BEFORE THE
MARYLAND STATE BOARD OF CONTRACT APPEALS

In The Appeal of Manuel Luis Construction Co., Inc. Under SHA Contract No. BA6885184	))))))	Docket No. MSBCA 2875

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OPINION BY BOARD MEMBER DEMBROW

This contract dispute is a claim for recovery of damages incidental to alleged delay and loss of productivity occasioned by numerous changes made by the State after contract award. While the modified total cost method of calculating damages is rejected, limited relief is afforded appellant under the reasoning set forth below.

Findings of Fact

1. On or about December 4, 2006, the Maryland State Highway Administration (SHA) published an Invitation for Bids (IFB) identified as SHA Contract No. BA6885184, also entitled "Community Safety and Enhancement on MD 7 (Philadelphia Road) from US 40 to Golden Ring Road," a road reconstruction

for surface improvement and streetscape upgrade hereinafter referred to as the Route 7 Project. (Resp. Admission of Fact No. 1 but references date of December 5, 2006; App. Ex. 3B, Romanowski Dep., pg. 98; App. Ex. 4; Resp. Ex. 2.)

2. A central purpose of the Route 7 Project was to replace and improve the existing storm drain system along Route 7. (App. Ex. 3B, Romanowski Dep., pg. 246.)

3. The scope of the project as described in the IFB included the following work:

   a. Replace existing gas line;
   b. Replace existing water line;
   c. Replace existing storm water system;
   d. Widen the roadway;
   e. Install new curb and gutters;
   f. Overlay existing pavement;
   g. Repair or replace existing sidewalks;
   h. Modify traffic signalization;
   i. Erect new signage;
   j. Stripe the roadway;
   k. Construct three retaining walls;
   l. Install new storm water management;
   m. Landscape the area; and
   n. Improve roadway and sidewalks in compliance with requirements of the Americans with Disabilities Act (ADA).

(Resp. Admission of Fact No. 6; App. Exs. 4, 8; Resp. Ex. 13; Rule 4 File, pgs. 72, 294.)

4. The IFB included Special Provision 875, which stated:

> The contractor shall locate all existing utilities and be responsible for their safety. . .
>
> Prior to ordering any storm drain materials, the Contractor shall locate and test pit any underground facilities that appear to be in conflict in order to determine if conflicts exist.

(App. Ex. 4, pg. 228; Resp. Ex. 2, pg. 228.)

5. The construction plan sheets for the Route 7 Project also contained the following disclaimer:

> *UTILITIES*
>
> THE LOCATION OF UTILITIES SHOWN ON THE PLANS ARE FOR INFORMATION AND GUIDANCE ONLY. NO GUARANTEE IS MADE OF THE ACCURACY OF SAID LOCATIONS.

(*Emphasis in original.*)(App. Ex. 5.)

6. Because the project restricted traffic on a busy thoroughfare, the advertised contract provided that work was permitted only between 9:00 a.m. and 3:00 p.m. weekdays. (Resp. Ex. 18, pg. 4; Rule 4 File, pg. 92.)

7. Prior to SHA's publication of the IFB, John "Dutch" Poole (Poole), a consultant employed by Whitman Requardt & Associates, performed constructability reviews for SHA District 4 and in that capacity reviewed the Route 7 Project plans and specifications. On or after November 17, 2006, shortly before public release of the IFB, Poole wrote by hand on a copy of e-mail related to the project, "This job is not ready to be advertised. Needs a lot of work. Utilities - Drainage is terrible." (*Emphasis in original.*) (Trial stipulation; Resp. Admission of Fact No. 2; App. Ex. 2D; Rule 4 File, pg. 2521.) Before and after publication of the IFB and bid opening, SHA's Project Design Engineer, Brian Romanowski (Romanowski), also recognized the necessity of design changes. (Appellant's Ex. 3B, Romanowski Dep., pgs. 127, 130, 139.) The IFB was nevertheless released.

8. In the course of developing the project design, in order to determine the location of utilities for incorporation into the construction plans, SHA requested as-built plans from the utility owners along Route 7. (Appellant's Ex. 3B, Romanowski Dep., pg. 56.) It was SHA's responsibility, not

the contractor's, to identify location of utilities for purpose of developing the project plans and specifications. (Cook, Tr. 1779; App. Ex. 3B, Romanowski Dep., pg. 54.)

9. As re-design continued after the IFB was published, by memorandum dated December 14, 2006, Romanowski directed others at SHA to modify the terms of the IFB by addendum prior to the deadline for bid submission, stating, "The first addendum should include: Sink Hole, Landscape, MOT [maintenance of traffic], Plan sheet changes, Property owner requests, Drainage revisions, Construction Comments, Utilities, Geotech, Permits." (App. Ex. 3B, Romanowski Dep. pgs. 147-151.) As more specifically detailed below, those items were not included in the first addendum, or any other addendum to the IFB.

10. About a month after Romanowski's instructions to modify the IFB by addendum, by e-mail dated January 12, 2007, Romanowski was informed that the first addendum was still not acceptable according to Johnson, Mirmiran & Thompson (JMT), SHA's engineering consultant on the project. A few days later SHA was informed concerning a sink hole that "things were not working with the sketch" as a result of which a representative of Century Engineering went to the project site to refine a better solution. By e-mail to Romanowski dated January 16, 2007, Century Engineering suggested that that issue be handled by redline revision rather than pre-bid addendum. (App. Ex. 3B, Romanowski Dep., pgs. 155-160.)

11. In light of the ongoing design changes still occurring, by memorandum dated January 17, 2007, Norie A. Calvert, the Chief of the Design Technical Services Division for SHA, increased the project engineers' estimate by the sum of $93,295, from $10,923,944 to $11,017,239. Per SHA's pricing limitations, this raised the "not to exceed price" to $14,045,000. (App. Ex. 3B, Romanowski Dep., pgs. 165-167.)

12. After the IFB was released in early December 2006, SHA issued three addenda, including one which made minor revisions to the plan sheets and the contract terms and another extending the due date for the filing of bids from January 16, 2007 to January 25, 2007. The third addendum incorporated contractor questions and answers into the contract documents. (SHA Admission of Fact No. 11; N. Luis, Tr. pgs. 104-105; Rule 4 File, pgs. 10-30.)

13. By e-mail of January 22, 2007, another SHA design consultant informed Romanowski that she was revising two sheets for Addendum No. 4 but by response the same date Romanowski stated, it was "too late for Addendum No. 4. It will need to go in as a redline." (App. Ex. 3B, Romanowski Dep., pg. 170.)

14. Even following receipt of bids, SHA was still receiving information that caused ongoing modifications to the construction plans. For example, the Maryland Department of the Environment required changes to the initial storm water management design and Baltimore County provided SHA funding to relocate its waterline into the roadway at certain locations and add a right turn lane at Golden Ring Road where it intersects with Route 7. These changes, and many others, required several material alterations of the construction plans that existed as of the bid due date. (App. Ex. 3B, Romanowski Dep., pgs. 96, 173, 306, 311.)

15. Manuel Luis Construction Company, Inc. (Luis) is a reputable Maryland firm with prior experience with work comparable to the Route 7 Project, including storm drain installation. (N. Luis, Tr. pg. 98.)

16. In the fall of 2006, Karsan Limbasiya (Limbasiya) worked as the chief estimator for Luis, and in that capacity prepared Luis' bids. On every job bid, including the Route 7 Project, Limbasiya applied a 40% overhead rate on top of estimated direct labor costs. That overhead figure was

derived from appellant's accounting department. (N. Luis, Tr. 226; Limbasiya, Tr. pgs. 753, 1056-1057, 1060-1062; Resp. Ex. 6.)

17. Limbasiya reviewed the IFB for the Route 7 Project and prepared Luis' bid after determining that Luis could perform most of the job tasks, including the storm drain work. (Limbasiya, Tr. pgs. 791-792.) The total amount determined by Limbasiya as Luis' bid was $10,688,661. (Resp. Exs. 1, 6.) At the time, with a bid price of over $10 million, the Route 7 Project was the largest single job that Luis had ever bid. (Limbasiya, Tr. pg. 1062.)

18. In preparing the bid, Luis reasonably relied upon SHA's design plans and specifications, believing that following them would produce a satisfactory result. (N. Luis, Tr. pgs. 111-112; Cook, Tr. pgs. 1202-1204, 1222-1223.)

19. Most of the utility lines on the Route 7 Project were located under the shoulder of the road or under the roadway itself. (Hatwell, Tr. pg. 430; Davitt, Tr. pg. 1639.) The sequence of task work specified in the IFB was as follows: gas line relocation followed by water line relocation followed by storm drainage, concluding with pavement overlay and finishing work. (Cook, Tr. pg. 1787.) Although the first task to be performed on this project was relocation of gas lines, Redline Revision #1 did not pertain to gas lines, which were addressed in Redline Revision #2. (Limbasiya, Tr. pgs. 1031, 1035.)

20. The IFB required that gas line relocations be performed by a subcontractor pre-approved by Baltimore Gas & Electric Company (BG&E). Luis planned to subcontract that work to a pre-qualified BG&E contractor, namely, Lineal Industries, Inc. (Lineal), at a cost of $875,000. Luis also planned to subcontract the water line relocation work specified for the project, using Windsor Construction (Windsor) for that work, but during the job, Windsor was replaced by Hawkins Brothers

(Hawkins) due to issues related to Windsor's job performance, which caused a 14-day delay. (N. Luis, Tr. pgs. 244-246; Limbasiya, Tr. pg. 1058; Bond, Tr. pgs. 1310-1311; Resp. Ex. 18, Tab 37; Rule 4 File, pg. 298.)

21. Limbasiya did not include in Luis' bid any costs for overtime. (Limbasiya, Tr. pg. 1000; N. Luis, Tr. 1839.) According to Luis' certified payroll records, it ultimately expended $143,832 for overtime on this job, for which Luis now claims entitlement to additional funds from SHA. (N. Luis, Tr. pg. 179.) However, that figure includes $8,085 for overtime expenses allegedly incurred during the 2008-2009 winter shutdown and an additional $641 for overtime expenses said to have been incurred during the 2009-2010 winter shutdown. The total overtime claim of $143,832 also includes $4,710 allegedly incurred after substantial completion of the project on April 13, 2010, and another $8,785 incurred to accomplish remedial repair work caused on 22 occasions when Luis struck and broke a utility line. The total sum of $121,611 represents the cost of Luis' actual overtime expenses after deducting the foregoing four items for which Luis may not be entitled to additional compensation from SHA. (Resp. Ex. 2.) Early in the course of settlement negotiations, on October 28, 2010, Luis submitted to SHA a request for equitable adjustment which stated that its bid had included 1,168 hours of overtime, but that claim appears to have been in error and was contradicted by sworn testimony adduced at trial. (N. Luis, Tr. pgs. 179-182, 1856-1857.)

22. Before selection for award of the contract or commencement of any work, Limbasiya estimated that Luis would expend on the Route 7 Project $1,591,918 in direct labor costs and $2,461,528 on subcontractors. (Resp. Ex. 6.) Based upon review of certified payroll records examined after project completion, the actual direct labor costs incurred by Luis

on the Route 7 Project totaled $1,611,924, a difference of only $20,000 more than Luis' pre-award estimate, and the slightly higher actual sum includes $30,000 in direct labor costs associated with change orders, so Luis' estimated direct labor charge was ultimately determined to be only $10,000 lower than that actually incurred, a difference of less than 1%. (Davitt, Tr. 1603; App. Ex. 8, pg. 67.)

23. In determining appellant's bid, Limbasiya did not apply the 40% overhead factor to M. Luis' estimated subcontractor costs, only to appellant's direct labor costs, and accordingly, M. Luis' projected overhead for the Route 7 Project was $636,767. (Limbasiya, Tr. pgs. 1057, 1058; Kime, Tr. pgs. 1722-1723; Resp. Ex. 6.) That estimated overhead was intended to cover home office expenses, bond and insurance, and the following supervisory personnel:

    a. a full-time project manager or project engineer (Limbasiya, Tr. pg. 1000);
    b. two part-time superintendents (Limbasiya, Tr. pg. 1043);
    c. a foreman (Limbasiya, Tr. pg. 1079);
    d. mechanics (Limbasiya, Tr. pg. 1044); and
    e. Limbasiya's time (Limbasiya, Tr. pg. 1045).

Because the cost of supervision was included in Luis' overhead and not broken out as a separate bid item, it is not possible accurately to calculate the amount Luis included in its bid for supervision alone, though we do know that it was less than the total overhead figure of $636,767.

24. The accounting methodology employed by Luis during construction of the Route 7 Project was perfectly suitable but did not track salaried supervision to any particular project, only to Luis' general ledger account. (N. Luis, Tr. 229; Wodiska, Tr. 496; Limbasiya, Tr. 1000.)

25. SHA received nine bids for the Route 7 project in the following order listed from least to most costly:

    a. Daisy Concrete of Maryland
    $10,549,220.25

b. M. Luis Construction Co.
$10,688,661.25
c. Pessoa Construction Co.
$10,745,195.00
d. Peak Incorporated
$11,780,767.90
e. P. Flanigan & Sons, Inc.
$12,833,987.15
f. Dixie Construction Company, Inc.
$13,439,995.00
g. Gray & Son, Inc.
$13,475,000.00
h. Facchina Construction Company, Inc.
$13,621,321.70
i. Melvin Benhoff Sons, Inc.
$13,655,514.34

(Resp. Admission of Fact No. 15; App. Ex. 18.)

26. Noting that Luis was not even the lowest bidder and that the three lowest bids were all lower than SHA's cost estimate and were within a variance of less than 2% of each other, and based upon the amounts of all nine bids received by SHA for the Route 7 Project, as well as the thoughtful an detailed explanation provided by Limbasiya to support Luis' bid estimate, the bid submitted by Luis was reasonable. (Cook, Tr. 1205-1207, 1209.)

27. As reflected above, Daisy Concrete of Maryland (Daisy) was the apparent low bidder, but in reviewing Daisy's bid, Limbasiya noted a defect pertaining to the correct designation of Minority Business Enterprises (MBEs) as subcontractors for a portion of the required work. That defect was reported to SHA as a result of which Daisy's bid was deemed ineligible and on or about March 12, 2007, SHA notified M. Luis that it was the low bidder instead of Daisy. (App. Ex. 19.) Daisy filed a protest challenging the rejection of its bid and on April 10, 2007, SHA requested that all of the bidders extend their prices. (Resp. Admission of Fact No. 17; Limbasiya, Tr. 829-832; App. Ex. 20; Resp. Ex. 25.)

28. Luis did extend its bid price but would not have done so if it had been aware of the numerous changes that SHA intended to incorporate into the contract by post-award contract revision. (N. Luis, Tr. 144-145.)

29. On June 13, 2007, SHA awarded Luis the contract for the Route 7 Project for the bid amount of $10,688,610. (Resp. Admission of Fact Nos. 25, 27.) At the time of contract award, SHA made no mention of the need for any changes to the advertised design plans and specifications. (Limbasiya, Tr. 831.) By contrast, the job when finished was ultimately determined to cost a total of $14,197,856. (App. Ex. 29A.)

30. SHA initially established the date of June 27, 2007 for its Notice to Proceed; however, due to the pendency of the bid protest filed by Daisy, SHA put Luis on a work shutdown until the protest was resolved. (Resp. Admission of Fact No. 28; Resp. Ex. 18, Tab Nos. B-2, B-3.) SHA's determination to disqualify Daisy's bid was ultimately sustained after recourse to judicial relief in the Circuit Court for Cecil County, following which SHA permitted the Route 7 Project to proceed. (Limbasiya, Tr. pgs. 830-831; Cook, Tr. pg. 1209.) SHA changed the Notice to Proceed date to August 13, 2007, though Luis mobilized to the job site earlier, on July 30, 2007. (Resp. Admission of Fact Nos. 30, 74.)

31. The contract allowed a total of 390 work days for project completion, with August 13, 2007 being the first work day charged to Luis. (N. Luis, Tr. 208; Resp. Ex. 18, pg. 1.) The contract provided for liquidated damages at a daily rate of $3,990 as the penalty for failure to complete the project on time. (Limbasiya, Tr. 969.)

32. SHA used a private firm, Century Engineering, to assist in the design and revision of the Route 7 Project, paying approximately $468,000.00 for design services rendered between the bid due date of January 25, 2007 and the date Luis was awarded the contract, namely, June 13, 2007.

(Trial Stipulation; Resp. Admission of Fact No. 16; App. Ex. 3B, Romanowski Dep., pg. 26.)

33. SHA never informed Luis or the other bidders that the contract plans were still being revised between the time the IFB was issued in early December 2006 and the contract award date of June 13, 2007. As a result, Luis did not know that the plans were still under revision when bids were submitted nor that SHA intended to accomplish its design modifications by redline revisions issued after contract award. (Resp. Admission of Fact Nos. 21, 29; Limbasiya, Tr. 829.)

34. There are three basic redesign classifications for facilitating changes to construction plans and specifications: Redline revisions are indicated in red on plans and generally originate with project designers. Greenline revisions are written in green and may reflect changes required by circumstances encountered during construction. Field directives are generally less substantial changes made on site as conditions may dictate. (Hatwell, Tr. 340; Cook, Tr. 1219-1220.)

35. Only a couple of days after Luis initially mobilized at the site, SHA issued Redline Revision #1, which included formal drawings revising the construction plans. That revision, and subsequent revisions, was numbered and dated according to issuance, and also accompanied by a written narrative. Redline Revision #1 included several minor changes to the construction plan sheets in the nature of correcting typos or clarifying the prior plans, as well as other more substantive changes like material variances in the design and installation specifications of sections of the storm drain system. Redline Revision #1 included 167 design changes impacting 91 of the 243 total plan sheets in the contract drawings. (App. Ex. 21; Resp. Ex. 18, Tab Nos. B-15, B-17; App. Ex. 3B, Romanowski Dep., pgs. 202, 204; Rule 4 File, pgs. 477, 1760-1801.)

36. A month later, SHA issued Redline Revision #2, which was principally related to the installation of the gas line work directed by BG&E and which introduced 160 additional design changes in the contract plans and specifications, affecting 18 pages of design sheets. (Resp. Ex. 4; Resp. Ex. 18, pg. 10, Tab No. B-18; Rule 4 File, pgs. 2493-2501.)

37. On October 17, 2007, SHA issued Redline Revision #3, which modified the plans for relocation of water lines along the Route 7 Project, introducing 53 more design changes affecting 18 pages of design sheets. (Resp. Ex. 18, pg. 10; App. Ex. 3B, Romanowski Dep., pgs. 279, 288; Rule 4 File, pgs. 1981-1994.)

38. On February 15, 2008, SHA issued Redline Revision #4, which included 13 changes affecting 11 pages of design sheets. (Resp. Ex. 18, pg. 10; Rule 4 File, pgs. 2233-2235.)

39. On May 12, 2008, SHA issued Redline Revision #5, which affected the storm drain plans and included 100 changes affecting 44 pages of design sheets. (Resp. Ex. 18, pg. 10, Tab Nos. B-63, B-71, B-93; Rule 4 File, pgs. 2251-2269.)

40. On October 29, 2008, SHA issued Redline Revision #6, which revised the signal modification plans and included 25 changes affecting 18 pages of design sheets. (Resp. Ex. 18, pg. 10, Tab No. B-187; Rule 4 File, pgs. 1803-1806.)

41. In addition to the above referenced 498 redline revisions made after contract award, by appellant's count, SHA also issued about 50 greenline revisions, averaging two changes per revision. (Resp. Admission of Fact No. 45; App. Ex. 2B; Resp. Ex. 18, pgs. 10-11.) In addition, SHA approved 14 formal change orders for $158,973. (App. Ex. 2B; Resp. Ex. 18, pg. 11.) Finally, appellant also itemized 401 specific field changes. (Resp. Ex. 7.)

42. As detailed more fully in the Inspectors' Daily Reports (IDRs), and skipping a lot of other incidents which occurred

between the dates below, a few of the 401 field changes are described chronologically by appellant as follows:

2007

Sept. 21: removed existing storm drains not shown

Sept. 24: removed existing inlet in conflict with new 6" HP gas main

Oct. 2: removed existing 18" storm drain pipe in conflict with new 6" gas main

Dec. 10: work stopped due to lead joint in the line & elevation conflict with 16" line and 8" line

Dec. 12: railroad timbers found during test pitting

Dec. 17: 8" duct iron pipe found during excavation

Dec. 19: found and hit 1.5" water line not noted on contract documents

Dec. 20: concrete slab found and removed during install for 6" gas line

2008

Jan. 8: removal of concrete duct bank not on plans 5 hours

Feb. 14: found unmarked storm drain/gas line encased in concrete. Trench was closed up and contractor refused to install because water line has to be placed beneath

Feb. 21: Luis idle for 3 hours to allow utility survey co. to find missing water valves incorrectly shown on drawings

March 4: found old water lines while digging for 6" gas main, not shown on the drawings / 3 unidentified pipes crossed trench, were removed / old telephone cabling also was located while digging trench across gas line trench

The foregoing abbreviated list is merely to provide a flavor of the myriad of challenges presented on the Route 7 Project. It reflects a sample of only a dozen of the early

events encountered by Luis during the first months of work, among the total of 401 identified. A similar pattern of excavation surprises continued throughout the project as identified through Aug. 18, 2010. (Resp. Ex. 7.)

43. Not all of the 401 field changes were caused by design defects or other matters attributable to SHA. At least 22 incidents, or about 5% of the total number of field changes identified, occurred because Luis or its subcontractor struck and broke a utility line. (Hatwell, Tr. 423; App. Ex. R-7.) It is unclear from the record how many of those 22 incidents may have been the fault of appellant rather than caused by defective information or instructions provided to Luis by SHA, or involved action for which fault may have been shared by both parties.

44. Thus, in total, according to appellant, SHA interposed a total of around 1,000 design changes during the course of the Route 7 Project, over 300 of which occurred during the first six weeks of construction. By contrast, according to SHA's count, there were only 84 redline revisions affecting construction and just 26 greenline or field directed changes. (Resp. Ex. 18, pg. 11.)

45. Besides utility lines discovered in different locations than expected, during pitting and excavation work, Luis encountered a number of unanticipated subsurface obstacles including timber piles, concrete slabs, unidentified wires, wooden pipe, and other unknown abandoned buried material. (Hatwell, Tr. pgs. 366, 403; Limbasiya, Tr. pgs. 848-849.)

46. When Luis encountered differing site conditions that affected the proposed design of the storm drain systems, SHA directed a partial shutdown for Luis from April 28, 2008 through June 1, 2008. (Bond, Tr. pgs. 1305-1306; Respondent's Ex. 18, pg. 17.)

47. When it bid the job, Luis expected to be able to work in a spatially sequential fashion, moving from the intersection

of Rt. 40 and Philadelphia Road to the opposite end of the project. (Limbasiya, Tr. pg. 1019.)

48. Due to the discovery of differing site conditions by the subsurface obstacles encountered contrary to expectations, SHA encouraged Luis to work out of the sequence of construction set forth in the construction plans. (Limbasiya, Tr. pg. 1020; Bond, Tr. pg. 1304.) Because of all of SHA's design changes, Luis was unable to perform the required work in the order it initially anticipated, but instead was required to hopscotch from one point to another, requiring multiple on-site mobilizations which negatively impacted work efficiency. (Limbasiya, Tr. pg. 1012.)

49. The upheaval in planned construction activities was particularly detrimental to Luis on this project because the area available to perform the necessary work was tightly confined, generally between the roadway and the sidewalk, and also because of the need to continue to permit traffic flow during periods of construction, requiring multiple mobilizations not only of excavation and installation work crews and equipment but also the relocation of personnel, signage and related materials to keep the road passable at multiple road locations. (Almeida, Tr. pgs. 882-883; Resp. Ex. 18, Tab No. B-168.)

50. Under the Maryland Department of Transportation's Standard Specifications for Construction and Materials (2001) (hereinafter "MDOT Standard Specifications"), which were incorporated into the contract, a partial shutdown allows the contractor to continue working on a project without being directly assessed work days. Instead, in accordance with Sec. TC 5.05 of the MDOT Standard Specifications, in a partial shutdown, SHA charges the contractor work days based on a percentage of the amount of money earned while working on the project during the shutdown period. Luis earned

$362,857 for 13 days during the April to June 2008 partial shutdown period. (Respondent's Ex. 18, pgs. 8, 9, 18.)

51. Throughout the period of construction on the project, Luis repeatedly encountered unmarked utilities and other conflicts in the design specifications. This occurred with such regularity that work was nearly constantly complicated and slowed. (Limbasiya, Tr. pg. 850.)

52. Examples of some of the construction challenges encountered by Luis in the field are set forth below:

> *Manhole 100*. Due to location conflicts with the existing 16" water line and 4" gas line, in Redline Revision #1, SHA changed the design, height and depth of Manhole 100 and the associated piping between plan stations 103+60 and 104+25. The re-design set forth in Redline Revision #1, however, did not correct all of the design problems. Two months later, Redline Revision #3 again rerouted the existing 16" water line to accommodate changes in the location of storm piping as set forth in Redline Revision #1. Four months after that, Luis encountered additional new design issues with MH-100 and its associated piping. Luis therefore waited for SHA to issue Redline Revision #4 which yet again changed the elevation of MH-100. Meanwhile, Luis was forced to work in other areas until May 4, 2008, when Redline Revision #5 was issued, allowing the remaining storm work to station 111+10 to be done. After multiple remobilizations at this site, Luis was finally able to complete this section of storm water drainage about June 5, 2008.
>
> *Inlet 59*. While installing the gas line at Inlet 59, Luis discovered that later storm drain work would conflict with that installation due to incorrect locations indicated in the Route 7 Project plans and specifications. SHA therefore stopped work and directed its engineering consultant to redesign the inlet using an offset cog in place of a standard cog in order to fit around the gas line. Because of the delays necessitated by this redesign, Luis was again

forced to work out of sequence in an effort to mitigate delays by keeping the job moving forward wherever work could be done. A greenline revision issued August 26, 2008 modified the design of Inlet 59. But on October 3, 2008, Luis found that that newly designed and fabricated standard inlet did not fit, so it was forced to modify that inlet in the field as it was directed by SHA to "make it work." The extra work associated with these redesigns was not contemplated when Luis priced the job, nor was the cost of that work included in Luis' bid.

Inlet 64. Among many other alterations, Redline Revision #1 changed the location of the existing water line and the elevation to the top of the curb in the vicinity of Inlet 64. But when Luis dug a test pit there, it encountered a gas line that was shallower than indicated on SHA's drawings. Similarly, Luis also discovered that the water line was incorrectly located on the construction plans. It was actually three feet closer to the road than indicated by SHA. This rendered the planned storm pipe at that location in conflict with the water line. To address the repeated problems at this inlet, SHA issued multiple greenline revisions on August 20, September 5, and September 22, 2008. With crews ready to work and needed structures already on site, Luis nevertheless had to delay various aspects of the construction of Inlet 64 until completion of water line relocation, followed by gas line installation, before initiating storm drain work, all contrary to its staged construction plans for the efficient performance of the Route 7 Project.

Manhole 17. Although Luis completed the work on Manhole 17 on time, that work was performed inefficiently due to SHA design defects. When Luis first mobilized at that location it quickly discovered that the existing pipes tying into that manhole were not marked at the correct elevation on SHA drawings and the water line conflicted with the storm drain. This section of the project was redesigned by Redline Revision #1, but SHA had to issue an additional greenline

revision which further modified the structure and storm water drainage system. Even after the revisions, however, the location of the storm water drain did not account for the location of the water line, and as a result, the storm water structure was off by two feet, forcing Luis again to field coordinate the installation of the various impacted utilities.

53. Luis submitted its Initial Critical Path Method Schedule (ICPM) which was reviewed by SHA in August 9, 2007 and accepted on October 13, 2007, anticipating project completion in two years, by October 14, 2009. (Resp. Ex. 18, Tab Nos. B-6, B-7, B-8, B-9, B-10, B-11.)

54. In its ICPM Schedule, Luis anticipated beginning the storm drain work on October 15, 2007 and completing it by July 28, 2009, but that work actually began 114 days late. (Hatwell, Tr. pg. 417; Limbasiya, Tr. pgs. 964-965; Resp. Ex. 13, Tab Nos. B-12, B-13, B-62.)

55. At Luis' request, SHA extended the permissible working hours of operation on the roadway. (Bond Tr. pg. 1305; Resp. Ex. 18, pg. 16, Tab No. B-73.)

56. In the spring of 2008, Luis estimated its completion date to be May 6, 2010 but later, on November 19, 2008, Luis' CPM showed that the project would be completed earlier, by November 2, 2009. On April 13, 2009, Luis anticipated completing the project still earlier, by October 16, 2009. (Resp. Ex. 18, Tab Nos. B-10, B-23 & B-30.)

57. SHA approved appellant's request for winter shutdown from November 21, 2008 through March 15, 2009, during which time SHA charged M. Luis only 11 working days based on the amount of work performed during that period. (Resp. Ex. 18, pgs. 9, 20, Tab Nos. B-199, B-200.)

58. Even though Luis started the storm drain work four months later than planned, that work was completed on July 10, 2009, 18 days earlier than planned. (Resp. Ex. 13, pg. 62.)

59. As Luis set about finishing up the concrete flat work and paving in 2009, additional delays were experienced due to traffic signalization issues and the need to address requests from impacted homeowners and business owners. (Davitt, Tr. pg. 1581; Resp. Ex. 18, pgs. 20-21.)

60. During the fall of 2009, Luis experienced a significant number of bad weather days that prevented it from completing weather sensitive activities such as paving. (Resp. Ex. 18, Tab Nos. B-38, B-39, B-254, B-255.)

61. During December 2009, Luis was unable to complete striping in the roadway due to cold weather. As a result, Luis requested another partial shutdown which SHA granted for the period November 21, 2009 through March 15, 2010. During this winter partial shutdown period, Luis was charged only one work day based on the value of work performed. (Resp. Ex. 18, Tab Nos. B-254, B-255.) That work was finally done from March 16, 2010 until April 13, 2010, when Luis completed roadway striping. (Resp. Ex. 18, pg. 22.)

62. Because of all of the delays occasioned by SHA redesigns, Luis expended more overhead than it initially anticipated for this job. Many more supervisory personnel were needed to be assigned to the Route 7 Project beyond those expected when the job was bid. (N. Luis, Tr. pgs. 232, 1767, 1833; Limbasiya, Tr. pgs. 999-1000, 1092-1094.)

63. As set forth above, in its bid, Luis estimated overhead on the Route 7 Project to cost $636,767, but the Aegis report prepared after job completion determined the actual amount expended by Luis on overhead to be $2,207,184, for an overrun of about $1.6 million in supervision expenses. This calculation was made as if Luis' overhead included only the cost of supervision and not the other components ordinarily associated with overhead, like home office expenses, for example. (Resp. Ex. 23, pg. 4.) To the extent that overhead is correctly calculated to include costs other than

supervisory personnel, Luis' cost overrun would exceed appellant's more conservative estimate of $1.6 million expended in unexpected extra supervision. To be clear, Luis undoubtedly actually expended a substantial sum of money for the cost of supervision well in excess of its initial estimate of $637,00 for all overhead expenses, including supervision, and this expenditure resulted from Luis' decision to direct its supervisory personnel to the Route 7 Project to accelerate construction and assure timely work completion notwithstanding all of the differing site conditions and design defects it discovered during the course of job performance; but no sufficiently credible evidence supports appellant's contention that that overrun totaled more than $1.6 million, or any other certain identifiable sum.

64. On April 13, 2010, SHA determined that Luis had achieved substantial completion of the Route 7 project and stopped charging work days. (Resp. Ex. 18, pg. 22, Tab No. B-260.)

65. At the same time that Luis was working on the Route 7 Project, Luis was also simultaneously working on a total of 186 other jobs. (App. Ex. 1, Tab No. 9, pgs. 22-26.)

66. During the tortured course of the Route 7 Project, Luis submitted 17 updates to its pre-construction ICPM Schedule. (Davitt, Tr. pgs. 1568-1569, 1578-1579.)

67. Luis wanted its schedules to reflect the impacts of delay, so SHA directed Luis to note on its CPM schedules the impacts at the points where they actually occurred, but not to incorporate the delay days into the schedule, which Luis did in order to secure its progress payments. (Limbasiya, Tr. pgs. 937-939; N. Luis, Tr. pgs. 1800-1801; Resp. Ex. 18, pg. 12.)

68. Ultimately SHA determined that Luis had utilized 390 work days to complete the Route 7 Project and did not assess

liquidated damages. (Hatwell, Tr. pg. 435; Limbasiya, Tr. pgs. 964-965.)

69. During 2010 and 2011, SHA and Luis engaged in discussions regarding Luis' request for payment for certain unit items. (Rule 4 File, pgs. 971-973, 977.)

70. On August 8, 2011, SHA District 4 issued a decision pertaining to Luis' outstanding requests for additional compensation for certain unit items. (Rule 4 File, pg. 971.) With the possible exception of additional sums due for delay, overtime, and loss of productivity, it is respondent's position that SHA has already been paid in full for labor and materials for all of Luis' work, including about $618,381 in satisfaction of 49 separate change orders, reserving for determination in the instant appeal only the question of entitlement and quantum arising from alleged loss of productivity and delay. (Davitt, Tr. pg. 1651; Rule 4 File, pgs. 2611-1612.)

71. On September 20, 2011, SHA inquired of Luis whether it was going to supplement its claim relating to loss of productivity/delay/inefficiency. (Rule 4 File, pg. 979.)

72. On October 17, 2011, Luis notified SHA's procurement officer of its disagreement with SHA's decision denying additional compensation for certain unit items. (Rule 4 File, pg. 980.)

73. On February 1, 2012, Luis notified SHA's procurement officer of its specific claims including its claim for loss of productivity. (Rule 4 File, pg. 986.) Luis claims that its loss of productivity arises in part from stacking of trades, working out of sequence, having to reassign and reinstruct personnel, conducting concurrent operations in congested spaces, increasing crew sizes resulting in dilution of supervision, and paying for overtime. (Hatwell, Tr. pgs. 287-295, 308-309, 365-368; Limbasiya, Tr. pgs. 911, 913-916, 962-963, 999-1000, 1004-1005, 1008, 1011, 1024-1026, 1092; Cook, Tr. pgs. 1219-1230; Wodiska, Tr. pg. 1473; N. Luis,

Tr. pg. 1790-1795.) The bulk of the loss claimed by Luis is attributable to an alleged overrun of at least $1.6 million in the cost of supervision. (Kime, Tr. pg. 1677.)

74. On December 21, 2012, Luis submitted to SHA's procurement officer a report prepared by Aegis Construction Consultants, Inc., hereinafter referred to as the "Aegis Report." (App. Ex. 8; Resp. Ex. 13; Rule 4 File, pg. 1005.) Based in part on IDRs made by SHA, the Aegis Report describes how M. Luis experienced 75 days of delay on the Route 7 Project and cost overruns associated with work supervision. (Resp. Ex. 13, pgs. 12-64, 68-69.)

75. The Aegis Report utilized a modified total cost approach to measure Luis' damages. (App. Ex. 8; Resp. Ex. 13, pgs. 67-73.) It allocated the expenditure of costs incurred for supervision on the Route 7 Project by calculating a portion of the annual salary paid to supervisors on the basis of the estimated percentage of time expended by that supervisor on the subject project. (Limbasiya, Tr. 838; App. Exs. 13, 14, 15.) Those estimates were made *post hoc*, years after the work was actually done and without reference to any record made contemporaneously with the activity alleged.

76. In the Aegis Report, Luis' inefficiency on the job was accounted for by applying a 5% deduction from actual direct labor costs on the project. Like the overhead add-on Luis used to determine its bid, that deduction for a 5% inefficiency factor was not applied to Luis' subcontractor costs, including subcontractors for the water and gas lines. (Resp. Ex. 13, pg. 72.)

77. Using a modified total cost method, the Aegis Report summarized Luis' damages as follows:

    a. $206,219 for 75 days of delay at a general conditions daily rate of $2,750;
    b. $143,832 for overtime; and
    c. $1,637,655 for loss of productivity.

    (Resp. Ex. 13, pg. 73.)

A second version of the Aegis Report provided to SHA in January of 2013 included inserts for exhibits, but the substance of the report was the same. (App. Ex. 8; Wodiska, Tr. pgs. 489-490.)

78. SHA's delay expert also used and relied upon the IDRs for the Route 7 Project and calculated 99 days of delay attributable to the State, for which the State concluded that Luis is entitled to the sum of $263,798 based upon a daily rate of $2,665 for extended general conditions. (Wodiska, Tr. pgs. 566, 618; Davitt, Tr. pg. 1604; App. Ex. 27; Resp. Exs. 18, 19, 20.) Luis' daily rate as calculated by SHA, therefore, was slightly lower than the rate as calculated by Luis; but the State determined a significantly higher number of compensable days of delay, resulting in the State's conceding a total amount due for delay greater than the amount claimed by appellant by the sum of $57,579.

79. Luis also submitted a series of direct cost claims relating to distinct work items on the Route 7 Project, hereinafter referred to as the Direct Cost Claims, totaling $1,303,250. (Rule 4 File, pg. 1005, *et seq.*)

80. In July 2013, representatives of SHA and Luis met to discuss Luis' alternative sets of claims. (App. Ex. 3F, Marciszewski Dep., pg. 159.) Luis offered to SHA at that time that if it was made whole by payment of about $1.9 million as calculated using the Modified Total Cost approach set forth in the Aegis Report, then it would drop its Direct Cost Claims for about $1.3 million. (App. Ex. 3F, Marciszewski Dep., pgs. 157-159; Rule 4 File, pg. 2593.)

81. By correspondence dated October 17, 2011 and February 1, 2012, Luis had first claimed that it was due from SHA the sum of $956,751 for loss of productivity and delay. (Rule 4 File, pg. 987.) After expert calculations completed in January 2013, the amount claimed by Luis to be due using the Modified Total Cost calculation determined by Aegis was

doubled to $1,987,706. (Rule 4 File, pg. 1101.) Then in October 2014, the amount of the claim was increased by another $120,000 to $2,116,990 due to revisions made in light of the State's calculations. (N. Luis, Tr. pg. 181; Wodiska, Tr. pgs. 508-509; App. Ex. 29A; Resp. Ex. 11.) Appellant's claim was increased again during the course of trial, to a total of $2,207,184, when it became apparent from trial testimony that the cost of foremen had not been included in Luis' initial presentation on quantum, Luis' analyst incorrectly believing that foremen were captured by Luis' accounting software as a component of direct labor cost, which testimony taken later during the trial disclosed was not the case, requiring those costs to be added to the true cost of supervision. (Wodiska, Tr. pgs. 551-552; Kime, Tr. pgs. 1697-1698; App. Exs. 29C, 29D, 29E, 29F.) As stated in appellant's post-trial brief, Luis' total claim for loss of productivity is now in the amount of $2,281,084 or $2,320,316, not counting $143,832 in overtime and an additional $263,798 for 99 days of delay, the foregoing items being a part of Luis' total claim for $2,688,714 or $2,727,946, which Luis seeks to be reimbursed to offset an alleged total project loss of $2,816,341. (App. Brief *cf.* App. Reply Brief.) According to SHA's post-trial brief, the State understands Luis' current claim for equitable adjustment to be in the amount of $2,116,990.

82. By letter dated December 4, 2013, SHA's procurement officer issued a final decision denying Luis' claim. (Rule 4 File, pgs. 1-9.)

83. On December 11, 2013, Luis noted an appeal of the procurement officer's decision to the Maryland State Board of Contract Appeals (Board) which appeal was supplemented on January 23, 2014 by the filing of a complaint consisting of 366 paragraphs, which included extensive verbatim text from the Aegis Report and focusing primarily on delay and loss of

productivity but alternatively seeking recovery for the Direct Cost Claims. In its detailed appeal, Luis filed its Complaint in the alternative, for "some portion of its Direct Cost Claims" or $1,987,706, as determined by calculating equitable entitlement using the Modified Total Cost approach. (Complaint, ¶357.)

84. The parties appeared for a 10-day trial of this matter, which concluded on March 12, 2015, following which briefs were submitted to the Board through June 26, 2015.

Decision

This is a claim for Luis to recover from SHA substantial additional sums of money which appellant claims it is due as the result of repeated delays and loss of productivity for work it performed between July 2007 and August 2010 under a certain contract known as the Route 7 Project, which was the subject of a number of changes and revisions after contract award. As the principal basis of liability, appellant contends that the project plans and specifications contained multiple material defects and, if followed, would not have produced a satisfactory result. Luis bears the burden of proof by a preponderance of evidence as to both entitlement and quantum. So the first question for the Board to resolve is to determine whether the State has any liability at all under the circumstances present.

The underlying project was for the primary purpose of replacing a failing storm drain system while preserving the functionality of other utilities in the vicinity of the storm drain, such as gas and water lines, and completing the project with various aesthetic and functional improvements including road and sidewalk upgrades. Appellant's claim for delay and loss of productivity may be referred to as a cumulative impact claim. See John Cibinic, Jr., Ralph C. Nash, Jr. & James F. Nagle, Administration of Government Contracts (4th ed., 2006); Long D.

Nguyen & William Ibbs, "Case Law and Variations in Cumulative Impact Productivity Claims," Journal of Construction Engineering and Management (Aug. 2010).

In short, a cumulative impact claim is a claim for loss of productivity "resulting from the 'synergistic' effect of an undifferentiated group of changes." *Centex Bateson Constr. Co.*, VABCA No. 4613, 99-1 BCA ¶ 30,153, at 149,258 (1998), *aff'd sub nom Centex Bateson Constr. Co. v. West*, 250 F.3d 761 (Fed. Cir. 2000). The nature of a cumulative impact claim is that a huge number of post-award changes to the terms of a contract may impact not only the portions of the contract that are modified, for which change order liability is undeniable; but also other unchanged portions of the contract that may be negatively affected and for which additional entitlement to compensation may therefore be fairly and equitably imposed, for example, when changes force other work to be done in an inefficient unplanned manner out of sequence from what was originally envisioned.

As creatively described by the Veterans Administration Board of Contract Appeals (VABCA), "Cumulative impact is referred to as the 'ripple effect' of changes on unchanged work that causes a decrease in productivity and is not analyzed in terms of spatial or temporal relationships. This phenomenon arises at the point the ripples caused by an indivisible body on two or more changes on the pond of a construction project sufficiently overlap and disturb the surface such that entitlement to recover additional costs resulting from the turbulence spontaneously erupts. This overlapping of the ripples is also described as the "synergistic effect" of accumulated changes. This effect is unforeseeable and indirect. Cumulative impact has also been described in terms of the fundamental alteration of the parties' bargain resulting from changes." *Id.* at 149,259.

While recognizing the prospective viability of a cumulative impacts claim, in *Centex* the VACBA also expressly referenced the tough hurdle required to establish grounds for relief, limiting

the possibility of recovery by stating, "The mere existence of numerous contract changes in and of themselves, whether or not the number of changes is considered to be reasonable or unreasonable and whether or not the changes resulted from defective specification, establishes no right to recover cumulative impact costs. Consequently, contract changes alone, regardless of their number or nature combined with Government liability do not serve as a substitute for causation and do not necessarily give rise to cumulative impact damages." In *Centex* the VABCA concluded that the certain electrical plans and specifications at issue did not present a design defect notwithstanding the necessity of 728 changes. The VABCA also stressed that beyond proof of defective plans, to prevail, a contractor must show not only that a cumulative impact of change orders occurred, but in addition, must prove the fundamental requisite facts of "liability, causation, and resultant injury." *Wunderloch Contracting Co. v. U.S.*, No. 286-58, 351 F.2d 956, U.S. Ct. Cl. (1965) at 199.

According to historic precedent prior to 1967 modification of the standard changes clause in federal government contracts, cumulative impact claims were not recognized as a proper cause for judicial relief. *Rice v. U.S.*, 317 U.S. 61, 64-65 (1941) *cf. Bell BCI Co. v. U.S.*, No. 03-1613C, 81 Fed. Cl. 617 (2008). Even by modern legal standards, a claim for loss of productivity is by nature very amorphous and quite difficult to prove. Innumerable claims for cumulative impact have been denied by various boards of contract appeals. This Board dismissed such a claim only recently. *Manekin Construction, LLC,* MSBCA No. 2874 (2015).

In *Wunderlich, op cit.*, for example, analyzing the cause of action as a breach of contract, the contractor's appeal was dismissed based on the determination that the possibility of a series of change orders was part and parcel of the contract agreement, and not a violation of it. The U.S. Claims Court similarly disallowed recovery in *Pittman Construction Co., Inc.*

v. U.S., 2 Cl. Ct. 211 (1983), concluding there was no design defect proven as the cause of costly cumulative impacts because no fundamental change occurred in the character of the work. Evidence of alleged design defect was also deemed insufficient by the Armed Services Board of Contract Appeals (ASBCA) in *Argo Technology, Inc.*, 88-1 BCA ¶ 20,381, ASBCA No. 30522 (1987), in which that Board required more than general, conclusory, self-serving assertions from the contractor that it suffered impact, holding that the allegation by appellant's president that employees were forced to stand idle due to delay caused by the government was "inadequate to constitute even the minimum proof of damage needed for a finding of liability." (*Id.* at 103,060.) In *Gulf Coast Trailing Co.*, 94-2 BCA ¶ 26,921, Eng. B.C.A. No. 5795 (May 1994), a $10 million cumulative impact claim was similarly dismissed for failure of adequate proof of alleged differing site conditions.

In spite of more than 200 change orders having been issued in a cumulative disruption claim for half a million dollars as compensation for 14,000 hours of unanticipated work, the U.S. Department of Transportation Contract Appeals Board (DOTCAB) denied recovery in *Southwest Marine, Inc.*, 94-3 BCA ¶ 27,102, DOTCAB No. 1663 (1994), concluding inadequate proof that the myriad of contract modifications disrupted work to the degree that an equitable adjustment was warranted. There the DOTCAB stated, "A critical condition precedent to the allowance of cumulative disruption costs . . . is a showing that they relate to excessive and frequent design or structural changes the impact of which were distant and unforeseeable during the pricing of proposals and negotiations for direct costs." *Id.* at 135,076.

In *Triple "A" South*, 94-3 BCA ¶ 27,194, ASBCA No. 46866 9 (1994), the ASBCA denied a cumulative impact claim for $1.5 million in extra working hours allegedly caused by 600 change orders, concluding, "many of these hours may have been attributable to underestimating, contractor inefficiencies and

erroneous charging of modification work to basic items," awarding to the contractor therefore the sum of only $21,992. In that case, the ASBCA stated, "[F]or the Government to be liable for a separately compensable constructive change, despite the contracting officer's explicitly reserved right to 'make changes within the general scope of any job order,' the contracting officer must have exceeded the permissible limits of his discretion under the Changes clause and ordered changes that 'materially alter the nature of the bargain' originally agreed upon." *Id.* at 135,541.

In *Coates Industrial Piping, Inc.*, 99-2, BCA ¶ 30,479, VABCA No. 5412 (July 1999), while recognizing the potential viability of some cumulative impact claims, recovery was disallowed by the VABCA based on the determination that work resequencing did not affect the project's critical path. In *Coates*, the Board quoted *Centex, op cit.*, and also cited *Wunderlich, op cit.*, and *Aragona Construction Co., Inc. v. U.S., 165 Ct. Cl. 382 (1964)*, elucidating further, "For the Government to be liable for cumulative impact, a contractor must show that the Government exceeded the permissible limits of its discretion under the Contract changes provisions serving to 'materially alter the nature of the bargain' originally agreed upon." *Coates, op cit.* at 150,586.

So it may be fairly observed that, assuming that cumulative impact claims may be legitimately asserted at all, they are extremely difficult, if not impossible, to prove. Indeed, successful cumulative impact claims are so rarely established in case law that the nation's preeminent experts in government procurement law, Ralph Nash and John Cibinic, have stated that "there is no independent claim for cumulative impact. If a contractor receives a thousand changes plus some suspensions of work, it will probably incur costs of cumulative impact. But if it settles all of these changes and suspension of work claims and signs total releases for all costs flowing from these claims, it

will have no remaining claim for cumulative impact." *Cardinal Changes: A Correction*, 6 No. 5 Nash & Cibinic Rep. ¶ 27 (May 1992). That reasoning is inapposite here, where it is clear that the parties contemplated negotiation of delay and loss of productivity claims following settlement of change order disputes. So although cumulative impacts claims are indeed unavoidably amorphous and imprecise, and therefore quite difficult to prove, that is not to imply that they are illegitimate.

As discussed above, many federal authorities have rejected cumulative impact claims. But others have allowed recovery. Like the instant case, in *Coley Properties v. U.S.*, 593 F.2d 380 (1979), the contractor sought to be compensated because it had to perform unchanged work out of sequence due to change orders attached to other portions of the job. See also *The Clark Construction Group, Inc.*, VABCA No. 5674, 00-1 BCA ¶ 30,870 (2000). Also similar to the case at bar, in *C. Norman Peterson Co. v. Container Corp.*, 172 Cal. App. 3d 628, 218 Cal. Reptr. 592 (1985), appellant claimed that hundreds of change orders arising from design errors constituted a breach of contract, causing lost productivity for which the contractor was entitled to damages. The same reasoning was employed in *Clark Concrete Contractors, Inc. v. GSA*, GSBCA No. 14340, 99-1 BCA ¶ 30,280 (CCH) (1999). Indeed, a number of other cases have allowed extra compensation for loss of productivity arising from multiple change orders. See *State ex rel. DOT v. Guy F. Atkinson, Co.*, 187 Cal. App. 3d 25, 231 Cal. Rptr. 382 (1986); *David J. Tierney*, GSBCA Nos. 6198, 7107, 88-2 BCA ¶ 20,806 CCH (1988); *Charles G. Williams Constr., Inc.*, ASBCA No. 33766, 8902 BCA ¶ 21,733 CCH (1989); *Atlas Constr. Co., Inc.*, GSBCA No. 8593 90-1, BCA ¶ 22,812 CCH (1990).

In order to prove entitlement to damages using the cumulative impact theory, a contractor must demonstrate the following elements: (1) The project suffered an extensive amount of change such that the contract has been fundamentally altered;

(2) The contractor has not waived its claim; (3) There is a causal link between changes and contractor inefficiency; and (4) There exists a reasonable estimate of the costs associated with the changes. See Dennis A. Estis, Mary Beth Hogan & Dorothy E. Terrell, *Delay Damages - What's Hot, What's Not*, American Bar Association - Forum on the Construction Industry, Midwinter 2013, at 7. *Cf. AMEC Civil, LLC v. DMJM Harris, Inc.*, No. 06-64, 2009 WL 1883985, at *15 (D. N.J. June 30, 2009), stating that a cumulative impact claim requires proof that "(1) Impact attributable to changes was unforeseeable or was expressly excluded from change order settlements; (2) The changes were the sole cause of disruption for which the claim is made; (3) The 'cumulative impact' was excessive and unreasonable in relation to what the contractor might have expected; (4) Impact costs cannot be segregated; and (5) Cumulative impact costs can be reasonably proven as to amount."

Was Luis' contract fundamentally altered by virtue of all of the revisions made to the plans and specifications? Appellant asserts that that first element of proof is clearly established in the case at bar by the fact that so many revisions and change orders were issued. However, the mere tally of a number of contract modifications is not necessarily a fair indication of the materiality of those changes. Consider the following hypothetical: A bridge reconstruction project specifies a certain fastening mechanism to affix metal beams to one another. The project contemplates the use of 1,000 of the specified fasteners. Later, the State determines that it wants the contractor to use a different type of fastener. That change requires revision of virtually every page of contract schematics. Should such a modification count as 1,000 changes, as a contractor might contend, or is it really only one?

At first blush, one might surmise that the State can make a compelling argument in this hypothetical that only a single change was required to the plans and specifications for the

subject bridge. But what if the newly specified fastening mechanism was much different than the one set forth in the original plan, requiring expensive new equipment and larger crews with different skill sets? What if the use of the new fastener totally disrupted the critical path initially anticipated by the contractor, extending the expected time for completion of the whole project? Should the contractor be otherwise bound by the unchanged terms and conditions of the original IFB? The answer, plainly, is no. Such a hypothetical change, whether it is counted as one or one thousand, fundamentally alters the contractual agreement between the parties and the contractor may fairly be entitled to receive not only the extra cost of the new fasteners, but other costs incurred as well.

With respect to a gravity fed storm drain, modification of the elevation of a single point of pipe may generally require a change in the elevation and possibly also the angle of every other portion of pipe in that drain line. So every plan drawing that indicates a change in the location to any part of that particular line of pipe may require a revision to every other point in that line, even if those changes arise because only a single particular point must be modified to avoid conflicting with another utility like a water or gas line. Some of those revisions may be quite modest, like moving the pipe a few inches up or down or from one side to the other. Other changes could be more complex, requiring the use of an offset cog, for example, when a standard cog was initially anticipated, as occurred at Inlet 59 of the Route 7 Project, with continuing failed intent. The significance of a change is not determined by the mere number of plan sheets where red or green ink indicates a revision. The number and degree of material changes required is much more subjective, depending on the particular circumstances involved.

Another issue which the Board should address in its evaluation of whether the numerous contract modifications on the Route 7 Project fundamentally altered the contract between SHA

and Luis is the distinction between redline, greenline, and field revisions. Greenline revisions and field revisions may be indicative of differing site conditions for which a contractor may be entitled to equitable adjustment, but do not necessarily indicate design defects, only remedial measures to meet conditions discovered in the field. By contrast, redline revisions may occasionally do the same, but ordinarily, one should not see in suitable and adequate design specifications the great profligacy of redline revisions that were required to correct this IFB. When the designers have to go back to the drawing board for significant modifications before work even begins on site, that is generally indicia of design inadequacies or defects. Here, comprehensive sets of redline revisions were promulgated on no fewer than six separate occasions, embodying by appellant's count about 500 separate design changes that SHA designers determined were required to complete this project with successful results. This speaks volumes to the sufficiency of the plans and specifications as advertised in the IFB.

Luis here argues that it bid one job and then was required to build a different job. That is a fair assessment. But there is no suggestion that the length of storm drain pipe doubled nor that the limits of the project were extended at all, nor that the required number of manholes tripled, nor the requisite number of inlets quadrupled, nor that an entirely different type of work was piled onto the job initially specified. Furthermore, on the innumerable occasions when utility lines were mislocated on SHA's plans and specifications, the multiple errors were matters of feet, not yards. The advertised job was to replace the storm drain system in a particular location. The job built replaced the storm drain system in that location.

Appellant might seek to employ the common analogy of apples vs. oranges, claiming that Luis bid the price of an apple but was then instructed to produce an orange. But such an analogy would constitute an exaggeration of a fair characterization of what

occurred on the Route 7 Project. It would be more accurate to analogize that Luis bid a price for a particular type of apple and was thereafter directed to provide a different type of apple. Luis must concede that it has already been compensated in full for the actual cost of the particular type of apple specified by the State's changes to the contract by virtue of SHA's negotiated payment of change orders. That issue is not presently before the Board. What is at issue in the instant contract dispute is only appellant's claim for reimbursement for extra costs arising from the delay and inefficiency of having to procure and produce a type of apple in variance from the type that Luis initially anticipated as set forth in the IFB to which it responded.

From the evidence adduced at trial, it is abundantly clear that appellant was justifiably frustrated by the volume and frequency of revisions to the contract plans and specifications that occurred at the very beginning of the job. Over 300 revisions were promulgated during the first six weeks of work. But here again, the Board, while sympathetic to the challenges confronting the contractor on Route 7, cannot unduly criticize SHA for presenting its required contract modifications as early in the course of job performance as possible. It would have only made matters worse were the State to have deliberately dribbled out its modifications to the plans and specifications as the job proceeded. The project was already quite convoluted enough as it progressed, often requiring the contractor to remove and re-do work that had just been revised incorrectly and then performed.

What is more troubling to the Board than the mere tally of the number of plan revisions and the timing thereof is the undisputed fact that the project was being continuously modified after release of the IFB and by non-disclosure of that fact, Luis was kept in the dark about what changes were going to be imposed upon it as construction began. SHA deserves accolades for doing its best to move road projects forward as quickly as possible after funding becomes available. But it was unfair to

contractors to release an IFB for a job that had been expressly marked, "This job is not ready to be advertised." The evidence adduced by appellant establishes beyond a doubt that SHA knew its design was defective and initially hoped to cure the various design defects by issuing redline revisions through IFB addenda prior to bid submission, but that became impossible because the required changes were ultimately determined to be so complex and significant that they could not be incorporated into IFB addenda.

Instead, months after bids had been submitted, SHA was continuing to require such substantial changes to the contract plans and specifications that the State incurred additional design expenses of at least $468,000 between the time that bids were submitted and the time that the contract was entered into. To sum, the Board concludes that the Route 7 Project design and specifications were materially defective and that the extraordinary number and scope of required design revisions fundamentally altered the construction contract that Luis bid. Had appellant followed SHA's initial design plans and specifications, it would not have produced a satisfactory result. Based upon the State's superior knowledge of the project requirements, Luis enjoyed the right to reasonable reliance upon the adequacy of SHA's plans and specifications, notwithstanding the boilerplate disclaimer that was included in the contract documents to the effect that the State made no guarantee of the accuracy of the location of utilities shown on its plans. Moreover, the State breached its implied contract and warranty of suitability of design specifications for the very purpose that the design plans and specifications were rendered.

The differing site conditions element of appellant's claim for equitable adjustment is somewhat of a hybrid in that Luis apparently claims to have encountered both Type I and Type II differing site conditions on the same job. "A Type I differing site condition is dependent upon a contractual indication as to existence of some latent or subsurface condition." *C. J.*

Langenfelder & Sons, Inc., MDOT 1000, 1003 & 1006, 1 MSBCA ¶2 at 43 (1980). See also *Corman Construction, Inc.*, MSBCA No. 1254, 3 MSBCA ¶206 (1989); *Eric K. Straub, Inc.*, MSBCA No. 1371, 3 MSBCA ¶214 (1989); *Cherry Hill Construction, Inc.*, MSBCA 1547, 3 MSBCA ¶274 (1991). Here, the Route 7 Project plans and specifications were replete with references to the location of underground utilities that were not at the locations identified and were in locations other than those identified. This created an excavation nightmare at the job sight as the contractor repeatedly encountered subsurface conditions unlike those depicted on the project plans. It also caused the contractor repeatedly to have to halt work and also to remove work it had just completed in order to rebuild utility lines at different locations or elevations to avoid conflicting with other utility lines many of which were also wrongfully depicted. Because the State bore primary responsibility to depict on its plans and specifications in a reasonably accurate fashion the true location of underground obstacles, Luis is entitled to equitable adjustment for Type I differing site conditions.

A Type II differing site condition exists by "the encountering of a condition which is unknown, unusual and differs materially from that ordinarily encountered in the performance of the type of work contemplated by the parties." *Langenfelder, supra* at 43. This basis of Luis' prayers for equitable adjustment is somewhat more tenuous. Yes, besides mismarked utilities, Luis did come across a number of underground barriers and other material that it did not expect to discover during its excavation work. This included buried railroad timber piles, concrete slabs, and unknown wires, among other items found in the ground in the vicinity of Route 7 once digging began. From the limited testimony and other evidence on this point, the Board has no hesitancy concluding that such obstacles existed and were struck, but the Board is not convinced that the material other than utility lines discovered during Luis' excavation activity

rose to such a level of unforeseen nature or unanticipated frequency that apart from Type I differing site conditions, appellant would be independently entitled to equitable adjustment for Type II differing site conditions alone. Every excavation contractor must anticipate that from time to time one may encounter an unknown underground obstruction, whether geologic or otherwise. This is particularly so when excavation must occur in an area which has been highly developed over a long period of time. Nevertheless, Luis is entitled to equitable adjustment due to the Type I differing site conditions it encountered on multiple occasions at variance from expected underground utility locations and conditions as depicted on SHA's project plans and specifications, so the inadequacy of proof of Type II differing site conditions is immaterial to the outcome of this contract dispute.

The other requisite elements of proof to support liability in this matter are readily established. Clearly, Luis incurred additional costs to perform the Route 7 Project in a manner other than the efficient work schedule it anticipated when it bid and much later began the job. On multiple occasions Luis had to idle crews and machinery while waiting for design revisions. To minimize additional loss and delay, Luis had to hopscotch from one location to another rather than being able to proceed in an orderly fashion from one end of the project to the other. Causation is proven by evidence supporting the finding of work inefficiency, extra cost of labor and supervision, and other expenses incurred by Luis as a direct consequence of innumerable identified defects in SHA's design plans and specifications. While it may not be as clear cut a case as appellant would contend, there was plenty of unrefuted testimony at trial to support the conclusion that Luis suffered losses arising from the cumulative impact of the State's breach of its implied warranty of suitability of the contract plans and specifications. To sum, damages and causation are both evident. Under such

circumstances, the government is liable for extra costs arising from inadequate or poor design. *White v. Edsall Constr. Co.*, 296 F.3d 1081 (Fed. Cir. 2002). Thus, because the Board determines that Luis is entitled to relief, as a procedural matter, appellant's July 2, 2014 Motion for Partial Summary Judgment is hereby granted. The Board next turns from entitlement to the more difficult component to decide in order to resolve this contract dispute, namely, the question of quantum of damages.

Luis seeks to employ the Modified Total Cost Method for calculating its losses. For that method of determining damages to be used, appellant must demonstrate four elements of proof: (1) the nature of the particular losses makes it impossible or highly impracticable to determine them with a reasonable degree of accuracy; (2) the contractor's bid or estimate was realistic; (3) the contractor's actual costs were reasonable; and (4) the contractor was not responsible for the cost overrun. *Youngdale & Sons Construction Co., v. U.S.*, 27 Fed. Cl. 516, 38 Cont.Cas.Fed (CCH) ¶76,467 (1993); *Servidone Constr. Corp. v. U.S.*, 931 F.2d 860 (1991); *Dick Corp.*, MSBCA Nos. 2458, 2459 (2007). There appears to be no contest concerning the first prong of the above referenced four-prong test. Calculating losses by use of a Measured Mile analysis is impossible in this case because there is no substantial portion of the project that was not detrimentally impacted by SHA's design defects.

As to the second prong, SHA argues forcefully that Luis has failed to demonstrate that its estimate and bid were realistic. The Board wholeheartedly disagrees. One need merely examine the tight cluster of the three lowest bids submitted in response to this IFB to determine that appellant's bid was reasonable. Luis was not the lowest bidder but was in the center of that cluster. The three lowest bids were within a mere 2% variance of one another and all three were lower than SHA's project estimate. Six other bidders were significantly higher, but even without take-off sheets, Luis' bid estimator attested to the specific and

detailed basis of the bid amount. In addition, other witnesses justified the estimate by offering the professional opinion that Luis' bid was reasonable.

What the Board surmises as the reason for the State's objection to this finding is that SHA believes that Luis should have included a much higher figure to cover the cost of direct labor supervision on the Route 7 Project. This is perplexing. Luis estimated its direct labor cost at $1.6 million, the same amount that it actually expended. Luis' direct labor costs were actually a mere $10,000 less than it anticipated in its bid, after deducting $30,000 extra direct labor costs associated with change orders that were naturally not included in the bid price. It is rare that any other estimate would come as close to the actual cost of such a significant item as direct labor expense. Quite the opposite, however, may be said about Luis' estimate of the cost of supervision of its direct labor.

Appellant added 40% overhead to its direct labor costs as the price not only of project supervision but also home expenses and related general management costs like bond and insurance. That sum amounts to $637,000 in total. It is unknown what portion of the 40% overhead is attributable to supervision alone as compared to home office expenses, but we do know that Luis planned to engage on the Route 7 Project a full-time project manager, two part-time superintendents, a foreman, mechanics, and the time attributable to Limbasiya as Luis' chief estimator. No one has suggested that this level of planned supervision was inadequate, nor has anyone asserted that Luis should have included a level of supervision price of $1.6 million to manage direct labor costing the same amount. Yet, the downfall of the entire project erupted because the actual cost of supervision, according to appellant's accounting experts, was closer to $2.2 million, for an overrun of at least $1.6 million, which forms the essence of appellant's claim for equitable adjustment.

The Board concludes that there is no evidence adduced to support a finding that Luis should have included in its estimate at the time that it prepared its bid more than $637,000 for project supervision and other overhead costs. No credible testimony or document indicated any deficiency in appellant's initially anticipated degree of requisite supervision needed to complete the Route 7 Project. The reason for Luis' huge overrun in the cost of supervision was the unanticipated discovery, long after it bid the job, that Luis would be called upon to rectify SHA's multiple design defects by dispatching numerous supervisory personnel to the job on Route 7 instead of other jobs that Luis was performing at the time. This was done because of the enormous remedial decision-making and manual labor that was needed to address all of SHA's plan revisions to this IFB. In short, Luis' bid was reasonable. Furthermore, even though there is no evidence to support such a finding, assuming *arguendo* that Luis' bid was not reasonable, that shortfall would have been the fault of SHA's concealment of the numerous design changes underway to correct plan deficiencies after receipt of Luis' bid.

The other two prongs of the four-part test for use of the Modified Total Cost Method for calculating losses, however, are much more problematic for Luis. The third prong that appellant must prove is that its costs were reasonable. The Board by this discussion does not intend to imply that Luis' costs were not reasonable, only that the costs expended by Luis on the Route 7 Project are not known. The Board has stated in the past that "A claimant need not prove its damages with absolute certainty or mathematical exactitude." *Traylor Bros. & Assoc.*, MSBCA 1028, 1 MSBCA ¶86 at 19 (1984), quoting from *Wunderlich Contracting Co. v. U.S., supra.* The contractor who seeks to take recourse to the Modified Total Cost Method of determining damages often may not be able to make a certain precise calculation of total job costs; but in the case at bar, the actual expenditure allegedly incurred by Luis on this job is ever changing because it is so speculative

as to afford the Board no adequate basis upon which total cost can be fairly ascertained. Undoubtedly, this has been an obstacle to amicable resolution of this claim from the outset. Appellant has been unable to state and stick with a specific demand for satisfaction. Though it once demanded less than a million dollars, Luis' claim has generally hovered around $1.6 million, but at various times during this contract dispute, using the Modified Total Cost Method for determining damages, Luis has alternatively claimed that it is entitled to $2.0 million, $2.1 million, $2.2 million and $2.3 million, exclusive of overtime and stipulated delay damages. If Luis itself finds it so challenging to calculate what this job actually cost, how is SHA possibly expected to make the correct calculation?

Moreover, the Board cannot conclude that all of Luis' costs were reasonable, in part because the Board does not know with sufficient certainty what total expenditure actually occurred. Luis was working on 186 jobs at the same time as the Route 7 Project. During the 3-year period that transpired after work began in August 2007 on the Route 7 Project, among the 186 jobs appellant was performing at that time, Luis employed a great many supervisors and other employees. While the specific salary information will remain confidential, it is uncontested that many of Luis' very talented supervisory personnel were highly compensated. It is not enough for appellant, years after the fact, simply to approximate or guess how much time any given supervisor might have committed to the Route 7 Project. Undoubtedly Luis redirected a substantial component of its human resources to this job as it became aware of numerous construction challenges created by the deficient plans it was provided by SHA. Luis desperately sought to avoid the potential imposition of liquidated damages of nearly $4,000 per day in the event of project delay, even if that meant that multiple well-paid supervisors were simultaneously sent to Route 7. There most

certainly was a very significant cost overrun for supervision on this project. We simply don't know what it was.

Appellant's proofs also fail to establish the fourth and final element before use of the Modified Total Cost Method of calculating damages may be deemed acceptable, namely, that the contractor was not responsible for any of the cost overruns. Here it appears that on 22 occasions during the course of the Route 7 Project, Luis broke utility lines. Is the State and not the contractor to be held accountable for all of those setbacks? Is SHA responsible for the delay incurred when Luis had to change its subcontractor performing water line relocations from Windsor to Hawkins? Did appellant carry its burden of proof by a preponderance of the evidence that its cost overrun in supervision was truly $1.6 million or higher, rather than some lesser figure? Although it is admittedly the same inefficiency reduction factor as the one used in the Board's seminal case of *Richard F. Kline, Inc.* MSBCA 2092, 5 MSBCA ¶491 (2001), does the evidence adduced in the instant appeal support a determination that a reduction of only 5% is an accurate and suitable amount to account for inefficiency in total direct labor costs incurred by Luis? Was there sufficient testimony adduced at trial to justify the use of that rate? It is the Board's position that the answers to each of these questions is no, and so it would not be correct, fair, or equitable to hold that Luis should be held harmless for all alleged cost overruns. The Modified Total Cost Method of determining damages is rejected because it is inapplicable to the particular circumstances and constraints of the instant dispute.

This conclusion is consistent with well established prior rulings making clear that the Modified Total Cost Method for calculating damages is highly disfavored. *Richard F. Kline, Inc., Id.; Municipality of Anchorage v. Frank Coluccio Constr. Co.*, 826 P.2d 316, 325 (1992). It is often said that the Modified Total Cost Method should be tolerated only when there is

no other mode of calculating damages. *Dick Corp., op cit.; Southern Comfort Builders, Inc. v. U.S.*, 67 Fed.Cl. 124, 146 (2005); *Servidone Constr. Corp. v. U.S., op cit.; WRB Corp. v. U.S.*, 183 Ct. Cl. 409 (1968). The reason that the Modified Total Cost Method should be avoided is that it creates an incentive for contractors to spend excessively, or to charge expenses to a job for which liability may be calculated on the basis of whatever amount is spent. The Board does not suggest that Luis did this in the contract dispute that is the subject of this appeal, but instead, only seeks to point out that an alternative to the use of the Modified Total Cost Method should be employed whenever possible regardless of any particular contractor or job.

In the absence of the ability to employ either the Measured Mile or the Modified Total Cost Method for calculating quantum in this matter, the Board is relegated to use the jury verdict approach, which has been engaged in the past in an attempt to reach a fair and reasonable approximation of the costs reasonably incurred for which the contractor may be entitled to damages. *Richard F. Kline, op cit.; Hardaway Constructors*, MSBCA No. 1249, 3 MSBCA ¶227 (1989); *Granite Construction Co.*, MDOT No. 1014, 1 MSBCA ¶66 (1983). After considerable reflection, the Board has deigned an approach to determining a fair amount for equitable adjustment in the instant matter based upon the unique circumstances here present.

Using an overly simplistic analysis, one might readily conclude that the loss of productivity on this job was 25%. After all, the job was supposed to take 390 days to perform but following job completion, the period of delay was determined to be 99 days, which is 25% of 390. That logic would be flawed. Appellant is already known to be entitled to full reimbursement for the 99 days of delay. To allow Luis to recover another 25% of its costs would constitute a double recovery. The point of much of Luis' proofs at trial thoroughly establishes the Board's conclusion that the Route 7 Project would have entailed much more

than 99 days of delay except for the fact that multiple highly compensated supervisory personnel were poured into the mix of labor required to put the subject job on track and to accelerate work to secure timely job completion. The cost of that extra unanticipated supervision is the true reflection of the value of appellant's loss of productivity claim.

It is undisputed that between the time that Luis submitted its bid on January 25, 2007 and the time that it was awarded the contract on June 13, 2007, SHA paid to a particular private engineering firm the sum of $468,000 to re-design the project that had been advertised by IFB dated December 4, 2006. Not counting costs expended in-house, that is $468,000 for a firm to re-draw plans and specifications that had already been released to the contracting public, and released with SHA's knowledge that those plans and specifications needed to be extensively modified. For every dollar that SHA paid to have a private design engineer write down on a piece of paper the innumerable contract changes that needed to be made during that interval, SHA should have reasonably expected the possibility that an extra dollar would have to be expended by the contractor actually performing the work in the field in the nature of loss of productivity for having to build the re-designed plans instead of the plans that were the subject of the contractor's bid. That is to say that the extra cost of supervision expended in order to perform the contract revisions was, at a minimum, equivalent to the known cost expended to design them. Therefore it is the Board's determination that appellant is entitled to recover the sum of $468,000 for loss of productivity. The Board is confident that Luis expended at least that amount but not more than that amount as expenses reasonably and actually incurred due to unanticipated overrun in the cost of supervision.

To the foregoing sum is added appellant's entitlement to the sum of $121,611 which is the undisputed amount of Luis' unanticipated overtime expenses as reduced from appellant's claim

of $143,832. Also added is the sum of $263,798, an amount which is stipulated by the parties as the value of appellant's delay claim. Thus, aggregating $121,611 in overtime, plus $263,798 in delay damages, plus $468,000 for loss of productivity, it is the decision of the Board that judgment be and hereby is entered in favor of appellant in the total aggregate sum of $853,409.

So Ordered, this 29th day of OCTOBER, 2015.

Dated: 10/29/15

Dana Lee Dembrow
Board Member

I Concur:

Michael J. Collins
Chairman

Certification

COMAR 21.10.01.02 **Judicial Review.**

A decision of the Appeals Board is subject to judicial review in accordance with the provisions of the Administrative Procedure Act governing cases.

Annotated Code of MD Rule 7-203 **Time for Filing Action.**

(a) Generally. - Except as otherwise provided in this Rule or by statute, a petition for judicial review shall be filed within 30 days after the latest of:

(1) the date of the order or action of which review is sought;
(2) the date the administrative agency sent notice of the order or action to the petitioner, if notice was required by law to be sent to the petitioner; or
(3) the date the petitioner received notice of the agency's order or action, if notice was required by law to be received by the petitioner.

(b) Petition by Other Party. - If one party files a timely petition, any other person may file a petition within 10 days after the date the agency mailed notice of the filing of the first petition, or within the period set forth in section (a), whichever is later.

* * *

I certify that the foregoing is a true copy of the Maryland State Board of Contract Appeals decision in MSBCA 2875, Appeal of Manuel Luis Construction Co., Inc. Under SHA Contract No. BA6885184.

Dated: 10/29/15

Michael L. Carnahan
Clerk