 WL 5112598 (C.D. Cal. 2006); *Clark Concrete Contractors, Inc. v. Gen. Servs. Admin.*, GSBCA No. 14340, 99-1 BCA ¶ 30,280, dismissed, 230 F.3d 1372 (Fed. Cir. 1999); *P.J. Dick Inc.*, VABCA No. 5597 et al., 01-2 BCA ¶ 31,647, *aff’d* in part, vacated in part, *rev’d* in part, 324 F.3d 1364 (Fed. Cir. 2003).

<sup>40</sup>*Clark Concrete Contractors, Inc. v. Gen. Servs. Admin.*, GSBCA No. 14340, 99-1 BCA ¶ 30,280, dismissed, 230 F.3d 1372 (Fed. Cir. 1999); accord *P.J. Dick Inc.*, VABCA No. 5597 et al., 01-2 BCA ¶ 31,647, *aff’d* in part, vacated in part, *rev’d* in part, 324 F.3d 1364 (Fed. Cir. 2003).

<sup>41</sup>*P.J. Dick Inc.*, VABCA No. 5597 et al., 01-2 BCA ¶ 31,647, *aff’d* in part, vacated in part, *rev’d* in part, 324 F.3d 1364 (Fed. Cir. 2003).

<sup>42</sup>*Safeco Ins. Co. v. Cty. of San Bernardino*, No. EDCV 05-194-VAP(OPx), 2006 WL 5112598 (C.D. Cal. 2006), *aff’d*, 347 F. App’x. 315, 317–18 (9th Cir. 2009) (“The district court also did not commit clear error by accepting the [contractor’s] expert’s measured-mile analysis and method of identifying impacted and unimpacted days. The County contends that the expert’s analysis might have excluded some low-productivity unimpacted days or wrongly attributed decline in production to the fault of the County. Yet ‘once the cause and existence of damages have

been so established, recovery will not be denied because the damages are difficult of ascertainment. Liability cannot be evaded because damages cannot be measured with exactness.’ The district court concluded that the delays [the contractor] caused were ‘insignificant’ in light of the scope of the project and the County’s own delays. [The contractor] presented a reasonable estimate of lost-productivity damages, and the County’s argument that the damage amount is not exact is insufficient to establish clear error.” (citations omitted)).

<sup>43</sup>See, e.g., *Clark-Fitzpatrick, Inc. v. Gill*, 1993 WL 853794, at \*21–22 (R.I. Super. Ct. 1993), *aff’d in part, rev’d in part*, 652 A.2d 440 (R.I. 1994) (court found that impacted soil condition affected all piers, hence the measured mile produced an impacted measured mile that was not accepted as an appropriate measurement of damages).

<sup>44</sup>*Clark Concrete Contractors, Inc. v. Gen. Servs. Admin.*, GSBICA No. 14340, 99-1 BCA ¶ 30,280, *dismissed*, 230 F.3d 1372 (Fed. Cir. 1999).

<sup>45</sup>*Clark Concrete Contractors, Inc. v. Gen. Servs. Admin.*, GSBICA No. 14340, 99-1 BCA ¶ 30,280, *dismissed*, 230 F.3d 1372 (Fed. Cir. 1999).

<sup>46</sup>*Clark Concrete Contractors, Inc. v. Gen. Servs. Admin.*, GSBICA No. 14340, 99-1 BCA ¶ 30,280, *dismissed*, 230 F.3d 1372 (Fed. Cir. 1999).

<sup>47</sup>*Clark Concrete Contractors, Inc. v. Gen. Services Admin.*, GSBICA No. 14340, 99-1 BCA ¶ 30,280, *dismissed*, 230 F.3d 1372 (Fed. Cir. 1999) (government argued that “the methodology is more properly termed a modified total cost method” and that the “calculations are really of actual productivity as compared to budgeted productivity—or, more precisely (though less elegantly), that [contractor] seems to have juggled numbers so as to secure payment which it had expected to receive per man-hour on the job.”).

<sup>48</sup>*Clark Concrete Contractors, Inc. v. Gen. Servs. Admin.*, GSBICA No. 14340, 99-1 BCA ¶ 30,280, *dismissed*, 230 F.3d 1372 (Fed. Cir. 1999) (citations omitted).

<sup>49</sup>*Clark Concrete Contractors, Inc. v. Gen. Servs. Admin.*, GSBICA No. 14340, 99-1 BCA ¶ 30,280, *dismissed*, 230 F.3d 1372 (Fed. Cir. 1999).

<sup>50</sup>*P.J. Dick Inc., VABCA No. 5597 et al.*, 01-2 BCA ¶ 31,647, *aff’d in part, vacated in part, rev’d in part*, 324 F.3d 1364 (Fed. Cir. 2003).

<sup>51</sup>*P.J. Dick Inc., VABCA No. 5597 et al.*, 01-2 BCA ¶ 31,647, *aff’d in part, vacated in part, rev’d in part*, 324 F.3d 1364 (Fed. Cir. 2003) (while direct costs were agreed, the inefficiency costs were the subject of “supplemental agreements [that] included ‘reservation of rights’ language preserving its right to seek additional impact and suspension costs”).

<sup>52</sup>*P.J. Dick Inc., VABCA No. 5597 et al.*, 01-2 BCA ¶ 31,647, *aff’d in part, vacated in part, rev’d in part*, 324 F.3d 1364 (Fed. Cir. 2003).

<sup>53</sup>*P.J. Dick Inc., VABCA No. 5597 et al.*, 01-2 BCA

¶ 31,647, *aff’d in part, vacated in part, rev’d in part*, 324 F.3d 1364 (Fed. Cir. 2003).

<sup>54</sup>*P.J. Dick Inc., VABCA No. 5597 et al.*, 01-2 BCA ¶ 31,647, *aff’d in part, vacated in part, rev’d in part*, 324 F.3d 1364 (Fed. Cir. 2003).

<sup>55</sup>*Daewoo Eng’g & Constr. Co. v. United States*, 73 Fed. Cl. 547 (2006), *judgment aff’d*, 557 F.3d 1332 (Fed. Cir. 2009).

<sup>56</sup>Even with respect to the measured mile calculation itself, the court was quick to highlight that the plaintiff had never submitted a certified claim using the measured mile to the government, bypassing a key aspect of the Contract Disputes Act process. Indeed the experts engaged in the measured mile calculation took great pains to avoid having any ties to the certified claim from which most of the decision’s fame arises. See *Daewoo Eng’g & Constr. Co. v. United States*, 73 Fed. Cl. 547, 573 (2006), *judgment aff’d*, 557 F.3d 1332 (Fed. Cir. 2009) (“The experts emphasized that they had not read the certified claim they were to update or reprice. They wished to distance themselves from any numbers or supporting data that had been a part of that claim. . . . So either they merely scanned the certified claim or they did not read it at all.”).

<sup>57</sup>*Daewoo Eng’g & Constr. Co. v. United States*, 73 Fed. Cl. 547, 580–81 (2006), *judgment aff’d*, 557 F.3d 1332 (Fed. Cir. 2009).

<sup>58</sup>*Daewoo Eng’g & Constr. Co. v. United States*, 73 Fed. Cl. 547, 582 (2006), *judgment aff’d*, 557 F.3d 1332 (Fed. Cir. 2009).

<sup>59</sup>*P.W. Constr., Inc. v. United States*, 53 Fed. Appx. 555 (Fed. Cir. 2002).

<sup>60</sup>*P.W. Constr., Inc. v. United States*, 53 Fed. Appx. 555, 557 (Fed. Cir. 2002).

<sup>61</sup>*P.W. Constr., Inc. v. United States*, 53 Fed. Appx. 555, 557 (Fed. Cir. 2002) (“The trial court recognized this problem, but did not correct for the error.”).

<sup>62</sup>*S. Comfort Builders, Inc. v. United States*, 67 Fed. Cl. 124 (2005).

<sup>63</sup>*S. Comfort Builders, Inc. v. United States*, 67 Fed. Cl. 124, 146 (2005).

<sup>64</sup>*S. Comfort Builders, Inc. v. United States*, 67 Fed. Cl. 124, 150 (2005).

<sup>65</sup>*S. Comfort Builders, Inc. v. United States*, 67 Fed. Cl. 124, 150 (2005).

<sup>66</sup>See the discussion of utilizing multiple methods for proving loss of productivity in Dale & D’Onofrio, *Construction Schedule Delays* § 18:9 (Thomson Reuters 2021 ed.); see also Figure 19-2 summarizing measured mile cases in Dale & D’Onofrio, *Construction Schedule Delays* § 19:9 (Thomson Reuters 2021 ed.); Dale & D’Onofrio, *Construction Schedule Delays* § 23:1 (Thomson Reuters 2021 ed.) (noting that the measured mile has been accepted in 60% of the cases it has been used, the highest acceptance rate of any disruption method).

# BRIEFING PAPERS