In the United States Court of Federal Claims

No. 04-299C

(Filed: March 31, 2006)

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ACE CONSTRUCTORS, INC.,	)	Trial on equitable adjustments and damages; contract for construction of Ammo Hot-Load Facility at Biggs Army Airfield, Fort Bliss, El Paso, TX; claim requirements of the Contract Disputes Act, 41 U.S.C. §§ 601-613; differing site conditions; FAR [48 C.F.R. §] 52.236-2; defective specifications; constructive-change doctrine; liquidated damages
Plaintiff,	)	
v.	)	
UNITED STATES,	)	
Defendant.	)	

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W. Robert Vezina, III, Vezina, Lawrence & Piscitelli, P.A., Tallahassee, FL, for plaintiff. With him at trial and on the briefs was Bradley S. Copenhaver, Vezina, Lawrence & Piscitelli, P.A., Tallahassee, FL.

Timothy P. McIlmail, Trial Attorney, Commercial Litigation Branch, Civil Division, United States Department of Justice, Washington, D.C., for defendant. With him on the briefs were Peter D. Keisler, Assistant Attorney General, David M. Cohen, Director, and Donald E. Kinner, Assistant Director, Commercial Litigation Branch, Civil Division, United States Department of Justice, Washington, D.C. Of counsel was Rex Crosswhite, Office of Counsel, U.S. Army Corps of Engineers, Fort Worth, TX.

OPINION AND ORDER

LETTOW, Judge.

In this contract case, the court conducted a 5-day trial on October 17 through 21, 2005, in El Paso, Texas. Plaintiff ACE Constructors, Inc. ("ACE") contracted with the United States Army Corps of Engineers ("the Corps") to construct the Ammo Hot-Load Facility at Biggs Army Airfield, Fort Bliss, El Paso, TX. That facility consists primarily of a roadway, a storage pad, a loading apron, and a taxiway that is connected with the main runway at Biggs Army Airfield, and

it enables munitions to be transferred onto cargo aircraft for transport. ACE claims that it was required to perform work not envisioned in the Contract due to unexpected site conditions resulting from an inaccurate survey of the site, errors and omissions in the contract drawings and specifications, and the Corps' failure properly to administer the Contract. ACE seeks equitable adjustments to recover the costs associated with this extra work. ACE also seeks to recover additional costs that were incurred by its paving subcontractor, Cambro Construction Company, Inc. ("Cambro"), as a result of alleged defects in the contractual documents and the Corps' failure properly to administer the Contract. In addition, ACE seeks to recover liquidated damages that were imposed by the Corps as a result of delays in project completion caused by the extra work. ACE avers that the government, not ACE, was responsible for the delays and therefore ACE should not have been required to pay the liquidated damages. ACE seeks an award of $1,822,146.39 in total compensation and return of liquidated damages, together with interest on this sum, in accord with the Contract Disputes Act ("CDA"), 41 U.S.C. §§ 601-613. Additionally, ACE seeks to recover attorney's fees and costs under the Equal Access to Justice Act, 28 U.S.C. § 2412.

Liability, entitlement to equitable adjustments, and damages remain unresolved in this contract case. To adjudicate the issues of fact respecting liability and calculation of equitable adjustments and damages, the court conducted a trial in El Paso and in that connection visited and examined the Ammo Hot-Load Facility. Post-trial briefs were filed thereafter, and a closing argument was held on February 2, 2006. The case is now ready for disposition.

For the reasons set forth below, the court finds the government liable for differing site conditions, defective specifications, and a constructive change to the Contract, and also finds that the government wrongfully assessed liquidated damages against ACE. The court finds that ACE is entitled to an equitable adjustment to the Contract in the amount of $1,383,009.97 and to recovery of liquidated damages assessed by the government in the amount of $246,130. ACE is entitled to recover interest on these awarded amounts pursuant to Section 12 of the CDA, 41 U.S.C. § 611. Furthermore, the court concludes that ACE may be entitled to costs and attorney's fees under the Equal Access to Justice Act, 28 U.S.C. § 2412, but reserves a final determination in that regard pending completion of further proceedings under Rules 54(d) and 58(c) of the Rules of the Court of Federal Claims ("RCFC"). *See also* RCFC Appendix of Forms, Form 5.

FACTS[1]

1. The Solicitation.

On July 14, 2000, the Corps issued Solicitation No. DACA63-00-B-0023 for construction of the Ammo Hot-Load Facility. The Solicitation consisted of the primary solicitation document

[1]This recitation of facts constitutes the court's principal findings of fact in accord with RCFC 52(a). Other findings of fact and rulings on questions of mixed fact and law are set out in the analysis.

as well as two packets of architectural and engineering plans. *See* PX 177 (Contract No. DACA63-00-C-0025, Specifications for Ammo Hot-Load Area, Project No. 44921 (July 2000)); PX 178 (Plans for Solicitation No. DACA63-00-B-0023 (June 13, 2000) ("Original Plans")); PX 179 (Amendment Number 2 Drawings (July 31, 2000) ("Amended Plans")).[2] Upon the award of the Contract to ACE, the solicitation documents were incorporated into the Contract. *See* PX 177 (Contract No. DACA63-00-C-0025 (Sept. 27, 2000) ("ACE Contract" or "Contract")). The plans, PX 178 and PX 179, were prepared by the engineering firm of Crawford, Murphy, and Tilly, Inc. ("Crawford Murphy") for the Corps.

The project entailed construction of a concrete loading apron approximately 9.5 acres in size where munitions are loaded onto large cargo aircraft (primarily C-5As). To the south of the loading apron, construction of a concrete aircraft taxiway approximately 1,500 feet in length was required to connect the loading apron with the main runway at Biggs Army Airfield. PX 178 Seq. Nos. 1-3, 45; *see also* Stipulations of Fact ("Stip.") ¶ 2. To the north, the apron is connected by a short roadway to a concrete pallet storage area approximately two acres in size bearing a substantial shelter where munitions can be stored after delivery via trucks while awaiting loading onto aircraft. Tr. 214:23 to 215:2 (Test. of John Fulkerson, President of ACE). To the north of the pallet storage area, construction of an asphalt road approximately 1.3 miles in length enables vehicular traffic to reach the storage pad from a preexisting access road to the north. In addition to building the taxiway, loading apron, storage pad, and access road, the project required the contractor to reconstruct a segment of the main runway to join the taxiway, excavate and grade drainage ditches and two drainage impoundments running along each side of the access road and around the storage pad and loading apron, Stip. ¶ 2, and install water and electrical lines and light poles. Tr. 215:4-6 (Test. of Fulkerson).

The Solicitation was designated as a "100% Small Business Set-Aside Solicitation." PX 177. ACE, which qualified as a small business, submitted its bid on the project on August 23, 2000. *Id.*; *see id.* at 00010-3 to 00600-7.

The plans provided by the Corps for the Ammo Hot-Load Facility superimposed the elevations that would be required for the finished project over an aerial topographical survey of the site. *See* PX 178 (Original Plans) Seq. Nos. 24-29 (overlaying the grading plan onto the aerially-surveyed contours of the site), 34-41 (comparing aerially-surveyed grades with the planned level of the finished subgrades), 54-57 (comparing aerially-surveyed grades with finished grades), 66-88 (showing cross-sections of the site at 20-meter intervals, and indicating the amount of cut or fill that would be needed at each cross-section based upon the aerial survey and planned finished elevations). These plans provided potential contractors with the magnitude of cutting and filling that would be required to reach the final elevations shown on the plan documents. From the plans, bidders could project whether the project would generate excess soil

[2]Citations to the trial transcript are to "Tr. __." Citations to the closing argument transcript are to "Cl. Tr. __." Plaintiff's exhibits are denoted as "PX," and defendant's exhibits are identified as "DX."

or would require importation of fill from off-site. Based on the plans provided by the Corps and on the aerial survey, ACE estimated in preparing its bid that the project would approach being a "balanced" job,[3] producing a moderate excess of excavated dirt. Tr. 234:1-5, 527:5 to 528:9 (Test. of Fulkerson).[4]

The loading apron, storage area, and taxiway were to be constructed of concrete poured in lanes, surrounded on the perimeter by asphalt shoulders. The plans showed that each poured concrete lane was to be divided into individual panels by cutting expansion joints in the lanes at regular intervals. Tr. 255:25 to 256:6, 260:14-19 (site visit). The finished concrete panels on the loading apron and taxiway were to be 5.75 meters by 5.75 meters square, those on the new runway section were to be 7.62 meters by 7.62 meters square, and those on the storage pad were to be 4 meters by 4 meters square. PX 178 Seq. Nos. 45-52. The plans showed a specific directional orientation for the poured concrete lanes. The individual concrete lanes were to be interconnected using steel dowels incorporated into the reinforcing steel for the concrete. Tr. 256:7 to 257:6 (site visit). The dowels in the taxiway and loading apron were primarily designed to be inserted in an "east-west" orientation, while those in the pallet storage area were generally designed to be inserted in a "north-south" orientation. PX 178 Seq. Nos. 45-52. Surfaces with dowels oriented in an east-west direction are poured north-south and *vice versa*. Tr. 721:2 to 722:18, 725:25 to 726:15, 732:24 to 733:19 (Test. of Fulkerson), 444:5 to 445:12 (Test. of Stanley Herrin, manager of the aviation services group, Crawford Murphy, and the chief project engineer of the Ammo-Hot Load project), 1256:21 to 1257:20 (Test. of Eleuterio Fuentes, a project engineer with the Corps' Fort Bliss resident office); *see* PX 180 at 7 (photos showing dowels inserted into side of already-paved lane), 29 (bottom photo showing dowels being prepared for insertion into drilled holes). When ACE was developing its bid, ACE necessarily assumed, based on the plans, that the lanes comprising the taxiway and loading apron would be poured in a north-south direction, while the lanes comprising the pallet storage area would be poured in an east-west direction. Tr. 724:1-8, 729:23 to 730:10 (Test. of Fulkerson). ACE's concrete subcontractor, Cambro, which was hired after the prime contract was awarded to ACE, also projected that it would follow the plans as drawn. Tr. 771:9 to 773:24 (Test. of David "Moe" Camilli, Vice President of Cambro).

The plans showed changes in elevation from one panel to the next for purposes of grading the site in preparation for concrete placement. In the final construction plan, an elevation was to be specified for each corner of each panel, also known as a "staking point." Tr. 457:17-21 (Test.

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[3]A "balanced" job is one in which the amount of fill required for portions of the project is equal to the amount of fill excavated from other portions of the project; the result is that no fill is required to be imported nor is it necessary to dispose of excess fill material.

[4]Besides doing its own calculated estimates, ACE relied upon computations performed by Dirt-Tek, a subcontractor to ACE, which used the cross-sections provided in the plans to extrapolate the total amount of fill that would be needed. Tr. 234:12 to 235:5 (Test. of Fulkerson).

of Herrin); *see* PX 178 (Original Plans) Seq. Nos. 49-52 (Staking Plans); Tr. 484:14-19 (Test. of Herrin). However, the plans supplied with the Solicitation provided some, but not all of the staking point elevations. *See* PX 178 Seq. Nos. 49-52. Additional information regarding finished grades was provided in a schematic included in the Solicitation plan documents showing "typical" cross-sections of the loading apron and pallet pad from both a north-south and east-west orientation. PX 178 Seq. Nos. 60-61. Mr. Fulkerson stated that based upon the plan documents made available pre-bid, ACE determined that the loading apron would be a structure having a relatively simple pyramidal shape. Tr. 278:22 to 279:5. Theoretically, however, each panel could have a different elevation at each of its four corners.

The Solicitation provided that a contractor could perform the job using either of two different concrete paving techniques: fixed-form paving or slip-form paving. PX 177 (Contract) Section 02753 ¶¶ 3.5.5-3.5.6; Stip. ¶ 15. A fixed-form paver operates by running along rails. Metal or wooden forms are laid on the sublayer in the desired shape and length; concrete is then poured into the space between the forms and the paver rides atop the forms, leveling the concrete poured in front of the machine. After the concrete sets, the forms are removed. By contrast, a slip-form paver in effect provides its own temporary forms, taking concrete that is relatively dry and continuously laying it in the desired configuration.[5] The concrete retains its shape without the aid of a form. A slip-form paver is more complex and significantly more expensive to purchase and operate than a fixed-form paver. A slip-form paver and the associated equipment would cost between $1 million and $1.5 million, Tr. 386:4-16 (Test. of Fulkerson), 787:9-12 (Test. of Camilli), while the fixed-form paver that Cambro used to perform the paving cost $166,000. Tr. 786:16 to 787:8 (Test of Camilli); PX 62 (Cambro Invoice). The Solicitation specified that concrete with a maximum 50-millimeter slump (approximately 2 inches) was to be used. Tr. 390:25 to 391:9 (Test. of Fulkerson), 1182:22 to 1183:16 (Test. of David Wise, Area Engineer, Army Corps of Engineers); PX 177 Section 02753 ¶ 2.10.1.

The Solicitation provided two different testing methodologies for a contractor to use in determining whether the finished concrete was sufficiently smooth and level: straightedge testing and profilograph testing. A straightedge is simply a straight, rigid length of material that can be placed across a surface to determine if it is level. Tr. 1097:10 to 1098:2 (Test. of Danny Menchaca, a construction representative with the Corps' Fort Bliss field office). A profilograph is an instrument that has the appearance of two bicycle tires with an intervening truss that can be rolled across pavement to measure its smoothness. Tr. 811:2 to 812:1 (Test. of Camilli). Profilograph testing is typically used in highway construction, generally for a long stretch of pavement, up to a mile or more in length. *See* Tr. 416:1-10 (Test. of Fulkerson). The

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[5]The fluidity of concrete (*i.e.*, its ability to hold its shape) is measured using a "slump test." To perform a slump test, a rigid cone is filled with concrete and turned onto a flat surface. When the cone is removed, the concrete will settle, or "slump." The amount of slump is determined by measuring the vertical distance that the top of the concrete cone settles. For example, if the top of the concrete cone settles two inches, the concrete is referred to as "2-inch slump" concrete. Tr. 391:10-25 (Test. of Fulkerson), 784:15-22 (Test. of Camilli).

profilograph testing specifications set out in the Solicitation were based upon standards developed by the California Department of Transportation for use in highway projects. *See* PX 177 Section 02753 ¶ 1.3.7.2(b) (stating that all profilograph testing should be performed according to "CDT [California Department of Transportation] Test 526 ").

2. ACE's performance.

The Corps accepted ACE's bid of $8,616,840.00 and awarded the contract to ACE on September 27, 2000. PX 177; Stip. ¶ 1. The Contract provided that the project was to be completed within 360 days, although the contractual deadline was later extended to December 21, 2001. Stip. ¶ 3.

Work on the taxiway, loading apron, pallet storage area, and roadway was to take place in the following phases: (1) clearing and grubbing; (2) bringing the site to the designated elevation; (3) installing drainage pipes; (4) covering the pipes with a drainage layer consisting of rock; and (5) pouring the concrete. *See* Tr. 69:1 to 70:4 (Test. of Jerry Fletcher, site superintendent for ACE on the project); PX 178 (Original Plans) Seq. Nos. 59-61. After winning the Contract, ACE hired a subcontractor, SLI Engineering, Inc. ("SLI") to perform surveying work at the project site. ACE could not begin clearing or excavation work on the site until SLI had performed a "control" survey that marked the outlines of the project site. Tr. 63:8 to 64:4 (Test. of Fletcher). SLI began surveying work at the site on December 5, 2000. DX 191 at 0023 to 0024 (SLI Invoice to ACE (Jan. 15, 2001)). Mr. Fletcher testified that contemporaneously with its control survey, SLI conducted a topographical survey which measured the elevation of the project site. Tr. 70:12-15, 76:2-19. As of January 26, 2001, the topographical survey was essentially complete. Stip. ¶ 6. Danny Menchaca, the quality-assurance representative with the Corps assigned to the project, authorized ACE to commence clearing and grubbing at an inspection meeting on January 10, 2001. PX 37 (Preparatory Phase Checklist (Jan. 10, 2001)). ACE commenced clearing and grubbing operations on January 9, 2001. Stip. ¶ 5.[6]

Mr. Fletcher testified that on or about January 9 he was informed by SLI that the topographic survey work SLI had performed to date indicated that the elevations at the project site were lower than those on the plans and the aerial topographical survey that had been provided by the Corps. Tr. 88:7 to 89:16 (Test. of Fletcher). The elevations at the project site were of concern because they would affect the balance between cut and fill to attain the prescribed final profile of the completed construction. Mr. Fletcher testified that he orally

[6]Clearing the construction area of vegetation was undertaken at the site before any excavation was performed. Tr. 60:19 to 61:24 (Test. of Fletcher). The vegetation in the project area consisted primarily of cactus, low-lying mesquite, and other desert vegetation. Tr. 59:10 to 62:8 (Test. of Fletcher); PX 180 at 116 (picture of pre-existing site conditions). Because the vegetation was minor, clearing and grubbing required relatively little disturbance of the surface; the vegetation was removed by scraping with a bulldozer blade, Tr. 61:2-12 (Test. of Fletcher), and by gathering and burning the material on site. Tr. 61:21 to 62:8 (Test. of Fletcher).

conveyed the information about the lower than expected elevations to the Corps' Mr. Menchaca on at least two different occasions before the topographical survey ("topo") was complete. Tr. 89:15 to 90:25. According to Mr. Fletcher, Mr. Menchaca indicated that he could not take any action on this information because Mr. Menchaca had to wait until the "topo" was complete to determine whether the project would be short on fill. Tr. 90:17-23. Mr. Menchaca gave testimony that conflicted with Mr. Fletcher's account, but on cross-examination Mr. Menchaca was unable definitively to discount Mr. Fletcher's timetable and version of events, *i.e.*, that Mr. Fletcher notified Mr. Menchaca of the elevation problem in January. Tr. 1070:23 to 1073:6, 1129:3 to 1130:1 (Test. of Menchaca). Mr. Fletcher testified that he also conveyed the information regarding the low elevations to Eleuterio Fuentes, a Corps project engineer at Fort Bliss, on or about January 30, 2001. Tr. 91:1-22. Mr. Fuentes, however, stated that he was not notified of a possible dirt shortfall until early March. Tr. 1233:9-17, 1254:15 to 1256:20.

In all events, on February 15, 2001, Del Hyland, ACE's quality control manager, met with Mr. Menchaca and Mr. Menchaca gave ACE permission to commence excavation work at that time. Tr. 94:17 to 96:17 (Test. of Fletcher); PX 42 (Preparatory Phase Checklist (Feb. 15, 2001)). ACE began excavation and fill activities on February 5, 2001. Stip. ¶ 7.

To provide a formal notification to the Corps that the site elevations were lower than shown on the contractual plans, ACE submitted a Request for Information ("RFI") to Mr. Menchaca on March 2, 2001. PX 44 (RFI #4 (Mar. 2, 2001)). In that RFI, ACE stated that it estimated that the project would require approximately 125,000 additional cubic yards of fill, and suggested that additional dirt could be obtained by widening the ditches associated with the project. *Id*.[7] A meeting took place on March 22, 2001, attended by Messrs. Fulkerson, Fletcher, and Hyland of ACE, and Mr. Menchaca and David Wise, the resident engineer with the Corps at Fort Bliss. At that meeting, Mr. Fulkerson described the elevation problem to Mr. Wise and they explored possible solutions, including widening the ditches and drainage impoundments and importing fill dirt from another construction project that was underway at another location on Fort Bliss (the "Dan Williams site"). Mr. Wise indicated that the project was to continue without delay and approved widening the ditches as well as importing fill from the Dan Williams site. Tr. 107:11 to 112:25 (Test. of Fletcher), 315:4 to 316:24 (Test. of Fulkerson); *see also* Tr. 1190:5-13 (Test. of Wise) (stating that he "ratified" the decision to allow ACE to over-excavate the ditches and drainage ponds); Stip. ¶ 9.

To generate enough fill to bring the site up to the proper elevation, the size of the retention ditches and ponds was doubled and ACE also imported material from the Dan Williams site at Fort Bliss. Tr. 109:9 to 111:4 (Test. of Fletcher). ACE began importing fill material from the Dan Williams site on March 26, shortly after Mr. Wise's approval. Tr. 319:19 to 320:4 (Test.

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[7]Additionally, a daily Quality Control Report prepared by Mr. Hyland on March 13, 2001, indicated that the "topo" conducted by SLI showed the site to be approximately two feet lower than reflected on the site plans supplied by the Corps. PX 52 (Daily Quality Control Report (Mar. 13, 2001)).

of Fulkerson). ACE estimates that approximately 129,000 additional cubic "truck" yards of fill were required to increase the level of the site to the proper elevation, which roughly doubled the amount of fill work that ACE had to perform. Tr. 340:16 to 341:22.[8] Of these 129,000 cubic "truck" yards, approximately 45,000 cubic yards were hauled from the Dan Williams site and the remainder was excavated from the expanded ditches and ponds. Tr. 348:15-19. The work to acquire the additional fill and bringing the site up to the elevations specified in the plans lasted from approximately March 24 to May 15, 2001. Tr. 346:8-12.

After completing the cut-and-fill work to bring the site up to the necessary elevation, the next steps at the taxiway, loading apron, and pallet storage pad called for fine-grading the dirt subgrade, covering the dirt subgrade with a synthetic textile material, placing a rock drainage layer on top of the textile material, and then fine-grading the drainage layer. Tr. 277:17 to 278:17 (Test. of Fulkerson); PX 178 Seq. Nos. 59-61. The concrete would be poured on the drainage layer. *See* PX 178 Seq. Nos. 59-61. ACE experienced significant difficulties when it began fine grading the dirt sublayer. The grading on the subgrade level and the drainage layer had to be finished to reflect the gradients of the final concrete work. *See* Tr. 284:6-14, 364:8-18 (Test. of Fulkerson), PX 177 Section 02753 ¶ 3.5.5.1(d). Although the original plans provided by the Corps did not include all of the individual panel points (or staking points) for the taxiway, loading apron, or storage pad, after contract award, a full set of panel points was provided to ACE. From the time when ACE bid on the project and continuing until ACE began the fine grading of the dirt sublayer, ACE assumed that the gradients from one panel to the next would remain constant in both a north-south and east-west orientation. However, when ACE began the fine grading, ACE began to realize, in conjunction with its surveyors, that although the gradient was constant in one direction, the gradients constantly changed from one panel to the next in the other direction. For example, on the loading apron, the gradients were constant in a north-south orientation, but continually changed in the east-west orientation. The result was a shape more akin to a geodesic dome. Constant gradients would have allowed ACE to perform the fine grading work at a constant angle. *See* Tr. 282:7 to 284:5 (Test. of Fulkerson). ACE instead had to change the angle of the grader at virtually every panel to account for the constantly changing grades. Tr. 287:24 to 290:10. ACE estimated that this process resulted in a loss of approximately three weeks' time on the project. Tr. 368:15-24, 372:3 to 374:7. ACE encountered similar grading issues when it began spreading the rock drainage layer on which the concrete would be poured. Tr. 288:19-24. ACE estimated that approximately two weeks' additional time was spent grading the drainage layer. Tr. 368:25 to 369:16, 375:15 to 376:11.

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[8]Mr. Fulkerson used the term "truck yard" to describe a cubic yard of uncompacted fill. Tr. 340:16 to 341:22 (Test. of Fulkerson). When fill material is used in a construction project such as the one at issue in this case, it must be compacted to provide a solid base for the pavement. The volume of the fill material after compaction will be significantly less than that of the uncompacted fill. The soil used at the Ammo Hot Load site had a compaction rate between 22% and 24%, meaning that soil as-compacted would fill a volume between 76% and 78% of the uncompacted soil. Tr. 339:4-24. Thus the 129,000 cubic yards of uncompacted fill resulted in approximately 105,000 cubic yards of compacted, in-place fill. Tr. 340:16-22.

Thereafter, Cambro, ACE's paving subcontractor, began to pour the concrete on the taxiway, loading apron, and pallet pad. Cambro elected to use the fixed-form method of paving. Stip. ¶¶ 11, 16. The constant grade breaks also led to significant delays for Cambro. As with other form-riding pavers, the forms used by Cambro's form-riding paver were assembled from segments of a given length, set in place to form a paving lane and bolted together at the joints. *See* Tr. 781:7-21 (Test. of Camilli); PX 180 at 70 (showing an example of a length of the steel forms used by Cambro on the project). Under the terms of the Contract, the contractor was required to use steel forms that were at least three meters in length. Tr. 381:4-10 (Test. of Fulkerson), 826:17-20 (Test. of Camilli); PX 177 Section 02753 ¶ 3.5.5.1(b). Cambro obtained forms for use on the project that were ten feet (3.048 meters) in length. PX 63 (Invoice (May 10, 2001)). Ten-foot form lengths are considered standard in the paving industry. Tr. 381:11-17 (Test. of Fulkerson), 822:1-3 (Test. of Camilli).

Cambro began preparing its paving machine for concrete pavement on June 27, 2001. Stip. ¶ 18. Between July 17 and July 24, Cambro set forms on the pallet storage area, which was the first area of concrete that Cambro poured. Stip. ¶19. Cambro poured its first test strip on the pallet storage area on July 25, 2001. Stip. ¶ 20. When Cambro set the forms in place to pour concrete, Cambro often found that the forms would not rest flush against the graded drainage layer, *i.e.*, there would be spaces between the forms and the ground. As a result, ACE and Cambro had to perform significant hand-grading and re-grading of the drainage layer to allow the forms to rest against the drainage layer. *See* Tr. 369:20 to 371:11 (Test. of Fulkerson), 778:14 to 779:23 (Test. of Camilli). ACE and Cambro eventually concluded that this problem was largely due to the constantly changing grade breaks. For example, on the loading apron, each panel was 5.75 meters long, while two 10-foot forms rigidly bolted together were approximately 6.1 meters in length. Because the joints in the forms did not match the length of the panels on the loading apron, the form would "overshoot" the length of the panel, and the end of the rigid form would not reflect the grade of the next panel. Tr. 778:22 to 780:25 (Test. of Camilli).

The constant grade breaks caused Cambro to assemble the forms such that they would have a small amount of "play" in the joints to allow the forms to conform as closely as possible to the constantly changing slopes. Tr. 781:7-21 (Test. of Camilli). The fixed-form paver, which is designed to distribute concrete uniformly by using a vibrating screen on the bottom of the machine, would at some of the grade breaks rock from side to side or ride up onto the concrete between the rails or even fall off the rails entirely. Tr. 780:6 to 781:21. The result led to bumps or dips in the concrete that would then have to be re-worked by hand, through use of "bump cutters" and "channel floats." Tr. 792:19 to 793:10, 794:8 to 795:11, 795:24 to 796:12; *see* DX 117 (picture of bump cutter and channel float in use during concrete paving).

Cambro's fixed-form paver was also adversely affected by the 2-inch maximum slump requirement for the concrete. The 2-inch slump concrete proved to be too stiff for normal use with the fixed-form paver. Tr. 393:20 to 394:9, 394:19 to 395:2 (Test. of Fulkerson). The rigidity of the concrete would at times cause the paver to fall off the rails, and achieving a smooth finish using the fixed-form paver with 2-inch slump concrete was very difficult. The

imperfections that resulted from the 2-inch slump concrete also required significant hand finishing. Tr. 792:19 to 793:12 (Test. of Camilli). In October of 2001, after significant conflict erupted between Cambro and ACE regarding Cambro's performance, ACE and Cambro became aware that 2-inch slump concrete was inappropriate for use with a fixed-form paver. An inquiry to the manufacturer of the paver disclosed that the paver should be used with concrete with at least a 3-inch slump; the 2-inch slump concrete would be difficult for a form-riding paver to handle. Tr. 394:10-13, 395:12 to 396:1 (Test. of Fulkerson), 789:3-7 (Test. of Camilli). On October 23, 2001, ACE submitted a request to the Corps to change the concrete specifications to a 76-millimeter slump, or an approximately 3-inch slump. PX 112 (change request (Oct. 23, 2001)); Tr. 789:21 to 791:10 (Test. of Camilli). The Corps rejected this requested change on January 3, 2002. PX 112; Tr. 746:3-23 (Test. of Fulkerson), 792:5-11 (Test. of Camilli).

Profilograph testing of the finished paving also became an issue. ACE and Cambro believed that profilograph testing was optional under the Contract, and ACE did not include profilograph testing in its bid; however, when Cambro began its concrete work, the Corps required that ACE use a profilograph for testing. Tr. 407:25 to 408:11, 678:10 to 679:15 (Test. of Fulkerson). After Cambro poured the first concrete on the pallet storage area on July 25, 2001, Stip. ¶ 20; Tr. 810:3-6 (Test. of Camilli), the Corps directed that a profilograph test be used to test the smoothness of the lanes, and some of the concrete failed the profilograph test. Tr. 810:7-17 (Test. of Camilli). Cambro was required to remove concrete that failed the profilograph test and re-pour concrete on those areas. *Id*. Initially, Cambro was not paid for areas that did not pass the profilograph test, Tr. 835:1-21 (Test. of Camilli), but the Corps on August 23, 2001, waived the profilograph test for purposes of determining payment for the pallet storage area. Stip. ¶ 21. Two months later, on October 18, 2001, the Corps waived the profilograph test for purposes of determining payment for the loading apron. Stip. ¶ 30. Even though the profilograph test was waived for payment purposes, the profilograph test was retained for purposes of determining areas of concrete that Cambro would be required to grind or mill (known as "must-grind areas") to achieve adequate smoothness. PX 126 (RFP-0005, Letter from David Wise, Corps of Engineers, to ACE (Feb. 5, 2002)). Cambro hired the Penhall Company to perform this milling work. Tr. 806:24 to 807:23 (Test. of Camilli).

Cambro initially blamed ACE for most of the difficulties Cambro encountered; in particular, Cambro believed that ACE was improperly grading the drainage layer upon which Cambro was placing concrete. Tr. 831:16 to 832:16 (Test. of Camilli); *see* PX 66 (Letter from Camilli to ACE (July 11, 2001)), PX 71 (Letter from Camilli to Fulkerson (July 17, 2001)); PX 75 (Letter from Mike Kraus and Camilli to ACE (Aug. 15, 2001)); PX 83 (Letter from Camilli and Kraus to Fulkerson (Sept. 7, 2001)); PX 92 (Letter from Camilli to Wise (Sept. 19, 2001)). Similarly, ACE initially believed that Cambro's difficulties with pouring the concrete were the result of errors by Cambro. *See* Tr. 668:8 to 669:1 (Test. of Fulkerson); PX 98 (Letter from Fulkerson to Camilli (Sept. 25, 2001)); PX 99 (Letter from Fulkerson to Camilli (Sept. 26, 2001)). On September 24, 2001, Cambro notified ACE that it was vacating the project until Cambro received payment from ACE. PX 95 (Letter from Camilli to Fulkerson (Sept. 24, 2001)); Stip. ¶ 25. On September 25, ACE terminated Cambro for default, for failure to

complete the work with diligence and for stopping work at the site. PX 98; PX 99; Stip. ¶ 26. ACE investigated the possibility of having another paving company finish the job in place of Cambro and notified the Corps that ACE was considering another paving contractor. PX 100 (Letter from Fulkerson to Wise (Sept. 27, 2001)). Approximately two weeks after ACE terminated Cambro, on October 7, 2001, ACE and Cambro entered into an agreement that called upon Cambro to return to the work site to complete the project. Stip. ¶ 28. On October 8, Cambro's employees returned to the job site and continued work. Stip. ¶ 29.

The project was ultimately completed by ACE to the Corps' satisfaction, and the Ammo Hot-Load Facility is currently in use by the Army for its intended purpose. Tr. 1208:9-23 (Test. of Wise). However, the Corps assessed a total of $254,280 in liquidated damages against ACE for delay in completion, Stip. ¶ 31, and ACE assessed a total of $326,000 in liquidated damages against Cambro for 200 days of delay. Stip. ¶ 32.

Significant disputes arose after completion of the project among ACE, Cambro, and Jobe Concrete Products, Inc. ("Jobe"), the subcontractor that provided concrete to Cambro. Jobe sued Cambro and ACE in the United States District Court for the Western District of Texas; ACE and Cambro filed cross-claims against each other. *See* DX 172 (Cambro's Answer to Jobe's original claim and Cross-Claim against ACE (Feb. 14, 2003), *United States for the Use and Benefit of Jobe Concrete Products, Inc. v. ACE Constructors, Inc., The Insurance Company of the State of Pennsylvania, Cambro Construction, Inc., and Merchants Bonding Company, Inc*. (W.D. Tex.)). ACE and Cambro represent that they eventually recognized that the problems they encountered were in fact caused by the Corps rather than by ACE or Cambro. ACE and Cambro claim that much of Cambro's difficulty was the result of faulty and incomplete specifications in the Contract, as well as the Corps' insistence on profilograph testing and refusal to modify the requirement that Cambro use 2-inch slump concrete. All of the parties (ACE, Cambro, and Jobe) agreed voluntarily to dismiss the lawsuit in the Western District of Texas, while abating their claims against each other until the conclusion of this proceeding. Tr. 895:9-24 (Statement of Michael Shane, attorney for Cambro).

DISCUSSION

ACE seeks to recover additional expenses that it incurred as a result of the alleged differing site conditions, the allegedly incomplete and internally contradictory plan documents provided by the Corps, and the Corps' alleged failure properly to administer the contract. Specifically, ACE seeks to recover (1) the costs of acquiring additional fill to bring the site facilities up to the elevations specified in the plans and the ensuing delay with the project (the "dirt claim"), (2) the costs of additional grading and delays allegedly caused by inaccurate drawings and plans and the omission of staking points in the plan documents (the "defective-specifications claim"), (3) on behalf of its subcontractor Cambro, the excess costs Cambro incurred as a result of the allegedly incomplete and internally contradictory plan documents, including the omission of staking points in the plan documents, the Contract's erroneous assumption that a contractor would use a slip-form paver, and the Corps' insistence on

profilograph testing (the "Cambro pass-through claim"), and, finally (4) the liquidated damages imposed on ACE by the Corps as a result of delays in completing the project because the delays were attributable to errors by the Corps and not through actions of ACE and its subcontractors.

The government responds that ACE should not recover for the dirt claim because ACE failed to verify the topographical survey prior to starting construction and to provide timely notice of the claim, thereby prejudicing the government's position. The government avers that ACE should not recover on its defective-specifications claim because ACE was unreasonable in its interpretation of the plan documents and because it should have derived the actual grading requirements based on the partial staking plans that were provided. Respecting the Cambro pass-through claim, the government contends that ACE and its subcontractors were responsible for the decision to use a fixed-form paver and that the government should not be held accountable for the negative consequences of that decision, including the liquidated damages that were assessed against ACE. The government also maintains that profilograph testing was required by the Contract and that the government was reasonable in requiring such testing. Additionally, the government avers that even if the plans provided by the Corps were erroneous and that the Corps was at fault in its administration of the Contract, ACE should not be able to recover on behalf of its subcontractor. Finally, the government argues that this court does not have jurisdiction to entertain (1) plaintiff's claim that the Contract was erroneous in its failure to specify a preference for slip-form paving or (2) plaintiff's claim that the Contract specifications did not require a profilograph, because ACE failed to raise these claims initially with the Contracting Officer as required by the Contract Disputes Act.

This analysis first addresses this court's jurisdiction under the Contract Disputes Act to consider ACE's claims. Thereafter, the court addresses each of ACE's claims in turn.

A. Claim Requirements of the Contract Disputes Act

The Tucker Act provides this court with "jurisdiction to render judgment upon any claim against the United States founded either upon the Constitution, or any Act of Congress or any regulation of an executive department, or upon any express or implied contract with the United States, or for liquidated or unliquidated damages in cases not sounding in tort." 28 U.S.C. § 1491(a)(1). The Tucker Act, however, is "'only a jurisdictional statute; it does not create any substantive right enforceable against the United States for money damages.'" *United States v. Mitchell*, 445 U.S. 535, 538 (1980) (quoting *United States v. Testan*, 424 U.S. 392, 398 (1976)). Therefore, a litigant invoking the Tucker Act "must identify a substantive right for money damages against the United States separate from the Tucker Act." *Todd v. United States*, 386 F.3d 1091, 1094 (Fed. Cir. 2004). In the case at hand, there is no dispute that an express contract existed between ACE and the government or that this contract falls within the scope of the Tucker Act's jurisdictional grant. *See* PX 177 (Contract). And, under the Tucker Act, this court has "jurisdiction to render judgment upon any claim by or against, or dispute with, a contractor arising under . . . the Contract Disputes Act of 1978." 28 U.S.C. § 1491(a)(2).

When the Contract Disputes Act applies, it requires the exhaustion of administrative remedies before a claim may be filed in this court. *See* 41 U.S.C. § 605(a) ("All claims by a contractor against the government relating to a contract shall be in writing and shall be submitted to the contracting officer."). If the contracting officer denies the claim, the party may file an action in this court. *Id*. § 609(a)(1).

In the case at hand, the government challenges this court's jurisdiction to hear claims relating to the form-riding paving machine (particularly the concrete-slump requirements) or to whether the profilograph test was mandatory, asserting that ACE did not raise these issues with the Corps' Contracting Officer. *See* Tr. 396:7 to 401:11; Def.'s Reply to Pl.'s Post-Tr. Brief ("Def.'s Post-Tr. Reply Br.") at 14.

Although the Contract Disputes Act does not define the term "claim," the Federal Circuit has held that no particular formula or terminology is required:

> This court "know[s] of no requirement in the [CDA] that a 'claim' must be submitted in any particular form or use any particular wording. All that is required is that the contractor submit in writing to the contracting officer a clear and unequivocal statement that gives the contracting officer adequate notice of the basis and amount of the claim."

Scott Timber Co. v. United States, 333 F.3d 1358, 1365 (Fed. Cir. 2003) (quoting *Contract Cleaning Maint., Inc. v. United States*, 811 F.2d 586, 592 (Fed. Cir. 1987)). Rather, a contractor must make a written, non-routine demand to a contracting officer, request a final decision, and seek the payment of money in a sum certain, the adjustment or interpretation of contract terms, or other relief arising from or relating to the contract. *See England v. The Swanson Group*, 353 F.3d 1375, 1380 (Fed. Cir. 2004); *James M. Ellett Constr. Co. v. United States*, 93 F.3d 1537, 1542-43 (Fed. Cir. 1996); *Mills v. United States*, 69 Fed. Cl. 358, 363 (2006); *Record Steel and Constr., Inc. v. United States*, 62 Fed. Cl. 508, 518-19 (2004).

ACE submitted four separate requests for equitable adjustment, the first on April 27, 2001, PX 60, the second on May 29, 2001, PX 64, the third on November 4, 2002, PX 176, and the fourth on August 6, 2003. PX 174. The first three, PX 60, PX 64, and PX 176, address only ACE's dirt claim. The request dated August 6, 2003, however, puts forward ACE's defective-specifications claim and the Cambro pass-through claim. PX 174 at 1. In that request, ACE stated that its claim for an equitable adjustment was "based upon ACE's and Cambro's belief that the Contract Documents were defective in three different but related areas." *Id*. Two of the three categories of errors addressed in PX 174 are relevant to the government's jurisdictional challenge. One category of defects relates to the difficulties ACE and Cambro experienced using a form-riding paver to perform the project. The request stated that the Contract required that the contractor "use three-meter long steel forms for concrete paving. . . . The[] grade breaks made it impossible for three-meter long rigid forms to conform to the surface of the drainage layer." *Id*.

at 2. ACE thus unquestionably made a claim regarding the specifications related to the form-riding paver. That request "arise[s] from the same operative facts, claim[s] essentially the same relief, and merely assert[s] different legal theories for . . . recovery" than the proofs ACE offered at trial. *Scott Timber*, 333 F.3d at 1365. The request is accordingly permissible in this court under the Contract Disputes Act. ACE addressed the 2-inch slump requirement at trial to further its proposition that the Corps did not design the Ammo Hot-Load project to be completed by a form-riding paver. Furthermore, the Corps was put on notice respecting the slump issue because ACE submitted a written change request to the Corps on October 23, 2001, seeking approval to use 76-millimeter slump concrete, a request the Corps ultimately rejected on January 3, 2002. *See supra*, at 10.

Similarly, PX 174 also questioned whether ACE was required to use profilograph testing. In PX 174, ACE stated that "[t]he [profilograph] machine design was *not applicable to the subject project due to the short test runs*." PX 174 at 2 (emphasis added). At trial, the government objected to ACE's assertion that as an adjunct to being *inapplicable*, the profilograph test was *not required* by the language of the Contract itself. The government seeks to establish a distinction between inapplicability and the lack of a requirement, but any such distinction is too attenuated to be significant; in its claim to the Contracting Officer, ACE manifestly was challenging the need for profilograph testing. In this context, there is no material difference between inapplicability of and the lack of a requirement for such testing. It is hardly unusual for a litigant's arguments to sharpen between the time of the original claim and the time of trial, and the government was given ample notice by ACE's contention that profilograph testing was not applicable.

The court thus finds that the claims ACE presented at trial are encompassed within the "claims" ACE asserted in its requests to the Contracting Officer. Moreover, ACE has satisfied the other requirements of the Contract Disputes Act for presenting a claim. A contractor must bring an action on a claim in this court within twelve months of the contracting officer's final decision. *See* 41 U.S.C. §§ 609(a)(1), (3). Here, the Corps' Contracting Officer issued a final decision denying ACE's amended and supplemented request of November 4, 2002 (the dirt claim) on March 7, 2003, and the Contracting Officer rendered a final decision denying ACE's request of August 6, 2003 (the defective-specifications and Cambro pass-through claims) on February 12, 2004. Compl. ¶¶ 7-8. ACE filed suit in this court on March 5, 2004. Jurisdiction in this court over ACE's claims is thus proper under the Contract Disputes Act.

B. The Differing-Site-Condition Claim ("The Dirt Claim")

1. *Liability.*

In examining the provisions of the Contract, the court is guided by the principle that "[w]here the provisions of a contract are phrased in clear and unambiguous language, 'the words of those provisions must be given their plain and ordinary meaning by the court in defining the

. . . obligations of the parties.'" *Aluminum Co. of Am. v. United States*, 2 Cl. Ct. 771, 776 (1983) (quoting *Elden v. United States*, 617 F.2d 254, 260-61 (Ct. Cl. 1980)). Further, where an interpretation is available that gives a "reasonable meaning" to all parts of the Contract, that interpretation "will be preferred to one which leaves a portion of it useless, inexplicable, inoperative, void, insignificant, meaningless or superfluous." *Hol-Gar Mfg. Corp. v. United States*, 351 F.2d 972, 979 (Ct. Cl. 1965).

"[I]t is elementary that the language of a contract must be given that meaning that would be derived from the contract by a reasonable[,] intelligent person acquainted with the contemporaneous circumstances." *Hol-Gar Mfg.*, 351 F.2d at 975 (citing *New York Trust Co. v. Island Oil & Transport Corp.*, 34 F.2d 655, 656 (2d Cir. 1929); *Hammond Ford, Inc. v. Ford Motor Co.*, 204 F. Supp. 772, 773 (S.D.N.Y. 1962)). In that respect, the expectations of the parties upon entering into the contract are to be based upon the information available to the parties at the time the contract was made, without the benefit of hindsight. *See*, *e.g.*, *North Am. Phillips Co. v. United States*, 358 F.2d 980, 982-83 (Ct. Cl. 1966).

Similarly, "the parties' understanding as shown by their conduct before the controversy" may have a bearing on the meaning to be ascribed to disputed terms. *Julius Goldman's Egg City v. United States*, 697 F.2d 1051, 1058 (Fed. Cir. 1983), *cert. denied*, 464 U.S. 814 (1983). Thus, in its interpretation of the contract, the court will give weight to what the parties believed their respective obligations to be prior to any dispute.

ACE contends that because the plan documents supplied by the government provided explicit and detailed cut-and-fill data points, the lower actual site elevations that ACE actually encountered at the job site constituted a differing site condition. ACE's Post Trial Brief ("Pl.'s Post-Tr. Br.") at 2-4. The government responds that ACE should not recover the costs of any additional dirt work because ACE has failed to prove that the site conditions indicated in the Contract differed materially from those actually experienced and that ACE did not prove that it incurred unexpected fill costs. Defendant's Post-Trial Brief ("Def.'s Post-Tr. Br.") at 19-24. The government further contends that even if actual site conditions varied from those in the plans, ACE failed to verify the survey data before commencing work as required by the Contract, *id.* at 13-14, and ACE failed to provide adequate notice such that the Corps was prejudiced in its ability to mitigate the differing site conditions in the most cost-effective manner. *Id*. at 14-19.

The Contract included the standard Federal Acquisition Regulation ("FAR") clauses for Differing Site Conditions, FAR [48 C.F.R. §] 52.236-2,[9] Site Investigation and Conditions

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[9]FAR 52.236-2, as adopted by the Contract, states, in pertinent part:

> (a) The Contractor shall promptly, and before conditions are disturbed, give a written notice to the Contracting Officer of
>
> > (1) . . . latent physical conditions at the site which differ materially from those indicated in this contract . . . .
>
> . . .

Affecting the Work, FAR 52.236-3,[10] and Changes, FAR 52.243-4.[11] PX 177 (Contract) Section

> (b) The Contracting Officer shall investigate the site conditions promptly after receiving the notice. *If the site conditions do materially so differ and cause an increase . . . in the Contractor's cost of, or the time required for, performing any part of the work* under this contract, whether or not changed as a result of the conditions, *an equitable adjustment shall be made* under this clause and the contract modified in writing accordingly.
> (c) No request by the Contractor for an equitable adjustment to the contract under this clause shall be allowed, unless the Contractor has given the written notice required.

(Emphasis added.)

[10]FAR 52.236-3, as adopted by the Contract, states, in pertinent part:

> (a) The Contractor acknowledges that it has taken steps reasonably necessary to ascertain the nature and location of the work, and that it has investigated and satisfied itself as to the general and local conditions which can affect the work or its cost, including but not limited to . . .
>
> (4) the conformation and conditions of the ground . . . .
>
> The Contractor also acknowledges that it has satisfied itself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered *insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by the Government, as well as from the drawings and specifications made a part of this contract*. Any failure of the Contractor to take the actions described and acknowledged in this paragraph will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the work without additional expense to the Government.
>
> (b) The Government assumes no responsibility for any *conclusions or interpretations made by the Contractor* based on the information made available by the Government.

(Emphasis added.)

[11]FAR 52.243-4, as adopted by the Contract, provides in pertinent part:

> (a) The Contracting Officer may, at any time, by written order designated or indicated to be a change order, make changes in the work within the general scope of the contract, including changes--
>
> (1) In the specifications (including drawings and designs);

00700 at 54-55, 62. These contract clauses form the framework for analysis of ACE's differing-site-conditions claim.

ACE alleges a differing site condition as stated in FAR 52.236-2 (a "latent physical condition[] at the site which differ[s] materially from those indicated in this contract"). This is known as a "Type I" differing site condition. *See H.B. Mac, Inc. v. United States*, 153 F.3d 1338, 1343 (Fed. Cir. 1998). "To establish entitlement to an equitable adjustment due to a Type I differing site condition, a contractor must prove, by preponderant evidence, that: the conditions indicated in the contract differ materially from those actually encountered during performance; the conditions actually encountered were reasonably unforeseeable based on all information available to the contractor at the time of bidding; the contractor reasonably relied upon its interpretation of the contract and contract-related documents; and the contractor was damaged as a result of the material variation between expected and encountered conditions." *Comtrol, Inc. v. United States*, 294 F.3d 1357, 1362 (Fed. Cir. 2002) (citing *H.B. Mac*, 153 F.3d at 1345). "A contractor cannot be eligible for an equitable adjustment for a Type I differing site condition unless the contract indicated what that condition would be." *H.B. Mac*, 153 F.3d at 1345 (citing *P.J. Maffei Bldg. Wrecking Corp. v. United States*, 732 F.2d 913, 916 (Fed. Cir. 1984)).

> (2) In the method or manner of performance of the work;
> . . .
> (4) Directing acceleration in the performance of the work.
> (b) Any other written or oral order (which, as used in this paragraph (b), includes direction, instruction, interpretation, or determination) from the Contracting Officer that causes a change shall be treated as a change order under this clause; provided, that the Contractor gives the Contracting Officer written notice stating (1) the date, circumstances, and source of the order and (2) that the Contractor regards the order as a change order.
> (c) Except as provided in this clause, no order, statement, or conduct of the Contracting Officer shall be treated as a change under this clause or entitle the Contractor to an equitable adjustment.
> (d) If any change under this clause causes an increase or decrease in the Contractor's cost of, or the time required for, the performance of any part of the work under this contract, whether or not changed by any such order, the Contracting Officer shall make an equitable adjustment and modify the contract in writing. . . . In the case of defective specifications for which the Government is responsible, the equitable adjustment shall include any increased cost reasonably incurred by the Contractor in attempting to comply with the defective specifications.

ACE's differing-site-condition claim includes the elements necessary to find a Type I differing site condition. First, the project documents indicated what the site conditions would be with respect to elevations and expected cut-and-fill quantities. As noted *supra*, at 3-4, the plan documents provided by the Corps included a topographical plan of the site with elevations showing facilities to be constructed overlaid on that topographical rendering, and also providing detailed cut-and-fill quantities at 20-meter intervals. ACE's subcontractor, Dirt-Tek, used the cut-and-fill data to extrapolate whether the job would be a 'balanced' job. Tr. 244:7 to 245:14 (Test. of Fulkerson). Dirt-Tek's calculations found that the job would result in a moderate excess of cut over fill. *See* Tr. 527:5-15 (Test. of Fulkerson); PX 176 (ACE dirt claim) at 175037 (Summary page for Dirt-Tek earthwork analysis (Aug. 21, 2001)).[12] Based largely upon this information, ACE determined that the Ammo Hot-Load Project would at least be a balanced job and would potentially result in excess fill material.[13] The government suggests that the schematics it provided for the project were not sufficiently detailed to indicate to a reasonable contractor that the site would balance because the drawings "do not indicate any swell or shrinkage factor to apply." Def.'s Post-Tr. Br. at 22. For support, the government cites *Pacific Alaska Contractors, Inc. v. United States*, 436 F.2d 461 (Ct. Cl. 1971) (*per curiam*), which also involved a differing site claim. In *Pacific Alaska*, the court upheld the Department of Commerce Appeals Board's denial of an equitable adjustment where the contractor claimed the plan documents indicated the project would be a balanced job. *Id*. at 473. The plan documents in *Pacific Alaska* used arrows marking segments of the job and contained a breakdown, for each segment, of the total estimated amounts of unclassified and borrow excavation; the contractor relied on these estimates to determine that the project would be a balanced job. *Id*. at 470. Two factors appeared to be critical to the court's finding that the contractor could not reasonably rely on the plans to calculate the project's balance: first, "there [was not] any indication in the contract documents as to a 'swell factor'" and "[t]here w[ere] no data contained in the bid information documents, either in the contract drawings or otherwise, [showing] that defendant had by drilling or otherwise made any subsurface investigation of the nature and extent of the useable materials involved in the . . . roadway or in the borrow pits, *id.* at 469;[14] and second,

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[12]The excavated material which was used as fill was re-compacted. As a general rule, Mr. Fulkerson stated that a contractor "can generally compact the soil a couple percent more than it will swell. When you put it in, compact it in place, it's going to probably be a couple percent more dense than in natural conditions." Tr. 339:4 to 340:12 (Test. of Fulkerson). Mr. Fulkerson's testimony indicated that the dirt at the Ammo Hot-Load site demonstrated these properties. Tr. 339:4 to 340:9 (the dirt expanded 20%-25% when excavated, then shrank 22%-24% when used as fill and re-compacted).

[13]Mr. Fulkerson also personally examined the site prior to submitting a bid; he participated in a pre-bid site visit. Tr. 220:17 to 221:13.

[14]Rock deposits and rocky soil appeared to cause the shortage of fill in *Pacific Alaska*. As the Court of Claims noted, although it is an "established principle that rock excavated from its natural location occupies substantially more space when deposited in a fill, even after

"frequent reminders [appeared] throughout the specifications that the estimated figures must be viewed with great caution." *Id.* at 470. The government claims that as with the contract in *Pacific Alaska*, the Contract here did not include a swell factor; therefore, a contractor could not accurately determine whether the site would balance based on the plans. Cl. Tr. 31:9 to 32:24.

Pacific Alaska is distinguishable. First, although the cut-and-fill cross-sections provided by the Corps in this instance did not include an explicit shrinkage factor, *see* PX 178 Seq. Nos. 66-87, the plans did include the results of subsurface soil boring logs that were taken at 16 different locations across the site; these logs included information such as soil descriptions and moisture and plasticity information. PX 178 Seq. Nos. 110-112. The Contract also included a section detailing the minimum soil compaction that would be acceptable in the subgrade for pavements. *See* PX 177 Section 02300 ¶ 3.7.2.1. Second, unlike the contract in *Pacific Alaska*, the Contract in the case at hand did not include "frequent reminders throughout the specifications that the estimated figures must be viewed with great caution." *Pacific Alaska*, 436 F.2d at 470.[15] Finally and most importantly, the evidence here does not indicate that there was any material difference in the actual compaction of the soil and what the parties estimated pre-bid. Instead, ACE's claim relies primarily upon the fact that much of the site simply was lower in elevation than the plan documents had indicated.[16] ACE has established that it relied on the information provided in the plan documents.[17]

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compaction . . . in this case there was very little, if any, swell in the rock excavated and used in the embankments, due to the fact that the rock encountered was slate and shale, with cracks and voids in its natural state, and which broke up into much finer materials than expected." 436 F.2d at 467.

[15]The Contract did advise with respect to the boring samples that "variations may exist in the subsurface between boring locations." PX 177 Section 02300 ¶ 1.4. However, ACE has made no claim that the properties of the soil it found on the site differed from those shown in the plans. In fact, all of the evidence indicates that the soil exhibited the properties that were expected based upon the boring data.

[16]The discrepancy in elevation occurred markedly in the middle portions of the site, while the northern and southern end points were a close match to the expected elevations. The site visit demonstrated that the access road approaching the pallet pad from the north, and the pallet pad itself, were significantly elevated above the surrounding terrain; they were constructed to conform to the planned absolute elevations, not elevations that correlated to the pre-existing actual surface.

[17]The government avers that ACE has not sufficiently established that it relied on the government's representations in the plans because ACE never provided dirt take-off sheets that it might have generated on its own prior to making its bid, and no witness from Dirt-Tek was called to testify about the preparation of its dirt take-offs. Def.'s Post-Tr. Br. at 19-22; Cl. Tr. 34:16 to 37:3. Regarding the first issue, the government suggests that the court should draw a negative

Secondly, ACE's reliance on the plans must have been reasonable. *Comtrol*, 294 F.3d at 1362. In this respect, the Federal Circuit has stated that "[t]he fact that a contract is a set-aside for small [] businesses does not change in any way the standard that a court applies in analyzing the contractor's pre-bid conduct. . . . [A small business] has its conduct judged under the same standard as that of any other contractor. That standard is whether, without qualification, the contractor acted reasonably and prudently." *H.B. Mac*, 153 F.3d at 1345. The court accordingly has disregarded the fact that ACE was and is a small business and that this contract was a small-business set-aside.

The evidence indicates that ACE's reliance on the plan elevations and the attendant cut-and-fill data was reasonable. Mr. Fulkerson testified that he obtained proposed bids for the dirt

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inference regarding ACE's reliance on the plan documents due to the fact that ACE did not produce in discovery any of its pre-bid dirt estimates. Def.'s Post-Tr. Br. at 19-20. This contention is based upon pure speculation on the part of government's counsel, and assumes that ACE retained documents but withheld them in discovery. There is no factual support for the government's implicit contention that ACE did not fulfill its obligations during discovery. Moreover, regarding the meaning and significance of the cut-and-fill information the government set out in the plans, the testimony of witnesses at trial uniformly indicated that the information projected a moderate excess of material, not a deficit. The engineer at Crawford Murphy who designed the project, Mr. Herrin, testified that "Ace's original pre-bid estimate of the amount of earthwork on this job was the same magnitude as the [estimate] that [I] had pre-bid." Tr. 477:10-25 (Test. of Herrin).

Regarding the second issue, the government maintains that the court should discount the information on the Dirt-Tek take-off sheet and the testimony Mr. Fulkerson gave regarding the Dirt-Tek estimate. Def.'s Post-Tr. Br. at 20-22. Specifically, the government argues that the court should draw a negative inference on these factual matters because Carl Bice, the principal of Dirt-Tek, was never called as a witness. It is a well-established principle of evidence in civil trials "'that if a party has it peculiarly within his power to produce witnesses whose testimony would elucidate the transaction, the fact that he does not do it creates the presumption that the testimony, if produced, would be unfavorable.'" *Caroline Hunt Trust Estate v. United States*, 65 Fed. Cl. 271, 291 (2005) (quoting *Graves v. United States*, 150 U.S. 118, 121 (1893)). However, the court refuses to apply an adverse inference here because the production of Mr. Bice was not "peculiarly within [ACE's] power." *See Energy Capital Corp. v. United States*, 302 F.3d 1314, 1323 (Fed. Cir. 2002) (noting that the trial court refused to find an adverse inference because the witnesses were equally available to both parties). Mr. Bice had been included on the parties' witness lists as a third-party witness. ACE's counsel noted at the outset of the trial that Mr. Bice had undergone surgery just before the trial, but would nevertheless be available to testify telephonically. Tr. 13:20 to 14:13. Government's counsel "ha[d] no problem with that." Tr. 14:15. Ultimately, ACE's counsel decided not to call Mr. Bice because "Mr. Bice['s] . . . substantive testimony we got in other ways." Tr. 1258:14-16. The government's counsel did not object to this course of action, nor did he attempt to call Mr. Bice although he was available to be called by government's counsel.

portion of the project from two companies that were considered as subcontractors to perform the dirt work, Camino Construction and Ortega Construction, based upon the plans provided with the Solicitation. Both firms indicated to Mr. Fulkerson that they were interested in the dirt work at the Ammo Hot-Load project because they hoped to acquire the excess dirt that they expected the job to generate, for use in other projects. Tr. 270:8 to 274:23 (Test. of Fulkerson). Similarly, the plans provided by the Corps provided no reference to a "borrow" area, *i.e.*, an area where a contractor could obtain excess soil needed for fill. Mr. Fulkerson stated that he would have expected a project that would require importation of fill to include reference to such a "borrow" area. Tr. 274:24 to 275:14.

Most importantly, ACE's interpretation of the plan documents was in agreement with the calculations performed by the designers of the Ammo Hot-Load Project, Crawford Murphy. Mr. Herrin testified that the Corps initially did not require Crawford Murphy to design a balanced project. Tr. 462:25 to 463:7. Mr. Herrin further testified that a subcontractor of Crawford Murphy had performed a project cost and time estimate based on an early set of plans and had determined that the fill requirements would add approximately $2.5 to $2.6 million to the cost of the project. Tr. 468:5 to 469:19 (Test. of Herrin). Crawford Murphy then redesigned the project to eliminate the need for importation of fill, thus eliding the cost of importing fill from the cost estimate. *Id.*; PX 15 (Letter from Herrin to the Corps' Fort Worth District (Feb. 23, 2000)) (proposing elimination of the cost of imported fill material as a way to reduce the cost estimate of the project, stating that "[w]e believe this [imported fill] is not required."). In fact, Crawford Murphy ultimately designed the ditches surrounding the project to be "oversized" such that they would produce enough fill material to bring the Ammo Hot-Load site to the required elevation. Tr. 467:19 to 470:14 (Test. of Herrin). That this redesign proved to be insufficient for its intended purpose was attributable to the incorrect elevations that were used, and not to any intended design characteristic.

In short, the site conditions actually encountered by ACE were unexpected and differed materially from those that were indicated by the plans. Rather than being a balanced project as indicated by the cut-and-fill schematics, the site required approximately 129,000 additional cubic yards of soil. These conditions were reasonably unforeseeable by ACE, based upon all of the information available to ACE at the time of bidding. The lower elevation of a portion of the project site was not a condition that a reasonable contractor would be expected to detect through visual observation on a site visit, and Mr. Fulkerson was given no reason to doubt the accuracy of the plan documents provided by the Corps.[18] Finally, ACE has shown that it was damaged as a result of the material variation between expected and encountered conditions. ACE was required

[18]Mr. Fulkerson's personal site visit and ACE's reliance on the data provided in the Corps' plan documents demonstrate that ACE satisfied the investigation and due diligence requirements of FAR 52.236-3, "Site Investigation and Conditions Affecting the Work."

to perform approximately seven weeks of extra work in order to bring the site to the proper elevation. *See supra*, at 8.[19]

The government contends that even if ACE can show a differing site condition, ACE should still not recover for the costs incurred as a result because ACE had a contractual duty and burden to inform the Corps of the differing site condition in a timely manner, but ACE delayed informing the Corps, ultimately prejudicing the Corps' ability to mitigate the problem. Def.'s Post-Tr. Br. at 14-19; Def.'s Post-Tr. Reply Br. at 2-8. The government additionally claims that ACE did not comply with Section 01720 of the Contract, which required the contractor to verify contract survey data before existing site conditions were disturbed. Def.'s Post-Tr. Reply Br. at 8-9;[20] *see* PX 177 (Contract) Section 01720 ¶ 3.1.

The Differing Site Conditions Clause, FAR 52.236-2, required prompt written notice to the contracting officer before the area affected by the differing condition was disturbed. "The purpose of such notice is to allow the government an opportunity to investigate and to exercise some control over the costs . . . and effort expended in resolving the [differing site condition]." *See* John Cibinic and Ralph Nash, *Administration of Government Contracts* ("*Cibinic & Nash*") 531 (3d ed. 1995). Because the purpose of the notice requirement is to allow the government to mitigate costs that might result from the differing site condition, a contractor that fails to provide adequate notice will not be barred from recovery unless the government is prejudiced by the lack of notice. *See Shepherd v. United States*, 113 F. Supp. 648, 651-52 (Ct. Cl. 1953); *Cibinic & Nash* 533. The government bears the burden of showing prejudice. *Cibinic & Nash* 533. The government can show prejudice by demonstrating either that it might have minimized extra costs if proper notice had been given, or the passage of time obscured the elements of proof. *See*

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[19]Additionally, ACE claims that the extra work required to address the differing site condition caused ACE to incur substantial overtime in an effort to avoid liquidated damages, which resulted in increased costs in terms of overtime paid to employees (so-called "constructive acceleration" costs), as well as the reduced productivity of its workers. *See* Pl.'s Post-Tr. Br. at 15. The recoverability of these costs will be addressed *infra*.

[20]This Section states, in pertinent part:

> During initial site layout and before existing conditions are disturbed the Contractor shall verify, in writing, the basic survey data provided on the contract drawings. Verification . . . shall include, as a minimum, benchmark elevations, horizontal control points, and sufficient spot checks of critical elevations to ensure that the survey data adequately reflects existing conditions. The Contractor shall not proceed with construction until survey verification is provided to the Contracting Officer's Authorized Representative.

PX 177 (Contract) Section 01720 ¶ 3.1.

Seaboard Lumber Co. v. United States, 45 Fed. Cl. 404, 407 (1999) ("the question is whether the lack of notice caused any real prejudice to the government's ability either to defend against the contractor's claim, or to limit damages"); *Calfon Constr., Inc. v. United States*, 18 Cl. Ct. 426, 439 (1989) (discussing how the government could have minimized costs if notified, in the context of a "changes" clause), *aff'd*, 923 F.2d 872, (Fed. Cir. 1990); *Cibinic & Nash* 533.

ACE provided its first written notice to the Corps that the site elevations were lower than shown on the contractual plans via a Request for Information sent to Mr. Menchaca on March 2, 2001. PX 44 (RFI #4 (Mar. 2, 2001)).[21] As noted *supra*, at 7, ACE stated in that RFI that it estimated that the project would require approximately 125,000 additional cubic yards of fill, and it suggested that additional dirt could be obtained by widening the ditches associated with the project.[22] Three separate events confirm that Corps employees acted on the notice ACE had given and that they did so as early as March 5, 2001. First, a Quality Assurance Report ("QAR") filed by Mr. Menchaca on March 5 stated that "[t]he amount of cut does no[t] balance with the amount of fill needed to finish [the] job. Ideas talked about today [were] lessening the slope on road [and] lowering job [and] . . . widening trenches." DX 79-013 (Quality Assurance Report (Mar. 5, 2001)).[23] Second, an e-mail from Eleuterio "Telo" Fuentes of the Corps to Roland Ray advised that "Danny [Menchaca] and I talked to our Superintendent this morning and he told us that he does not have enough earth fill in the project." PX 48 (E-mail from Fuentes to Ray (Mar.

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[21]The government avers that ACE neglected its contractual duty to verify the survey elevations prior to disturbing site conditions, in violation of Section 01720 of the Contract. ACE commenced clearing and grubbing on January 9, 2001, and the topographical survey (which verified the survey elevations) was not completed until January 26, 2001. However, the Corps' quality-assurance representative, Mr. Menchaca, authorized ACE to commence clearing and grubbing at an inspection meeting on January 10, 2001. *See supra*, at 6. The Corps does not appear to have raised any discussion or concern about the elevation verification at this time. *See* PX 37 (Preparatory Phase Checklist (Jan. 10, 2001)). Much of the on-site surveying had been completed before ACE began to clear and grub the site. Also, as stated *supra*, at 6 & n.6, the clearing and grubbing operations neither removed soil from the site nor significantly changed the elevation of the site, and therefore they would not have affected the surveyor's ability accurately to complete a determination of the site's actual elevations. The clearing and grubbing operations thus would not have adversely affected the surveyor's assessment of the existence of the condition. In short, the Corps was not prejudiced by ACE's clearing and grubbing operations.

[22]Additionally, a daily Quality Control Report prepared by Mr. Hyland on March 13, 2001, indicated that the "topo" conducted by SLI showed the site to be approximately two feet lower than reflected on the plans provided by the Corps. *See* PX 52 (Daily Quality Control Report (Mar. 13, 2001)).

[23]This daily QAR, prepared by Mr. Menchaca, was not signed and dated until April 16, 2001. DX 79-014. Similarly, Mr. Menchaca's QAR for March 8, 2001, DX 79-026, discussed *infra*, also was not signed and dated until April 16, 2001. DX 79-027.

5, 2001)). Third, on March 8, 2001, Corps employees Messrs. Menchaca, Ray, and Fuentes conducted a teleconference with Crawford Murphy's Mr. Herrin, the principal designer of the project, to discuss whether Mr. Herrin had been asked to design a "balanced" job. Tr. 1254:20 to 1255:11 (Test. of Fuentes); DX 79-026 (QAR (Mar. 8, 2001)). Thus, the court finds that the Corps had explicit notice of the site-elevation issue no later than March 2, 2001.[24] Notably in this regard, notice need not follow any specific format, but must merely make the Contracting Officer aware of the differing site condition. *Cibinic & Nash* 531. In fact, oral notice has been found to be sufficient to notify the Contracting Officer of the condition. *See Shepherd*, 113 F. Supp. at 651.

Finally, the Corps has not presented evidence showing that it was prejudiced by delay. By March 22, the date of the meeting with the Corps' Mr. Wise, ACE had essentially completed excavation of the ditches and ponds to the dimensions shown on the project plans, but it had not yet taken any action to expand the size of the ponds and ditches beyond those shown on the plans or to acquire any additional dirt. Tr. 318:6 to 319:14 (Test. of Fulkerson). Both ACE and Corps employees testified that on March 22 there would have been no logistical barrier to lowering the

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[24]The government asserts that the RFI of March 2, 2001 and the Quality Control Report of March 13, 2001, do not constitute notice for purposes of invoking the Differing Site Conditions clause. The government claims that these documents only mentioned a shortage of dirt, and did not raise the issue of site elevation, thereby making the notice ineffective. Def.'s Post-Tr. Reply Br. at 3-6. The government argues a distinction that has no real meaning; a shortage of dirt and a low elevation are two sides of the same coin. Under a differing-site-conditions clause, a contractor need not identify every aspect of a problem with specificity:

> [T]he [government] has the duty, once notice is given, to investigate the existence, nature, extent, and validity of the contractor's claim. It is not necessary that the allegedly new condition be set forth specifically and in detail. It is enough if the Government knows that the contractor is claiming such a condition in a certain area; no formal or technical requirements have been imposed.

Farnsworth & Chambers Co. v. United States, 346 F.2d 577, 581 (Ct. Cl. 1965) (citing *General Cas. Co. of Am. v. United States*, 127 F. Supp. 805, 812-13 (Ct. Cl.), *cert. denied*, 349 U.S. 938 (1955); *Shepherd*, 113 F. Supp. at 650-52). That ACE phrased its notice in terms of dirt quantities rather than elevation does not make ACE's notice ineffective. *See Farnsworth & Chambers*, 346 F.2d at 581 ("The fact that plaintiff later sought to make its claim more precise does not deprive that original notice of effectiveness.").

Furthermore, contrary to the government's claims, once the Corps was on notice of the differing site condition, the Corps failed to adequately review the "nature" and "extent" of ACE's claim. During the teleconference on March 8, 2001, between Corps employees Messrs. Menchaca, Ray, and Fuentes and Crawford Murphy's Mr. Herrin, the topic addressed was whether Mr. Herrin was asked to design a "balanced" job, and thus the teleconference was oriented toward assigning responsibility for the extra costs rather than determining the possible mitigating steps that might be taken.

entire site or otherwise adjusting the construction plans to accommodate the lack of fill. Tr. 317:25 to 318:5 (Test. of Fulkerson), 1130:15 to 1131:5 (Test. of Menchaca); *see also* Tr. 986:18 to 988:10 (Test. of Louis M. Wenick, plaintiff's construction expert).[25] However, a technical problem with lowering the site may have existed. Testimony indicated that lowering the site would have been infeasible from a design standpoint because the elevation of the loading apron had to match that of the taxiway, which tied directly to the runway. Tr. 316:25 to 317:24 (Test. of Fulkerson). Mr. Wise, however, testified that parts of the site could have been lowered from the elevations shown on the plans, including especially the northern-most elements, the roadway and the pallet storage pad. Tr. 1165:19 to 1169:7. Regardless of whether lowering the site was technically feasible, there was no suggestion by the Corps at the meeting of March 22 about lowering the site. Tr. 316:25 to 317:7 (Test. of Fulkerson). Despite the government's claim that the Corps might have cost-effectively lowered the elevation of at least part of the site if it had received earlier notice, *see supra*, the Corps never provided ACE with any contemporaneous indication that this option was viable. To the contrary, Mr. Wise himself stated that he did not consider "rebalancing" the site during March when the dirt problem was brought to his attention. Tr. 1186:15-18, 1204:6 to 1205:8 (Test. of Wise).[26] Additionally, although ACE made the original suggestion of widening the trenches and impoundments and importing dirt from the Dan Williams site, it was Mr. Wise who, at the meeting of March 22, 2001, directed ACE to perform these actions and to avoid work stoppage on the project. *See supra*, at 7. Mr. Wise testified that rebalancing the site would have required Crawford Murphy to conduct engineering work requiring four to six weeks to complete, a considerable delay. Tr. 1187:11 to 1188:14 (Test. of Wise).

The court consequently finds that ACE's notice was adequate under the Differing Site Conditions clause and that the Corps suffered no prejudice.

2. *Determination of an equitable-adjustment amount for the dirt claim.*

The court has determined that ACE may recover under the differing-site-condition clause for the dirt claim. The question remaining for the court concerns the quantum of recovery. The burden is on ACE to establish the amount of the equitable adjustment by a preponderance of the evidence. *See Teledyne McCormick-Selph v. United States*, 558 F.2d 808, 810 (Ct. Cl. 1978). However, "[a] claimant need not prove his damages with absolute certainty or mathematical exactitude." *Wunderlich Contracting Co. v. United States*, 351 F.2d 956, 968 (Ct. Cl. 1965) (citing *Houston Ready-Cut House Co. v. United States*, 96 F. Supp. 629 (Ct. Cl. 1951)). "It is sufficient if [a claimant] furnishes the court with a reasonable basis for computation, even though

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[25] *But see* Tr. 1169:8 to 1170:18 (Test of Wise) (stating that the Corps had lost the opportunity to lower the site and reduce the amount of fill needed "by the late March timeframe" because ACE had imported fill by that time).

[26] "Rebalancing" the site "would be to reengineer it such that the quantity of cut and quantity of fill would then equal one another." Tr. 1186:1-3 (Test. of Wise).

the result is only approximate." *Wunderlich Contracting*, 351 F.2d at 968 (citing *Locke v. United States*, 283 F.2d 521 (Ct. Cl. 1960); *F. H. McGraw & Co. v. United States*, 130 F. Supp. 394 (Ct. Cl. 1955)); *see also Daly Constr., Inc. v. Garrett*, 5 F.3d 520, 522 (Fed. Cir. 1993) ("it was incumbent upon [the contractor] to establish a reasonable method for computing the requested compensation").

The proper measure of an equitable adjustment is the extra costs incurred by the contractor, if those additional costs are reasonable. *Cibinic & Nash* 682; *George Sollitt Constr. Co. v. United States*, 64 Fed. Cl. 229, 245 (2005) (citing *Bruce Constr. Corp. v. United States*, 324 F.2d 516, 518-19 (Ct. Cl. 1963)). Although a contractor's incurred costs were once considered to have a presumption of reasonableness when determining the amount of an equitable adjustment, *see Bruce Constr.*, 324 F.2d at 519, this presumption was superseded by an amendment made in 1987 to FAR 31.201-3, codified at 48 C.F.R. § 31.201-3(a), at least where that provision of the FAR applies. *See George Sollitt Constr.*, 64 Fed. Cl. at 245.[27] For some time, Department of Defense contracts have incorporated the contract cost principles of FAR part 31 by reference, including the reasonableness test of FAR 31.201-3. *See* DFARS [48 C.F.R. §] 252.243-7001; *George Sollitt Constr.*, 64 Fed. Cl. at 246 (citing *Cibinic & Nash* 686). The Contract in the case at hand included DFARS 252.243-7001. PX 177 Section 00700 at 63. Therefore, FAR 31.201-3 provides the standard of reasonableness for ACE's incurred costs, and no presumption of reasonableness applies.[28]

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[27]FAR 31.201-3 states, in pertinent part, that "[n]o presumption of reasonableness shall be attached to the incurrence of costs by a contractor. If an initial review of the facts results in a challenge of a specific cost by the contracting officer or the contracting officer's representative, the burden of proof shall be upon the contractor to establish that such cost is reasonable." FAR 31.201-3(a).

The *Bruce Construction* presumption of reasonableness would apply to the contractor's incurred costs for changed or added work if FAR 31.201-3 were not applicable. *See George Sollitt Constr.*, 64 Fed. Cl. at 245-46. *Compare R.P. Richards Constr. Co. v. United States,* 51 Fed. Cl. 116, 125 (2001) (stating that "there is a presumption that [the contractor's] actual costs paid are reasonable"), *with Information Sys. & Networks Corp. v. United States*, 48 Fed. Cl. 265, 268 (2000) (noting that the proper test for reasonableness was found in FAR 31.201-3, because "FAR Part 31 . . . establishes a set of principles and provisions for the reimbursement of costs for contractors performing the type of contract at issue in this case.").

[28]FAR 31.201-3(b) states:

> What is reasonable depends upon a variety of considerations and circumstances, including--
> (1) Whether it is the type of cost generally recognized as ordinary and necessary for the conduct of the contractor's business or the contract performance;
> (2) Generally accepted sound business practices, arm's length bargaining, and Federal and State laws and regulations;

ACE seeks to recover all of its costs incurred between March 23 and May 15, 2001, the period during which ACE performed the additional dirt work that was required by the differing site condition. *See* Pl.'s Post-Tr. Br. at 14. ACE submitted its claim for equitable adjustment in this regard to the Corps on November 4, 2002. PX 176. The costs claimed in PX 176 were analyzed by ACE's construction expert, Mr. Louis Wenick. PX 175 (Report of Wenick); PX 175a (summary page). Mr. Wenick's analysis suggested changes to ACE's claim, lowering the amount sought, and ACE has adjusted its claim accordingly. *See* Pl.'s Post-Tr. Br. at 13-14. ACE seeks to recover a total of $528,185.63 for the dirt claim, which consists of $476,401.63 of direct costs, plus $16,292.00 in costs attributed to alleged constructive acceleration and $35,492.00 in costs attributed to reduced productivity. PX 175a. The court first addresses ACE's direct costs and then turns to the constructive-acceleration and reduced-productivity components.

a. *ACE's direct costs (additional grading and filling).*

ACE seeks to recover additional labor, equipment, and equipment operating costs, additional water costs, costs for hauling additional fill, and costs for outside services including soil-quantity calculation, surveying, and soils testing. ACE also requests markups (made on a percentage basis) for field overhead, home office overhead, profit, and bond costs. PX 176 at 175091. ACE's dirt claim of November 4, 2002 requested an equitable adjustment of $520,478 for the direct costs. *Id*. Mr. Wenick's review reduced these claimed direct costs to $476,401.63. PX 175a.

Two line items of costs were uncontested by the government, water ($8,106) and a DirtTek soil study ($910). *See* Tr. 1291:16-22 (Test. of Hughes Will Sanford, a Corps employee in the Corps' Fort Worth District); DX 237 (estimate sheet prepared by Mr. Sanford (Oct. 4, 2005)); PX 175a. The court therefore determines that ACE may recover these costs. All of the other direct costs were contested, at least in part.

In Mr. Wenick's review, he evaluated labor costs by examining certified payrolls, equipment costs by examining rental invoices, equipment operating costs by reference to standard handbooks for equipment operating rates, and material and subcontractor costs by examining invoices. Tr. 920:15-21 (Test. of Wenick). Regarding ACE's claimed increased labor costs, Mr. Wenick's review of ACE's payrolls for the time period of March 23 to May 15, 2001 showed a total amount incurred of $55,732.41. Tr. 922:2-8; PX 175 App. Tab 3 (Dirt Claim-Direct Labor). In addition to this direct labor cost, ACE seeks to recover for a category called "labor burden", which consists of various factors applied to direct labor including FICA, unemployment taxes, and workers' compensation insurance. Tr. 922:14-20 (Test. of Wenick).

> (3) The contractor's responsibilities to the Government, other customers, the owners of the business, employees, and the public at large; and
> (4) Any significant deviations from the contractor's established practices.

Mr. Wenick employed a "labor burden" rate of 40%; multiplying this rate by the direct labor cost added $22,292.96.[29] Total labor costs thus were $78,025.37. PX 175a at 2. The government challenged ACE's claimed labor costs on the basis that the proper labor-burden rate should have been 31.8%. A government auditor, Mr. Doran Storey, testified that the labor-burden calculation by ACE's auditor was partially based on estimations and also included some improper items. Mr. Storey testified that he calculated ACE's labor burden based on ACE's general ledger, and on that basis ACE's labor burden for 2001 was 31.8%. Tr. 1026:15 to 1028:13 (Test. of Storey); *see* PX 143 (Defense Contract Audit Agency, Dirt Claim Audit (Feb. 4, 2004)) at 8. The court credits this testimony and will reduce ACE's labor-burden recovery to 31.8% of direct labor cost, or $17,722.91. This reduces ACE's total recovery for labor costs to $73,455.32.

ACE's claimed costs for the March 23 through May 15 include both equipment rental and operating costs. To calculate rental costs, Mr. Wenick reviewed the rental invoices for the time period in question. The total requested rental costs totaled $108,459.90. Tr. 924:11 to 925:6 (Test. of Wenick); *see* PX 175 App. Tab 5 (Dirt Claim–Additional Grading Equipment Rental). This total is actually lower than the total determined by a government auditor. *See* Tr. 1275:25 to 1276:5 (Test. of Sanford); DX 237 (Estimate sheet prepared by Mr. Sanford (Oct. 14, 2005)). However, $2,650 of this "rental" expense consists of the costs of operating owned equipment (2 pickup trucks charged at $50/day). PX 175a at 2. This expense (cost of ownership) is better allocated to operating costs, and will be addressed below. Therefore the court will reduce recovery for rental by $2,650 to $105,809.90.

ACE estimated the operating costs of its equipment at $73,915.22. *See* PX 175a. This amount should be increased to $76,565.22 to reflect the cost of ownership of the two owned pickup trucks. *See supra*. Of this amount, $70,839.32 was for rented equipment; $4,099 was for owned equipment (2 owned crew-cab pickup trucks), and $1,626.90 represented a pro-rated amount of insurance charged on the rented equipment. The operating cost of a piece of rented equipment covers expenses such as fuel, filters, lubrication, repairs, and minor maintenance. Tr. 925:18-19 (Test. of Wenick). Mr. Wenick reviewed ACE's calculation of equipment operating costs, which were calculated by multiplying the number of hours each piece of equipment was used during the period of March 23 to May 15, by the hourly rate for each piece of equipment. Tr. 931:7-9 (Test. of Wenick). Mr. Wenick derived the number of hours from certified payrolls, and cross-checked these data with the equipment operators that were listed on separate equipment-utilization sheets that were kept on the project. Tr. 931:17-22 (Test. of Wenick); *see* PX 175 App. Tab 7 (Dirt Claim–Equipment Operating). Mr. Wenick calculated hourly equipment operating expenses for rented equipment using a combination of the *Caterpillar Handbook* and the *DataQuest Blue Book*, two publications that are widely used in the construction industry to determine rental-equipment operating rates. Tr. 926:8 to 927:12 (Test.

[29]Mr. Wenick confirmed this labor-burden rate by contacting the accounting firm that performs the annual audit and financial statement of ACE; this firm advised that ACE's actual labor-burden rate was 44.1%. Tr. 922:25 to 923:23 (Test. of Wenick); PX 175 App. Tab 4 (Components of Labor Burden).

of Wenick). When determining hourly rental rates for each piece of rental equipment, Mr. Wenick used the lesser rate as shown by the two publications. Tr. 927:13-18; *see* PX 175 App. Tab 8 (Dirt and Cambro Claim–Equipment Operating Rates).[30] The government challenges ACE's operating costs on the basis that instead of using the *Caterpillar Handbook* or the *DataQuest Blue Book*, ACE should have used a manual published by the Corps. Tr. 1299:3 to 1301:20 (Test. of Sanford); *see Construction Equipment Ownership and Operating Expense Schedule, Region VI*, EP 1110-1-8, Volume 6 (June 1999) ("*Corps Manual*").[31] The Contract states that the cost principles and procedures in FAR part 31 and DFARS part 231 are to be applied when costs are a factor in any price adjustment under the Contract. PX 177 Section 00700 at 63 (FAR 252.243-7001). FAR 31.105, "Construction and Architect-Engineer Contracts," is applicable to this Contract.[32] Mr. Sanford stated at trial that FAR 31.105 required the use of the *Corps Manual* in calculating the hourly rates for all of ACE's equipment. FAR 31.105 defines "construction equipment as used in this section," as "equipment . . . either owned or controlled by the contractor or subcontractor at any tier, or obtained from a commercial rental source." FAR 31.105(d)(2). The pertinent portion of the regulation provides as follows:

> (I) Allowable *ownership and operating costs* shall be determined as follows:
>
> > (A) Actual cost data shall be used when such data can be determined for both ownership and operating costs for each piece of equipment, or groups of similar serial or series equipment, from the contractor's accounting records. When such costs cannot be so determined, *the contracting agency may specify the use of a particular schedule of predetermined rates* or any part thereof to determine ownership and operating costs of construction equipment (see subdivisions (d)(2)(i)(B) and (C) of this section). . . .
> >
> > (B) Predetermined schedules of construction equipment use rates (e.g., *the Construction Equipment Ownership and Operating Expense Schedule published by the U.S. Army Corps of Engineers,* industry sponsored construction

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[30]Mr. Fulkerson used only the *Caterpillar Handbook* when preparing the original dirt claim. Tr. 349:25 to 350:5 (Test. of Fulkerson).

[31]The June 1999 edition was in effect from June 30, 1999 until August 31, 2001, encompassing the March-May 2001 time period during which ACE performed the extra dirt work. Therefore, the 1999 edition should be used to determine the applicability of the *Corps Manual*.

[32]FAR 31.105 states, with respect to applicability: "This category includes all contracts and contract modifications negotiated on the basis of cost . . . for construction . . . of buildings, . . . roads, or other kinds of real property." FAR 31.105(a).

> equipment cost guides, or commercially published schedules of construction equipment use cost) provide average ownership and operating rates for construction equipment. The allowance for ownership costs should include the cost of depreciation and may include facilities capital cost of money. The allowance for operating costs may include costs for such items as fuel, filters, oil, and grease; servicing, repairs, and maintenance; and tire wear and repair. Costs of labor, mobilization, demobilization, overhead, and profit are generally not reflected in schedules, and separate consideration may be necessary.
> . . .
> (ii) Reasonable *costs of renting construction equipment* are allowable . . . .
> (A) Costs, such as maintenance and minor or running repairs incident to operating such rented equipment, that are not included in the rental rate are allowable.
> (B) Costs incident to major repair and overhaul of rental equipment are unallowable.

FAR 31.105(d)(2) (emphasis added).

It appears from FAR 31.105(d)(2)(i)-(ii) that subparagraph (i) applies to owned equipment, and subparagraph (ii) applies to rented equipment. Therefore, contrary to Mr. Sanford's assertion, the "Construction Equipment Ownership and Operating Expense Schedule" published by the Corps referenced in FAR 31.105(d)(2)(i) should *not* be applied to rented equipment. The *Corps Manual* itself states that "[t]he use of this pamphlet . . . relates *only* to equipment that is contractor-*owned*." *Corps Manual* at 1-1 (emphasis added). The court thus finds that ACE was reasonable in using the *Caterpillar Handbook* and the *DataQuest Blue Book*, two widely used reference guides, for estimating its costs of operating rental equipment. ACE may therefore recover its estimated operating costs of $70,839.32 for rented equipment. Further, ACE may also recover $1,626.90 for insurance paid on the equipment, as this is a "[c]ost[], . . . incident to operating . . . rented equipment, that [is] not included in the rental rate." *See* FAR 31.105(d)(2)(ii)(A). It appears, however, that the *Corps Manual* should be applied to determine the hourly rate with respect to the owned pickup trucks.[33] The *Corps Manual*, Table 2-1, Hourly Equipment Ownership and Operating Expense, shows that the average hourly rate for a Chevrolet 3500 4X4 pickup is $7.76.[34] *Corps Manual* at 2-160. Multiplying this hourly rate by the total

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[33]The *Corps Manual* states that "[t]his pamphlet . . . is applicable to all solicitations and contracts for construction expected to exceed . . . $100,000 when actual cost data . . . cannot be determined. *Corps Manual* at Cover Letter (June 30, 1999).

[34]This is the best estimate of the type of trucks ACE used - a 1996 Chevrolet K3500 Crew Cab and a 1998 Dodge Quad Cab. PX 175 App. Tab 8. Mr. Sanford's methodology would have

number of hours claimed for pickup usage (450 hours, *see* PX 175a), ACE may recover a total of $3,492 for the use of the owned pickups. In total, ACE's recovery for operating costs for the dirt claim is $75,958.22.

ACE seeks to recover $58,954 paid to a subcontractor for hauling the dirt from the Dan Williams site. PX 175a at 2. This amount was calculated using the invoices from Trujillo Trucking. Tr. 355:6-10 (Test. of Fulkerson), 994:13 to 996:23 (Test. of Wenick); *see* PX 175 App. Tab 11 (Trujillo Trucking Invoices & Field Purchase Orders). The government provided a different estimate for this dirt hauling, $52,184, on the basis that Mr. Sanford's review showed that some of the invoices consisted of charges for hauling trash rather than hauling dirt. Tr. 1280:6 to 1281:2 (Test. of Sanford); *see* DX 237. Mr. Sanford, however, could not identify the source he used to make this adjustment, *e.g.*, whether the information came from a contemporary document or another source. *See* Tr. 1280:22 to 1281:2. The court therefore finds the testimony by Mr. Fulkerson and Mr. Wenick more credible on this point, and the court accepts ACE's calculation of $58,954 for the cost of dirt hauling.

ACE seeks to recover $33,054 for extra surveying costs that ACE incurred from March 23 to May 15. PX 175a at 2. ACE calculated this amount based upon ACE's invoices, and this information was audited by Mr. Wenick. Tr. 959:16-22, 961:7 to 963:7 (Test. of Wenick); *see* PX 175 App. Tab 23. The government seeks to reduce this amount to $31,630 to account for a cancellation fee that is not chargeable to the government and for the fact that others were outside the pertinent period. Tr. 1281:3-19 (Test. of Sanford); *see* DX 237. The court credits the government's revisions and allows ACE recovery of $31,630 for extra surveying costs.

ACE seeks recovery of $10,866 for additional soils testing that took place from March 23 to May 15. PX 175a at 2. The government seeks to reduce this amount to $10,286 based on the facts that some of the invoices included concrete testing and that others are outside the relevant time period. Tr. 1281:20 to 1282:1 (Test. of Sanford). The court allows ACE recovery of $10,286 for additional soils testing.

The final items that ACE seeks to recover under the category of direct costs are field overhead, home-office overhead, profit, and bond cost. PX 175a at 2. Each of these items is calculated as a percentage of the total direct costs. The total amount of direct costs awarded by the court before adding these items is $365,093.44. Field overhead is described as "administrative costs to run a project, such things as [a] superintendent, quality control, vehicles associated with those people, clerical staff, [and] office supplies." Tr. 942:5-10 (Test. of Wenick). Field overhead is a generally recoverable item in the construction industry. *See M.H.*

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resulted in a lower rate than $7.76. Mr. Sanford excluded categories for tire repair, maintenance, and service, and subtracted these categories from the *Corps Manual* rates. Tr. 930:6-8 (Test. of Wenick). ACE was in fact responsible for tire repair, maintenance, and minor service. Tr. 350:6-13 (Test. of Fulkerson). Therefore, the court concludes that ACE and Cambro should be allowed to recover the full amount shown in the *Corps Manual* for their owned equipment.

McCloskey, Jr., Inc. v. United States, 66 Ct. Cl. 105 (1928) (allowing recovery for "the additional amount paid for overhead and superintendents" where the government wrongfully delayed the project).[35] ACE requests field overhead equal to approximately 8.2% of direct costs before markups. *See* PX 175a.[36] The government provided evidence of a higher rate (10%) for field overhead for the dirt claim. Tr. 1292:22 to 1293:2 (Test. of Sanford); *see* DX 237. The court awards ACE all of the field overhead it requested - equal to 8.2% of direct costs – rather than the higher amount provided by the government. The resulting addition is $29,938.97.

The next markup category, home-office overhead, includes items such as salary of officers and home-office expenses. Tr. 944:25 to 945:5 (Test. of Wenick). This category of cost is recoverable. *See Luria Bros. & Co. v. United States*, 369 F.2d 701, 709-10 (Ct. Cl. 1966) (citing *J. D. Hedin Constr. Co. v. United States*, 347 F.2d 235 (Ct. Cl. 1965); *F. H. McGraw*, 130 F. Supp. 394; *Fred R. Comb Co. v. United States*, 103 Ct. Cl. 174 (1945)) ("Home office overhead is a well-recognized item of damage for delay and plaintiff would be entitled to recover it."). ACE has accepted the government's suggested home-office overhead rate of 5.8% of pre-markup direct costs plus field overhead. Tr. 945:11-15 (Test. of Wenick), 1044:7-19 (Test. of Storey); *see* PX 175a at 2; DX 237. Because the percentage and methodology are undisputed, the court awards ACE 5.8% of $395,048.41, or $22,912.81.

ACE seeks a markup of 10% for profit (10% multiplied by direct costs plus field and home-office overheads). PX 175a at 2. A "rate of profit included in an equitable adjustment should fairly reflect the nature of the work and the risks involved." *Cibinic & Nash* 754. Although a 10% rate is often treated as standard, *id.*, where a modification is of relatively small dollar value and contains basically the same mix of work as the basic contract, many agencies apply the profit rate that pertains to the basic contract. *Id*. at 754-55. Mr. Wenick testified that 10% is both a fairly standard profit rate and also the profit rate used by the Corps to markup other contract modifications on this project. Tr. 945:18-23. The government contends that the profit rate should be 8.28% of direct costs plus field and home-office overheads. *See* DX 237. Mr. Storey, who performed an audit of the dirt claim for the Corps, was reluctant to opine as to a reasonable profit rate, although he did state that some of the early amendments to the contract incorporated a 10% profit but other amendments incorporated profit rates as low as 5%. Tr. 1046:3 to 1047:8. The government does not adequately explain how it derived its suggested 8.28% profit rate. Furthermore, it appears that a 5% profit rate was used on modifications where subcontracted work was involved, but a 10% rate was used on modifications that did not involve subcontracted work. Tr. 1061:5 to 1063:6 (Test. of Storey). Because the extra dirt work was not

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[35]In this instance, the allowance for field overhead reflects extra work performed by ACE and the need for field supervision of that extra work. Thus, the *Eichleay* formula applicable to unabsorbed overhead during delays is not pertinent to this case. *Cf. Interstate Gen. Gov't Contractors, Inc. v. West*, 12 F.3d 1053, 1056-57 (Fed. Cir. 1993).

[36]Mr. Wenick expressed this amount as a "per diem" amount of $584.90, or a total of $30,999.70. Tr. 943:3-14.

based on subcontracted work and was of the same nature as the other work ACE was performing under the contract, the court will award a profit rate of 10% of direct costs plus field and home-office overheads (10% of $417,961.22), a total of $41,796.12.

The final markup item ACE seeks to recover is "bond costs", which represents a percentage of bond premium that is a typical markup on an item of extra construction work. ACE seeks to recover bond costs of 0.84% of direct field costs plus field and home-office overheads and profit. Tr. 945:24 to 946:7 (Test. of Wenick); PX 175a at 2. Under FAR part 31, "[c]osts of bonding required pursuant to the terms of the contract are allowable," FAR 31.205-4(b), and the government does not dispute the allowability of bond costs as an item of recovery. Mr. Wenick claimed that the 0.84% rate was taken from information ACE submitted when billing the bond costs to the Corps. Tr. 946:4-7. The government seeks to reduce this amount to 0.65% multiplied by the same base suggested by ACE. Tr. 1044:20 to 1046:1 (Test. of Storey); *see* PX 143 at 22; DX 237. Mr. Storey testified that his calculations, based on actual invoices, indicate that 0.65% is the appropriate bond rate, Tr. 1045:3-10, and the Corps' audit of the dirt claim stated that the Corps auditors verified the 0.65% rate with the bonding insurance agent. PX 143 at 22. The court accepts the government's contentions and awards ACE a bond premium of 0.65% multiplied by direct field costs plus field and home office overheads and profit (0.65% of $459,757.19), a total of $2,988.42.

In sum, the court awards ACE a total of $462,745.76 in direct costs on the differing site condition claim.

b. *Constructive acceleration.*

In addition to the direct costs, ACE also claims that because the Corps would not give ACE a time extension for the dirt claim, ACE was forced to work extended overtime due to the threat of liquidated damages assessments. Tr. 345:20 to 346:7 (Test of Fulkerson). ACE claims a total of $16,292.00 in constructive acceleration costs. PX 175a at 1. ACE calculated these extra overtime costs by reviewing its certified payrolls on a week-by-week basis and capturing the overtime hours that were either worked on Saturdays or that were in excess of 50 hours a week (or in excess of a full work week where there was a holiday-shortened week). Tr. 355:19 to 356:7 (Test of Fulkerson). The claimed amount is comprised of $13,637 of direct overtime costs, plus markups for field and home-office overhead, profit, and bond cost. *See* PX 175 App. Tabs 14 (detailed overtime analysis), 15 (constructive acceleration summary sheet). Mr. Wenick reviewed these costs and found them to be reasonable and compensable. Tr. 947:17 to 950:16; *see* PX 175 App. Tabs 14-15. Mr. Wenick noted that the constructive-acceleration claim assumes that all of the additional overtime came as a result of the differing site condition, not as a result of defective specifications or the profilograph requirement. Tr. 999:8-21. The government's auditors, Mr. Storey and Mr. Sanford, apparently did not address the constructive-acceleration calculation. *See* PX 143; DX 237.

Constructive acceleration is recognized as a form of constructive change. *See Cibinic & Nash* 450. Compensable acceleration occurs when the government orders the work to proceed faster in an attempt to complete performance earlier than otherwise expected. *Id*. A constructive acceleration is commonly found to exist where the government requires a contractor to meet the original delivery schedule in spite of excusable delays on the part of the contractor. *Id*. Five requirements have been applied to support a finding of constructive acceleration: (1) excusable delay; (2) knowledge by the government of the delay; (3) a statement or act of the government that can be construed as an acceleration order; (4) notice by the contractor that the order is a constructive change (causation); and (5) incurrence of additional costs as a result of the acceleration. *Id*. at 451.

This is not a case of delay but rather one in which extra work was required to address a differing site condition. The same criteria should apply, with the substitution of extra work for excusable delay. The Corps was on notice of the differing site condition no later than March 2, 2001. *See supra*, at 7. With regard to whether the Corps gave an "order" to accelerate, it appears that ACE and the Corps discussed the possibility of a time extension for the dirt claim at the time the site-elevation problem was discovered, but the Corps never granted such an extension. Tr. 321:24 to 322:25 (Test. of Fulkerson). Instead, the Corps indicated that ACE would need to file a claim for equitable adjustment and face the possibility of liquidated damages. *Id*. Additionally, the Corps' Mr. Wise, during the meeting of March 22, 2001, indicated that the project was not to stop as a result of the dirt shortfall and ordered ACE to begin widening the ditches and importing fill from the Dan Williams site. *See supra*, at 7. In a case with facts similar to those in the case at hand, the Court of Claims found such a refusal to grant an extension plus the threat of liquidated damages to constitute an acceleration order. *See Norair Eng'g Corp. v. United States*, 666 F.2d 546 (Ct. Cl. 1981). In *Norair*, the government's resident engineer sent a letter to the contractor requesting that the contractor "take positive action to expedite the work by supplying the job with all materials necessary to accelerate progress." *Id*. at 549. The government "on later occasions insisted on increases in work force and materials to speed up work," and there "was also considerable pressure applied to open the building [being constructed] as quickly as possible." *Id*. The Court stated:

> [P]ressure applied, even if it were merely implicit . . ., is particularly strong where liquidated damages hover in the background. Where the Government refuses (for whatever reason) to tell the contractor until the end of the project just what delay is excusable and what is not, the contractor is under considerable additional pressure to accede to a request because it does not know whether it will be found liable for liquidated damages. . . . In short, while the Government recognized that some delays were validly excusable, it did not say which, and left it very clear that it disagreed with plaintiff as to the amount; therefore, plaintiff could have been required to accelerate work beyond what it thought was

> the proper rate (allowing for excusable delays) to avoid the risk of liquidated damages.

Id. Here, although the Corps did not issue written warnings of the kind issued in *Norair*, it continued to insist on the completion date of December 21, 2001, and in fact assessed liquidated damages against ACE from that date. The court finds that the Corps' refusal to grant an extension while keeping the original deadlines in place effectively constituted an order for constructive acceleration. ACE has demonstrated that it understood the Corps' actions in that manner, as evidenced by the fact that ACE began working more overtime after the differing site condition was discovered. Additionally, ACE represented throughout the project that it was approximately 60 days behind schedule as a result of the low site elevation. *See* PX 100 (Letter from Fulkerson to Wise (Sept. 27, 2001)). Finally, ACE has provided reasonable proof that it incurred additional costs as a result of the constructive acceleration, in the form of increased overtime payments. The court finds that ACE has met all of the criteria for constructive acceleration. Regarding the quantum of ACE's recovery, the court awards ACE compensation for the actual overtime paid, $13,637. Additionally, because this overtime constituted an extension of the work that ACE was already performing on the project, it is reasonable for ACE to recover field and home-office overhead, profit, and bond expense at the same rates awarded for the costs of additional grading. Adding field overhead of 8.2%, home-office overhead of 5.8%, profit of 10%, and bond expenses of 0.65%, results in a total recovery of $17,283.76 for ACE's constructive-acceleration claim.

c. *Reduced productivity.*

The final category of recovery ACE seeks as a result of the differing site condition is reduced productivity. ACE claims that the productivity of its workers was adversely affected by the fact that they were required to work the additional overtime that resulted from the differing site condition. *See* Tr. 346:8-25 (Test. of Fulkerson). To estimate the loss of productivity, ACE relied upon a study published by the Business Roundtable that purports to show the reduction in productivity that results from long-term scheduled overtime on construction projects. *See* PX 176 at 175380-81 (Figs. 4 & 5 from The Business Roundtable, *Scheduled Overtime Effect on Construction Projects, Report C-2* (November 1980)). The study includes examples that calculate the productivity rate that results from working a 50-hour week vs. a 40-hour week, as well as the productivity rate that results from working a 60-hour week vs. a 40-hour week, both as a percentage of productivity that results from working a 40-hour week. *Id*. Mr. Fulkerson stated that he "interpolated" between the 50-hour and 60-hour productivity figures to arrive at an estimated productivity rate that results from working a 58-hour week vs. a 50-hour work week. Tr. 359:19 to 360:4 (Test. of Fulkerson); *see* PX 176 at 175382. It appears that Mr. Fulkerson took the weighted average productivity rate between the 50-hour week and the 60-hour week to determine the hypothetical productivity rate for the 58-hour week, *i.e.*, 0.8 (60-hour rate) + 0.2 (50-hour rate). He then compared the 58-hour week to the 50-hour week to determine the "marginal" productivity loss between the 58-hour week and the 50-hour week. *See* PX 176 at 175382. Having calculated this productivity loss, Mr. Fulkerson multiplied the 58-hour

productivity rate by the number of "straight time" hours worked during overtime weeks to determine the number of "lost" straight time hours, and then multiplied the number of lost hours by the wage rate of the employees to determine the total productivity loss. Tr. 360:12 to 361:12 (Test. of Fulkerson); PX 176 at 175385.[37] ACE's calculations resulted in reduced labor productivity costs of $12,561.23, to which ACE added a 40% labor burden to arrive at a total labor reduced productivity of $17,585.73. PX 175 App. Tab 16 (Labor Cost Due to Reduced Productivity). ACE also appears to have applied the reduced productivity calculations to its equipment. ACE calculated the number of "lost" hours of equipment for each type of equipment and multiplied the lost hours by the hourly operating cost of that type of equipment. The total loss of productivity for equipment was $10,809. ACE also claimed a loss of productivity on its water supply, calculating a total productivity loss of $1,271. PX 175 App. Tab 17. Adding these together, ACE requests recompense for a total direct productivity loss of $29,665.73. On top of this amount, ACE requests markups for field (1.8%) and home-office (5.8%) overhead, profit (10%), and bond cost (0.84%). PX 175 App. Tab 18.

"A contractor may recover for loss of efficiency if it can establish both that a loss of efficiency has resulted in increased costs and that the loss was caused [by the government]." *Cibinic and Nash* 745. "That loss of productivity of *labor* resulting from improper delays caused by defendant is an item of damage for which plaintiff is entitled to recover admits of no doubt." *Luria Bros*., 369 F.2d at 712 (citing *Abbett Elec. Corp. v. United States*, 162 F. Supp. 772 (Ct. Cl. 1958)) (emphasis added). Extended work schedules have been recognized as a cause of productivity loss. *See Maryland Sanitary Mfg. Corp. v. United States*, 119 Ct. Cl. 100 (1951) (recognizing that efficiency would be impaired by working 12-hour days and seven-day weeks); *Appeal of Casson Constr. Co.*, GSBCA No. 4884, 83-1 BCA ¶ 16523, 1983 WL 13526 (GSA 1983) (stating that continual work on an overtime or premium basis results in inefficient expenditures of direct labor, and awarding "a fair and reasonable approximation of the direct labor inefficiency loss appellant actually experienced [of] seven percent of total direct labor costs."). ACE has established that its workers were required to work extended overtime as a result of the differing site condition, and presented uncontroverted evidence that such overtime resulted in reduced productivity of labor. Therefore, the court will allow recovery for loss of labor productivity if ACE's evidence on quantum of damages proves to be credible. The court will not, however, allow recovery for lost productivity on ACE's equipment or its water supply. Productivity as measured in the Business Roundtable Report focuses on output per hour of labor; it does not address concomitant impacts on equipment. Furthermore, while ACE presented testimony at trial regarding lost productivity of its workers, ACE did not present evidence to show that the reduced productivity of its workers resulted in reduced output of its equipment apart from the labor. ACE has thus not met its burden of proof regarding an incremental addition to equipment operating expense or water-supply costs.

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[37]Mr. Fulkerson testified that he measured loss of productivity on the normal 50-hour week ("straight time") rather than the total 58 hours to avoid "double-counting" the overtime, which ACE seeks to recover under the constructive-acceleration claim. Tr. 360:5-11.

Having found that reduced productivity of labor is recoverable, the court must now quantify that loss. Productivity is, by its very nature, difficult to measure or quantify. The impossibility of proving the amount of loss of productivity with exactitude does not bar recovery for the loss. *Luria Bros*., 369 F.2d at 712 (citing *Needles v. United States*, 101 Ct. Cl. 535, 618 (1944)). A plaintiff need not prove loss of productivity "by books and records; almost always it has to be proven by the opinions of expert witnesses." *Luria Bros*., 369 F.2d at 712. "However, the mere expression of an estimate as to the amount of productivity loss by an expert witness with nothing to support it will not establish the fundamental fact of resultant injury nor provide a sufficient basis for making a reasonably correct approximation of damages." *Id.* (citing *Wunderlich Contracting*, 351 F.2d at 968). In the case at hand, ACE has relied upon the Business Roundtable Report on reduced productivity and that Report appears to be both credible and relevant. The court finds no errors in ACE's interpolation of the data in the Business Roundtable Report to apply those data to ACE's actual circumstances. The court therefore awards ACE its projected lost productivity of labor, $12,561.23. In addition to this amount, the court also awards the appropriate labor-burden rate of 31.8%. *See supra,* at 28. Finally, the court deems it appropriate to award markups for field and home-office overhead, profit, and bond cost, as this loss of productivity was equivalent to an increase in construction costs for ACE. *See Casson Constr.,* 1983 WL 13526 (allowing recovery of overhead, as well as profit at ten percent of total costs, on the lost productivity award pursuant to an Equitable Adjustment clause). Adding field overhead of 8.2%, home-office overhead of 5.8%, profit of 10%, and bond expenses of 0.65% results in a total recovery of $20,982.97 on ACE's lost-productivity claim.

d. *Synopsis of ACE's recovery for the differing-site-condition claim.*

The court awards $462,745.76 in direct costs, $17,283.76 for constructive acceleration, and $20,982.97 for lost labor productivity. This results in a total recovery of $501,012.49 for ACE's differing-site-condition claim, *i.e.*, the "dirt claim."

C. Defective-Specifications and Constructive-Changes Claims

ACE avers that the difficulties and delays it experienced in grading the subgrade and drainage level in preparation for Cambro's paving, as well as the difficulties and delays that Cambro itself experienced in its paving operations, were primarily due to defective specifications in the Contract. ACE claims that Cambro's performance was also significantly hampered by the Corps' application of profilograph testing, which ACE claims was optional but which the Corps treated as mandatory. *See* Pl.'s Post-Tr. Br. at 17-29. ACE seeks to recover the excess costs that it allegedly incurred as a result of the delays caused by the defective specifications and the required profilograph testing. ACE also seeks to recover on behalf of Cambro the additional costs that Cambro allegedly incurred as a result of the defective specifications and the profilograph testing. Additionally, ACE seeks to recover a standard markup on the Cambro pass-through claim. The government claims that ACE relied on some but not all of the specifications in the Contract documents, and that to the extent ACE did rely on specifications its interpretation was unreasonable. As a result, the government asserts that ACE cannot recover anything based

on the alleged defective specifications. Def.'s Post-Tr. Br. at 24-30; Def.'s Post-Tr. Reply at 13-20. The government additionally avers that the profilograph testing was mandatory and therefore ACE and Cambro may not recover excess costs incurred as a result of profilograph testing. Def.'s Post-Tr. Br. at 28-30. Finally, the government implies that even if it is liable for defective specifications and constructive changes, ACE cannot recover on behalf of its subcontractor, Cambro. Def.'s Mem. and Contentions of Fact and Law at 10-11. The court first addresses the defective-specifications claim, then turns to an analysis of the profilograph claim within the analytical framework of a constructive change. The court thereafter examines the propriety of a pass-through claim. The court lastly analyzes the quantum of an equitable adjustment, including the availability of a markup for ACE on the Cambro pass-through claim.

1. *Liability for defective specifications.*

"When the government provides a contractor with defective specifications, the government is deemed to have breached the implied warranty that satisfactory contract performance will result from adherence to the specifications, and the contractor is entitled to recover all of the costs proximately flowing from the breach." *Essex Electro Engineers, Inc. v. Danzig*, 224 F.3d 1283, 1289 (Fed. Cir. 2000) (citing *United States v. Spearin*, 248 U.S. 132, 136 (1918); *USA Petroleum Corp. v. United States*, 821 F.2d 622, 624 (Fed. Cir. 1987); *Ordnance Research, Inc. v. United States*, 609 F.2d 462, 479-80 (Ct. Cl. 1979)). "The compensable costs include those attributable to any period of delay that results from the defective specifications." *Essex Electro*, 224 F.3d at 1289 (citing *La Crosse Garment Mfg. Co. v. United States*, 432 F.2d 1377, 1385 (Ct. Cl. 1970)). "Unlike some situations in which the government has a reasonable time to make changes before it becomes liable for delay, 'all delay[s] due to defective or erroneous Government specifications are *per se* unreasonable and hence compensable.'" *Essex Electro*, 224 F.3d at 1289 (quoting *Chaney & James Constr. Co. v. United States*, 421 F.2d 728, 732 (Ct. Cl. 1970) and citing *Daly Constr., Inc. v. Garrett*, 5 F.3d 520, 522 (Fed. Cir. 1993)).

In the case at hand, ACE alleges two related categories of defective specifications. The first category of alleged defective specifications relates to the fact that the Contract explicitly allowed the contractor to select between a slip-form and a fixed-form type of paver, while the plans and specifications were specifically designed only for a slip-form paver. *See* Pl.'s Post-Tr. Br. at 20-25. The second category relates to the contours and elevations shown on the plan documents, which prevented a contractor from determining prior to bidding the actual shape of the structure to be constructed. *See* Pl.'s Post-Tr. Br. at 17-19; Pl.'s Post-Tr. Reply Br. at 20-22.

For a number of reasons, the approved paving methods in the Contract did not comport with the design requirements. The Solicitation and Contract explicitly authorized a contractor to used a fixed-form paver. *See supra*, at 5. The Corps, after rejecting one paving machine proposed by Cambro, ultimately approved the fixed-form paver that Cambro used on the project. Tr. 388:16 to 389:5 (Test. of Fulkerson), 785:10 to 786:7 (Test. of Camilli). Despite the fact that a fixed-form paver was permitted and approved, the evidence indicates that the project was designed to be completed with a slip-form paver. Crawford Murphy's Mr. Herrin, the principal

designer of the project, stated that even though the plan documents did not explicitly denote a preference for slip-form paving, "I did not envision that there would be [] form work on this project." Tr. 447:23 to 448:9. Two major aspects of the design and project specifications were inconsistent with fixed-form paving methods. First, the Solicitation and Contract required the use of maximum 2-inch slump concrete. *See* PX 177 (Contract) Section 02753 ¶ 2.10.1. The Corps strictly enforced this 2-inch slump requirement, and concrete that was greater than 2-inch slump was rejected. Tr. 391:2-25 (Test. of Fulkerson). As noted *supra*, at 9-10, Cambro experienced significant problems using its fixed-form paver in conjunction with 2-inch slump concrete. An inquiry to the manufacturer of the paver by ACE and Cambro disclosed that the paver should be used with concrete with at least a 3-inch slump; the 2-inch slump concrete would be appropriate for use with a slip-form paver. Tr. 394:10-13, 395:12 to 396:1 (Test. of Fulkerson), 789:5-18 (Test. of Camilli). After discovering this discrepancy, ACE and Cambro attempted to provide a solution by submitting a request to the Corps to change the concrete specifications to a slump of 76 millimeters (approximately a 3-inch slump). PX 112 (change request (Oct. 23, 2001)); Tr. 789:21 to 791:2 (Test. of Camilli). The Corps rejected this requested change on January 3, 2002. PX 112; Tr. 746:3-23 (Test. of Fulkerson), 792:5-11 (Test. of Camilli).

Second, the direction of the paving lanes, when combined with the direction of the gradient changes, is consistent only with slip-form paving. As described *supra*, at 8-9, the paving lanes on the loading apron were specified to be poured in a north-south orientation. At the same time, the final staking points provided to ACE after contract award resulted in continued gradient changes when considered in a north-south direction, *i.e.*, the grade varied from one panel to the next in a north-south direction. Use of a fixed-form paver paving north-south lanes resulted in the problems Cambro experienced with the forms "overshooting" grade breaks, which required constant hand manipulation of the forms to meet the grade breaks. *See supra*, at 9. The constantly changing gradients also caused the problems Cambro experienced with the paver "rocking" and falling off the rails as it passed over the grade breaks. *Id*. Mr. Herrin testified that ACE could have avoided the constant gradient changes by paving the loading apron in an east-west rather than north-south direction, and that a contractor that planned to use a fixed-form paver should have paved east-west lanes. Tr. 443:17-22. However, Mr. Herrin emphasized that a contractor examining the plans would recognize that the paving was designed to take place north-south because the "contract drawings show that the longitudinal joints have dowel bars in them, and the longitudinal joints are shown as being north to south." Tr. 444:20 to 445:12. Other witnesses who were asked about paving the project in the opposite direction than shown in the plans indicated that this would not have been a reasonable course of action. Tr. 732:24 to 733:19 (Test. of Fulkerson), 772:19 to 773:24 (Test. of Camilli), 1256:23 to 1257:20 (Test. of Fuentes). Furthermore, if a contractor were to pave the project in a direction other than that indicated in the plans, it would likely have to seek approval from the Corps to do so, and the plans would have to be redesigned. *See* Tr. 732:24 to 733:6 (Test. of Fulkerson). In short, as Mr. Herrin testified, "[t]he contract drawings were set up to assume the contractor would slipform the paving from north to south." Tr. 444:5-8.

The government contends that ACE and Cambro could have avoided many of the difficulties encountered with use of a fixed-form paver by acquiring forms that were the exact length of the concrete pads on the loading apron, 5.75 meters. *See* Tr. 669:11-17 (Fulkerson Cross-Examination), 825:22-24 (Camilli Cross-Examination), 1242:5 to 1243:17 (Fuentes Direct Examination). The court does not credit this postulate. First, the government employs hindsight that was not available to ACE and Cambro when they were bidding the job and doing the work. Based upon the plans available to ACE during the Solicitation, ACE would not be expected to foresee that grade breaks would occur at every panel point. Second, as with the loading apron, the pallet storage area also appears to have required constantly changing gradients in a north-south orientation. *See* PX 178 Seq. No 52. Third, Mr. Camilli of Cambro testified that 5.75-meter forms would have been too heavy for his work crew to manipulate by hand, as was required at the project site. Tr. 774:3 to 775:15, 778:3-13 (Test. of Camilli). Finally, Mr. Camilli testified that while use of 5.75-meter forms might have helped ACE and Cambro avoid some of the dirt re-work that was required to compensate for the fact that the forms were "overshooting" the grades, this still would not have alleviated the problems the paver itself encountered when passing over the grade breaks. Tr. 778:14 to 781:22. In short, the court finds that the forms used by Cambro could not overcome the design flaws inherent in the project specifications. The fact that the Corps designed the project for a slip-form paver while simultaneously approving the use of a fixed-form paver constituted a defective design specification that is compensable. *See Essex Electro*, 224 F.3d at 1289.

The second category of defective specifications alleged by ACE relates to the contours and elevations shown in the plan documents. ACE claims that with the information provided during the solicitation process it was unable to identify pre-bid the variable slopes that it encountered when completing the project. As noted *supra*, at 5, the plans provided with the solicitation provided some, but not all, of the staking point elevations. *See* PX 178 Seq. Nos. 49-52. Importantly, the staking plans for the apron area showed staking points only for every other north-south lane. *See* PX 178 Seq. Nos. 51-52. Similarly, the staking plans for the pallet pad showed staking points only for every other east-west lane. *See* PX 178 Seq. No. 52. Given that nearly half of the staking points were not made available, the data provided with the plans did not enable bidders to determine directly the constancy of the gradients on the loading apron and the pallet pad. A note provided with the plans stated that the missing panel points would be provided to the successful offeror after the contract was awarded. PX 179 (Amended Plans) Seq. No. 49, Note 3 ("Plan elevations at the joint pattern grid lines intersections will be provided by the government as supplemental elevations after award."). The apparent rationale for omitting some of the panel points was that although Mr. Herrin and the Corps had the information available, the bid process would have been delayed by several weeks for the Corps to amend the drawings and provide these to the bidders. Tr. 287:12-19 (Test. of Fulkerson), 485:6 to 486:17 (Test. of Herrin).

The Solicitation provided additional information regarding finished grades in a schematic showing "typical" cross-sections of the loading apron from both a north-south and east-west orientation. PX 178 Seq. No. 60. This schematic indicated a constant gradient of 1% in both a

north-south and east-west orientation on the concrete portion of the apron, starting from a high point near the center of the apron and declining in elevation towards each edge. *Id.* A similar schematic for the pallet storage area showed a constant gradient of 1% in the east-west direction and 0.5% in the north-south direction. PX 178 Seq. No. 61. Mr. Fulkerson testified that ACE relied on these schematics when preparing its bid on the project, stating that these drawings did not indicate that the grades would change from one panel to the next in either direction. Tr. 277:17 to 279:5. Similarly, the project engineer, Mr. Herrin, also stated that "[t]he sheets on page 60 do not show the vertical curve going through the project site. And there is a [vertical curve on 51 and 52]." Tr. 457:3-25 (Test. of Herrin).[38] Mr. Fulkerson stated that the structure indicated by the schematic on PX 178 Sequence Number 60 would be a relatively simple pyramidal shape, Tr. 278:22 to 279:5, as contrasted to the actual "geodesic" shape that was ultimately indicated by the final staking points provided post-award.

The court finds that the information provided by the plan documents was not sufficient to indicate the constantly varying grade breaks to a reasonable contractor. Two of the government's witnesses, Mr. Wise and Mr. Herrin, testified that one could have used an "interpolation" process to calculate the missing staking points, and that engineers and experienced surveyors would have the skills to interpolate from the available points. Tr. 457:17 to 458:1, 460:9 to 461:7 (Test. of Herrin), 1178:21 to 1181:8 (Test. of Wise). The court accepts that an engineer or experienced surveyor could have interpolated the panel points on PX 178 Sequence Nos. 49-52 to derive a vertical curve or constantly changing gradient. However, as Mr. Fulkerson testified, a contractor that is making a bid on a project typically is not expected to make such calculations. He indicated that staking point diagrams are "drawings that are provided to the surveyors so they can lay the job out[, not] drawing[s] that a contractor would use in his bid preparation." Tr. 286:16 to 287:11 (Test. of Fulkerson). Such staking points are not "routinely provided in . . . bidding documents." *Id*. The plan documents provided during the solicitation process support Mr. Fulkerson's testimony. The plans specifically stated that the Corps would provide missing elevations after contract award. PX 179 Seq. No. 49, Note 3. The inclusion of this language indicates that a reasonable contractor would not be expected to perform the interpolations prior to placing a bid. The Corps made a conscious decision to issue the missing staking points after contract award to avoid delaying the bidding process. PX 178 Sequence Numbers 60-61 also explicitly set out constant gradients for the loading apron and pallet storage area in both directions.[39] The government may not now shift the responsibility to the contractor for these failures by the Corps. Thus, it may not avoid liability for its own omissions and errors. ACE

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[38]"Vertical curve" is the term Mr. Herrin used to describe constantly changing gradients. *See, e.g.*, Tr. 442:22 to 443:8 (Test. of Herrin).

[39]*Compare* the "Typical North-South Ammo Hot-Load Apron Section," *with* the diagram entitled "Ammo Hot-Load Apron Pallet Storage Area Connector" on PX 178 Seq. No. 60. The diagram for the pallet-pad connector (between the pallet pad and the apron) specifically states that the gradient is "1.5% And Varies", while that for the apron carries no indication that the gradient varies.

was reasonable in relying primarily upon the "typical section" shown in PX 178 Sequence Number 60, which did not allow ACE to anticipate the constantly changing grade breaks that were encountered after ACE began performance. *See* Tr. 277:9 to 279:5 (Test. of Fulkerson). The court finds that the failure to provide all of the staking points pre-bid, as well as the erroneous and misleading information provided in the cross-section diagrams of the loading apron and pallet pad, taken together with the explicit approval for use of a fixed-form paver, constituted defective design specifications that are compensable. *See Essex Electro*, 224 F.3d at 1289.

2. *Liability for a constructive change (profilograph testing).*

The Corps required that Cambro use profilograph testing to evaluate the smoothness of its concrete on the pallet pad, loading apron, and taxiway. *See supra*, at 10. The Corps initially refused to pay Cambro for concrete work that did not pass the profilograph testing. *Id*. Eventually the profilograph testing was waived for payment purposes, but profilograph testing was retained to determine areas of pavement that ACE and Cambro would be required to grind to achieve adequate smoothness. *Id*. ACE claims that profilograph testing was not required by the Contract and that it had not budgeted for profilograph testing when bidding on the Ammo Hot-Load project. As a result, ACE claims the Corps imposed an additional testing requirement upon ACE and Cambro that was not required in the Contract, and the Corps should compensate ACE and Cambro for the costs this extra requirement imposed upon ACE and Cambro in performing the Contract. Pl.'s Post-Tr. Br. at 25-27. The government responds that the profilograph testing was required by the Contract. Def.'s Post-Tr. Br. at 28-30.

The dispute over profilograph testing can be analyzed within the framework of "constructive changes." "'A constructive change generally arises where the Government, without more, expressly or impliedly orders the contractor to perform work that is not specified in the contract documents.'" *SIPCO Servs. & Marine v. United States*, 41 Fed. Cl. 196, 222 (1998) (quoting *Lathan Co. v. United States*, 20 Cl. Ct. 122, 128 (1990), and citing *Chris Berg, Inc. v. United States*, 455 F.2d 1037, 1050 (Ct. Cl. 1972)).

ACE has established that Cambro and it were required to use profilograph testing during the paving portion of the project, originally as a prerequisite to receiving payment. Tr. 835:1 to 836:4 (Test. of Camilli) (explaining that Corps employees told Cambro not to expect payment because concrete pavement was not passing profilograph testing). Later, profilograph testing was omitted as a precondition for payment purposes on the pallet pad and loading apron, but such testing still was used to determine areas that required grinding, milling, or additional work. *See* PX 126 (RFP-0005, Letter from Wise to ACE (Feb. 5, 2002)). Profilograph testing for payment purposes was never removed for the taxiway portion of the concrete work. *Id*.

Whether the work was "outside the scope of the contract," *SIPCO*, 41 Fed. Cl. at 223, requires a careful analysis of the Contract language. The Contract mandated testing for smoothness and addressed two methods for such testing. The Solicitation stated that "[t]he

Contractor *shall* furnish and maintain . . . one 4 m straightedge," PX 177 (Contract) Section 02753 ¶ 1.11.9 (emphasis added), but it provided that "[t]he Contractor *may* furnish a 7.6m profilograph for testing the finished pavement surface." PX 177 Section 02753 ¶ 1.11.10 (emphasis added). An additional reference to smoothness testing in the Contract stated that "[t]he Contractor shall use one of the following methods [straightedge or profilograph] to test . . . surface smoothness of the pavement." PX 177 Section 02753 ¶ 1.3.7. Later in that same paragraph, the Solicitation provided that "[t]he profilograph method shall be used for all longitudinal and transverse testing, except where the runs would be less than 60 m in length and at the ends . . . . Where drawings show required deviations from a plane surface (crowns . . . , etc.), the surface shall be finished to meet the approval of the Contracting Officer." *Id*. Mr. Fulkerson testified that ACE interpreted this language as stating that if the contractor believes profilograph testing is appropriate, then it should be used in those circumstances described in the Contract. Tr. 413:22 to 414:18. As Mr. Fulkerson put it, "[ACE] didn't see anything on this project that would indicate that a profilograph was appropriate or should be used. It said [ACE] may use it, and because the grades, even on the taxiway, go up and down, it's not the appropriate test." Tr. 416:11-15.

The key to addressing these contractual provisions is the distinction between the terms "shall" and "may" as they are used in Section 02753 ¶ 1.11.9 of the Contract. The Contract stated that the contractor "shall" furnish a straightedge but merely stated that the contractor "may" furnish a profilograph. The court honors this distinction, and finds that profilograph testing was not required by the Contract. *See* Tr. 490:18 to 492:7 (Test. of Herrin) (Mr. Herrin was the drafter of the relevant portions of the Solicitation and acknowledged the distinction between the terms "shall" and "may"). In addition, the Corps eventually made an internal determination that profilograph testing was inappropriate for the loading apron and the pallet pad because of the "dome shape", as well as for those parts of the taxiway "where the slope changes." PX 125 (E-mail exchange between Wise and Fuentes (Feb. 5, 2002)). The Corps' elimination of the profilograph test for the loading apron and pallet pad is an indication that profilograph testing was neither applicable nor appropriate for this project.[40]

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[40]The government contends that the different language regarding profilograph testing in Paragraphs 1.3.7 and 1.11.3 of Section 02753 of the Contract created a patent ambiguity, which required ACE to inquire of the Contracting Officer as to the true meaning of the contract term before submitting its bid. *See* Def.'s Post-Tr. Br. at 29. Assuming, *arguendo*, that an ambiguity existed in the Contract, the government misapplies the standards that apply to ambiguous contract terms. Unless the nondrafting party knew or should have known of an ambiguity (*i.e.*, the ambiguity was patent), the risk of ambiguities in contract language is generally allocated to the drafting party. *See B. B. Andersen Constr. Co., Inc. v. United States*, 1 Cl. Ct. 169, 172 (1983) (citing *WPC Enters., Inc. v. United States*, 323 F.2d 874 (Ct. Cl. 1963)); *see also Restatement (Second) of Contracts* § 206. "A patent ambiguity is one that is 'obvious, gross, [or] glaring, so that plaintiff contractor had a duty to inquire about it at the start.'" *NVT Technologies, Inc. v. United States*, 370 F.3d 1153, 1162 (Fed. Cir. 2004) (quoting *H & M Moving, Inc. v. United States*, 499 F.2d 660, 671 (Ct. Cl. 1974)). Here, the apparently conflicting

In addition to finding that profilograph testing was not required by the Contract, to find a constructive change the court must also determine that "'the [g]overnment . . . directed the contractor to perform the additional work.'" *SIPCO*, 41 Fed. Cl. at 223 (quoting *Calfon Constr. Inc. v. United States*, 18 Cl. Ct. 426, 434 (1989) and citing *Singer Co. v. United States*, 568 F.2d 695, 701 (Ct. Cl. 1977)). Furthermore, "[t]he work may not have been volunteered" by the contractor. *SIPCO*, 41 Fed. Cl. at 223 (citing *Calfon Constr., Inc. v. United States*, 17 Cl. Ct. 171, 177 (1989); *Len Co. & Assocs. v. United States,* 385 F.2d 438, 443 (Cl. Ct. 1967)). In the case at hand, the Corps imposed the profilograph requirements on ACE and Cambro. That ACE and Cambro did not volunteer to perform the profilograph testing is shown by the fact that ACE did not envision that profilograph testing would be required and did not make provision for profilograph testing in its bid. Tr. 408:9-11 (Test. of Fulkerson).

The court finds that the Corps' imposition of a requirement for profilograph testing constitutes a compensable constructive change.

3. *Allowability of the Cambro pass-through claim.*

The government contends that ACE should be barred from recovering damages on behalf of its subcontractor, Cambro. The issue of recovery by a prime contractor on behalf of a subcontractor was addressed in *E.R. Mitchell Constr. Co. v. Danzig*, 175 F.3d 1369 (Fed. Cir. 1999), where the Court of Appeals considered the exception to the privity-of-contract doctrine, which allows "a prime contractor in certain circumstances to sue the government on behalf of its subcontractor, in the nature of a pass-through suit, for costs incurred by the subcontractor." 175 F.3d at 1370 (citing *Erickson Air Crane Co. of Wash. v. United States*, 731 F.2d 810, 813 (Fed. Cir. 1984). This exception is commonly referred to as the *Severin* doctrine. *See Severin v. United States*, 99 Ct. Cl. 435 (1943), *cert denied*, 322 U.S. 733 (1944). Under the original *Severin* doctrine, if the prime contractor could prove its liability to the subcontractor for the damages sustained by the subcontractor, then the prime contractor itself could show injury from the government's action. Such a showing would overcome an objection based upon the lack of privity between the government and the subcontractor. *E. R. Mitchell*, 175 F.3d at 1370. Initially, the burden of proving the prime contractor's "liability to a subcontractor, to avoid the defense of sovereign immunity, rested on the prime contractor." *Id*. The burden of proof subsequently was shifted from the prime contractor to the government. *Id*. "Thus, it became, and still is, the burden of the government to prove that the prime contractor is *not* responsible for the costs incurred by the subcontractor that are at issue in the pass-through suit." *Id*. (citing *John McShain, Inc. v. United States*, 412 F.2d 1281, 1283 (Ct. Cl. 1969); *Blount Bros. Constr. Co. v. United States*, 346 F.2d 962, 964-65 (Ct. Cl. 1965)). "The *Severin* doctrine can only bar the prime contractor's pass-through suit against the government if the government first asserts at trial, and then proves, that the prime contractor is not liable to the subcontractor for the costs in

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language regarding profilograph testing was not so "obvious, gross, or glaring" as to create a patent ambiguity. Rather, the court finds that ACE was reasonable in reconciling the two apparently conflicting paragraphs in the manner Mr. Fulkerson described at trial.

suit." *E. R. Mitchell*, 175 F.3d at 1371 (citing *George Hyman Constr. Co. v. United States*, 30 Fed. Cl. 170, 177 (1993), *aff'd*, 39 F.3d 1197 (Fed. Cir.1994) (table)).

In this case, the government has done no more than to recite the general proposition that "[w]here the subcontractor has released the prime contractor from liability for claims, the prime contractor may not sue the Government upon [*sic*] behalf of the subcontractor upon those claims." Def.'s Memo. of Contentions of Fact and Law at 11 (citing *J.L. Simmons Co. v. United States*, 304 F.2d 886, 888-89 (Ct. Cl. 1962)). However, the government has not presented evidence tending to show that ACE, the prime contractor, is not responsible for the costs incurred by Cambro, the subcontractor. Thus, the government has not satisfied its burden of proof. *See E. R. Mitchell*, 175 F.3d at 1370-71. Further, the court notes that the evidence adduced at trial indicates that although ACE and Cambro agreed voluntarily to dismiss their cross-claims against each other in litigation filed in the Western District of Texas, ACE and Cambro have a tolling agreement in place that would allow them to re-file their cross-claims upon the conclusion of this proceeding. Tr. 895:13 to 896:8 (Statement of Michael Shane, attorney for Cambro). The court thus finds that ACE may pursue the pass-through claim on behalf of Cambro.

4. *Determination of equitable adjustment amounts.*

The court has determined that ACE may recover an equitable adjustment on behalf of both ACE and Cambro for a defective-specifications claim as well as a constructive change (profilograph testing). Respecting the quantum of damages, ACE seeks to recover the costs Cambro and it incurred during the period of extra work that resulted from the defective specifications and the profilograph testing. ACE also seeks to recover the costs incurred by Cambro for grinding uneven areas of concrete to pass the profilograph test, which ACE avers would not have been necessary but for the profilograph requirement.

a. *ACE's direct costs.*

ACE seeks to recover $393,084 in "direct costs" that ACE incurred as a result of the extra work caused by the defective specifications and the constructive change (profilograph requirement), as well as markups on its direct costs. *See* PX 175a at 1. ACE's request for payment of direct costs is comprised of four categories: labor, equipment, supplies, and subcontract work. *See* PX 175a at 3-7; Tr. 955:13 to 956:8 (Test. of Wenick).

ACE seeks recovery of $81,768.57 in direct labor expenses. These expenses were derived from ACE's certified payroll and were audited by Mr. Wenick. Tr. 956:11-21 (Test. of Wenick). The court allows recovery of these costs. ACE additionally seeks to recover a labor burden of 40% of the direct labor expense. *See* Tr. 956:22 to 957:5 (Test. of Wenick); PX 175 App. Tab 21 (indicating a 40% labor burden). However, as determined *supra*, at 28, the court finds that the government's proffered labor burden rate of 31.8% is more appropriate. Totaling the direct labor and labor burden, ACE may recover a total of $107,770.98 in labor costs on its portion of the defective specifications and profilograph claims.

ACE calculated its equipment rental expenses using its rental invoices. As it did with the dirt claim, ACE estimated the operating costs of the rented equipment using the *Caterpillar Handbook* and the *DataQuest Blue Book.* Tr. 956:13-19 (Test. of Wenick). As discussed in the differing site condition analysis, the court accepts ACE's proffered rental expenses, as well as its methodology for calculating the operating costs of this rented equipment. *See supra*, at 30. The court grants ACE total compensation of $174,613.49 for rental and for operating expenses of rented equipment. This amount includes an allowance of 1.5% of rental cost to cover equipment insurance. *See* PX 175a at 3-7.

As discussed previously, the appropriate source for determining the costs for equipment that is owned by ACE is the *Corps Manual*. The only owned pieces of equipment for which ACE seeks compensation are its pickup trucks. ACE seeks to recover 156.5 days of pickup usage. *See* PX 175a at 3-7. Assuming an 8-hour work day, ACE seeks to recover approximately 1,252 hours of pickup truck usage. The hourly cost of ownership and operating costs for a comparable pickup shown in the *Corps Manual* is $7.76. *Corps Manual* at 2-160. Multiplying the number of hours by this hourly rate yields a total expense of $9,715.52 for owned equipment. The court awards a total recovery of $184,329.01 in equipment costs to ACE for the direct portion of the defective specifications and profilograph claims.

ACE seeks recovery of $10,064 in extra supplies used, and $85,221 for subcontractor expenses as part of its direct claim. *See* PX 175a at 3-7. The extra supplies for which ACE seeks reimbursement consist of water and other miscellaneous items. *See id*. The court concludes that these additional supplies were required in connection with the additional work, and therefore allows these expenses. The subcontractor expenses for which ACE seeks reimbursement relate to primarily to extra survey costs, as well as $5,624 paid to a subcontractor to perform the profilograph testing. *See* PX 175a; Tr. 959:16 to 960:8 (Test. of Wenick). Mr. Wenick testified that he had reviewed the survey expenses and found that the additional amount claimed by ACE was actually substantially less than the amount that ACE actually spent on additional surveying. Tr. 961:11-22. The court has already found such additional survey costs to be compensable because they were incidental to the additional work that ACE was required to perform as a result of government fault. *See supra*, at 31. The court also finds that the direct costs of hiring a subcontractor to perform the profilograph work should be reimbursed by the government, because the profilograph testing was not required by the contract yet was imposed by Corps representatives. The court awards ACE $10,064 for additional supplies, and $85,221 for additional subcontractor expenses as part of its direct claim. The court thus awards a total of $387,384.99 in direct costs for the defective specifications and profilograph claims.

ACE also seeks to recover markups on its "direct costs." As before, the markups consist of four different categories: field overhead, home-office overhead, profit, and bond cost. For the reasons discussed earlier, the court allows ACE to recover home-office overhead of 5.8%, profit of 10%, and bond expenses of 0.65%. Because ACE has adopted the government auditors' suggested field overhead of 1.8% on this claim, *see* Tr. 942:11-20 (Test. Of Wenick); PX 175a,

the court grants that amount.[41] Adding these markups to the direct costs already awarded, the court awards ACE a total of $461,936.95 in costs for its portion of the defective-specifications and profilograph claims.

b. *The Cambro pass-through amount.*

ACE seeks to recover $477,160.00 on behalf of Cambro for additional costs that Cambro incurred as a result of the defective specifications and the profilograph requirement. PX 175a. Cambro claims that it was required to perform additional work and that it was required to stay on the job site for five and a half months longer than the company originally estimated as a result of the defective specifications and the imposition of the profilograph testing. Cambro seeks to recover additional costs of labor and equipment costs, as well as overhead. Cambro also seeks to recover its payments to Penhall Milling, which was hired to grind areas determined to be uneven when tested for smoothness. *See* PX 174 (ACE's Cambro Claim) at 174031; Tr. 797:5-16 (Test. of Camilli) (conceding certain adjustments with respect to its original claim). ACE's expert, Mr. Wenick, did not review the Cambro portion of the claim. Tr. 966:1-6 (Test. of Wenick).

Cambro seeks to recover $186,115 in additional labor expenses incurred from the time Cambro returned to the job site in early October 2001 until the job was completed. Tr. 801:10-19, 803:14-20 (Test. of Camilli). The claimed labor expenses are based on Cambro's certified payrolls and include labor burden. Tr. 803:24 to 805:12 (Test. of Camilli). The government's auditors, Messrs. Storey and Sanford, calculated amounts that agree with these totals. *See* PX 144 (Defense Contract Audit Agency Analysis of Cambro Claim (May 21, 2004)); DX 237 (estimate sheet prepared by Mr. Sanford). The court therefore awards Cambro $186,115 for its additional labor. Cambro originally sought in its claim to recover costs for the mobilization of its work force after Cambro agreed to return to the job in early October 2001. At trial, Mr. Camilli stated that Cambro no longer sought to recoup those amounts. Tr. 802:2 to 803:13, 882:18 to 883:1 (Test. of Camilli); *see* PX 174 at 174031. They accordingly are omitted.

Cambro also seeks to recover the costs of keeping its equipment on the job site for an additional 5.5 months beyond the time period originally envisioned by Cambro. Tr. 805:13 to 806:2 (Test. of Camilli). It appears that Cambro's original claim encompassed only the actual costs of renting equipment for the additional 5.5 months. For rented equipment, Cambro relied on its actual invoices. *See* PX 174 at 174321-24, 174328-29 (rental invoices). Cambro requests a total recovery of $40,023 for rented equipment. The government does not dispute these amounts. *See* Tr. 1285:21 to 1286:5, 1292:11-16 (Test. of Sanford); DX 237. The court will therefore award Cambro $40,023 for the additional costs of rented equipment.

Cambro also seeks to quantify and recover the costs of keeping its owned equipment on-site for an additional 5.5 months. Cambro identified these costs by applying an estimated rental

[41]By comparison, the court allowed recovery of field overhead of 8.2% on the differing-site-conditions claim. *See supra*, at 32.

rate to all of its owned equipment, which included the concrete paver, the steel forms used with the paver, a compressor drill, and lighting towers. Tr. 806:3-14, 879:2 to 880:1 (Test. of Camilli); *see* PX 174 at 174031, 174327, 174330 (estimates for Cambro-owned equipment). Cambro estimated a total of $98,103 as the total cost incurred for keeping the owned equipment on site for the additional 5.5 months. *See* PX 174 at 174031. The government disputes these estimates on the basis that the *Corps Manual* should have been employed to estimate these costs. Tr. 1284:24 to 1286:16 (Test. of Sanford). Additionally, the government seeks to exclude any recovery for the steel forms. *See* DX 237. The court agrees that the *Corps Manual* should have been applied to determine the costs regarding the owned equipment. The criteria for applicability of the *Corps Manual* have been met. Cambro's work was part of a construction contract that exceeded $100,000, and the Cambro portion of that work also exceeded $100,000. Furthermore, by Cambro's own admission, actual cost-of-ownership data was not available to Cambro; it had to resort to an outside source for its estimates.

Mr. Sanford stated at trial that he used the *Corps Manual* to determine the hourly rates for Cambro's owned equipment that should be applied. Tr. 1285:3 to 1286:16. The total recovery suggested for Cambro's owned equipment by Mr. Sanford's analysis is $46,184, which does not allow any recovery for the steel forms. *See* DX 237. Where the *Corps Manual* did not include a particular piece of equipment, Mr. Sanford indicated that the auditors who reviewed the claim would have researched the price of the equipment then developed an hourly rate for it. *See* Tr. 1286:9-15. Because the specific items of equipment for which Cambro seeks recovery do not appear in the *Corps Manual*, and Mr. Sanford testified that he has experience implementing the *Corps Manual*, *see* Tr. 1269:10-27, the court accepts Mr. Sanford's estimates of rates for Cambro's owned equipment.[42] In addition to the $46,184 suggested by Mr. Sanford, the court also allows Cambro recovery for the 5.5 additional months that the steel forms were on site. Because the government has provided no estimate as to the rate that should apply to the forms if recovery is allowed and the court has insufficient information to calculate the cost in accordance with the *Corps Manual*, the court will accept the estimate proffered by Cambro, $17,825. Cambro based its estimate on a quotation that Cambro requested from a rental service company that was asked to determine the rental rate that the rental company would have charged for the forms. *See* Tr. 806:3-14, 879:2 to 880:1 (Test. of Camilli); PX 174 at 174327 (Rental Quotation for Cambro from Rental Service Corporation (April 24, 2003)). The court finds this to be a reasonable approximation of the cost of keeping the forms on site, noting that Mr. Camilli stated at trial that the forms could have been deployed on another job or rented to another contractor. *See* Tr. 879:20 to 880:12 (Test. of Camilli). In total, the court awards Cambro $64,009 for the additional cost of owned equipment. The court finds no evidence that Cambro has at any point sought to recover operating expenses for its rented or owned equipment (including fuel, oil, and maintenance); therefore, the court will not award such expenses as it relates to Cambro's rented or owned equipment.

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[42]The *Corps Manual* contains a methodology for determining hourly rates for equipment that are not specifically addressed in the *Manual* (*e.g.*, where a specific manufacturer or model number does not appear in the *Manual*). *See Corps Manual* Appendix A.

Regarding the cost of hiring Penhall Milling to grind areas of the taxiway, Cambro and ACE aver that the grinding would have been unnecessary but for the profilograph testing, which the government required to test the smoothness of the taxiway. *See* Tr. 806:24 to 807:23 (Test. of Camilli). Cambro and ACE maintain that profilograph testing was neither required nor appropriate for the taxiway because the taxiway contained the same types of changing grade breaks as the loading apron and the pallet pad. *See* Tr. 806:24 to 807:23 (Test. of Camilli), 254:20 to 255:2 (Test. of Fulkerson). The parties have represented that the taxiway was ultimately tested with the profilograph. *See* Tr. 258:25 to 259:6 (site visit). The court has determined that profilograph testing was not required by the Contract. However, the evidence adduced at trial indicated that the pavement for the taxiway did not pass the straightedge test and required milling as a result. *See* Tr. 701:13 to 702:14 (Test. of Fulkerson); DX 221 (Facsimile from ACE to Camilli (April 10, 2002)) (stating that "[t]he taxiway, runway and apron did not pass the straightedge. It needs to be ground now."). ACE and Cambro did not present evidence to show that the milling would have been unnecessary absent the profilograph test, or what percentage of the milling would have been unnecessary if profilograph testing had not been required. The evidence therefore supports the proposition that the grinding would have been required even if the profilograph test had not been improperly imposed; thus, the court will not allow recovery to Cambro for the cost of grinding the taxiway.

The final two items for which Cambro seeks recovery are for office indirect expenses and office administration expenses totaling $112,532; this was later revised to $111,454. *See* Tr. 807:24 to 808:12 (Test. of Camilli); PX 174 at 174031; DX 237. Mr. Camilli explained that these costs were derived using the "*Eichleay* formula." Tr. 808:1-7. Mr. Camilli did not, however, explain how the calculation was made or the rationale for using the *Eichelay* formula, where the cause was extra work rather than delay. The government claims in its post-trial briefing that Cambro should not be eligible for *Eichleay* damages. Def.'s Post-Tr. Reply Br. at 20. The DCAA audit of the Cambro claim prepared by Mr. Storey did not find fault with Cambro's *calculation* of *Eichleay* damages; however, this analysis did not appear to address Cambro's *entitlement* to such damages. *See* PX 144 at 9-11. The government estimate prepared by Mr. Sanford asserted that Cambro should receive only $33,436 in "Office Indirect/Admin" costs. Mr. Sanford did not, however, testify as to how he calculated this number. The *Eichleay* formula appears to be inapplicable to Cambro's claim because it is primarily designed to address a contractor's recovery of unabsorbed overhead costs; *i.e.*, where a contractor has invested in overhead items that become idled due to a government-caused delay. *See supra*, at 32 n.35. That did not occur here, and therefore, the *Eichelay* formula should not be applied. Rather, Cambro should be allowed to recover for its overhead and for profits in a similar manner as ACE. The court will award Cambro a field overhead of 10%, home-office overhead of 5.8%, and a profit rate of 10%, calculated in the same manner as ACE's markups for the dirt claim. *See supra*, at 32-33.[43] Adding these three elements to the direct amount the court has awarded to

[43]These rates were provided by the government respecting ACE's dirt claim. *See* DX 237.

Cambro for labor and equipment ($290,147), the court awards Cambro a total of $371,440.39 for the defective specifications and profilograph-related claims.

c. *ACE's markups on Cambro pass-through amounts.*

Finally, ACE seeks to recover markups on the pass-through expenses it has sought on behalf of Cambro. The markups consist of the same four categories noted above: profit, field overhead, home-office overhead, and bond cost. *See* PX 175a (Combined Summary of Dirt & Cambro Claim, prepared by Wenick). Each of these categories is calculated as a percentage of Cambro's pass-through recovery. Because ACE has adopted the government auditors' suggested field overhead of 1.8% on this claim, *see* Tr. 942:11-20 (Test. of Wenick); PX 175a, the court will grant that amount. The court otherwise awards ACE home-office overhead of 5.8%, and profit of 5%. *See supra*, at 32-33. The court awards ACE a total of $48,620.14 in markup costs on the Cambro pass-through recovery of $371,440.39.

D. Return of Assessed Liquidated Damages

The Corps determined that the project was completed 156 days late. Tr. 648:1-3 (Test. of Fulkerson), 977:20-22 (Test. of Wenick). The Contract provided for liquidated damages of $1,630 per day of delay, PX 177 Section 01000 ¶ 1.1; accordingly, the Corps assessed a total $254,280 in liquidated damages against ACE for this delay in completion. *See* Stip. ¶ 31. ACE seeks to recover these assessed liquidated damages on the theory that the delays ACE experienced were excusable because they were caused by the differing site condition, the defective specifications provided by the government, and the Corps' improper requirement of profilograph testing.

As a general matter, "liquidated damages will not be assessed during any period in which the contractor experienced an excusable delay." *Cibinic & Nash* 1059. The construction contract default-termination clause in FAR 52.249-10, which was incorporated into the Contract, *see* PX 177 Section 0700 at 70,[44] relieves the contractor from damages if delays are excusable.[45] Where a

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[44]FAR 52.249-10, as incorporated into the Contract, provides that the contractor will not be charged with damages under this clause if:

> (1) The delay in completing the work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor. Examples of such causes include
> . . .
> (ii) acts of the Government in . . . its . . . contractual capacity.

PX 177 Section 0700 at 70.

[45]Even in the absence of an excusable-delays clause in the contract, liquidated damages should not be assessed for a period of delay that is excusable. *See Cibinic & Nash* 1059 (citing *Appeal of N. Am. Aviation, Inc.*, ASBCA 11603, 68-1 BCA ¶ 6998, 1968 WL 4910 (1986);

contractor is delayed by a series of nonconcurrent causes, liquidated damages should be assessed only after all of the periods of excusable delay have been taken into account. *Cibinic & Nash* 1059; *see Robinson v. United States,* 261 U.S. 486, 488-89 (1923). Further, where a delay is attributable to both an excusable and an inexcusable cause, liquidated damages will not be assessed for the period of that delay. *Cibinic & Nash* 1059; *see William F. Klingensmith, Inc. v. United States*, 731 F.2d 805, 809 (Fed. Cir. 1984) (where both parties contribute to delay, generally neither can recover damages). However, if the government can show that the delays attributable to the government's actions or omissions were not the actual cause of the delay and that the contractor caused the delay, then the contractor may be assessed liquidated damages. *Cibinic & Nash* 1059-60. One method for determining whether a concurrent government delay should excuse the contractor's delay is to determine which party's delay affected the project's "critical path," in projects where the critical-path method is applied. *Id*.[46]

The Ammo Hot-Load Project did not require ACE to use the critical-path method in planning the project (a bar chart was required). Tr. 972:22 to 973:14 (Test. of Wenick). However, ACE's expert witness, Mr. Wenick, prepared a chart showing the critical-path activities involved in the project. Tr. 973:15 to 974:1; *see* PX 175 (Report of Wenick) App. Tab 25. In general, ACE avers that the delays in completing the project were not the responsibility of ACE, but rather were brought about by delays in the critical path that resulted from the differing site condition, the improper specifications, and the improperly imposed profilograph testing. The first excusable-delay period that ACE asserts relates to the differing-site-condition claim (the dirt claim). The court has found that the government is legally responsible for the extra dirt work. ACE estimates that the additional earth work delayed project completion by 53 days, from March 24 to May 15, 2001. Tr. 950:4-8 (Test. of Wenick). The government never granted ACE an extension for any of this claimed time. *Id*. ACE carried out the extra dirt work expeditiously and without pause, and there is no indication that ACE was the cause of any concurrent delay. Additionally, this extra work affected the critical path to project completion. Neither final grading nor concrete placement could commence until the taxiway, loading apron, pallet pad, and roadway were brought to the proper subgrade elevation. Therefore, the court credits ACE with a 53-day extension for the time spent on the extra dirt work, *i.e.*, ACE should not be charged liquidated damages for this period.

The second excusable-delay period that ACE asserts relates to the extra time that ACE spent grading the subgrade and drainage layer, and that ACE and Cambro spent in setting the forms as a result of the defective specifications. The extra subgrade work required three weeks in May and June 2001, the extra drainage layer work required two weeks between June and July 2001, and the additional form setting required eight weeks starting in July 2001 and ending in March 2002, a total of 91 days. *See* PX 175 Tab 4 (Schedule Analysis) at 11; PX 175 (Report of

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Appeal of Gen. Precision, Inc., ASBCA 11071, 66-2 BCA ¶ 5904, 1966 WL 508 (1966)).

[46]The "critical path" is the longest path through a project and thus defines the total duration of the project. Tr. 972:10-11 (Test. of Wenick).

Wenick) App. Tab 20 (Memo. from ACE to Sanford (Oct. 15, 2003)). The court has found that the Corps provided defective specifications. Mr. Wenick's review of these claims found that the three weeks of extra time spent grading the subgrade were concurrent with a portion of the 53 days spent building up the subgrade. Tr. 978:23 to 979:1 (Test. of Wenick). This reduces the excusable delay period by 21 days. Mr. Wenick estimated that two weeks spent grading the rock drainage layer were compensable because they delayed the critical path of the project. *See* Tr. 978:17 to 979:6. Mr. Wenick also characterized as compensable the additional time spent by ACE and Cambro setting the forms that resulted from the Corps' defective specifications, stating that these delays also interfered with the critical path of the project. *See id*. The court accordingly credits ACE with a 70-day extension as a result of the extra subgrade work and form-setting work. Although the delays caused by the form-setting work consisted of non-consecutive days and were spread over a period of several months, this does not make this time non-compensable for liquidated damages purposes. *See Cibinic & Nash* 1059.

The final excusable-delay period that ACE asserts relates to a 51-day period of time from September 22, 2001 to November 11, 2001 during which no concrete was poured on the project. *See* PX 175 Tab 4 at 10, App. Tab 26 (Chart, Cubic Yards of Concrete Placed). Concrete placement was part of the critical path of the project. ACE avers that the "hiatus" in concrete placement was the result of the disputes that were caused by the profilograph testing. PX 175 Tab 4 at 10; Tr. 979:15 to 981:3 (Test. of Wenick). The court has determined that the profilograph testing was not required and that the Corps acted improperly by requiring ACE and Cambro to use the profilograph test. The evidence indicates that the primary reason Cambro stopped pouring concrete was that the concrete work was not passing the profilograph test and therefore ACE was not being paid for the lanes Cambro had poured to date. *See supra*, at 10. The stoppage was attributable to the government. The evidence, however, does not indicate that this entire 51-day hiatus in concrete placement was due to the profilograph dispute. Mr. Fulkerson's testimony indicated that Cambro's decision to leave the job site on September 24, 2001 resulted in approximately four weeks of delay (September 24 to October 20), two weeks while Cambro was off the site and two additional weeks after Cambro returned to the site to restore the drainage layer to a condition that was suitable for further concrete work. Tr. 411:24 to 412:12 (Test. of Fulkerson). The court recognizes that the profilograph testing may have engendered other delays when, for, example, some panels had to be removed and re-poured as a result of failing the profilograph test; however, these delays have not been quantified by ACE. The court will therefore credit Cambro with an extension of four weeks (28 days, not 51 days) for the delay caused by the profilograph dispute.

In the end, the court concludes that ACE has established its entitlement to extensions of 53 days for the differing site condition, 70 days for the defective specifications, and 28 days for the profilograph dispute, a total of 151 days. ACE should therefore recover the liquidated damages it was assessed for 151 of the 156 days that were charged. At $1,630 per day, the total reimbursement is $246,130.

CONCLUSION

For the reasons stated, ACE is awarded an equitable adjustment in the amount of $1,383,009.97, plus interest, as well as a return of liquidated damages in the amount of $246,130. ACE also is awarded interest at the rate specified in 41 U.S.C. § 611, calculated from November 4, 2002 for the dirt claim ($501,012.49) and from August 6, 2003 for the other claims ($1,128,127.48), until the receipt of payment from the government. The clerk shall enter final judgment in favor of ACE for these specified amounts.

ACE is awarded costs of suit. The court also concludes that ACE may be entitled to costs and attorney's fees under the Equal Access to Justice Act, 28 U.S.C. § 2412, but reserves a final determination in that regard pending completion of further proceedings under RCFC Rules 54(d) and 58(c).

It is so ORDERED.

s/ Charles F. Lettow
Charles F. Lettow
Judge