ARMED SERVICES BOARD OF CONTRACT APPEALS

Appeals of --	)	
	)	
Dick Pacific Construction Co., Ltd.	)	ASBCA Nos. 57675, 57806, 58149
	)	58150, 58151, 58174
	)	
Under Contract No. W9128A-07-C-0004	)	

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OPINION BY ADMINISTRATIVE JUDGE CLARKE

Dick Pacific Construction Co., Ltd. (DPC), timely appeals from the U.S. Army Corps of Engineers' (COE's) denial of various claims arising from DPC's construction contract to install additional concrete pavement for aircraft parking and a Clear Water Rinse Facility (CWRF) at Hickam Air Force Base (AFB) in Honolulu, Hawaii. We have jurisdiction pursuant to the Contract Disputes Act of 1978 (CDA), 41 U.S.C. §§ 7101-7109. We consider entitlement only (*see* tr. 1/12-13). The six numbered appeals deal with certified claims relating to delayed access to the airfield work area, change to low profile fire hydrants, unsuitable soils, the Air Force's direction to remove alleged non-conforming base course and concrete, concrete spalling, substantial completion and liquidated damages. Both parties presented scheduling experts with differing views on the critical path and associated delays. Our decision generally addresses these appeals in chronological order. We sustain the appeals in part and deny the appeals in part.

FINDINGS OF FACT

Contract No. W9128A-07-C-0004

1. Contract No. W9128A-07-C-0004 (0004) was awarded to DPC on 21 February 2007 (R4, tab C-26 Award at PDF 1). The work was to be performed on Hickam AFB, Honolulu, Hawaii.[1] The work generally involved the extension of existing airfield pavement and construction of a CWRF to clean C-17 aircraft. The schedule provided for three item numbers with a total contract price of $26,440,000.00 as follows:

ITEM NO.	DESCRIPTION	QTY	UNIT	AMOUNT
1	FY04 Strategic Aircraft Airlift Ramp Expansion	1	LS	$9,700,000
2	FY05 Clear Water Rinse Facility	1	LS	$11,637,000
3	Infield of FY04 Strategic Aircraft Airlift Ramp Expansion (Phase 1)	1	LS	$5,103,000
	TOTAL PROPOSAL SCHEDULE			$26,440,000
	PERIOD OF PERFORMANCE	430	Calendar Days	

(*Id.* at PDF 7) The Notice to Proceed (NTP) was issued on 13 March 2007 and received by DPC on 15 March 2007 and thus the original completion date was 18 May 2008 (app. supp. R4, tab 302 at 20794, AEX 59 at 21).

2. The provision for payment for each of the three items allowed for payment when each item was "complete in place and ready for use" (R4, tab C-26 Award at PDF 9, 10).

3. The contract included the following pertinent clauses: FAR 52.211-10, COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK (APR 1984) that required the contractor to commence work within seven (7) calendar days of receipt of the NTP; FAR 52.211-12, LIQUIDATED DAMAGES – CONSTRUCTION (SEP 2000) that set the daily liquidated damage rate at $2,298.00 for each calendar day of delay until the work is completed or accepted; FAR 52.228-5, INSURANCE – WORK ON A GOVERNMENT INSTALLATION (JAN 1997) that requires notification to the contracting officer that the required insurance has been obtained before commencing work; FAR 52.236-11, USE AND POSSESSION PRIOR TO COMPLETION (APR 1984) that allows the government to take possession of or use part of the work; FAR 52.243-4 CHANGES (AUG 1987); FAR

[1] Renamed to Joint Base Pearl Harbor-Hickam.

52.246-21, WARRANTY OF CONSTRUCTION (MAR 1994) that provides for a one-year warranty from the date of either possession or final acceptance (R4, tab C-26 Award at PDF 66, 109, 113-14, 132, 139). FAR 52.249-10, DEFAULT (FIXED-PRICE CONSTRUCTION) (APR 1984), specifically states that the contract shall not be terminated nor the contractor charged with damages due to delays caused by unusually severe weather (nor other specified causes not relevant herein) (R4, tab C-26 Award at PDF 145-46). DFARS 252.236-7005, AIRFIELD SAFETY PRECAUTIONS (DEC 1991) that provides that the contractor shall not permit either its equipment or personnel to use any runway without permission of the contracting officer, unless the runway is closed by order of the contracting officer and marked as required by the contract (R4, tab C-26 Award at PDF 160-61). The "airfield waiver" embodies the Air Force's official authorization to allow the contractor access to the airfield to commence work (R4, tab AEX 180; tr. 1/135-37). Next, clause S-36.5, TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER, provides a list of the expected days of adverse weather for every month in the year:

JAN	FEB	MAR	APR	MAY	JUNE	JUL	AUG	SEPT	OCT	NOV	DEC
3	3	2	1	1	0	1	1	1	2	2	3

(R4, tab C-26 Award at PDF 188-89) The clause requires that the contractor record adverse weather on the daily Quality Control Report (QCR). If the adverse weather exceeds the listed estimated days in a given month and prevents critical path work for at least half a day, the contract completion date will be extended pursuant to the Default clause. A contract extension made pursuant to these clauses is not compensable since S-36.5, Time Extensions for Unusually Severe Weather, subparagraph (a) authorizes a time extension only. (*Id.* at PDF 188)

4. The contract included the following pertinent specifications:

- Specification section 01351, "SAFETY, HEALTH, AND EMERGENCY RESPONSE," that requires DPC to develop and implement a Site Safety and Health Plan that is attached to the Accident Prevention Plan and submitted for acceptance. On-site work could not begin until the plans were accepted. (R4, tab C-26 Specs at PDF 67, ¶ 1.6.1)[2]

- Specification section 01451, "CONTRACTOR QUALITY CONTROL," that provides that DPC will submit a Quality Control Plan within 30 days of NTP and that construction will be permitted to begin only after acceptance of the plan or interim plan applicable to the particular feature of work to be started (*id.* at PDF 135, ¶ 3.2.1).

[2] The requirement is also included in section 01353, "SAFETY, HEALTH, AND EMERGENCY RESPONSE FOR CONTAMINATED AREA LF01 FOR EXPAND STRATEGIC AIRLIFT AIRCRAFT RAMP" (R4, tab C-26 Specs at PDF 86).

- Specification section 01355A, "ENVIRONMENTAL PROTECTION," that requires the contractor to submit an Environmental Protection Plan (EPP) for government approval prior to commencing construction activities or delivery of materials to the site (*id.* at PDF 102, 105, ¶ 1.7).

- Specification section 01900, "MISCELLANEOUS PROVISIONS," includes in part:

> 1.4 LOCATION OF UNDERGROUND FACILITIES
> Scan the construction site with electromagnetic or sonic equipment, and mark the surface of the ground where existing underground utilities are discovered. Verify the elevations of existing piping, utilities, and any type of underground obstruction not indicated or specified to be removed but indicated or discovered during scanning in locations to be traversed by piping, ducts, and other work to be installed. Verify elevations before installing new work closet than nearest manhole or other structure at which an adjustment in grade can be made.
>
> 1.4.1 Notification Prior to Excavation
>
> Notify the Contracting Officer at least 15 days prior to starting excavation work. Contact Utility 48 hours prior to excavating. Contractor is responsible for marking all utilities not marked by Utility.

(*Id.* at PDF 197)

- Specification section 02301, "EARTHWORK FOR STRUCTURES AND PAVEMENTS," identifies Unsatisfactory Material as:

> 3.2.3 Unsatisfactory Material
>
> Remove organic matter, sod, muck, rubbish, and unsuitable soils under embankments which are less than 0.90 m in thickness and under pavements or slabs on grade. Typical depth of removal of such unsuitable material shall be 450 mm.[3]

(*Id.* at PDF 224, 227, 233)

[3] Approximately 18 inches.

- Specification section 15899, "CLEAR WATER RINSE SYSTEM START-UP AND WATER RECYCLING SET-UP," includes the following paragraphs:

3.5.1 Final Performance Test

The final performance test shall consist of performance of the system during actual washing of an aircraft.

3.5.1.1 Satisfactory Performance

In the event a portion of the system or any piece of equipment fails to meet the test, the Contractor shall make the necessary repairs or adjustments and repeat the Performance Test until satisfactory performance is obtained. The determination of satisfactory performance shall be made by the Contracting Officer.

3.6 WATER RECYCLING SETUP

[Six steps in the water recycling setup process are summarized in pertinent part as follows:]

3.6.1 STEP 1

[After performing one aircraft rinse, test the water returned to the supply tank and compare to the Technical Order (TO) requirements and sanitary sewer discharge requirements.]

3.6.2 STEP 2

[If TO and sanitary sewer levels are not exceeded schedule and rinse another aircraft.]

3.6.3 STEP 3

[Continue steps one and two until the TO requirements are exceeded but the sanitary sewer levels are not exceeded.]

3.6.4 STEP 4

[Determine the number of plane rinse cycles completed before TO limits are exceeded and program that number into the Programmable Logic Controller (PLC).]

3.6.5 STEP 5

[A professional chemical engineer shall determine the conductivity level to be used to discharge water to the sanitary sewer and the conductivity probe set and tested for proper operation.]

3.6.6 STEP 6

[After two weeks of rinse operations, conduct steps one through four again to verify proper setup of the rinse water recycling operation.]

(R4, tab C-26 Specs at PDF 688-89)

- Specification section 02722, "GRADED CRUSHED AGGREGATE BASE COURSE," that includes the following:

2.1.1 Aggregates

Consist of durable and sound crushed gravel, crushed stone, or crushed slag, free of lumps or balls of clay or other objectionable matter. Crushed stone and gravel shall be free from flat, elongated, soft, or disintegrated pieces. Crushed gravel retained on 4.75 mm sieve shall have at least 90 percent by weight with at least two fractured faces and 100 percent by weight with at least one fractured face. **Base course materials samples shall have bearing ratio of at least 100 as determined by laboratory tests on 4-day soaked specimen in accordance with ASTM D 1883; compact specimen in accordance with ASTM D 1557, Method C.** Determine grain size in accordance with ASTM 136 and amount of material finer than 75 micrometers sieve in accordance with ASTM C 117.

....

3.6.1 Sampling

....

3.6.1.2 During Construction

Take one random sample from each 1000 metric tons of completed course material, but not less than one random sample per day's run. Take samples in accordance with ASTM D 75.

....

3.6.2 Testing

3.6.2.1 Aggregates

Test each sample of base course material without delay. Make gradation tests from each sample in accordance with ASTM C 136. Make sieve analysis on material passing the 75 micrometers sieve in accordance with ASTM C 117.

(*Id.* at PDF 323, 326) The 75 micrometers sieve is the #200 sieve (tr. 3/30). Mr. Fujioka, DPC's expert in geotechnical engineering, hydrology and testing (tr. 5/31-32), testified that even though the specification states test the sample without delay and not "take" the sample without delay, delay increases the possibility of contamination (tr. 5/79). Mr. Fujioka testified that the best way to protect the base course is to pave it immediately. Delaying paving allows the base course to be affected by rain and construction activity. (Tr. 5/167-68)

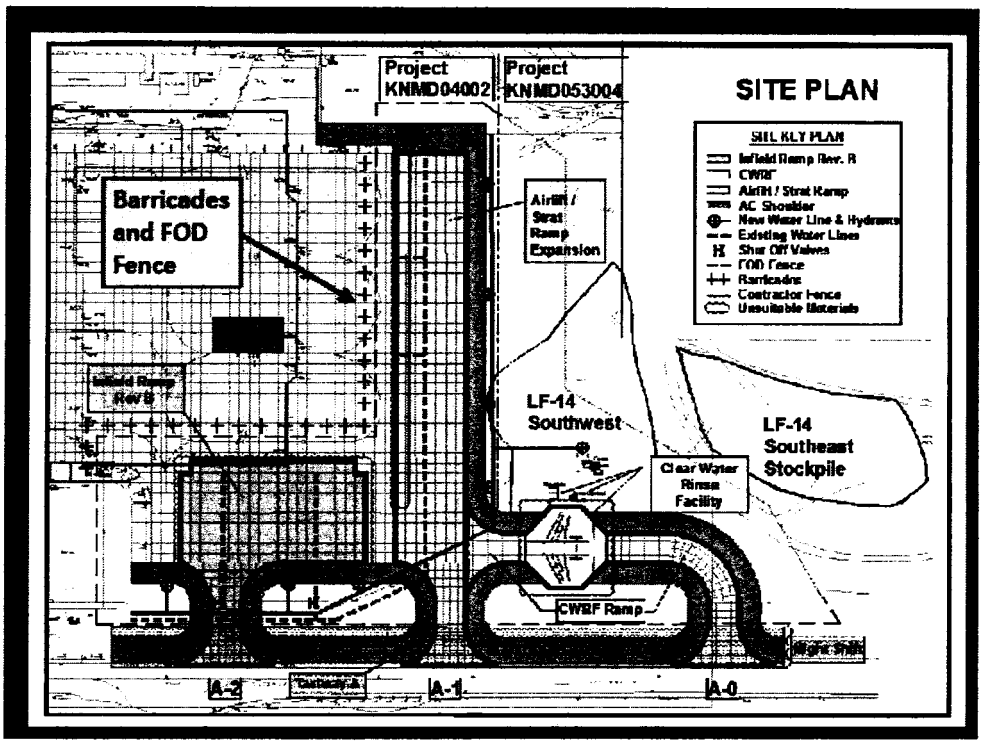
5. ASTM C 117 – 04, Standard Test Method for Materials Finer than 75-μm (No. 200) Sieve in Mineral Aggregates by Washing, requires reporting as follows:

> 11.1.1 Report the percentage of material finer than the 75-μm (No. 200) sieve by washing to the nearest 0.1%, except if the result is 10% or more, report the percentage to the nearest whole number.

(App. supp. R4, ex. 943 at 3; tr. 5/73)

Site Plan

6. The record contains the following site plan prepared by DPC[4]:



(App. supp. R4, ex. 52; R4, DVD 1, ex. 55)[5] The site is comprised of the "Infield Ramp Rev B" (Rev B Infield), just above is the foreign object debris (FOD) fence (black dashed line) and barricades (black +) running parallel to each other, to the right of that is the "Airlift/Strat Ramp Expansion" (Strat Ramp) and lower on the right is the "CWRF" (*id.*, tr. 1/118). The FOD fence extends beyond the barricades down to and along Taxiway A. The Rev B Infield was previously grass surrounded by existing concrete pavement. DPC installed Portland Cement Concrete (PCC) pavement to "tie into" that existing pavement. The Strat Ramp expansion area was also grass with existing Strat Ramp pavement running along the left (west) side of the expansion area. DPC installed the Strat Ramp expansion pavement to tie into the existing pavement. (Tr. 2/208) The right hand side of the vertical Strat Ramp is the east side (tr. 2/184). The plan shows existing fire hydrant waterlines in dashed lines and the new fire hydrant waterlines in solid lines (tr. 1/119). The existing main waterline runs below the Rev B Infield with two waterline "laterals" extending into

[4] The cite plan is required by specification section 01900 Miscellaneous Provisions subparagraph 1.2.1 Site Plan (R4, tab C-26 specs at PDF 196).

[5] There are several versions of the Site Plan (app. supp. R4, exs. 52, 55). The one we rely on has the "Barricades and FOD Fence" box with arrow in the upper left hand quadrant.

the Rev B Infield. The existing main waterline then runs the vertical length of the Strat Ramp with another two "laterals" running to the left (west). The existing waterlines were to be demolished and removed to make way for mass excavation of the Rev B Infield and Strat Ramp areas. The existing waterline had to stay active (on) until the new waterline was operational. (Tr. 2/63-64) The site was connected to Taxiway A (Honolulu Airport) by ramps denoted as A-0, A-1, and A-2 (tr. 1/119-20).

7. During construction, DPC divided the Strat Ramp into two "zones." Zone 1 is roughly the upper (north) half of the Strat Ramp above the lower lateral waterline depicted by the dashed line extending to the left (west) from the main waterline running vertically. (Tr. 6/174, 178; app. supp. R4, AEX 39) Zone 2 of the Strat Ramp was from about the midpoint south to the taxiway (tr. 4/103, 6/178).

Baseline Schedule

8. Mr. Hall, DPC project superintendent, testified about the sequence of work as originally contemplated (tr. 1/109). The NTP was issued on 15 March 2007. (App. supp. R4, exs. 425, 2503) The existing waterline and laterals had to be replaced with the new waterline before demolition could start in Rev B area (tr. 1/121-22). After demolition, mass excavation in Rev B Infield would start followed by mass excavation in the Strat Ramp area. Mass excavation is done with a big dozer and loader to excavate down to the subgrade elevation that is the bottom of the sub-base. This is followed by placement of layers (lifts) of sub-base, then layers of base course and finally the PCC pavement. (*Id.*) When mass excavation was proceeding in the Strat Ramp area, sub-base would be installed in the Rev B Infield (tr. 1/123). The CWRF was a new ramp with access to the existing taxiway (tr. 1/124). DPC subcontracted all of the mass excavation, sub-base and base course work to Paradigm Construction. DPC kept the pavement, utility work and support structures for the CWRF. (Tr. 1/127-28)

9. The record contains DPC's baseline CPM schedule that graphically depicts DPC's "as planned" sequence of construction and is labeled "CBLM" (app. supp. R4, ex. 2503 at 3-7, ex. 425 at PDF 4-8; R4, DVD 1, AEX 60 at PDF 2-9). The following table summarizes the major critical path activities[6] for the Rev B Infield and Strat Ramp on the as-planned CPM identified as CBLM (app. supp. R4, AEX 60 at 2-9; app. ex. 51 at PDF 101-08; tr. 9/231)[7]:

[6] Activities that were shown in red on the Baseline CPM schedule, CBLM, are critical path activities (tr. 2/118).

[7] Some columns omitted.

Activity	Activity Description	Early Start	Early Finish
1000	Contract Award	15MAR07	
1010	Notice to Proceed Acknowledgement	15MAR07	
1076	Hickam Airfield Waiver Approval	15MAR07	
1080	Develop & Submit Safety & Health Plan	15MAR07	23APR07
1100	Develop & Submit Best Management Practices (BMP)[8] Plan	15MAR07	23APR07
1260	Approve Safety & Health Plan	24APR07	23MAY07
1270	Approve BMP Plan	24APR07	23MAY07
1440	Begin Field Construction	24MAY07	
1450	Mobilization	24MAY07	14JUN07
1460	DPC Trailers and Staging Area	24MAY07	14JUN07
1470	FOD Fence	24MAY07	14JUN07
1480	Barricades	15JUN07	20JUN07
1660	Waterline 200mm Excavation	21JUN07	25JUN07
1700	Rev B Waterline 200mm Excavation	21JUN07	25JUN07
1710	Rev B Waterline 200mm Installation	22JUN07	25JUN07
1720	Rev B Waterline 200mm Backfill	26JUN07	28JUN07
1530	Remove Existing Waterline 200mm @ Revision B	02JUL07	09JUL07
1790	Rev B Mass Excavation	02JUL07	19JUL07
1800	Rev B Subgrade PCC Pavement	11JUL07	18JUL07[9]
1810	Rev B Subbase PCC Pavement	19JUL07	01AUG07
1820	Rev B Base Course PCC Pavement	26JUL07	10AUG07
1920	Strat Ramp Mass Excavation[10]	20JUL07	17AUG07
1930	Strat Ramp Subgrade PCC Pavement	13AUG07	24AUG07
1940	Strat Ramp Subbase PCC Pavement	27AUG07	11SEP07
1950	Strat Ramp Base Course PCC Pavement	05SEP07	25SEP07
1960	Strat Ramp Fine Grade Base for PCC Pavement	19SEP07	27SEP07
1970	PCC Pavement	28SEP07	19NOV07

[8] BMP Plan deals with environmental management (R4, DVD 1, AEX 6).

[9] This date is in error because its early finish is before the early finish of mass excavation.

[10] Not on critical path.

Airfield Waiver/Access to Job Site

10. A preconstruction conference was held at Hickam AFB on 8 May 2007 (app. supp. R4, ex. 426). The minutes[11] of the meeting contained the following:

> • **Description of Work**
>
> This contract was awarded to Dick Pacific Construction Co., Ltd., and consists of the following construction elements:
>
> > This project includes two separate construction projects. Projects will be constructed under one single set of contract documents. Projects are as follows: Expand Strategic Airlift Aircraft Ramp, and C-17 Clear Water Rinse Facility.
> >
> > ....
>
> • **Availability of Work Area**
>
> *The entire contract work area will be released to Dick Pacific Construction Co., Ltd., at one time at the NTP,* whereupon, Dick Pacific Construction Co., Ltd. shall have full control of progress and sequence of demolition and removal and clearing work, subject to all contract specifications. [Italics added]
>
> ....
>
> • **Status of Items Submitted by the Contractor:**
>
> 1. Environmental Protection Plan [EPP]
> 2. Contractor Quality Control Plan
> 3. Site Safety Health Plan
>
> Comments: All are in the process of being reviewed and will be either accepted or returned for further clarification/information.

[11] Mr. Morita's, the Corps project engineer, 8 May 2007 email forwarding the document within the COE for review refers to it as "minutes" but the document itself is entitled "PRECONSTRUCTION CONFERENCE OUTLINE" (R4, tab F-8 at 205-06).

(R4, tab F-8 at 207-09) Mr. Hall, DPC's project superintendent, attended (app. supp. R4, ex. 426) and recalled that DPC attendees expected that the full work area would be available to DPC at NTP but that it was made very clear that they could not go onto the airfield until DPC actually had the airfield waiver[12] (tr. 1/129). At the time of the conference, DPC had submitted the EPP, the Quality Control Plan and the Site Safety and Health Plan to the government and they were under government review (tr. 1/133; R4, tab F-8 at 209). At the time of the conference, 8 May 2007, DPC did not have access to the work site (tr. 1/132-33).

11. In a 5 June 2007 email from Mr. Morita, the COE's project engineer, to Mr. Barlongo, DPC's program manager, permission was given to DPC to install the "barrier at 125 [feet] from Taxiway A centerline" (tr. 1/125, 135; app. supp. R4, ex. 180). The "barrier" was the FOD[13] fencing (tr. 1/135). Mr. Morita wrote, "[o]ne more hurdle left before we can start construction. We are awaiting the approval of the Airfield Waiver Request." (App. supp. R4, ex. 180) Mr. Hall testified that there was nothing DPC could do to expedite the waiver (tr. 1/136), and DPC could not start work in the apron area without the waiver (tr. 1/137).

12. Mr. Serrao, Air Force inspector, performs quality assurance inspections and fills out daily Quality Assurance Reports (QARs) (tr. 15/37-38). DPC fills out daily Quality Control Reports (QCRs) (tr. 15/39). The first day of work is documented as 5 June 2007 on Mr. Serrao's, QAR #82 of that date (tr. 1/138, 15/122; R4, tab M-2, ex. 2 at 1). DPC was able to start mobilization in the office trailer and storage yard area, but could not work on the apron (tr. 1/137, 146). QCR #82 documents that the trailers were at the site on 5 June 2007 (R4, tab M-1, ex. 1 at 1).

13. By letter dated 7 June 2007, Mr. Barlongo notified the COE as follows:

> This letter provides notification that our construction progress is being impacted due to the pending approval of the airfield waiver request. The notice to proceed was issued on March 15, 2007 without approval of the airfield waiver request. Pre-construction requirements which include the required Quality Control Plan, Site Specific BMP, and Site Specific Health Plan are on file and were followed by the Mutual Understanding Meeting on May 30, 2007; thus, allowing mobilization and the start of field construction activities. Without the clearance, preconstruction surveys

[12] The airfield waiver is required before DPC could access the airfield and commence construction (R4, AEX 180; tr. 1/137).

[13] The transcript incorrectly has "odd fencing" (tr. 1/135).

> cannot commence as well as the perimeter fencing and barricade activities. New utilities, demolition and mass excavation are contingent on these activities.
>
> In reference to contract clause 52.211-13 Time Extensions, it is our intent to claim for compensatory time extension on the days past the scheduled start of field construction (Activity 1440 – see attached baseline schedule) through the time required to obtain the airfield waiver approval.

(App. supp. R4, exs. 425, 2503) Attached to the letter was a "baseline CPM schedule" that indicated Activity 1440 "BEGIN FIELD CONSTRUCTION" was scheduled to commence on 24 May 2007 (app. supp. R4, ex. 2503, sheet 2 of 5; tr. 1/144). Mr. Hall testified that after a month had gone by there wasn't much else DPC could do (tr. 1/140).

14. By email dated 7 June 2007, from Mr. Serrao to Mr. Tanaka, DPC, the COE took the position that DPC could not start work until the following submittals were received: EPP, written report with pictures of existing facilities, excavation clearance, photos of operation and storage area, site plan, and demolition plan (app. supp. R4, ex. 834).[14] Mr. Hall testified that this was the first time the government mentioned all of these items. He testified that he did not believe these items should hold up DPC from starting work. (Tr. 1/145-46)

15. Mr. Serrao's 7 June 2007 QAR #84 notes that DPC did not yet have an airfield waiver, but that DPC would not be able to start work because certain "items" had not been submitted to the COE (tr. 15/47; R4, tab M-2, ex. 2 at 4). Mr. Serrao listed the outstanding items on the QAR:

> As of this date, we have not received certain items that need to be submitted prior to Dick Pacific starting work. Please submit the following as soon as possible.
>
> 1. Your Environmental Protection Plan. It was initially submitted under a Schofield Project. You were instructed to resubmit under correct project and also to make it more site specific. Prior to commencing construction activities or deliever [sic] of materials to the site, your environmental protection plan need[s] to be submitted for reviewal [sic] and approval by both the contracting officer and 15 CES/CEV.

[14] These submittals are also listed on the 7 June 2007 QAR daily log (R4, tab M-2 at 3).

2. A written report with color photographs noting the condition of the existing facilities at the time of the inspection prior to construction shall be submitted to the contracting officer.

3. Prior to the start of any excavation or trenching work, the contractor shall obtain an excavation clearance in writing. We have not received this clearance.

4. The contractor shall submit to the contracting officer photographs and or videos depictng [sic] the condition of the contractor's operation and storage area.

5. We have not received a site plan indicating the proposed location and dimensions of any area to be fenced and used by the contractor, the number of trailors [sic] to be used, avenues of ingress/egress to the fenced area and details of the fence installation. Any areas which may have to be graveled to prevent the tracking of mud shall also be indentified [sic].

6. Demolition Plan.

If you have submitted these items, please let me know.

Timely submission of these items and other contract items that need to be submitted prior to start of certain phases of work will help to facilitate the work. If I can be of any assistance, please let me know.

(R4, tab M-2, ex. 2 at 4, 5) Mr. Serrao testified that these items had to be submitted before work could commence[15] (tr. 15/48).

16. QAR #90, 13 June 2007, includes a status to the list of submittals in the government's 7 June 2007 email: EPP resubmitted on 12 June 2007; Report with photos submitted 13 June 2007; Excavation Permit submitted 11 June 2007; Operation Area photos submitted 13 June 2007; and still waiting for site plan for fenced area for use by contractor – needed ASAP since trailers are already being installed on site. The QAR work progress indicated that project trailers, including the government's trailer, were "secured," stairways to trailers under construction, setting up interiors of storage and

[15] Mr. Serrao did not say the submittals had to be approved before work could commence, however, approval appears to be required (tr. 15/51; R4, tab M-2, ex. 2 at 22).

office trailers, and installing temporary waterline to trailers. (R4, tab M-2, ex. 2 at 18) The site plan was resubmitted on 19 June 2007 (*id.* at 28). The site plan was orally accepted on 21 June 2007 (*id.* at 32). The EPP was resubmitted on 28 June 2007 (*id.* at 44). The EPP was approved on 23 July 2007 (app. supp. R4, ex. 807 at 2).

17. Mr. Serrao's 14 June 2007 QAR #91 notes that DPC "claims delay in regards to not having the airfield waiver" (tr. 15/49-50; R4, tab M-2, ex. 2 at 20). Mr. Serrao wrote, "[e]ven if Dick Pacific had the airfield waiver, he would not be able to start work on the airfield due to not having submittals in to start that work" (tr. 15/50-51; R4, tab M-2, ex. 2 at 21). Mr. Serrao's 15 June 2007 QAR #92 notes that DPC's EPP and site plan had been submitted and disapproved (tr. 15/51; R4, tab M-2, ex. 2 at 22). Mr. Serrao wrote in the QAR and testified that on 15 June 2007, DPC was erecting their project trailers in permanent positions. He also wrote that if the site plan was not approved the trailers would have to be relocated at DPC's expense. Mr. Serrao wrote that DPC did not have a basis for its delay claim because of the outstanding paperwork. (Tr. 15/51-52; R4, tab M-2, ex. 2 at 22) The site plan was approved in writing on 22 June 2007 (tr. 15/53; R4, tab M-2, ex. 2 at 34). Mr. Serrao reminded DPC that a certificate of insurance was needed for any subcontractor to start work (*id.*).

18. A temporary airfield waiver was issued on 21 June 2007 (tr. 15/54-55; R4, tab M-2 at PDF 34). Internal COE emails indicate that the waiver was first submitted for approval on 1 May 2007 and after a series of internal emails was approved on 20 June 2007 (tr. 1/146-47; app. supp. R4, ex. 1008 at 1-5). DPC had the temporary airfield waiver as of 21 June 2007 (tr. 2/33; app. supp. R4, ex. 458), however, an escort was required until barricades were approved and in place to designate the airfield as a construction site and no longer a restricted access area (tr. 2/374; R4, DVD 1, GEX 4). The first time work started was on 28 June 2007 when layout started for the FOD fence and barricades (R4, tab M-1 at PDF 40, tab M-2 at PDF 44).

19. On 27 July 2007, Mr. Hall sent a letter to Mr. Timothy Phillips, COE administrative contracting officer (ACO), responding to Mr. Serrao's[16] 7 June 2007 email (app. supp. R4, ex. 439). Mr. Hall took the position that even if the government was correct that DPC could not start work until the six items were submitted, there was concurrent delay that entitled DPC to a time extension of 98 calendar days (*id.*; tr. 1/146-48). Mr. Hall calculated the 98 days from 15 March 2007 when the NTP was issued and DPC was supposed to have full access to the job site to 21 June 2007 when they received the temporary airfield waiver granting airfield access (tr. 2/23).

[16] Mr. Hall mistakenly identifies ACO Phillips as the author of the 7 June 2007 email (tr. 1/146).

Barricades & Foreign Objects Debris (FOD) Fence

20. DPC submitted request for information (RFI) No. 5 requesting to use water-filled collapsible barricades (tr. 1/150-53; R4, DVD 1, tab F-10). Modification No. A00004 authorized and paid for the new barricades and reduced the barricade spacing from 7.62 meters to 6.0 meters necessitating more barricades (R4, DVD 1, tab C-24 at PDF 15). DPC's planned sequence of work was to construct the FOD fence first and then place the barricades but on 3 July 2007 the government directed DPC to install the barricades first (tr. 1/157, 161, 200; R4, tab M-2, ex. 2 at 52). DPC's baseline CPM schedule, activities 1470 (FOD Fence) and 1480 (Barricades), show that DPC planned to install the FOD fence before the barricades (tr. 2/88-89; app. supp. R4, ex. 2503 at 4). When this direction was given, DPC did not have all of the required barricades and could not start the FOD fence installation before the installation of the barricades (tr. 1/161-62).

21. QAR #99, 22 June 2007, indicates that DPC was informed that the temporary airfield waiver was approved, that submissions (EPP, Site Plan, Temporary Power Plan and subcontractor certificates of insurance) remained outstanding and that no work was being performed (R4, tab M-2, ex. 2 at 34). QAR #105 and QCR #105, 28 June 2007, indicate that a "corrected certificate of insurance was submitted today" and that the contractor was escorted onto airfield to layout for FOD fence and barricades (*id.* at 44, tab M-1 at PDF 40). QAR #105 also indicated that the EPP was resubmitted "today," and the temporary power plan had not been submitted (*id.*). QAR #106, 29 June 2007, indicates that work on barricades and FOD fence was "satisfactory" (R4, tab M-2, ex. 2 at 46). QAR #110, 3 July 2007, indicates that FOD fencing was being installed without temporary safety barricades in place. DPC was instructed to install safety barricades first. (*Id.* at 52) QAR #112, 5 July 2007, indicates that the Air Force could not provide escorts and that HK Fencing and Concrete Coring could not get on the airfield to work (*id.* at 55). QAR #119, 12 July 2007, indicates that work on FOD fence was ongoing (*id.* at 67). QAR #138, 31 July 2007, indicates that "[c]ontractor began excavating for new waterline" (*id.* at 95). QCR #139, 1 August 2007, indicates, "[i]nstall 22 barricades received from supplier" (R4, tab M-1, ex. 1 at 110).

Partial Suspension of Work

22. By letter dated 3 August 2007, the COE ordered a partial suspension of work on the Rev B Infield area while the COE considered where to place the excavated material from that area (tr. 1/166; R4, DVD 1, ex. 758). DPC's work in the Rev B Infield was delayed as a result of the suspension of work (tr. 1/167). The partial suspension was lifted on 13 August 2007 when the COE decided that all excavated material from the project could be disposed of within the LF-14 disposal area (tr. 1/167-68; R4, DVD 1, ex. 759). DPC worked on installing the new waterline during the stop work order relating to the LF-14 disposal area (tr. 2/80-81).

Earthwork at Rev B Infield

23. Mr. Sohn was Paradigm's project manager on the C-17 contract for the entire duration of the project (tr. 3/201, 204). He testified about Paradigm's planned work. Paradigm's earthwork in the Rev B Infield, Strat Ramp and other earthwork areas consisted of: (1) complete mass excavation; (2) compact subgrade (existing soil); (3) lay down geotextile fabric; (4) install 18 inches of select borrow (sub-base) in two lifts (rock aggregate material similar to base course (tr. 3/213)) and compact; (5) install 21 inches of base course in three lifts and compact; and (6) fine grade the base course (tr. 2/188, 3/211, 202, 216; app. supp. R4, ex. 170 at PDF 5; R4, DVD 1, tab I-6 at 4).[17] Paradigm planned to do demolition and mass excavation in the Rev B Infield and when finished immediately move to mass excavation in the Strat Ramp area. Paradigm planned to commence installation of select borrow and base course in the Rev B Infield while mass excavation in the Strat Ramp was ongoing. When mass excavation at the Strat Ramp was complete, Paradigm would commence installation of select borrow and base course at the Strat Ramp. (Tr. 3/204-05, 217) The base course in the Rev B Infield and Strat Ramp came from Grace Pacific's quarry (tr. 3/218). All of the base course placed in the Rev B Infield passed testing (*id.*).

24. Mr. Sohn testified that Paradigm was not able to follow the planned sequence because of the existing waterline that ran through the entire length of the Strat Ramp and a fuel line in the Rev B Infield (tr. 3/206-08). Paradigm planned to use large equipment, dozers and scrapers, to perform the mass excavation because that was the most efficient method for this project (tr. 3/206). They wanted to follow the planned sequence of work because demobilizing these large machines was inefficient and expensive (tr. 3/207). Paradigm could not use the large equipment around the existing active waterlines (tr. 3/208). Paradigm accomplished some mass excavation and subgrade work at the Strat Ramp but could not complete it because of the active waterline (tr. 3/212).[18]

25. In August 2007 Shaw Engineering was doing environmental work in the Rev B Infield area and Paradigm could not work in that area (tr. 1/175-78; app. supp. R4, AEX 1, 2). By 28 August 2007 Shaw had completed its work but Paradigm could not start mass excavation because the old fire hydrants were still hooked to the waterlines (tr. 1/179, 181; app. supp. R4, AEX 3). However, QAR #160, 22 August 2007, indicates, "[s]ubcontractor continue to mass excavate at Rinse Facility[19] & Strat Ramp location and haul spoils to LF#14" (R4, tab M-2, ex. 2 at 133).

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[17] *See* Drawing C-5 Airfield Pavement Details and Sections, Typical Apron Pavement (R4, DVD 1, tab C-27 Final_Drawings Infield Strat.pdf).

[18] This testimony is inconsistent with the as-planned sequence of work (finding 9) and indicates Paradigm started mass excavation early in Rev B Infield.

[19] The first mention of mass excavation at the CWRF was in QAR #148 on 10 August 2007 (R4, tab M-2, ex. 2 at 113). QAR #160 included the first indication of

26. On 5 September 2007, Mr. Sohn, Paradigm, sent DPC a delay letter citing causes for delay as: (1) Relocation of the light poles; (2) Removal of an existing electrical conduit in concrete jacket; (3) Removal of existing waterline; (4) Fuel line abandonment; and (5) Drainline work (R4, DVD 1, ex. 755 at 4).

27. QAR #173 documents that mass excavation at the Rev B Infield started on 4 September 2007 (R4, tab M-2 at PDF 155). According to Paradigm's Production Report dated 5 September 2007, it "broke 6" water line" in the Rev B infield (R4, GEX 55 at slide #25(7)).[20] Mr. McTyre's GEX 55 includes two pictures of the Rev B infield with water from the broken waterline (tr. 11/128-29; R4, GEX 55 at slide #25, photos 1 & 2). As of 6 September 2007 the waterline laterals in the Rev B Infield were still "live" (tr. 1/183-84; app. supp. R4, AEX 4). However, Paradigm located two waterline valves on the lateral lines and was able to turn off the water, remove the laterals and hydrants in the Rev B Infield (tr. 1/185-90).

28. QAR #193, 24 September 2007, documents that existing waterline laterals were demolished and mass excavation resumed in the Rev B infield (R4, tab M-2 at PDF 186). QAR #197, 28 September 2007, documents that Paradigm had stopped mass excavation and was compacting subgrade (*id.* at PDF 194). QAR #228, 29 October 2007, documents that Paradigm started installing sub-base at the Rev B Infield (*id.* at PDF 252). QAR #256, 26 November 2007, documents that Paradigm started installing base course at the Rev B Infield (*id.* at PDF 304). QARs #308, 17 January 2008, and #309, 18 January 2008, document that base course installation was completed[21] (*id.* at PDF 425, 430). QAR 316, 25 January 2008, documents that mass excavation started at the Strat Ramp (*id.* at PDF 449). As DPC was preparing to install PCC in the infield it realized its forms were not following grade and would require Paradigm to make grade corrections (tr. 10/68). QAR #333, 11 February 2008, documents that Paradigm started correcting base course elevations at Rev B infield (R4, tab M-2 at PDF 503). QAR #362, 11 March 2008, documents that correction of base course grades was completed (*id.* at PDF 606).

29. Mr. Hall explained why Paradigm could not start mass excavation in the portion of the Strat Ramp near the old waterline (tr. 2/115). Mr. Hall testified, "[y]ou couldn't productively use a dozer and mass out those areas with the existing waterline in tact" (tr. 2/115), and "[w]e wouldn't have put the project together to do it in sections. The

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mass excavation at the Strat Ramp, however, the location of this mass excavation is not clear.

[20] GEX 55 is Mr. McTyre's expert report, "Rebuttal of PCCI's Delay Analysis," however, the individual pages are not uniformly marked, and rather they are organized by "slides" that were presented on a screen during the hearing.

[21] There was some additional subgrade work between infield and new ramp that appears to have been completed by 11 February 2008 (app. ex. 51 at PDF 279).

whole concept was always to finish the mass and cycle the mass forward through the areas." (Tr. 2/116)

Unsuitable Soil at the Rev B Infield

30. An "Earthwork Meeting" was held on 20 September 2007 to discuss the unsuitable materials in the Rev B Infield. Ken Fan, a government consultant and soils designer for Robert and Company, recommended that the subgrade soil be "scarified,"[22] allowed to dry and then compacted (tr. 2/160; R4, DVD 1, tab I-6). Mr. Kawamoto, DPC's project manager, disagreed with the statement in the minutes that everyone understood there was no change to the contract specifications and drawings. He explained that scarifying the soil could be done, but it was not what was detailed in the contract and that it "just took forever to actually dry out." (Tr. 2/161-62) The procedure eventually worked in most of the areas but there were some areas in which it did not work (tr. 2/162). Mr. Kawamoto testified that the biggest problem in the Infield was the unsuitable material because the method to deal with it depended on the weather and drying out of the soil (tr. 3/87).

31. Mr. McKittrick was resident engineer for the COE on the Hickam Airfield project (tr. 12/79, 82). Mr. McKittrick testified about the unsuitable soil in the Rev B Infield. He explained that the contract specification section 02301, paragraph 3.2.3 (*see* finding 4) required the contractor to replace any unsuitable soil it found down to a depth of 18 inches[23] below subgrade. If there was unsuitable soil deeper than 18 inches, it could not be left in place and it would be the government's responsibility to pay for removing that soil and replacing it with suitable soil. (Tr. 12/84-86)

32. By letter dated 16 June 2009, contracting officer's representative[24] (COR) McKittrick informed DPC that its assertion that there was unsuitable soil had "no merit" because they were responsible for dealing with unsuitable soil within 18 inches of subgrade (tr. 12/88; R4, DVD 1, tab M-1261).

Fuel Line in the Rev B Infield

33. The site plan shows a fuel line running through the north end of the Rev B Infield (app. supp. R4, ex. 52; R4, DVD 1, ex. 55). DPC submitted RFI No. 32, 18 September 2007, notifying the COE that the fuel line in Rev B Infield was approximately six inches above subgrade and asking what to do about it (R4, tab G-2 at 9). COR McKittrick explained that they knew the fuel line was there, but thought it was buried deeper under the subgrade (tr. 2/144, 12/79, 82, 92). QAR #224, 25 October 2007,

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[22] Using the "teeth of the bucket" till the top layer of soil to open it up and produce more surface area to allow it to dry (tr. 2/163).

[23] Specification section 02301, paragraph 3.2.3, uses 450mm which is 18 inches (finding 4).

[24] This is the first date Mr. McKittrick is identified as a COR (R4, ex. 1261).

indicated that DPC was "backfilled at existing fuel line with S4C" (R4, tab M-2, ex. 2 at 246). COR McKittrick explained that S4C was a different backfill material used over the fuel line and that he was not aware of any delays caused by the fuel line (tr. 12/94-95).

Low Profile Hydrants

34. On 3 July 2007 the COE directed DPC to suspend ordering the contract specified fire hydrants (app. supp. R4, tab 807 at 1). In a series of internal COE emails on 28 and 29 August 2007, the COE discussed low profile hydrants. The fact that there were two types of low profile hydrants was discussed and also the need to know what type of hose connection was required. (R4, DVD 1, AEX 7)

35. Contract Modification No. A00001, dated 5 September 2007, changed the fire hydrants from flush mount to Clow Valve Co. Series 92 low profile hydrants (R4, tab H-1). The modification stated DPC was "directed to proceed with this change" (*id.* at 2). Mr. Kawamoto explained that there was not enough information in the modification to purchase the hydrants because DPC needed to know what the outlet sizes were (tr. 2/132, 150). By email dated 25 September 2007, the COE provided DPC the outlet sizes that allowed DPC to place the order (tr. 2/150-51; R4, tab H-2). On 27 September 2007, DPC authorized Fluid Systems to proceed with the order for the Clow low profile hydrants specifying the various "bury heights" (tr. 2/152-53; R4, tab H-3). Some of the items were not available and had to be manufactured (tr. 2/154-55). DPC went out to other suppliers to locate the items that were out of stock (tr. 2/155). QCR #218, 19 October 2007, included, "[w]aterline – 200 (mm) stopped [Strat Ramp] pending rec[e]ipt of hydrant and appurtenances" (R4, tab M-1 at PDF 352). DPC was able to get the rest of the items "piecemeal" from other suppliers (tr. 2/155-56). QCR #327 and QAR #327 document that on 5 February 2008 the new waterline and hydrants were complete, demolition of the old waterline started at the Strat Ramp, mass excavation continued at the Strat Ramp and concrete form work was being installed at the Rev B Infield (R4, tab M-1 at PDF 612, tab M-2 at PDF 484; tr. 2/156-57).

36. Mr. Kawamoto, DPC's project manager, was responsible for general oversight of all phases of the project (tr. 2/132). He started working on the C-17 job in August 2007 (tr. 2/132, 137). At that time work on the new waterline had started but the hydrants were on hold so they could not complete installation (tr. 2/138). Mr. Kawamoto testified that DPC ordered the low profile fire hydrant material as soon as they got all the information (tr. 3/86). DPC was not able to work in the planned sequence due to the waterline delay caused by the low profile hydrants (tr. 2/148-49). The hydrants were installed, testing and chlorination completed and the new waterline connected on or about 4 February 2008 (R4, tab M-1 at PDF 608-12).

37. ACO Phillips, wrote a memorandum for record, dated 8 December 2008, wherein he considered DPC's request for a time extension due to the low profile hydrants

(tr. 15/154; app. supp. R4, ex. 807). ACO Phillips recommended that DPC be given 22 days of compensable delay and 48 days of non-compensable delay (app. supp. R4, ex. 807 at 5).

Weather

38. There was flooding during the course of the contract and Paradigm had to pump the water out of the flooded excavations. Paradigm was not allowed to use the existing storm drains and had to dig trenches to direct the water to the east side of the Strat Ramp. (Tr. 3/239-40) COR McKittrick agreed that the COE would not allow DPC to pump water into the storm drains because it was "against the law" (tr. 12/246-47).

39. Mr. Trabucco was DPC's supervisor during the time they had flooding. While he was supervisor, he recalled there was a period of time that DPC was not allowed to do anything with water because they were not allowed to pump water into the storm drains, not even if the water flowed through filter bags or other precautions that kept silt from entering the drainage system. (Tr. 16/45-46, 60, 63) Eventually DPC was allowed to pump water to a pond area outside the trailer complex (tr. 16/47).

40. Picture AEX 8, taken 4 November 2007, shows a completely flooded Rev B Infield with a grader in water up to half the height of its wheels and a gas water pump in operation (app. supp. R4, AEX 8). AEX 8 is a view looking west that shows water being pumped out of the flooded Infield (tr. 2/164, 166). At this time DPC was installing sub-base and they were pumping the water to the Strat Ramp area (tr. 2/167, 169). Since DPC had started sub-base work in the Infield, the idea was to pump water into the excavated Strat Ramp area and then to pump it into an area adjacent to the Strat Ramp and allow the water to naturally flow into the storm drains (tr. 2/169-70).

41. In an email from COR McKittrick to ACO Phillips, dated 2 December 2008, COR McKittrick stated that they did get permission to pump water anywhere on the job site as long as it did not leave the job site and did not flow into the storm drain system (R4, DVD 1, ex. 811). Mr. Trabucco recalled that they were allowed to pump water to the "pond" (tr. 16/48-49). Mr. Trabucco disagreed with criticism that DPC did not have enough pumps, explaining that both DPC and Paradigm had pumps but that the problem was that they didn't have adequate places to which the water could be pumped (tr. 16/49).

42. By email dated 11 December 2008 from Mr. Sohn to Mr. Tracy and Mr. Trabucco, Mr. Sohn discussed delays caused by heavy rains during Thanksgiving in Strat Ramp zone 2 area. Mr. Tracy was DPC's project manager for the C-17 project from September 2008 to the end (tr. 4/87). It took several days to pump out the water and there was concern that the rain would wash away fines from the base course. Paradigm scarified the base course to remix the material. (R4, DVD 1, ex. 608; tr. 4/78-79)

43. In an 11 December 2008 email to other COE personnel, COR McKittrick wrote, "the CWR/Strat Ramp site is completely under water.... Since we have blocked the

few storm drains we have the site is presently a lake." (R4, DVD 1, AEX 74 at PDF 1) Attached to the email were pictures showing the flooded job site (*id.* at PDF 3-14). Mr. Trabucco recalled the flooding and explained that because they received water from adjacent paved areas he was unable to effectively divert water (tr. 16/50). COR McKittrick testified that this was a "fairly significant amount of rainfall at one time" (tr. 13/165-66).

44. Picture O (app. supp. R4, AEX 9) dated 15 December 2008, shows flooding after a storm and water being pumped into a temporary trench (tr. 3/169, 197-98). Picture P shows the trench they were allowed to use to move water into an area outside the trailer area (tr. 3/170; app. supp. R4, AEX 9 at PDF 17). Mr. Trabucco told the COE they could not proceed with work without getting rid of the water at the site (tr. 3/171).

Strat Ramp Base Course

45. There are four major tests for the base course: proctor (compaction test); "gradation" (particles/"fines" passing through a sieve); abrasion test; and CBR (bearing strength) (tr. 3/19-20). A "Proctor" is "a predictive tool to enable a contractor to set the amount of moisture to get the maximum density in placing, compacting the base course" (tr. 4/190). It also measures base course density (*id.*). Gradation determines if the material may be used for sub-base (select) or base course (tr. 4/190-91). Grace Pacific checks gradation of its base course material at its quarry on a daily basis (tr. 4/190).

46. QAR #316 documents that mass excavation started at the Strat Ramp on 25 January 2008 with the old waterline still in place (R4, tab M-2 at PDF 449). QAR #330 documents that the old waterline was removed on or about 8 February 2008[25] (*id.* at PDF 496). QAR #412 documents that installation of sub-base started on or about 30 April 2008 (*id.* at PDF 778). QAR #432 documents that installation of base course started on or about 20 May 2008 (*id.* at PDF 835). QCR #678, documents that compaction of base course at the Strat Ramp ended on or about 21 January 2009 (app. ex. 51 at PDF 287; R4, tab M-1 at PDF 1596). QCR #702 documents that the last lane of PCC pavement at the Strat Ramp was poured on or about 14 February 2009 (app. ex. 51 at PDF 287; R4, tab M-1 at 1670).

47. Base course gradation testing at the Strat Ramp was required for each 1,000 metric tons (R4, tab C-26 Specs at PDF 326). The base course was installed in all lanes of the Strat Ramp north zone first; 1,000 metric tons would be about one seven inch lift for one third of the north zone (tr. 2/189). Typically, the gradation test is taken soon after compaction is completed (tr. 4/80). COR McKittrick testified that Hirata & Associates (DPC's testing lab (tr. 2/186)) did not take samples in the Strat Ramp as frequently as required by the contract which is why the COE did not have more base course samples in that area (tr. 12/198-200; R4, DVD 1, ex. 50 at PDF 296). Hirata & Associates

[25] The abatement contractor still had to wrap and dispose of water pipes but it appears that the excavation of the water pipe was complete (R4, tab M-2 at PDF 503).

acknowledged that they were not sampling as frequently as the contract required (app. supp. R4, ex. 50 at 295-99; tr. 7/197-204). COR McKittrick was concerned about the in-place gradation of the base course because it had a direct correlation to permeability of the material; if the base course didn't drain, water could collect under the concrete pavement (tr. 12/212).

48. In a 21 April 2008 letter from Grace Pacific to Paradigm, Grace Pacific stated that they noticed more cinder material in its base course. Test results of the material attached to the letter indicated that the base course passed the #200 sieve test. (R4, DVD 1, ex. 554; tr. 4/28)

49. Mr. Creps is a senior vice president of administration for Grace Pacific (tr. 4/177). Grace Pacific experienced a change in density of its base course material at its quarry in April 2008. The material processed before April 2008 was "denser" than that processed after April 2008. Mr. Creps concluded if Paradigm had been able to pick up base course before April, it would have been able to access the denser base course that it had picked up between November 2007 through January 2008. (Tr. 4/181-83; R4, DVD 1, ex. 784 at 1) Mr. Creps testified that all base course, the so-called "denser" and "lighter" material, that Grace Pacific sold to Paradigm met specification 02722 when tested at the quarry (tr. 4/196-98, 205, 208, 212-13; app. supp. R4, AEX 22). Testing at the quarry did not involve compacted base course (tr. 4/210). Mr. Creps testified that there is a tendency for compaction to break down cinder and it can "get finer" (*id.*).

50. COR McKittrick testified that in June 2008 they were starting to get sub-base and base course test results that indicated the material properties were changing. Paradigm was having trouble attaining proper compaction. Paradigm was using a proctor of 114 that COR McKittrick testified was "extremely low" and if true indicated that the material had "changed tremendously." (Tr. 12/181-84)

51. Mr. Lum, Mr. Kawamoto and Mr. Serrao each testified about the location of "lane 1"[26] where the first concrete was poured. Mr. Lum prepared the drawing of the Strat Ramp at AEX 35 (tr. 6/109). It was prepared within four or five months of the trial (tr. 6/110), but it depicts the "lane convention" he used during the Strat Ramp base course discussions (tr. 6/109). The drawing shows "lines" (as opposed to "lanes") 1 through 9 with "line" 1 on the left side (west) next to existing Strat Ramp pavement and line 9 on the right side (east). It indicates that the base course third lift was placed in Strat Ramp zone 1, east 100 feet, 1,850 metric tons, on 16 through 18 June 2008. (App. supp. R4,

[26] The "lines" (shown in AEX 35 and 37 at the top of the Strat Ramp) run west to east starting with "line" 1 at the west (left) edge of the Strat Ramp next to pre-existing pavement and line 9 at the east edge. The "lanes" (shown in AEX 39) run east to west with "lane" 1 between "lines" 9 and 8 on the east side of the Strat Ramp "Lane" 1 (east) is at the opposite side of the Strat Ramp as "line" 1 (west).

AEX 35) In addition to the vertical lines numbered at the top 1 to 9, AEX 35 shows horizontal lines on the right side (east) 1 to 28 (*id.*). Zone 1 lies between vertical lines 4-9 (100 feet) and horizontal lines 1 to 28 and is outlined on AEX 35 in orange filled in with red/pink. Horizontal line 1 is the north end of the Strat Ramp and line 28 is the south end of zone 1. (Tr. 15/85-88; app. supp. R4, AEX 35) The first concrete pavement was placed on lane 1, zone 1, which is on the east side (right side) of the Strat Ramp between vertical lines 8 and 9 and horizontal lines 1 to 28 (tr. 15/110).

52. On 23 June 2008 Mr. Serrao, COE, emailed Ms. Pettibone, Mid Pacific Testing and Inspection (MidPac) (the COE's test lab) to request that they take a sample of compacted base course the next day and provided directions for the testing (R4, GEX 18 at 1). He asked for a third lift test at "Grid line 1-28, Lanes 6 and 7 (50 feet from east end)," and "Grid line 1-28. Lanes 5 and 4. 100 feet from east end."[27] (*Id.*)[28] He stated that he would not be there the next day (24 June 2008) and that the technician should contact Mr. Morita (*id.*).

53. Mr. Lum worked on the C-17 project from about 26 June 2008 to August 2009 (tr. 6/10). Mr. Lum works for Bowers & Kubota Consulting which was under contract with the COE (tr. 6/8-9). Mr. Lum served as COE project engineer after Mr. Morita left (tr. 6/8). He was later replaced by Ms. Hinkle (tr. 6/11, 105). According to Mr. Lum, Mr. Morita told him that on 24 June 2008 he showed the MidPac technician where to take the sample on lane 1 (tr. 7/217-18, 222-23).[29] Mr. Lum testified that the LA abrasion test dated 30 June 2008 was the test of the 24 June 2008 sample Mr. Morita directed the technician to take (tr. 7/222-23; R4, GEX 17 at 4, DVD 1, ex. 59 at PDF 25). Mr. Lum testified that there was no confusion as to where the concrete was going to be placed and where Mr. Morita wanted the test sample to be taken. The sample was taken in lane 1 that was between lines 8 and 9 on AEX 35, third lift at row 23 (app. supp. R4, AEX 35; tr. 8/20-21). The Daily QCR for 24 June 2008 indicates a test sample was taken, "QA test

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[27] Mr. Serrao mistakenly referred to "lanes" rather than "lines." This can be seen from AEX 35 where the squares on the Strat Ramp formed by the vertical and horizontal "lines" are 20ft squares (100ft / 5 = 20ft). Using this convention, Mr. Serrao's direction makes sense.

[28] Mr. Lum interpreted Mr. Serrao's 23 June 2008 email to place lane 1 next to the existing concrete on the west side of the Strat Ramp (tr. 7/211-13). However, since Mr. Serrao specifically identified a sample location in feet from the east end of the Strat Ramp, a location that is clearly known, we do not consider any confusion over the lanes to be material.

[29] This hearsay was received by the Board over objection because Mr. Morita was deceased (tr. 7/223) at the time of the hearing and we consider Mr. Lum's recollection of his comments credible and material. *Federal Contracting Corp.*, ASBCA No. 20701, 77-1 BCA ¶ 12,239 at 58,947 n.1 (Witness testified about phone conversation of a deceased individual he overheard that was accepted as reliable under the circumstances.).

B/C 3rd lift Zone 1 100 x 500 ft" (R4, tab M-1, ex. 1 at 1028). Mr. Lum testified that "[Z]one 1, 100 by 500 ft" was in the pink area of AEX 35 (lines 4 to 9) (tr. 8/22). Mr. Lum marked an "x" on AEX 35; GEX 37[30] to show the location of the sample that was taken, tested and the test results reported in GEX 17. The "x" was between lines 8 and 9 at row 21[31] on GEX 37 (tr. 8/21). Mr. Lum testified there was "[a]bsolutely no doubt in my mind that the test results represented in GEX-17 represent that location marked by the x for lift 3" (tr. 8/24; app. supp. R4, AEX 35; R4, GEX 17, 37)

54. The third lift was 1,850 metric tons of base course placed between 16 and 18 June 2008 (tr. 6/179). Bag #58 was collected on 25 June 2008 at Strat Ramp, third lift, row 9, line 8 (tr. 2/198, 6/179). Mr. Kawamoto testified that he received verbal confirmation that the base course (bag #58) passed testing in the area where lane 1 PCC was to be installed (tr. 2/186). Mr. Lum testified that test bag #58 was taken from the third lift that is the same material under the lane 1 concrete (tr. 6/229, 235; app. supp. R4, AEX 35). The written test results indicated that bag #58 passed with a #200 sieve percentage of 9.7 (*id.*; tr. 2/187, 198; app. supp. R4, AEX 63, tab 31, plate 3).

55. On 25 June 2008, Mr. Morita forwarded a 25 June 2008 letter from the COE to Mr. Kawamoto. The letter said that Hirata & Associates[32] took a sample of base course on 24 June 2008. The COE had not received the results of base course testing to determine compliance with contract specification, section 02722, paragraph 2.1.1 - Aggregates. The COE warned, "[w]ithout our test lab report, your concrete placement on the Expand Strat Ramp scheduled for tomorrow, 26 June 2008, will be at your own risk." (R4, DVD 1, ex. 269 at PDF 2) Mr. Kawamoto replied stating that he had received verbal confirmation that the base course met specification and that he would forward a copy to the COE when he received it (*id.*; tr. 3/37). Mr. Morita replied stating "[e]ven with your test lab report which we still have not received as of 6:15 AM, 26 Jun 2008, you are proceeding at your own risk because our QA report will not be available until sometime next week" (app. supp. R4, ex. 270 at 1).

56. By email dated 30 June 2008, MidPac sent Mr. Morita test results including a sieve analysis and proctor (R4, GEX 17). The MidPac sieve test results have the date 25 June 2008 with no location identified for the sample; the report documents that 12.1% material passed the #200 sieve (*id.* at 2). The proctor test indicates the sample was taken on 24 June 2008 at zone 1, lane 1, #23 (*id.* at 3). Mr. Lum testified that he recalled these were the tests ordered by Mr. Morita (tr. 6/188-91). Mr. Lum referred to a proctor test

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[30] AEX 35 (app. supp. R4) and GEX 37 (R4) are the same diagram of the Strat Ramp. The actual "x" is seen on GEX 37, however, it is at row 21 not row 23, but still in lane 1.

[31] This location does not conform to the directions given by Mr. Serrao, i.e., 50 and 100 feet from the east side (finding 52). Line 8 is twenty feet from the east side which is line 9 (finding 51).

[32] While the letter refers to Hirata, the test results were from MidPac (R4, GEX 17).

and stated that it was taken at the same time as the sieve test material (tr. 6/191-92). Mr. Lum testified that this was the only test taken in lane 1 before the concrete was installed (tr. 6/193).[33] The COE's QAR for 24 June 2008 (No. 467) indicates that the "QA laboratory was on site this morning to performed [sic] density test on 3rd lift base course at expand ramp" (R4, tab M-2, ex. 2 at 934).

57. Mr. Kawamoto testified that when he directed the lane one concrete installation he believed that the layers of sub-base and base course were conforming (tr. 2/198-99, 3/21-23). The first PCC pavement was installed at Strat Ramp lane 1 on 26 June 2008 (tr. 2/199, R4, tab M-1, ex. 1 at 1036). Mr. Lum was there when DPC poured lane 1 concrete (tr. 6/106, 221-23).

58. By letter dated 3 July 2008 from COR McKittrick to DPC, COR McKittrick informed DPC that the QA testing sample taken on 24 June 2008 from the third lift base course "under the Strat Ramp zone 1" failed compaction and gradation tests (R4, ex. 1232 at 1). Mr. Lum recalled that he drafted the letter and the results referred to are from MidPac showing 12.1% passing the #200 sieve (tr. 6/245-47; R4, GEX 17).

59. By email dated 10 July 2008, the COE requested MidPac to collect base course samples from lanes 2 and 4 and perform the sieve testing. The sample in lane 2 was to be as close to the concrete pavement at lane 1 as possible without undermining the pavement. (Tr. 12/197; R4, GEX 69) COR McKittrick explained they were concerned that DPC had placed pavement over non-conforming base course (tr. 12/197-98). He was not concerned that the material had changed since it was placed because there was not much construction at the Strat Ramp or weather events during that time (tr. 13/213-15).

60. During a meeting concerning base course held on 11 July 2008, Mr. Tsue, Grace Pacific, stated that at that time the quarry was at its limits and they could not expand until a new permit was approved and that the amount of cinder will vary depending on where in the quarry the rock comes from (tr. 15/192-94; app. supp. R4, ex. 50 at PDF 295, 297-98).

61. By letter dated 6 August 2008 from DPC to the COE, DPC requested three variances. One of the variances was an exception to the in-place gradation requirements for the base course material. DPC asked that the 10% requirement be changed to 15%. The request was based on Mr. Fujioka's advice that was attached. (Tr. 5/41-44; R4, tab K-2) Mr. Fujioka believed the #200 sieve requirement should have been 15% because that is

[33] He did not include this test on AEX 39 (tr. 6/193). He did not refer to it in a declaration he signed in support of a motion submitted earlier in this appeal (tr. 6/213; app. supp. R4, ex. 542).

what is required for rigid pavement base course in UFC[34] (R4, tab K-2 at 4, 6; tr. 5/146). By letter dated 25 August 2008 from DPC to the COE, DPC requested reconsideration of the COE's denial of its variance request for the 10% passing the #200 sieve requirement[35] and attached another report from Mr. Fujioka (tr. 5/147, 149-51; R4, DVD 1, tab K-3).

62. By letter dated 10 September 2008, COR McKittrick requested that DPC conduct additional in-place gradation testing along the edge of lane 1 concrete (R4, tab M-1241 at 2). By letter dated 15 September 2008, Mr. Tracy responded to the COE's 9 September 2008 letter taking the position that DPC had a passing gradation test result (bag #58) for the third lift base course before it poured the lane 1 concrete (R4, DVD 1, ex. 2568). Mr. Tracy agreed to take samples along the edge of the concrete at lane 1 as requested by the COE, but did not concede that the tests would be representative of the base course under the concrete, and would not agree to remove the concrete "at our costs under any circumstance" (*id.* at 1-2). Mr. Tracy explained that months had passed since the base course was placed and weather and construction (placing the lane 1 concrete) could have affected the base course (tr. 16/12).

63. Mr. Creps testified how the base course is handled may affect gradation. He testified that taking the in-place sample using a back hoe was "highly suspect." These factors could make the in-place gradation vary from that at the quarry. (Tr. 4/210-11) He testified that rain could affect gradation by moving fines (tr. 4/214). Mr. Creps testified that testing base course should be conducted close to the time of placement and that testing conducted subsequently should not be used for acceptance/rejection (tr. 4/219).

64. Mr. Fujioka testified there was definitely the potential for contamination of the base course if it is tested several months after installation due to rain and construction activities. The longer you wait to take the tests the more likely the results would not be accurate. (Tr. 5/75-76)

65. Mr. Lafrenz testified that the more time elapses between placement of base course and testing, the less reliable the results because rainfall, wind, and construction activity can change the characteristics of the base course (tr. 9/37). The same is true if concrete is removed from above base course (tr. 9/38). DPC used a "Hoe-Ram"[36] to

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[34] UFC 3-260-02, Pavement Design for Airfields, Chapter 8, Aggregate Base Course, recommends no more than 15% passing #200 sieve for rigid pavement (R4, DVD 1, tab K-2 at 4).

[35] The letter acknowledges that the COE granted a variance of 18% passing the #200 sieve for sub-base (R4, DVD 1, tab K-3 at 1).

[36] Notes on the diagram of the Strat Ramp for samples under the concrete states, "(After Removal by Hoe-Ram)" (app. supp. R4, AEX 39).

remove the concrete at lane 1. Mr. Lafrenz explained that a "Hoe-Ram"[37] is an excavator with a pneumatic attachment like a jackhammer. The process of removing 14-inch thick concrete would create a lot of concrete dust and any test of the base course after removal of the concrete would be suspect. (Tr. 9/40-41) Mr. Creps also testified that demolition of the concrete in lane 1 with a "Hoe-Ram" would further crush the base course causing the base course to "get finer" (tr. 4/214-15).

66. COR McKittrick testified that the removal of the concrete would be a significant disturbance to the base course and a sample would not be representative of what was there before the concrete was placed (tr. 13/94). Dr. Rollings of Rollings Consulting, LLC, was accepted by the Board as the COE's expert in geotechnical engineering and design, construction and maintenance of military airfield pavements (tr. 13/218). He agreed that fines can be moved by construction equipment and water. He also testified that a sample only represents the material at the time the sample is taken, not before or after. (Tr. 14/21-22) For example, a sample taken three months after placement of the base course does "[n]ot necessarily" tell you what the gradation was at placement – it depends on what happened at the site (tr. 14/118). QAR #552 and QAR #560 document that Paradigm started removing the 6 inches of the third lift base course in zone 1 of the Strat Ramp on 17 September 2008 and finished on 25 September 2008 (R4, tab M-2, ex. 2 at 1174, 1193). Paradigm was allowed to use the third lift base course for select borrow (sub-base) in other areas of the project (tr. 3/225). By letter dated 29 September 2008, signed by COR McKittrick, he directed DPC to "completely remove the remaining 6" of the top lift of base course in the area designated as Zone 1" (R4, ex. 1243 at 1). The direction was based on testing adjacent to the concrete that failed gradation (tr. 8/32-34). COR McKittrick testified that the majority of the testing in lane 2 failed testing (tr. 12/217). All of the material had to be removed because it was all quarried at the same time and all placed at the same time (tr. 12/218-19). DPC argued that the material would perform properly (tr. 12/219-20).

67. The record includes a 7 November 2008 letter from Hirata with an attachment of tabular soil test results (app. supp. R4, ex. 63, tab 31). The table has test results for "SB" (select borrow) and "BC" (base course) (tr. 2/187). Base course samples were collected in "bags" (tr. 2/192-92). The Strat Ramp base course test results from Hirata (app. supp. R4, ex. 63, tab 31) grouped by month[38] are as follows:

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[37] The transcript of the question Mr. Lafrenz responded to erroneously used the term "whole round."

[38] We do not list test results after July 2008, that include tests at lane 1 after the PCC was removed using the "Hoe-Ram," because we have no confidence that the results are accurate due to time, weather, construction and removal of the lane 1 concrete – see Decision section below.

Bag No.	Date Taken	Location[39]	Lift	Result #200 Sieve Hirata Meet Spec Yes/No
42	05/20/08	S		9.8/Yes
47	05/28/08	R12/L6	1	10.4/No[40]
48	05/28/08	R28/L3	1	10.3/No[41]
52	06/06/08	S		9.5/Yes
53	06/07/08	R18/L7	2	9.1/Yes
56	06/07/08	R18/L3	2	9.6/Yes
1570[42]	06/24/08	R23/L1	3	12.1 MidPac/No
58	06/25/08	R9/L8	3	9.7/Yes
64	07/08/08	R38/L1	1	18.5/No
65	07/08/08	R35/L9[43]	1	10.3/No
66	07/08/08	S		7.4/Yes
73	07/11/08	R19/L7	3	15/No
74	07/11/08	R7/L5	3	18/No
76	07/16/08	R14/L6	3	11/No
77	07/16/08	R3/L8	3	14/No
78	07/16/08	R32/L3	1	11/No
79	07/16/08	R38/L9	1	12/No
82	07/18/08	R7/L1	3	6.8/Yes
83	07/22/08	R26/L4	3	16.1/No
84	07/22/08	R17/L2	3	11.5/No
93	07/29/08	R11/L3	3	8.7/No (passed gradation)
94	07/29/08	R4/L2	3	10.6/No

These and other test results are annotated on DPC's AEX 39, the diagram of the Strat Ramp with the test samples, locations, and dates indicated (app. supp. R4, AEX 39).

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[39] "R" is row, "L" is line, and "S" is stockpile. Samples taken from compacted base course unless at stockpile.

[40] Mr. Kawamoto testified that the contract required no more than ten percent fines passing the #200 sieve, but that ASTM required that the results be reported to the nearest whole number and he believed that bags 47 and 48 passed testing (tr. 2/194, 3/33).

[41] *See* footnote 26.

[42] This is the 24 June 2008 sample ordered by Mr. Morita, tested by MidPac, and results made available to Mr. Morita on 30 June 2008 (R4, GEX 17).

[43] Zone 2 started at row 29 so bags 64, 65, 78, and 79 were taken from zone 2 (tr. 15/85-88; app. supp. R4, AEX 35).

Portland Concrete Cement (PCC) Pavement at Strat Ramp

68. DPC installed the PCC pavement at the Strat Ramp lane 1 on 26 June 2008. QAR #469, dated 26 June 2008, includes the following entry for Strat Ramp work, "[c]ontractor is placing concrete on the first lane at grid 1-28, east end, 500 feet." (R4, tab M-2, ex. 2 at 941) The PCC was placed in twenty (20) foot wide continuous lanes, poured one lane at a time, and then saw cut at twenty (20) foot intervals for crack relief (tr. 2/184-85).

69. The record includes a 12 November 2008 document entitled "CoE RESPONSE TO QUESTIONS RAISED BY Ross Higa, PACAF FY07 MCAF Strategic Airlift Ramp, HAFB" (app. supp. R4, ex. 145). Mr. Higa is an Air Force pavements engineer (tr. 8/206). The document contains fifteen numbered questions with COE answers. Question and answer 13 and 14 are:

> 13. Why did the Ktr place Lane 1 in the expansion area prior to acceptance of the base course?
>
> The day prior to the lane 1 placement, the CoE noted by letter to the contractor our concerns with their base course due to varying and lower proctors and noting that the lane 1 placement scheduled for the next day would be at the contractor's own risk. The contractor's in-place gradation for the Lane 1 zone show contract compliance. It wasn't until early to mid July 08 that the contractor noted in-place gradation failures in many other areas of the base course.
>
> 14. What is the plan for Lane 1 since it was placed over base course that may be out of spec?
>
> Initially, the CoE had planned to direct replacement of the lane 1 concrete due to the suspected non-conforming base course. However non-conformance would be difficult to substantiate conclusively as slab demo would disturb the base. Also our District counsel rendered an opinion that directed replacement of lane 1 slab would potentially be economic waste i.e., the contractor would incur high costs (approx $250K) for no measurable material benefit to the Government meaning the contractor had achieved substantial compliance. Subsequently, our TSC suggested potential option where only a selected minimum number of slabs are replaced to allow the ramp base course lateral drainage. We anticipate selected slabs would be removed and replaced at strategic locations to promote positive

> lateral drainage of the ramp. It should also be stressed the existing 6" of suspect base material under these selected slabs would also be removed and replaced with high quality drainable base material meeting "in place" gradation requirements to ensure drainage of the area. The TSC is currently analyzing this option. However the location of these slabs may not necessarily correspond to the 2 slab locations removed last week by the contractor due to the plastic shrinkage cracking.

(App. supp. R4, ex. 145 at 3001172) Mr. Lum testified that "some" concrete slabs were removed from lane 1 due to problems related to the concrete (tr. 7/260). COR McKittrick testified that a "couple" of lane 1 slabs had to be removed due to problems with the concrete (tr. 15/236).

70. By letter dated 12 August 2008 to DPC, ACO Phillips denied DPC's request for a gradation variance and directed that the top lift (six inches) of existing base course that exceeds the 10% fines requirement be removed. ACO Phillips also directed DPC to submit QC gradation test data taken under the lane 1 concrete and if that data did not exist to take samples next to the lane 1 concrete for testing. (Tr. 15/202-04; R4, ex. 1238)

71. By letter dated 29 August 2008 to DPC, ACO Phillips agreed to accept in-place sub-base with a maximum of 18% fines passing the #200 sieve but again denied the request for a variance for the base course and directed the removal of non-conforming base course (tr. 15/204-05; R4, ex. 1239).

72. By letter dated 10 September 2008 to DPC, COR McKittrick again denied DPC's variance request and directed either gradation test results from under the lane 1 concrete or additional tests on samples from next to the lane 1 concrete (R4, DVD 1, M-1241). ACO Phillips recalled that they would consider base course gradation testing adjacent to the lane 1 concrete to be representative of the base course under the concrete (tr. 15/207-08). ACO Phillips' concern was that the base course was much less permeable than base course meeting the 10% fines requirement and that over time there would be pumping and overall degradation of the concrete (tr. 15/211).

73. By email dated 3 December 2008, to COR McKittrick, Mr. Gutierrez, COE Transportation Systems Center (TSC), recommended against removing any PCC panels in lane 1 (tr. 13/95; R4, DVD 1, ex. 148). By email dated 4 December 2008, COR McKittrick advised his superior chain of command that he was preparing a letter to DPC stating that the COE would not require DPC to remove additional concrete at lane 1 (tr. 13/95-96; R4, DVD 1, ex. 191).

Removal of PCC Pavement at Lane 1

74. Mr. Tracy's daily report for 5 December 2008 included, "[s]till have no answers for the COE concerning the acceptance of Lane 1, strat ramp, Zone 1. This is delaying the placement of Lane 2." (Tr. 4/140-41; app. supp. R4, tab 2423 at 138) Mr. Tracy explained that DPC did not want to place lane 2 concrete if lane 1 was going to be removed (tr. 4/141).

75. COR McKittrick testified there was a lot of discussion over whether to have the concrete in lane 1 removed or not. The COE was concerned that lane 1 would be subject to pumping[44] due to the load of aircraft and water under the concrete. There were portions of lane 1 that needed repair or replacement due to problems with the concrete and the COE considered if replacing the base course under those slabs would be sufficient to mitigate pumping, but decided it would not. (Tr. 12/224-26) COR McKittrick testified that pumping "was the primary concern that resulted in our direction to remove the lane; to remove the soils below it" (tr. 12/227-28). COR McKittrick recalled that the COE looked at the C-17 tire pattern on the Strat Ramp taxiway and found that the C-17 would not run over lane 1. However, he also recalled that other aircraft such as the C-5 and C-41 would also be using the taxiway. He testified that the COE had lane 1 removed to facilitate vertical draining and avoid pumping. (Tr. 13/186-88)

76. ACO Phillips signed the 9 December 2008 letter directing DPC to remove the third lift, top six inches, of base course directly under lane 1 of the Strat Ramp and the PCC pavement on top of lane 1 (tr. 15/155-56; R4, DVD 1, tab M-1249). The reason for this direction was concern over the lack of permeability in that base course and the potential for pumping (*id.*). QAR #636 and QAR #641 document that DPC started demolition of the PCC pavement on lane 1 on 10 December 2008 and completed demolition on 15 December 2008 (R4, tab M-2 at 1419, 1425). QAR #642, 16 December 2008, indicates that after demolition of the lane 1 pavement, 70% of the lane 1 PCC rubble had been removed and DPC started placing concrete at lane 9 (R4, tab M-2 at PDF 1427).

77. Dr. Barker did an analysis and determined that the C-5 aircraft's wheels would run over lane 1. In a 9 December 2008 email to the COE, Dr. Barker wrote, "[t]he plot is a clear indication that the transverse joints of lane 1 will receive substantial wheel loadings of the C-5 aircraft." (Tr. 15/158, 160, 195; R4, DVD 1, GEX 104) Mr. Higa testified that the main gear of large aircraft such at the C-5 or 747 would extend over to "very near" lane 1 on the Strat Ramp when proceeding north from Taxiway A1, but that the main gear on smaller aircraft such as the C-17 would travel inside the joint between lanes 1 and 2. There is also the fact that aircraft do not necessarily follow the taxiway lines exactly, referred to as "wander," which will cause the main gear to move closer or

[44] "Pumping" is the expulsion of water from under PCC through joints due to cyclical overloading (tr. 5/91-92).

further from lane 1. (Tr. 14/270-73) ACO Phillips testified that when they learned that lane 1 would be loaded by C-5 wheels they believed there would be a high risk for pumping and they decided to have lane 1 removed (tr. 15/157).

78. Mr. Fujioka looked at the justification used by the COE to direct DPC to remove the concrete installed in lane 1 (tr. 5/37). Mr. Fujioka testified that the Hickam PCC pavement is 14 to 15 inches thick, has sealed joints and is considered a "limited water entry" situation (tr. 5/82). Therefore, the soil is likely to be unsaturated and there is no difference in the rate at which water moves through the soil between 10% and 15% fines (tr. 5/82-86). Mr. Fujioka testified that pumping required "ponding" beneath the PCC and deflection of the PCC. Because this is a limited water entry condition with adequate drainage and overdesigned at 14 to 15-inch thick PCC, overdesigned 21 inches of base course, and overdesigned 18 inches of sub-base, there would be no ponding, very little deflection and no pumping. (Tr. 5/89-92, 167; app. supp. R4, ex. 170 at PDF 5)

79. Mr. Lafrenz explained that water does not move through the concrete so the only water infiltration in the Rev B Infield and Strat Ramp would come from the joints. The joints, however, are sealed and so long as the seals are intact there should be no water infiltration. (Tr. 9/53) Mr. Lafrenz testified that he "never witnessed a pumping condition on an airfield pavement that had a graded granular aggregate base" (tr. 9/64). Mr. Lafrenz reviewed the design of the pavement and testified that it was designed for the C-17, C-5, B-52 and F-15. He testified that based on this design criteria the concrete should not experience overload. (Tr. 9/191) Mr. Lafrenz testified that the Strat Ramp is an aircraft parking area that might see 16 to 20 aircraft per day or about 7,000 repetitions per year – nothing like what is seen on the runway (tr. 17/64).

80. Mr. Lafrenz authored a 20 September 2012 expert report concerning pumping (app. supp. R4, AEX 51). Mr. Lafrenz analyzed two types of base course material having 10% and 15% fines passing the #200 sieve. He testified, "both of those materials were recognized as not being susceptible to pumping." (Tr. 9/12) Three conditions are necessary for a risk of pumping: (1) Standing water at the interface of the base course and concrete; (2) Overloading of the pavement; and (3) High frequency loading (tr. 9/13-14; app. supp. R4, AEX 51 at 3). Mr. Lafrenz explained that high frequency loading in the context of an airport means a "channelized" runway or taxiway that many aircraft use (tr. 9/15-16). The concrete at Rev B Infield and Strat Ramp is not channelized but rather a parking area with a dispersed traffic pattern (tr. 9/15-16, 26-27, 36). The report concludes:

> None of the conditions at the Project support the COE's direction to remove and replace the top six inches of base course. There is no risk of pumping. There is no horizontal drainage. The COE's direction to remove and replace the top six inches of base course did nothing to reduce the risk of pavement damage, as alleged in the

> Contracting Officer's Final Decision. The Contracting Officer's Final Decision is based upon generic descriptions without quantitative analysis and without regard for the pavement section boundary limitations, as designed.

(App. supp. R4, AEX 51 at 3) Mr. Lafrenz's expert opinion is that with respect to drainage and pumping there is no difference in performance between 10% fines and 15% fines (tr. 9/101). That means there is no difference between the performance of the original base course that was removed from that of the replacement base course (tr. 9/125).

81. Dr. Rollings', the COE's expert in geotechnical engineering and design, construction and maintenance of military airfield pavements, first involvement with this project was in April 2010 when he was asked to investigate the spalling on the Rev B Infield concrete (tr. 13/220).

82. Dr. Rollings analyzed the QC test data taken before the lane 1 concrete was removed and came to the conclusion that the base course material was "highly variable" and that 82.4% of the test failed gradation (tr. 13/233-34; R4, GEX 93 at 4). Dr. Rollings discussed pumping and stated that three things were required for pumping: (1) Repetitions of traffic; (2) Water; and (3) Fines (tr. 13/236-39; R4, GEX 93 at 6). Dr. Rollings concluded the base course material that is present at the Strat Ramp is potentially vulnerable to pumping and should not be allowed to stay in place (tr. 13/239).

83. Dr. Rollings discussed continuous placement of concrete and cleaning of saw cut joints. The saw cut joints are "transverse saw joints" made the same day as the concrete is placed that are a fourth of the depth of the pavement deep. (Tr. 13/244-45, 14/143, 163; R4, GEX 93 at 8) The longitudinal joints are formed between the lanes where the Bid-Well paver places the cement and hand finishing is required (tr. 14/142). Pumping is less likely at the transverse joints because the joint does not go all the way through the concrete, but cracks can form through the concrete from the bottom of the saw cut. All joints are sealed, both transverse and longitudinal. If there is a crack at a transverse joint, the path for pumping is much smaller and pumping is more difficult. Pumping is more likely to occur at the longitudinal joints. (Tr. 14/162-66) Dr. Rollings agreed that the Rev B Infield and Strat Ramp have "non-channelized" traffic (tr. 14/12). He agreed that the pavement would not be overloaded as long as the aircraft it was designed to handle were the aircraft using the pavement (tr. 14/13).

84. Dr. Rollings testified that his 18 January 2013 final report supersedes his previous reports (tr. 14/150; R4, GEX 91). The compaction data from a sample of base course taken from a stockpile shows a "very low specific gravity" indicating it contained

volcanic ash and explaining why there were density variations seen in the field samples[45] (tr. 14/151; R4, GEX 91 at 8 of 15). The table on page 14 of Dr. Rollings' report sums up his findings. Dr. Rollings explained that "essentially half of it [base course] is unacceptable." (Tr. 14/152; R4, GEX 91 at 14 of 15) Dr. Rollings used the summary of Hirata QC test data on base course, all three lifts, presented in AEX 77 to write his 18 January 2013 report (R4, GEX 91) and PowerPoint presentation (R4, GEX 93) summarizing the report (tr. 14/155). He acknowledged that the Ancillary Data, number 2, data that was taken at lane 1 after the concrete had been removed "may have been compromised because of the removal techniques" (tr. 14/154).

85. DPC removed the concrete in lane 1 of the Strat Ramp (tr. 4/104-05). DPC "hoe rammed it, beat it up, broke it up, dug it out" and removed it (tr. 4/105). Paradigm removed the base course under the concrete after the PCC was removed by DPC (tr. 3/229).

Elevations

86. COR McKittrick testified that originally the design called for all 25 x 25 ft. slabs and the specified associated grade heights/elevations. An "elevation" defines the height of the concrete in reference to the water table (tr. 2/210). The elevations were used to set the top of the concrete (*id.*). The contract was changed to call for 20 x 20 ft. interior slabs but the elevations were not changed. On 5 June 2007, DPC submitted RFI #8 requesting that the COE provide elevations for the 20 x 20 ft. slabs (tr. 2/209-11; R4, tab G-2 at 003). The COE provided the new elevations in response to RFI #8 (tr. 2/210-11). DPC's Mr. Kawamoto calculated new elevations that DPC had actually built to, but did not get approval before the work was done. DPC did not inform the COE that the elevations in response to RFI #8 were wrong. The revised elevations indicated a minimally acceptable "flow gradient" of 0.5%, and "field observations" of flow patterns across the Infield indicate flow that "roughly follows" the intended path. The COE "reluctantly" accepted DPC's elevations, but imposed a price reduction of $77,512.80 for the "variance." (Tr. 12/176-78, 13/209-12; R4, ex. 1251 at 5-6, tab 24 at PDF 150-51)

87. Mr. Florez conducted a grade analysis on the Rev B Infield (tr. 17/118-19; R4, DVD 1, ex. 957). Mr. Florez testified about his calculations and stated that his conclusion was that the RFI #8 elevations were in error and unbuildable (tr. 17/128). Mr. Tracy testified that the elevations for the Strat Ramp and CWRF "weren't really going to work" and he provided elevations to the COE that were eventually approved (tr. 4/136-37). Mr. Tracy recalled that he developed DPC's "grades" for the purpose of closing out the contract (tr. 16/23, 42).

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[45] Although there was no testimony on this point, the chart Dr. Rollings testified about appears to indicate 8% fines passed the #200 sieve – a passing result (R4, GEX 91 at 8).

88. Mr. Lum testified that the Rev B Infield drained roughly in the same pattern as designed (tr. 6/96; app. supp. R4, ex. 546 at 3). Mr. Lum testified that COR McKittrick decided to use the Rev B Infield grades provided by DPC as the planned grades to be used for acceptance of the Rev B Infield concrete (tr. 6/99; app. supp. R4, ex. 546 at 3).

89. Unilateral contract Modification No. A00044, 24 November 2010, reduced the contract price by $77,512.80 for "non-conforming PCC Airfield Pavement grades for the Rev B Infield and the north half of Taxiway A-2 in accordance with Contract Technical Section 02753 (PC-Am-0005), Paragraph 1.5.5.1" (R4, tab C-24 at PDF 150-51). Mr. Lum determined the reduction by calculating the percentage of "points" that were out of tolerance in a "lot."[46] Pursuant to specification 02753, paragraph 1.5.5.1 when more than 5.0 and less than 10.0% of points within a lot are out of tolerance, payment will be 95%. When more than 10.0% of points within a lot are out of tolerance, payment will be 75%. (R4, GEX 29, note 2) Mr. Lum testified that he compared the Rev B Infield as-built spot elevations after grinding with the target elevations that were accepted as the grades that would be used, and determined the percentage reduction in accordance with specification 02753 (tr. 7/167-68). The Strat Ramp elevations were correct (tr. 7/170-71).

90. Mr. Lum testified that when he calculated the decrement in price for the Rev B Infield elevations, he was comparing "target grades" with "as-built" grades provided by DPC. "Target grades" were the grades that DPC provided and the COE accepted. He was not comparing RFI #8 grades with as-built grades. (Tr. 7/261-62)

Taxiway A Work

91. DPC was required to tie in the Rev B Infield, Strat Ramp and CWRF with existing HIA Taxiway A (tr. 4/90). Completion of that tie-in required that the HIA close Taxiway A, which it owned, for a two-week period (tr. 4/90-91).

92. Mr. Tracy wrote daily reports in the form of emails. These reports document that contaminated material (Petroleum Containing Soil (PCS)) at the A-2 Taxiway caused delay commencing 19/20 November 2008 (tr. 4/94-95; app. supp. R4, tab 2423 at 149-50). Sometime at the end of November, DPC received guidance from the COE on how to deal with the contaminated soil at the taxiway (tr. 4/97-98). Rains and wet soil conditions at the taxiway prevented work on the contaminated soil from the time they received guidance through 24 January 2009 (tr. 4/97-100; app. supp. R4, tab 2423 at 97, 105, 126, 128). Concerning unsuitable (soft) soil at the taxiway, DPC took the position that due to the restrictions on work at the taxiway, it did not have time to dry (scarify) the soil in order to be able to compact it for subgrade (tr. 16/18-19, 36, 40). DPC removed the contaminated soil from the taxiway area (tr. 4/101-02). Mr. Dean identified 56 days of "government-responsible delay" consisting of "13 days for utility marking delays,

[46] A "lot" was typically two adjacent lanes in the Rev B Infield (R4, GEX 29, note 4).

26wds/37cds of delay are due to unplanned weather and wet grades (vertical blue stripes on graphic) and 6 days for contaminated soils" (app. PFF at 53, ¶ 282; AEX 59 at 69). In footnote 16 DPC acknowledged that this allocation was not precise (app. PFF at 53). DPC also points out that the government recognized "22 CCD – potential time extension for delays at Taxiway A-2 (October 29, 2008 through November 19, 2008 – inclusive) due to the discovery of non-hazardous petroleum contaminated soil" (R4, ex. 2316 at PDF 2).

93. Mr. Trabucco disagreed with testimony that DPC failed to have adequate resources working on Taxiway A (tr. 16/52).[47] The work at Taxiway A was limited to night work and a two-week shutdown period (tr. 16/53). The two-week closure of Taxiway A-2 by the HIA commenced on Sunday night, 25 January 2009 (tr. 4/100; app. supp. R4, ex. 2423 at 96-97). Mr. Trabucco recalled delays at Taxiway A relating to marking utilities, asbestos, electrical/drainage boxes and unsuitable material (tr. 16/54). He testified that usually the owner marked utilities, but in this case there was a debate over who owned the utilities and DPC was directed to mark the utilities (tr. 16/55-56, 58, 65).

Clear Water Rinse Facility (CWRF)

94. In operation the CWRF shoots water out of nozzles and sprays the aircraft, the water is collected in trenches and pumped into a holding tank to be reused. When the water reaches a certain level of contamination it is discharged into the sewer system. (Tr. 4/130; AEX 59 at 4) Mr. Trabucco testified about photograph "X" of AEX 9 dated 21 March 2009 (app. supp. R4, AEX 9 at 1, 25). It shows the CWRF in an almost completed state with concrete, asphalt, and the trenches where the nozzles were to wash the planes (tr. 3/149-50).

95. The COE specified use of "CLA-VAL" model 134-52 ACS DS.SS.SS.ENP valves at the CWRF (tr. 4/106-07; app. supp. R4, ex. 1190 at 2). In a 17 March 2009 RFI (#75) DPC's subcontractor, Oahu Plumbing, asked if the CLA-VAL valves required end switches[48] (tr. 4/108-09; app. supp. R4, ex. 1195). The COE had previously indicated that end switches were not needed (tr. 4/108-09). In response to RFI #75, the COE stated that end switches were required for the CLA-VAL valves, that they must be installed by a CLA-VAL representative, and that this was a change to the contract (tr. 4/108-11; R4, tab G-2 at PDF 19). Modification No. A00022, 29 April 2009, authorized purchase and installation of the end switches (tr. 4/112-13; R4, tab C-24 at PDF 90-91). Mr. Tracy's daily report for 12 May 2009 includes, "[s]till have not received Limit switches, this is the critical path of the project, will delay the performance testing for the start-up" (tr. 4/125; app. supp. R4, tab 2423 at 12). The end switches had to be installed and working before

[47] Mr. Trabucco later recalled that at the taxiway he criticized Paradigm for not having enough "resources" on the job (tr. 16/57-58).

[48] Also referred to as "limit switches" but we will use the term end switches (tr. 4/108-09).

an aircraft could be brought in for the first test (tr. 4/131). The end switches were at the job site being installed on 28 May 2009 (tr. 4/113-14; app. supp. R4, ex. 2423 at 1).

96. On 16 April 2009, Mr. Tracy sent Mr. Lum a testing schedule for the CWRF (app. supp. R4, AEX 11). Testing was to start on 27 April 2009 (ID No. 2) and end on 17 September 2009 (ID No. 95) (*id.* at 2, 5). Schedule ID No. 32, Request First Aircraft Required was to occur on 18 May 2009 (*id.* at 3). ID No. 58, First Aircraft Required, is dated 4 June 2009 (*id.* at 4).[49] In a meeting held 6 May 2009, Mr. Lum, COE, stated that the schedule would be approved by the COE (tr. 4/124; app. supp. R4, AEX 12).

97. Mr. Tracy's daily report for 14 May 2009 indicates that both water supply pumps in the CWRF had shut off and were frozen (app. supp. R4, ex. 2423 at 10; tr. 4/114-15, 8/8-9). The pumps were fixed and reinstalled on 22 May 2009 (tr. 4/115; app. supp. R4, tab 2423 at 4).

98. Mr. Lum coordinated with the Hawaii Air National Guard that supplied the C-17 aircraft for testing the CWRF (tr. 6/12). A C-17 aircraft was scheduled to be available to test the CWRF on 18-19 May 2009, but due to the problem with the pumps the test was cancelled (tr. 7/174; R4, GEX 30 at 1). By email dated 17 June 2009, the Air Force then took the position there would be no more aircraft scheduled until it was clear that the system was ready to be tested (R4, DVD 1, GEX 31). By letter dated 22 June 2009 the COE requested that DPC provide a revised CWRF start up test schedule by 26 June 2009 and identified a list of things that DPC still needed to accomplish (R4, DVD 1, tab M-1262 at PDF 1; tr. 7/181).

99. QCR #810 documents that a power outage occurred at the CWRF on 2 June 2009 (R4, tab M-1, ex. 1 at 1946). QCR #816 documents that a CLA-VAL representative was on site on 8 June 2009 to install the end switches (*id.* at 1961). QCR #821, 13 June 2009, documents that the power was restored and that the CLA-VAL representative was rescheduled because of the power outage (*id.* at 1973). QCR #845 documents that the CLA-VAL representative was back on site on 7 July 2009 (*id.* at 2020). This was a delay of 35 days in installing the end switches caused by the power outage.

100. After the power outage ended, Oahu Plumbing realized that the CLA-VAL valves were not opening and closing within 5 seconds as required by the contract (tr. 10/95, 104-05). While at the site the CLA-VAL representative was apparently informed about the opening and closing issue because he returned on 21 July 2009 to install equipment to make the valves operate faster (tr. 10/110-11; R4, tab M-1, ex. 1 at

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[49] Mr. Tracy testified that the first aircraft was supposed to be there on 18 May 2009 (ID No. 32) (tr. 4/122), but that testimony appears to be incorrect. According to the schedule ID No. 58, 4 June 2009 was the first aircraft required date (tr. 4/173-75).

2048). QCR #861, 23 July 2009, documents that the valves were opening in 7 to 10 seconds and closing in 4 to 5 seconds (R4, tab M-1, ex. 1 at 2052).

101. COR McKittrick explained that the programmable logic controller (PLC) controlled the sequencing of pumps and valves that washed aircraft at the CWRF (tr. 12/253-54). The PLC was tested at a contractor's facility and witnessed by a COE engineer on 15 April 2009. The PLC demonstrated "parts" of the operating sequence but "[t]here were still some programming issues being resolved at the time of the test" (R4, DVD 1, GEX 35; tr. 7/187). COR McKittrick testified that when the PLC and all of the mechanical equipment (pumps, valves, float device, conductivity meter, nozzles, discharge device, etc.) were in place and operational, the system was complete and useable (tr. 12/263-64). As of 25 June 2009, DPC had not adequately tested the PLC, the "brain" of the CWRF system and no aircraft would be scheduled until this testing was accomplished (tr. 7/181-83, 12/257-58; R4, DVD 1, GEX 33 at 2). By email dated 6 July 2009, DPC notified COE that the PLC was scheduled for testing on 8 July 2009 (tr. 7/185-86; R4, DVD 1, GEX 34). The PLC operated properly during the 8 July 2009 testing (app. supp. R4, ex. 1552 at 1).

Substantial Completion

102. The first rinse was successfully completed on 4 August 2009 (tr. 5/184-85, 189; R4, tab M-1, ex. 1 at 2073-74). QAR #873, 4 August 2009, included a copy of an email that included the following:

> The operation of the nozzles to test spray patterns was successful today. With review from our customer we are accepting the adjustments that have been made to the nozzles and their respective patterns. We have extremely heavy winds today so there is a possibility that during operational testing on a calm day we may need to accomplish some minor adjustments, but overall the system looks good.

(R4, tab M-2, ex. 2 at 2036)

103. During a 17 August 2009 site visit Mr. Lum and COR McKittrick found that certain nozzles at the CWRF had flow rates of 500 gallons per minute (gpm) at 100 psi when the specification indicates they should be 440, 400 and 240 gpm at 100 psi. Oahu Plumbing had performed field modifications to meet the required gpm ratings and such modifications would void the warranty. DPC was told to replace the nozzles. (R4, ex. 1268; tr. 12/258)

104. In an email dated 2 December 2009, Mr. Morioka included his notes of a meeting held on 1 December 2009 that read in pertinent part:

> In speaking with Rick McKittrick yesterday afternoon specifically on the date of substantial completion, Rick reiterated that per his discussion with Timothy, they have determined that the date of substantial completion would be when the nozzles were changed. I inquired with Rick on what I was told by Wil and the project team that it was previously agreed that the date of substantial completion would revert back to the date of the first rinse, 8/4/[09][50], upon completion of the final rinse. Rick said YES and NO. YES in that there was an agreement early on when they were under the impression that the system was ready for final rinse and NO because they later learned that we installed the wrong nozzles and it affected the performance of the system. I mentioned to Rick that changing the nozzles had no affect on the system and therefore the LD's should be stopped as of 8/4/09 as previously agreed and that the LD's past this date should be released. Rick went into this long explanation on why the system was affected by the wrong nozzle and made it a point to mention to me that he is a mechanical PE so he understands the system very well.

(R4, ex. 2264) Mr. Tracy discussed substantial completion of the CWRF with COR McKittrick and recalled that COR McKittrick said substantial completion would be when the first plane was successfully rinsed and recycle set up (tr. 16/15-17). Mr. Morioka testified that he and COR McKittrick had agreed that substantial completion would be at the date of the first rinse, but that changed because of the nozzles (tr. 5/189-90). He testified that Oahu Plumbing had installed the wrong nozzles. The nozzles were changed on 29 September 2009, however, Mr. Morioka testified there was no difference in actual rinse operation and that was verified by testing by Oahu Plumbing. (Tr. 5/206-07, 251) Mr. Morioka testified that he believed substantial completion was on 4 August 2009 and COR McKittrick believed it was 29 September 2009 but the COE later changed that date (tr. 5/208).

105. Mr. Morioka testified that the test DPC performed on 4 August 2009 "included a full automatic wash of an aircraft" (tr. 5/191). DPC still had to do things identified in section 15899 but they were post-substantial completion (tr. 5/192).

106. Section 15899, paragraph 3.6, Water Recycling Setup, specified six steps that had to be performed on multiple aircraft in order to set the number of plane rinse cycles before discharging rinse water to the sanitary sewer (finding 4; R4, tab C-26 Specs at PDF

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[50] The date in the email of 08/04/08 was a typo (tr. 5/188).

688-90). Mr. Morioka agreed that DPC had to conduct four rinses going through the six steps to deal with the rinse water. He recalled there were problems getting planes for the rinses and that the COE had a problem getting a discharge permit. (Tr. 5/193-94, 203-04)

107. Meeting minutes from a 1 December 2009[51] meeting indicate that Ms. Andrea Hinkle, COR, considered substantial completion to be the date the nozzles were changed, 29 September 2009[52] (app. supp. R4, ex. 50 at PDF 1001). Mr. Morioka verified that the COE made it clear during the meeting that liquidated damages (LDs) would no longer be held from DPC (tr. 5/211-12). However, the COE continued to withhold LDs (tr. 5/212).

108. By letter dated 18 December 2009 from COR Hinkle to DPC, COR Hinkle stated that LDs would continue to be withheld until correlation of the conductivity meter and setting of the float levels for the underground tank are completed (R4, ex. 1273). Mr. Morioka testified that this letter conflicted with what COR Hinkle said during the 1 December 2009 meeting (tr. 5/213). The conductivity meter is a measuring device in the tank holding the water after the rinse. It measures how "dirty" the rinse water is. Once the meter is calibrated, when the rinse water gets to a predetermined level of "dirtiness" the conductivity meter tells the PLC to discharge the water and start over with clean water. (Tr. 12/161-62)

109. On 20 January 2010, the COE approved a variance for water supply pumps and "acknowledge[d] exhibit 6, Agreements and Conditions as submitted" (app. supp. R4, AEX 27). Mr. Morioka testified that exhibit 6 recognized that the COE agreed substantial completion was 29 September 2009, but that DPC continued to believe that substantial completion was on 4 August 2009 (tr. 5/225).

110. By letter dated 27 July 2012 from ACO Phillips to DPC, ACO Phillips explained the COE's position on substantial completion:

> On January 25, 2010, Dick Pacific effected the completion of the last two remaining construction work items which were required to proceed with the final rinse testing for turnover of the Clear Water Rinse Facility (CWRF). These two items were the installation and calibration/correlation of the permanent conductivity meter and probe and the removal and re-installation of the tank level switches at the contract required elevations. Upon completion of this work, the CWRF was ready for final rinse testing. This

[51] The minutes have two conflicting dates, but Mr. Morioka verified that the date was 1 December 2009 (tr. 5/210).

[52] The minutes erroneously say 2008 (tr. 5/211).

> final rinse testing was successfully completed on February 23, 2010, and the CWRF was accepted on March 19, 2010. Upon Dick Pacific's completion of these last two items of work which were prohibiting the final rinse test and facility usage, the Government considers the contract to have been substantially complete.
>
> Any earlier Government agreement to establish as the SCD the date when the nozzle and grate corrections were effected [sic] by Dick Pacific, e.g., October 21, 2009, was conditional on there being no more work items prohibiting the final rinse test and use of the facility. The tank level switches and the permanent conductivity meter and probe were work items which prohibited final rinse testing and use of the facility.
>
> Dick Pacific's allegation that Modifciation [sic] No. A00027 provided for 60 calendar days of relief from any Government liquidated damages has no merit. Modification No. A00027 provided for Government acceptance of the contractor's "Seeding Work Plan", 2 mon[t]hs of additional irrigation, and made the contract 60 day maintenance and establishment period for turf not subject to liquidated damages, i.e., liquidated damages would not be withheld or assessed for failure to establish turf. This modification did not wiave [sic] the provisions of the Liquidated Damages Clause for all other work under the contract. The Government's currently projected liquidated damages on the contract of $1,144,404.00 are not withheld due to turf establishment.

(R4, ex. 1293) Mr. Morioka disagreed with the letter. He testified there were no conditions on the previous agreement on the substantial completion date. He explained that the COE had different nozzle angles that caused the trench plates to have to be adjusted. (Tr. 5/201-02) He also explained that work on the conductivity meter was step six of the post-substantial completion effort (tr. 5/196-97).

Seeding & Mulching at the CWRF

111. Bilateral Modification No. A00027 was issued on 19 June 2009 for seeding and mulching at the CWRF. It modified the "Seeding Work Plan" and specified the type of seed to use at various locations, established a 60-day "maintenance and establishment" period and thereafter two months of irrigation. (R4, tab C-24 at PDF 108) It included the following, "[t]he 60-day maintenance and establishment period will not be subject to

liquidated damages" (*id.* at PDF 109; tr. 4/145). Mr. Lum helped draft the language of Modification No. A00027 for seeding and mulching (tr. 8/39). Mr. Lum testified that the purpose was to "preclude liquidated damages for the establishment period or work associated with the establishment" (tr. 8/41). There was no discussion of waiving liquidated damages for other portions of the project besides seeding and mulching (tr. 8/42-43). Mr. Morioka testified that he understood no liquidated damages would be assessed during the 60-day period (tr. 5/229-30; app. supp. R4, ex. 2368).

Spalls on the Rev B Infield

112. On 22 January 2013, Mr. Morioka sent a letter to COE in response to a COE letter, dated 26 November 2012, in which the COE directed DPC to repair concrete "spalls" on the Rev B Infield. Mr. Morioka stated that DPC would repair the spalls but reserved the right to submit a claim for the costs of the repair. (App. supp. R4, AEX 29)

113. By letter dated 16 March 2010 from Mr. Tanaka, DPC QA Manager, to COE, Mr. Tanaka noted that the Rev B Infield was accepted on 7 May 2009 and that there were no deficiencies noted during the four-month warranty inspection on 24 September 2009. The COE discovered spalls on the Rev B Infield on 16 February 2010. DPC took the position that the spalling was caused by construction at the Rev B Infield by another contractor (Watts). Photographs were attached to the letter showing what DPC contended was evidence of damage caused by the other contractor's construction equipment. (R4, DVD 1, ex. 2648)

114. Mr. Lafrenz was accepted by the Board as DPC's expert in airfield pavement and construction (tr. 8/159-60). Mr. Lafrenz authored an expert report dated 18 January 2013 dealing with the spalling on the Rev B Infield (app. supp. R4, AEX 46). Spalling is a problem at the edge of a concrete pavement joint where the edges will chip/break off (tr. 8/162-63). There are several types of spall. The first type can be the result of construction of the pavement itself that is called a "sliver spall" that is caused by a weakness in the concrete joint. This type of spalling usually shows up during construction or shortly thereafter. (Tr. 8/164) The second type of spall is the result of some type of mechanical crushing causing a shallow break. This type of spalling may be caused by a piece of construction equipment such as a tracked vehicle running over the concrete joint putting high pressure on the joint. (Tr. 8/164-65) The third type of spall is caused by debris in the joint that causes breaks as the concrete panel curls or warps (tr. 8/165).

115. Mr. Lafrenz testified about two pictures on page ten of his report. The pictures show heavy construction equipment, a roller and a steel tracked excavator, all used by Watt Construction performing fuel line and hydrant work on the Rev B Infield.

Mr. Lafrenz explained that this type of equipment can cause spalling.[53] (Tr. 8/220-21) His report includes, "[a]ctivities by Watt Construction could result in spalls that are the result of equipment operations. Maps that show spall occurrence vs. location by slab, developed by the COE (Appendix A), show that the highest occurrence of spalling are outside of aircraft traffic locations but within areas used by Watts Construction." (App. supp. R4, AEX 46 at 8, 14) Mr. Lafrenz reviewed the number, length and distribution of spalls presented in two surveys of the Rev B Infield (R4, DVD 1, ex. 1618, attachments Spall Count and Total Spall Length) and pointed out that spalling was greater in the area near hydrant 20D that Watts constructed (tr. 8/225-28). Mr. Lafrenz also testified that he did not see anything in Dr. Erlin's[54] petrographic evidence that "suggested that the spalls were the result of a concrete placement" (tr. 8/229).

116. The record contains pictures of Watts' equipment on the concrete without mats: steel roller (05/14/09) (app. supp. R4, DVD 1, AEX 68), concrete truck (08/06/09) (*id.*, AEX 69), tracked hoe-ram (01/13/09) (*id.*, AEX 70), backhoe (*id.*, AEX 71), tracked cranes and backhoes (01/12/09) (*id.*, AEX 72).[55] The record also includes a picture of Watts tracked hoe-ram on mats (02/20/09) (tr. 13/193-94; R4, DVD 1, GEX 86 at 1). COR McKittrick testified he personally saw Watts' tracked equipment on mats and sweeping/vacuuming equipment on a "few occasions" (tr. 13/208-09). There is also a picture of the "double saw cut" used by Watts to allow for removal of the damaged concrete edge visible on the concrete that is inevitable in such a construction project leaving a clean edge just prior to pouring the new concrete (09/15/09) (tr. 13/196-99; R4, DVD 1, GEX 86 at 3, 4).

117. Dr. Rollings gave detailed testimony concerning the Erlin & Associates petrographic examination. He testified that the examination revealed excess surface mortar, poor air void system, and cracking. (Tr. 13/147-253; R4, GEX 93 at 10) Each of these findings contribute to the existence of spalling at the Rev B Infield (tr. 13/253-56, 14/140-41; R4, GEX 93 at 11, 12). Dr. Rollings' opinion is that the spalling at the Infield was caused by "a poor quality non-durable concrete surface" (tr. 13/256). He testified that the spalling was a safety hazard and the loose concrete fragments will have to be removed and the spalls will have to be repaired (tr. 13/257).

118. Mr. Higa is a civil engineer dealing mainly with airfield pavements (tr. 14/168). He provided assistance to the project manager in the CWRF contract. He observed paving in the Rev B Infield (tr. 14/169). Mr. Higa testified that he observed

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[53] Mr. Lafrenz testified that the use of pads under heavy equipment is "best practice" and that he didn't see pads in the pictures (tr. 8/220, 232-33).

[54] Dr. Erlin was hired by Dr. Rollings to do a petrographic examination of the concrete (GEX 93).

[55] App. supp. Rule 4, AEX 70, 71 & 72, show equipment that was outside of the Rev B Infield where DPC installed concrete (tr. 13/150-51, 155).

DPC pouring concrete in individual slabs instead of using the Bid-Well paver at the Rev B Infield (tr. 14/177). Such a slab is shown in Rule 4, GEX 59, 0223.jpg. DPC started using the Bid-Well paver on 7 February 2008 (R4, GEX 61 at 3). After viewing pictures sent to him, Mr. Higa expressed concern over the hand finishing at the edges shown in the pictures because if the edges are overworked they can spall later (tr. 14/181, 194; R4, GEX 61 at 2, 0244.jpg).

119. Mr. Higa testified that he went to the Rev B Infield and took pictures of spalling. He obtained a diagram of the Infield with colors (red, yellow and green) associated with a grid pattern on the Infield. He was not sure what the colors meant. The locations where his pictures were taken were annotated on the diagram with the .jpg number associated with each picture. (Tr. 14/210, 213; R4, tab M-13, ex. 13 at 1) The diagram had the outline of an aircraft and lines depicting the taxiway the aircraft would be expected to generally follow (tr. 14/215). Mr. Higa testified about fifteen of the pictures depicting spalls (tr. 14/216-19). He testified that he was concerned that DPC's work practices in placing the concrete might cause spalling and these are the spalls he predicted (tr. 14/219).

120. COR McKittrick participated in a nine-month warranty inspection of the Rev B Infield performed on 16 February 2010 that identified spalling. On 25 February 2010 the COE representative returned to the site and identified the locations of the spalling on a sketch of the Rev B Infield. (Tr. 12/133-35; R4, ex. 1279)

121. COR McKittrick sent a 19 April 2010 letter to DPC concerning the 9-month warranty inspection including the spalling identified during that inspection (R4, ex. 1281). COR McKittrick responded to DPC's contention that the spalls were caused by construction equipment used by Watts Constructors working on the Hydrant Fuel System (HFS) in the Rev B Infield. He acknowledged the pictures of construction equipment on the airfield pavement without rubber mats submitted by DPC, but he wrote in the letter and testified that he witnessed the tracked equipment driving on rubber mats. He personally participated in the 21 January 2010 final walk-through inspection of the concrete slabs surrounding the HFS (Watts) and found no spalls or other damage.[56] The punch list from the final walk-through inspection, date stamped "RECEIVED JAN 21 2010, FORT SHAFTER RESIDENT OFFICE," did not identify any spalling. (R4, ex. 1281, encl. e at 2) The Rev B Infield was turned over to the Air Force immediately after the HFS inspection and aircraft began using it. He explained that the aircraft were much heavier than the construction equipment. COR McKittrick testified that the spalls identified and documented during the nine-month warranty inspection were not there during the HFS inspection conducted on 21 January 2010. (Tr. 12/139-141, 13/119-20, 130-31, 191; R4, ex. 1281 at 2) The "early-age spalling" at the Rev B Infield was also

[56] COR McKittrick's name does not appear on the sign-in sheet for the 21 January 2010 inspection, but he testified that he was there and participated in the inspection (tr. 13/131-32; R4, ex. 1281, encl. e at 1).

documented in an information paper dated 17 May 2010 (tr. 12/142-43; R4, GEX 64). By letter dated 4 June 2010, COR McKittrick notified DPC that until a "mutually agreeable repair method" was arrived at, the COE would not make additional progress payments (tr. 12/146; R4, ex. 1285).

Liquidated Damages

122. Mr. Chambers is a supervisory contract specialist/chief of contract execution branch and contracting officer for the COE since July 2011 (tr. 8/64-65). Mr. Chambers used a single substantial completion date for the entire project to calculate liquidated damages (tr. 8/119).

123. By letter dated 8 June 2010 from COR Hinkle to DPC, COR Hinkle stated that the project was completed and accepted as of 19 March 2010 (R4, ex. 1286). She established warranty dates for five elements of the project:

1. Clear Water Rinse Facility (includes physical pad where the grates are located and all of the infrastructure (piping, pumphouse, etc., except for items included in number 2 below)): 19 March 2010 through 18 March 2011
2. Electric Panel MCC RI and the south wall of the CWRF pump house: 22 September 2009 through 21 September 2010
3. Asphalt shoulder of Taxiway A-2 and the grass field area in the Western Keyhole (west of Rev B Infield): 22 April 2009 through 21April 2010
4. Rev B Infield: 06 May 2009 through 05 May 2010
5. Strat Ramp, Clear Water Rinse east and west taxiway pieces, AO, Al and A2 taxiways: 19 May 2009 through 18 May 2010

(R4, DVD-1, M-1286) COR McKittrick recalled that the COE took early/beneficial occupancy of the Rev B area in May 2009 (tr. 12/134). Mr. Lum testified that the beginning of the warranty period (start dates) reflect the completion dates (tr. 8/121). ACO Phillips testified that the project was accepted "incrementally" (tr. 15/219). ACO Phillips testified that the date the warranty started to run was substantial completion for the portion of the project affected (tr. 15/223-24). ACO Phillips never considered reducing the liquidated damages based on the incremental acceptance of the work (tr. 15/238).

124. COR McKittrick testified that the COE took beneficial occupancy of the project in three phases – the Rev B Infield, the Strat Ramp, and the CWRF last (tr. 13/207-08).

Modification No. A00043

125. Modification No. A00043 deducted $100,000 as a credit for the COE's allowing Paradigm to leave non-conforming base course in place at the Strat Ramp, zone 1, lifts 1 and 2, and zone 2, lift 1 (R4, tab C-24 at PDF 3029). There was no testimony at the hearing about this modification. However, DPC's claim demands the return of the $100,000 and relies on the testimony and its argument that the base course it was ordered to remove was conforming or at least suitable for its intended purpose (app. br. at 41).

Expert Witness Evidence

126. Mr. McTyre was accepted as the COE's expert in construction scheduling and delay analysis (tr. 11/7, 10). The project contract completion date was 18 May 2008 but it was actually completed on 25 November 2009, 557 days late according to Mr. McTyre (tr. 11/18; R4, GEX 55, slide 3). Mr. McTyre's analysis ran the critical path through the Rev B Infield because the work there took "so much longer"[57] (tr. 10/59-61, 11/50-51, 12/60-62; app. supp. R4, AEX 59, slides 55, 57). Mr. McTyre testified there is a CPM logic tie between completion of the base course at the infield and start of subgrade at the Strat Ramp. Mr. McTyre testified that if that tie is left in, the hydrants are not critical. (Tr. 11/39, 54-55, 60) Mr. McTyre contends that Mr. Dean changed that logic tie and "manipulated" the schedule to make the hydrants critical (tr. 11/54-55, 104). Mr. McTyre did not change the logic tie as a result of finding the shutoff valves and instead testified that the early work at the infield would receive a "credit" (tr. 11/39). Mr. McTyre's analysis did not use Primavera software to print out his as-built CPM analysis (tr. 11/215). He did use primavera to look at contemporaneous schedule information (tr. 11/223). He relied upon the daily reports (QARs and QCRs), among numerous other documents, and used PowerPoint and Excel to show the as-planned versus as-built schedule and perform his analysis. (Tr. 11/12, 213) Mr. McTyre's approach used "five periods of analysis" (R4, GEX 55, slide 20). The periods were: (1) 15 March 2007 to 15 December 2007; (2) 16 December 2007 to 15 January 2008; (3) 16 January 2008 to 30 June 2008; (4) 1 July 2008 to 15 October 2008; and (5) 16 October 2008 to 25 November 2009 (R4, GEX 55, slides 21, 29, 32, 35, 38, 40). The results of his analysis allocated the delay to DPC as follows: 23 days compensable, 50 days excusable, 479 days inexcusable (R4, GEX 55, slide 3).

127. Mr. Dean was accepted by the Board as DPC's expert in the field of construction scheduling and delay analysis (tr. 9/218-19). According to Mr. Dean finding the shutoff valves allowed Paradigm to start mass excavation at the Rev B infield early

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[57] At one point during the hearing Mr. McTyre testified that finding the shutoff valves for the Rev B Infield lateral waterlines allowed Paradigm to demolish the laterals and start mass excavation at the Rev B Infield, thereby removing the Rev B Infield from the critical path (tr. 11/22, 24). This seems to contradict Mr. McTyre's expert report.

which caused Mr. Dean to change the as-built critical path from running through the Rev B infield to running through the waterlines and low profile hydrants (tr. 10/143-44). Mr. Dean added a "weather calendar" to his as-built schedule that represents rain/wet grade days of delay (tr. 9/231; app. ex 41 at PDF 111-116).[58] The weather calendar was introduced "to allow the schedule software to automatically adjust activity durations as work moves in and out of the weather on the project" (tr. 10/27).[59] Mr. Dean's as-built schedule specifically referenced QARs and QCRs (tr. 9/241; app. ex. 51 at 173, 277-294). Mr. Dean utilized Primavera software to calculate nine "Fragnets" relating to the following nine periods of time: (1) 15 March 2007 to 16 July 2007/airfield waiver and barricades; (2) 16 July 2007 to 16 November 2007/low profile hydrants; (3A) 16 November 2007 to 16 December 2007/low profile hydrants; (3B) 16 December 2007 to 16 March 2008/Strat Ramp; (4) 16 March 2008 to 31 May 2008/Strat Ramp; (5) 31 May 2008 to 16 February 2009/rejection of Strat Ramp base course; (6) 31 May 2008 to 16 February 2009/Taxiway A; (7) 16 February 2009 to 16 May 2009/CLA-VAL limit switches; (8) 16 May 2009 to 5 August 2009/power outage & CLA-VAL modifications; and (9) 16 May 2009 to 1 November 2009/CWRF water recycling tests (app. supp. R4, AEX 59, slides 12, 13). Mr. Dean allocates the delay as follows: 449 days excusable and compensable government-caused delay; 20 days excusable and compensable weather delay (after planned contract completion); 1 day excusable and non-compensable weather; 14 days inexcusable and non-compensable DPC delay; 6 days excusable and non-compensable DPC delay; and 71 days Paradigm scope delays (tr. 9/221-22; app. supp. R4, AEX 59, slide 11).

128. The claims by DPC were heard and briefed essentially as one omnibus construction delay claim. However, the matters at issue arose from six separate claims, six final decisions and six docketed appeals as set forth below.

129. On 20 August 2009, the contracting officer received DPC's certified claim for $1,502,835 and 182-day time extension due to the lack of an airfield waiver. The CO issued a final decision dated 6 May 2011 which granted the claim in part and denied it in part. DPC filed a timely notice of appeal to this Board on 29 June 2011 which we docketed as ASBCA No. 57675. (R4, tab B-1)

130. DPC submitted Change Proposal 55.1 as a certified claim dated 25 January 2011 and it was received by the contracting officer on 27 January 2011. The claim requested $2,224,195 for costs associated with denial of site access and low profile

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[58] Mr. McTyre testified that it is more common to submit a separate weather delay analysis (tr. 11/26-27). We view both approaches as reasonable alternatives.

[59] Mr. McTyre, the COE's scheduling expert, testified that Mr. Dean's use of a weather calendar in his CPM schedule was unnecessary and misleading because it changed durations (tr. 11/25-27), but we disagree. It is reasonable to have the weather delays built into the schedule.

hydrants as they relate to the base course work. The claim was denied in a COFD dated 1 August 2011, was timely appealed to the Board and docketed as ASBCA No. 57806. (R4, tab B-2)

131. DPC submitted a 30 November 2011 certified claim for $93,544 on a change proposal for unsuitable soils. The CO denied the claim in a final decision dated 16 May 2012 which was timely appealed and docketed as ASBCA No. 58149. (R4, tab B-3)

132. DPC filed a certified claim for contract balance in the amount of $791,806 on 2 December 2011 and it was denied in a COFD on 16 May 2012. We docketed the timely appeal from that decision as ASBCA No. 58151. (R4, tab B-4)

133. A certified claim for $453,013 regarding the additional cost of performing Unilateral Modification Nos. A00043 and A00044 was submitted to the CO on 9 March 2012. The claim was denied in a final decision dated 16 May 2012 and was timely appealed to the Board and docketed as ASBCA No. 58150. (R4, tab B-5)

134. On 15 February 2012, DPC submitted a certified claim on Change Proposal 56a (also known as REA 3) for $2,083,734 and a time extension. The COFD granted the claim in part and denied it in part. The decision was timely appealed and docketed as ASBCA No. 58174. (R4, tab B-6)

DECISION

Critical Path

Both Mr. McTyre and Mr. Dean used the daily logs (QARs and QCRs), among other documents, to conduct their analyses (findings 126, 127). We consider daily logs to be the most reliable evidence of what actually happened during construction. *Technocratica*, ASBCA No. 46567 *et al.*, 99-2 BCA ¶ 30,391 ("Daily inspection reports have been held to be *prima facie* evidence of the daily conditions as they existed at the time of performance.") (Citation omitted). However, the two experts took different approaches to their presentations. Mr. Dean's presentation used Primavera software to print out his critical path diagram (finding 127). While Mr. McTyre used Primavera to view schedules, his presentation used PowerPoint and Excel (finding 126). The Board was, therefore, not able to do a side by side comparison of the expert's CPM schedules.

The original "as-planned" critical path ran through the Rev B infield (finding 9). The government's CPM expert Mr. McTyre's contends that critical path did not change (finding 126).[60] Mr. Dean contends that the CPM relationships changed when Paradigm

[60] We did not follow Mr. McTyre's testimony about using a "credit" to account for the shutoff valves and early start of mass excavation in the infield (finding 126).

found the shut off valves and was able to shut off and demolish the lateral lines in the Rev B infield and start mass excavation early (finding 127). Mr. McTyre contends that Mr. Dean "manipulated" the schedule to make the hydrants critical (finding 126). This may be true, however, it makes sense to us to change the logic to reflect what actually happened on the ground. We cannot square Mr. McTyre's critical path with the QARs and QCRs. Mass excavation was complete at the Rev B infield on or about 28 September 2007 (finding 28). Earthwork was complete at the Rev B infield on 18 January 2008 except for the correction of grades (*id.*). Mass excavation at the Strat Ramp started on 25 January 2008 (findings 28, 46). On 5 February 2008 DPC was installing PCC forms at the Rev B infield and at the Strat Ramp the new waterline (with hydrants) was complete and mass excavation continued (findings 35, 36, 46). We do not see any delay at the Strat Ramp caused by work at the Rev B Infield. By the time the new waterline/hydrants were completed, DPC was working on installing PCC at the Rev B infield. The earthwork equipment was no longer needed at the Rev B infield. Work at the Rev B infield did not have to be complete to start work at the Strat Ramp (findings 8, 23). Completion of mass excavation at the Strat Ramp waited for completion of the waterline/hydrants, not work at the infield. This supports our conclusion that Mr. Dean was correct when he changed the logic resulting in the critical path running through the waterline and hydrants. We consider Mr. Dean's as-built schedule reliable because it refers to and correlates with the QARs and QCRs (finding 127). Therefore, we use Mr. Dean's as-built schedule as the basis for our determination of delay. We make our own determination of which party is responsible for the delay. Also, Mr. Dean inserted a "weather calendar" in his CPM as-built schedule to account for weather delays and adjust durations (finding 127). Although not the only way to deal with weather delays, we find Mr. Dean's use of the weather calendar acceptable. However, we interpret this to mean that the days of delay requested by DPC in its Fragnets include weather delays.

Airfield Waiver

The contract includes DFARS 252.236-7005, AIRFIELD SAFETY PRECAUTIONS (DEC 1991) that limits access to runways unless they are closed. The "airfield waiver" implements this DFARS clause (finding 3). According to the initial CPM schedule the airfield waiver was to be approved on 15 March 2007 when the NTP was issued and received. The Safety & Health Plan and EPP were to be submitted and approved before construction that was scheduled to begin on the airfield on 24 May 2007. Mobilization, installing DPC's trailers and installing the FOD fence each had an early finish date of 14 June 2007. The barricades were scheduled to commence immediately after the FOD fence was installed. (Findings 9, 10)

At the 8 May 2007 preconstruction meeting the COE acknowledged that at the NTP, 15 March 2007, the "entire work area [would] be released to" DPC. The only way this could happen was if the airfield waiver was approved on 15 March 2007. The minutes of the meeting also document that by 8 May 2007, DPC had submitted the EPP, Quality Control Plan, and Site Safety Heath Plan and they were "being reviewed." (Finding 10)

As of 5 June 2007 the airfield waiver had not been approved (finding 11). However, on 5 June 2007, DPC was able to commence mobilization and installation of its trailers off the airfield (finding 12). Without the airfield waiver, DPC could not commence preconstruction surveys and install the FOD fence and barricades that were required before demolition and excavation could commence (finding 13).

On 7 June 2007, the COE took the position that DPC could not commence construction until the EPP, written report with pictures of existing facilities, excavation clearance, photos of operation and storage area, site plan, and demolition plan were received (findings 14, 15). Although the documents cited refer to "received," we interpret the COE's position to be that the submittals must be "approved." On 7 June 2007 the COE had DPC's EPP for over a month.

As of 13 June 2007, all of the submittals identified by the COE as necessary before construction could start had been submitted except the site plan. Some of the submittals had been disapproved and resubmitted. However, as of 13 June 2007, DPC was installing its trailers in the administrative area off the airfield. (Findings 16, 17)

The temporary airfield waiver was issued on 21 June 2007. The record reflects that the airfield waiver approval process was not started until 1 May 2007, over a month past the time the COE said it would be issued. (Finding 18) The EPP was resubmitted by DPC on 28 June 2007 (finding 16). Also on 28 June 2007, work commenced on the FOD fence and barricades (findings 19, 21). The delay in commencing work was caused by an unacceptable certificate of insurance that was corrected on 28 June 2007 (findings 17, 21).

In July 2007, DPC took the position that if the COE was correct about it not being able to start work without approval of the submittals, there was concurrent delay (finding 19).

DPC claims a total of 35 days of critical path delay (Fragnet 1) as a result of the delay in issuing the airfield waiver (AEX 59 at 20). This is calculated from the scheduled commencement of work, 24 May 2007, to 28 June 2007 when DPC commenced work (app. br. at 3; findings 19, 21). We find that the COE delayed DPC by not approving the airfield waiver on or before the scheduled start of construction on 24 May 2007. This is critical path delay. Whether there is concurrent delay depends on the validity of COE's argument that DPC could not start work until certain submittals were approved. The COE clearly allowed construction on the airfield to start on 28 June 2007 without an approved EPP. (Finding 21) When the EPP was approved on 23 July 2007 (finding 16) work on the FOD fence and barricades was ongoing (finding 21). DPC correctly points out that the COE's scheduling expert CDRSS states, "[t]he requirement of an approved EPP before the start of the FOD fence was evidently waived by the COE, because the installation commenced before approval of the EPP" (R4, GEX 54 at 23 of 84). The COE chose not to enforce the requirement that the EPP be approved before any work started on the airfield. We will not enforce something that the COE failed to enforce.

We conclude that the COE waived the requirement that it approve DPC's EPP before the start of work. Having waived the argument as to at least one submittal, it would be manifestly unfair for us to enforce the requirement as to other submittals.[61] Accordingly, there was no concurrent delay associated with the submittal procedure. We take into account the fact that DPC did not start work when the airfield waiver was issued due to an improper certificate of insurance. The temporary waiver was issued on 21 June 2007 (finding 18). Work started on 28 June (finding 21). Therefore, because of the delay in submitting a proper certificate of insurance (finding 21) we charge DPC with responsibility for not starting work on 22 June 2007 and subtract six days from the claimed 35 days. The COE is responsible for 29 days of critical path delay in issuing the airfield waiver.

Barricades & Foreign Objects Debris (FOD) Fence

The site plan specified where the FOD and barricades were to be located (finding 6). The initial schedule shows that DPC planned to install the FOD fence (activity 1470) before the barricades (activity 1480) (finding 9). The planned duration for the FOD fence was 21 days and for the barricades 5 days for a total duration of 26 days (*id.*). The COE directed DPC to install the barricades first and decreased the spacing between barricades; thereby increasing the number of barricades required (finding 20).

Work on the FOD fence and barricades started on 28 June 2007. It is unclear when the FOD fence was actually finished, but the last of the barricades were installed on 1 August 2007. DPC was allowed to start excavation for the new waterline on 31 July 2007 before the last of the barricades were installed. (Finding 21) Thirty-three days elapsed between 28 June 2007 and 31 July 2007. Mr. Dean calculates 11 days critical path delay (Fragnet 1) associated with the COE's changes to the FOD fence and barricade work. (AEX 59 at 42) We accept the 11 days of delay.

Partial Suspension of Work

The COE acknowledges responsibility for the partial stop work order issued on 3 August 2007 and lifted on 13 August 2007 (gov't br. at 41; finding 22). However, this delay runs concurrent with the low profile hydrant delay discussed below.

Waterline, Low Profile Fire Hydrants & Mass Excavation

According to the as-planned schedule, the first critical path activities after installation of the FOD Fence and barricades was installation and hook up of the new

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[61] Our conclusion should not be interpreted as a criticism of the Air Force, we think allowing work to commence before final approval of all submittals was beneficial to both parties.

waterline (critical activities 1660, 1700, 1710, and 1720). All four activities were planned to be completed between 21 June 2007 and 28 June 2007. The next critical activity was removal of the existing waterline (activity 1530) that was to take place between 2 July 2007 and 9 July 2007. Mass excavation in the Rev B Infield was next to take place between 2 July 2007 and 19 July 2007. (Finding 9) In other words, the new waterline with hydrants was planned to have been completed and operational before removal of the existing waterlines and start of mass excavation in the Rev B Infield. This sequence defined the as-planned critical path. However, Paradigm was able to commence mass excavation early (findings 24, 25, 46).

On 3 July 2007 the COE directed DPC to suspend ordering the contractually specified fire hydrants (finding 34). Modification No. A00001, 5 September 2007, directed DPC to install Clow Valve Co. Series 92 low profile hydrants and included a NTP (finding 35). Modification No. A00001 did not include all the information needed for DPC to order the hydrants (*id.*). DPC ordered the hydrants "as soon as they got all the information" (finding 36). However, some of the hydrant equipment was not available (finding 35). We consider DPC's efforts to obtain the new low profile fire hydrants to be reasonable and do not accept the COE's suggestion that DPC's efforts were inefficient causing unnecessary delay.[62]

On 4 September 2007 Paradigm started mass excavation at the Rev B infield (finding 27). On 5 September 2007 Paradigm broke one of the laterals causing water to accumulate at the infield (*id.*). Paradigm also located shutoff valves for the waterline laterals in the Rev B Infield and was able to shut off the water. By 24 September 2007, Paradigm was able to demolish the laterals. (Finding 28) By 28 September 2007, Paradigm had completed mass excavation at the Rev B Infield and was compacting subgrade (*id.*).

On 5 February 2008 the new waterline and hydrants were installed, demolition of the old waterline at the Strat Ramp started, and concrete form work was ongoing at the Rev B Infield (finding 35). Mr. Dean's Fragnets 2 & 3A allocate 108 days delay to the low profile hydrants. Mr. Dean's Fragnet 3B allocates an additional 26 days of delay for "waterline chlorinate," "waterline connect," and "waterline remove" that became critical as part of the waterline work. (App. supp. R4, AEX 59 at 43; tr. 10/49, 62-62) It would seem that the total number of days delay is 108 + 26 = 134 days. In its brief DPC asks for 141 days of delay (app. br. at 5). Mr. Dean's presentation during the hearing suggested 146 days. We do not follow Mr. Dean's explanation of the additional days of delay (tr. 10/51; app. supp. R4, AEX 59 at 44) and decide that the government is responsible for 134 days of delay as a result of changing to the low profile fire hydrants.

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[62] The COE suggests numerous instances of inefficiencies on the part of DPC that we do not address. We decline the COE's invitation to engage in after-the-fact second guessing of DPC's efficiency and give these arguments no weight.

High Grades in Rev B Infield

As DPC was preparing to install PCC in the infield it realized its forms were not following grade and would require Paradigm to make grade corrections (finding 28). Mr. Dean's Fragnet 4 covers this delay. The Fragnet log for Fragnet 4 identifies four days of government delay, seven days of DPC delay, nine days of compensable weather delay, one day of non-compensable weather delay, and 45 days of Paradigm "scope" delays (app. supp. R4, AEX 59 at 12). Mr. Dean recognizes 52 days of delay caused by DPC and Paradigm (tr. 10/73; app. supp. AEX 59 at 65). Unlike Mr. Dean's explanation of other Fragnet analysis, we were unable to follow his explanation of the four days of government delay. We view correcting the high grades in the Rev B infield base course as delay caused by Paradigm, not the COE. (*See* discussion of weather delays below.)

Unsuitable Soil

The COE called COR McKittrick, COE resident engineer at Hickam Airfield, to discuss unsuitable soil. We rely on his understanding of the unsuitable soil specification. (Finding 31) The contract specifications allocate responsibility for unsuitable soil to each party based on depth. We adopt COR McKittrick's interpretation that DPC/Paradigm is responsible to replace unsuitable soil to a depth of 18 inches below subgrade and the COE is responsible for unsuitable soil below that depth. (Findings 4, 31) The COE argues that unsuitable soil DPC encountered was within the 18 inches below subgrade (finding 32). There is no evidence in the record concerning the depth of unsuitable soil encountered anywhere on the job site. We also do not know the role Paradigm's rupturing a lateral waterline and flooding the Rev B infield had in contributing to unsuitable soil (finding 27). Assuming that unsuitable soil was encountered, the record is insufficient for the Board to determine with any accuracy at what depths so as to allocate responsibility between the parties. DPC has the burden of proof as to the COE's responsibility for cost or delay for unsuitable soils. DPC has not met its burden.

Fuel Line in the Rev B Infield

The site plan shows a fuel line running through the north end of the Rev B Infield. During excavation, it was determined that the line was not buried as deep as the COE had anticipated. The COE admits that a different backfill material had to be used over the fuel line. (Finding 33) We conclude that the COE is responsible for any additional cost of backfilling around the fuel line. COR McKittrick testified there was no delay caused by the fuel line (finding 33). Since we found that the work in the Rev B Infield was not on the critical path, we would not recognize critical delay due to the fuel line at the Rev B Infield. However, the record is not sufficient for us to identify any delay caused by the fuel line. DPC has the burden of proof as to the COE's responsibility for delay caused by the fuel line at the Rev B Infield. DPC has not met its burden.

Weather

The contract sets up a mechanism for dealing with weather delays. Clause S-36.5, TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER, provides a list of the expected days of adverse weather for every month in the year:

JAN	FEB	MAR	APR	MAY	JUNE	JUL	AUG	SEPT	OCT	NOV	DEC
3	3	2	1	1	0	1	1	1	2	2	3

(Finding 3) It is clear that the contract anticipated more weather delays during October through March than the rest of the year. The clause requires that the contractor record adverse weather on the daily QCR. If the adverse weather exceeds the listed estimated days in a given month and prevents critical path work for at least half a day, the contract completion date will be extended pursuant to the Default clause. A contract extension made pursuant to these clauses is not compensable, S-36.5, Time Extensions for Unusually Severe Weather, subparagraph (a) authorized a time extension only. (*Id.*)

DPC argues "[w]hen the government causes a delay that pushes the project into weather that the project otherwise never would have seen...those weather delays are both excusable and compensable" (app. br. at 9). DPC supports this argument with a 1966 Court of Claims case (*Luria Bros. v. United States*, 369 F.2d 701) and a 1996 ASBCA case (*Stroh Corp.*, GSBCA No. 11029, 96-1 BCA ¶ 28,265). We need not analyze these cases because there is ASBCA case precedent supporting DPC's argument. We recently considered the argument in *DTC Engineers & Constructors, LLC*, ASBCA No. 57614, 12-1 BCA ¶ 34,967 at 171,898:

> **Damages for Adverse Weather Delays**
>
> We view appellant's claim as one based upon seasonal differences in weather, as a result of government delays, rather than one based upon unusually severe weather as characterized by the government. *Charles G. Williams Construction, Inc.*, ASBCA No. 42592, 92-1 BCA ¶ 24,635 at 122,930. Appellant's adverse weather claim is not grounded in the Weather clause or the Differing Site Conditions clause (except for the inadequate laydown portion) but instead is based upon a constructive suspension by the government under the Suspension of Work clause (app. opp'n at 9). Specifically, appellant contends the government wrongfully delayed the design review and submittal process preventing appellant from proceeding under the contract which resulted in the work being pushed into the winter months where appellant was delayed by severe weather conditions (app. opp'n at 9, 10).

> Wrongful government delays that are not reasonably anticipated and push a contractor's performance into periods of adverse weather can be a cause of additional delay for which a contractor may be compensated. *Charles G. Williams Construction*, 92-1 BCA ¶ 24,635 at 122,930.

The *Charles G. Williams* case involved a suspension of work necessitated by defective government design. As in this case, the government characterized the claim as one based on unusually severe weather for which it has no responsibility for compensation. The Board, however, found weather interfered with work that would have been completed earlier under better weather conditions and that the delay was caused by the government's defective design and resulting suspension. The Board held, "[a]ppellant is entitled to additional costs incurred when the construction period was shifted into a colder and wetter performance period as the result of the Government's suspension of work." *Charles G. Williams*, ASBCA No. 42592, 92-1 BCA ¶ 24,635 at 122,930. We reach a similar conclusion here. We have found the COE responsible for the 40-day delay caused by the airfield waiver and change in FOD fence and barricade work and 134 days attributable to the change to low profile hydrants and waterline. We know that mass excavation in the Rev B Infield should have started in May 2007 but due to the delays actually started in September 2007 (finding 28). We know there was flooding during the excavation work (findings 38-44). The contract predicted more days of weather delay in October through February than the rest of the year. The delays caused Paradigm to start its earthwork in these months when rain caused flooding of the job site. As in *DTC Engineers* we view DPC's claim as one based on seasonal differences in weather as a result of government delays rather than one based on unusually severe weather as characterized by the government. DPC is entitled to compensation for those days of weather delay that meet the criteria set forth in *Charles G. Williams*.

Arriving at the number of days of compensable weather delay is far from straightforward. In its brief, DPC fails to tell us how many days it believes it is entitled to (app. br. at 9-10). In Mr. Dean's fragnet log he identified 20 days of compensable weather delay in Fragnets 4 and 6 (tr. 10/6; app. ex. 51 at 4; app. supp. R4, AEX 59 at 11-13). Mr. Dean accounted for weather by putting a weather calendar in his as-built schedule that allowed "the schedule software to automatically adjust activity durations" for weather (finding 127). On cross-examination Mr. Dean testified, "within the fragnets, there would be delays due to weather or wet grade" (tr. 10/172). We know there was flooding and compensable weather delays (findings 39-44). However, we interpreted the weather calendar and Mr. Dean's testimony to establish that weather delays are included in the delay durations in Mr. Dean's fragnets. Therefore, we need not discuss weather separately.

Strat Ramp Base Course

The base course material placed at the Rev B Infield and Strat Ramp came from Grace Pacific's quarry. All of the base course placed at the Rev B Infield passed testing after placement and compaction and was accepted by the COE. (Finding 23)

In April 2008, Grace Pacific notified Paradigm that although all base course it was supplying for the Strat Ramp passed testing at the quarry,[63] they noticed that the material was changing. It was "lighter" and contained more cinder material. (Findings 48, 49) Mr. Creps testified that it is possible for cinder material to break down during compaction producing smaller fines (finding 49). The COE also noticed that the base course material was changing (finding 50).

The COE had its lab take a sample of base course for testing on 24 June 2008. The parties dispute the location where the 24 June 2008 sample was taken. We are persuaded that there was no confusion over the location of lane 1 and that Mr. Lum's recollection of where Mr. Morita had the 24 June 2008 sample taken is credible and persuasive. Based on the record before us we conclude that the 24 June 2008 sample was taken at lane 1, zone 1, where the PCC pavement was placed two days later. (Findings 7, 51-53, 56) The COE informed DPC that it had taken the test but would not receive the results until after the planned placement of PCC pavement on 26 June 2008. The COE warned DPC that if it proceeded with the placement on 26 June 2008 it was at its "own risk." (Finding 55) The sample taken on 24 June 2008 at lane 1 failed gradation test but the results were not known until after the PCC pavement was installed at lane 1 (findings 56, 58).

DPC also had a sample taken just before the PCC pavement was installed. Bag #58 was taken on 25 June 2008 from the third lift at line 8 next to lane 1. We conclude that it was reasonable for DPC to consider bag #58 as representative of the material under lane 1. DPC received oral confirmation that bag #58 passed gradation testing before it installed the PCC pavement on lane 1. (Finding 54)

Mr. Kawamoto directed that the PCC pavement be installed on 26 June 2008 (finding 57). Before Mr. Kawamoto decided to install PCC pavement, eight samples had been taken in May and June – two from stockpiles (bags #42, #52), two from lift 1 (bags #47, #48), two from lift 2 (bags #53, #56) and two from lift 3 (bags #58 and #1570)[64] (finding 67). The parties disagree over the results of bags #47 and #48 because the lab report indicated that they failed gradation testing based on the 10% fines standard. Bag #47 tested 10.4% and bag #48 tested 10.3% and Hirata Lab annotated the results as "No" – does not meet specification. (*Id.*) However, we must apply the testing protocol required by the

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[63] Testing at the quarry did not involve compacted base course (finding 49).

[64] We consider the samples from the stockpiles and lifts 1 and 2 because it was the same base course material as in lift 3.

contract. Contract 0004 requires that the #200 sieve analysis be conducted in accordance with ASTM C 117 (finding 4, *see* section 02722). ASTM C 117 directs that results over 10% will be reported "to the nearest whole number" (finding 5). Therefore, following the dictates of the contract, the tests on bags #47 and #48 must be reported as 10% and passed. When Mr. Kawamoto directed that PCC pavement be installed on 26 June 2008 he believed the base course material was conforming (finding 57). We conclude that his belief and decision were reasonable because it was supported by seven passing base course tests.[65] DPC was not obligated to wait until the test result on bag #1570 was received and the record does not support the conclusion that one failed test result would cause the rejection of the entire base course given the existing seven successful tests. We do not consider the admonition that placement of PCC pavement would be at DPC's risk legally significant given the seven passing tests before placement and the fact that the COE proceeded to take many more samples for testing after the PCC pavement was poured and then removed.

The test results for bag #1570 indicated that the base course under lane 1 failed (findings 56, 58). As a result, the COE started taking more samples for testing (findings 59, 67). We agree with the witnesses testifying that samples should be taken close to the time the base course is installed and that as more time passes the less reliable the test results (findings 62-66). We also agree that testing at lane 1 after the PCC pavement was removed is unreliable (findings 65, 66, 85). Therefore, we only consider the tests on samples taken in June and July. It is clear from the data that many samples taken after 26 June 2008 did not conform to the 10% requirement. Of the 14 samples tested in July, 3 passed and 11 failed[66] (finding 67). It is also clear that there was notice that the material from the quarry was changing (findings 48-50, 60). We considered DPC's argument that the contract should have required a 15% pass standard and reject it (finding 61). The COE was justified in demanding that DPC remove the 6 inches of the third lift (findings 74, 75) of base course in zone 1 at the Strat Ramp. However, DPC makes two additional arguments: economic waste (app. br. at 18-27), and change (app. br. at 39-41), that we consider.

The theory of economic waste was well explained in *Valenzuela Engineering, Inc.*, ASBCA Nos. 53608, 53936, 04-1 BCA ¶ 32,517 at 160,852-53:

> Economic waste does not *ipso facto* excuse non-performance. Rather, it serves to limit excessive damages for repair of non-conforming work. RESTATEMENT (SECOND) OF CONTRACTS, § 348 (1981). It is a factor in determining whether the government has the right to demand strict compliance with

[65] At the time the COE did not reject base course on the basis that Hirata did not take samples as frequently as the contract required (finding 47).

[66] Four of the bags, #64, #65, #78, #79, were from zone 2, below row 28. We consider these test results because it was the same material as placed on zone 1.

specifications. *H.L.C. & Associates Construction Co. v. United States,* 367 F.2d 586 (Ct. Cl. 1966). It is well-accepted that in the absence of economic waste the government generally has the right to enforce its contracts so as to get precisely what it ordered:

> We recognize that the government generally has the right to insist on performance in strict compliance with the contract specifications and may require a contractor to correct nonconforming work. *S.S. Silberblatt, Inc. v. United States,* 433 F.2d 1314, 1323, [Ct. Cl.] (1970). However, there is ample authority for holding that the government should not be permitted to direct the replacement of work in situations where the cost of correction is economically wasteful and the work is otherwise adequate for its intended purpose. In such cases, the government is only entitled to a downward adjustment in the contract price. [Citations omitted.]

Granite Construction Co. v. United States, 962 F.2d 998, 1006-07 (Fed. Cir. 1992), *cert. denied*, 506 U.S. 1048 (1993). Read in context, and given the provisions of the Inspection of Construction clause, we do not consider the foregoing quote to mean that the government is literally precluded from ordering replacement if the cost is unreasonably high. Rather, we interpret this to mean that the government may be vulnerable to a claim for an equitable adjustment for the difference between the "downward adjustment" to which it would be entitled for loss of value and the cost of replacement if that cost is shown to be "clearly disproportionate." *Id.*

Appellant offered no evidence in the record to prove how much it cost to remove the third lift of base course at zone 1. This seems to us to be a fundamental element of economic waste. However, DPC claims $2,224,195 for "base course rejection." This amount includes removal of base course and removal of PCC pavement at lane 1 and other costs. (R4, tab A-14; compl. ¶¶ 10-20) We know that removing the base course took nine days and there was no cost for disposal because the material was reused elsewhere on the project (findings 66, 67). It is hard to believe that this nine-day effort to remove six

inches of base course cost around a million dollars,[67] but we leave the proof to quantum. What we do know is that after the installation of the PCC pavement on 26 June 2008, test results from July 2008 convince us that the base course did not meet contract requirements. The COE accepted the first two lifts of base course even though it was the same questionable material as in the third lift. We think the COE's decision to have the third lift, top six inches of base course removed before additional pavement was installed, made perfect sense and did not constitute economic waste.

Next, DPC makes a change based argument that asserts early delays caused by the COE (airfield waiver, barricades and low profile hydrants) caused Grace Pacific (the quarry) to run out of acceptable material. Even if true, we do not see how this could excuse DPC/Paradigm from delivering base course that met specification requirements after compaction.[68] This argument is analogous to the argument concerning weather delays we accepted above, but with one significant difference. DPC did not control the weather; it did control the quality of the base course it provided. Grace Pacific knew it was running out of quarry space under its then current operating permit (finding 60) and could have informed Paradigm or Paradigm could have inquired. Paradigm could have purchased the stock pile or made other arrangements to provide conforming base course. DPC eventually used another supplier and procured conforming base course to complete the Strat Ramp. Nothing in these facts shifts the risk of providing conforming base course from DPC to the COE. DPC cites two cases in support of this argument. The COE correctly argues that neither of these cases supports the argument. (Gov't br. at 85 n.15) First is *Koppers-Clough*, ASBCA Nos. 12485, 13119, 71-2 BCA ¶ 8920. We agree with the COE that the case, "is inapplicable and does not remotely suggest that government delay binds the government to accept non-compliant material." *Id.* Second is *Kehm Corp. v. United States*, 119 Ct. Cl. 454, 93 F. Supp. 620, 624 (1950) that DPC argues is "akin" to our situation. We agree with the COE there is no similarity between this appeal and *Kehm* and provides no support for DPC's argument (gov't br. at 85). We decline to accept DPC's delay argument.

We conclude that DPC is liable for the cost of removing the non-conforming third lift of base course in Strat Ramp zone 1 and any associated critical path delay. We determine the number of days delay below.

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[67] One document allocates $1,889,528 to "costs associated with the base course issues" (R4, tab A-7 at PDF 18).

[68] The base course material passed gradation testing at the quarry, but had more cinder material that was more susceptible to breaking down into finer particles due to compaction (finding 49).

Removal of PCC Pavement at Lane 1

As stated above, DPC installed PCC pavement on Strat Ramp lane 1, zone 1, on 26 June 2008 (finding 68). In November 2008 the COE discussed having the PCC pavement removed, estimated that it would cost $250K, and was concerned about the doctrine of economic waste (finding 69). There was much discussion within the COE and between the COE and DPC about having the PCC pavement removed (findings 70-75).

On 9 December 2008, the COE directed that the PCC pavement be removed from lane 1 (finding 76). Some of the concrete on lane 1 had to be removed for reasons relating to concrete deficiencies, but it is unclear if it had been removed and replaced as of 9 December 2008 or not (findings 69, 75).[69]

The reason for the direction to remove the PCC pavement from lane 1 was the COE's concern that the pavement would be subjected to "pumping" (findings 75-76). Pumping is the expulsion of water and material out from under airfield pavement through the pavement joints. Both sides presented expert testimony about pumping. (Findings 77-84) The conditions necessary for pumping are: (1) standing water at the interface between the base course and PCC pavement; (2) overloading of the pavement; and (3) high frequency overloading (findings 78, 80). High frequency overloading occurs in areas such as a taxiway or runway where there is "channelized" aircraft traffic (finding 80).

While we are not persuaded that there is "no" difference in vertical drainage characteristics between base course having 10% fines and base course having 15% fines in the #200 sieve test, we are likewise not persuaded that the risk of pumping was sufficient to justify removal of the PCC pavement at lane 1. The Strat Ramp is essentially a parking area for aircraft, does not have channelized traffic and does not have the high frequency loading necessary to have a risk of pumping. (Findings 80, 83) The pavement is designed to handle the loads of C-17, C-5, B-52 and F-15 aircraft and only the C-5 was expected to run wheels over lane 1's transverse joints (findings 77, 79). Therefore the loads of those aircraft, should one happen to run wheels over lane 1, would not exceed the design load of the pavement and should not cause overloading and deflection of the pavement necessary for pumping (findings 79, 83). Also, the transverse joints are saw cut after installation and the cut penetrates approximately one fourth of the depth of the concrete (finding 83). Therefore, there is no path for water to move through transverse joints unless there is a crack from the bottom of the saw cut to the base course. If a crack occurs, the crack path is smaller than the longitudinal joints that go completely through the pavement. (Finding 83) Both transverse and longitudinal joints are sealed (findings 78-79, 83). We are persuaded by the testimony that (1) water is not likely to enter the base course through the sealed joints, (2) the base course, although probably not conforming to the 10% fines requirement, will drain vertically to some extent and (3) that

[69] We leave this issue for the determination of quantum.

lane 1 pavement will not experience high frequency overloading. We accept DPC's expert testimony that it is unlikely that the conditions for pumping will exist at lane 1. We conclude that the pavement would likely perform properly and that the COE's concerns over pumping were unreasonable.

The demolition of lane 1 PCC took six days (finding 76). Seventy percent of the rubble was removed in one day (*id.*). It is not clear from the daily logs (QAR) when the base course under the demolished PCC was removed and replaced, however, we conclude that a total of ten days is a reasonable time to assign to the removal of the PCC and removal and replacement of base course at lane 1. DPC claims $2,224,195 for "base course rejection." This amount includes removal of base course and removal of PCC pavement at lane 1 and other costs. (R4, tab A-14; compl. ¶ 20) Although as before, DPC did not present evidence at the hearing concerning the cost of removing and replacing the PCC pavement, there is one document in the record that allocates $162,580 to this work (R4, tab A-7 at PDF 18). We do not know if this is the amount DPC would have us consider, but we conclude removing thick airfield pavement is costly and that the COE's concerns over pumping did not justify removal. We conclude that said removal constituted economic waste. Therefore, the COE is liable for the cost of removal[70] and associated critical path delay. *Valenzuela Engineering*, 04-1 BCA ¶ 32,517 at 160,852-53.

Fragnet 5 allocates 60 days of critical path delay to the rejection of the base course (app. PFF at 50; AEX 59 at 67). We allocate responsibility for fifty days to DPC and ten days to the COE.[71] The COE is responsible for the costs of removing the PCC and DPC is responsible for the cost of removing and replacing the top lift of base course.

Rev B Infield Elevations

Elevations are measurements that specify the surface of the pavement relative to the water table. Elevations are important because they affect water drainage on the pavement. At award the contract specified elevations for the 25 x 25 ft. slabs of concrete at the Rev B Infield. The COE changed the slabs to 20 x 20 ft. but did not change the elevations. DPC asked for new elevations. The COE provided new elevations. According to DPC the COE's elevations were wrong and DPC calculated its own elevations but failed to tell the COE its elevations were wrong or get COE approval before

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[70] In *Valenzuela Engineering*, 04-1 BCA ¶ 32,517 at 160,852-53, the damage was the difference in cost and the reduction in value, but in this case the COE has already taken a $100,000 reduction in value for the non-conforming base course under the PCC pavement in Modification No. A00043 (finding 125).

[71] Fragnet 5 does not appear to extend the critical path delay into December 2008 when the PCC was removed, however, we do not believe DPC should be held responsible for all of the 60 days of delay due to our decision that removal of the lane 1 PCC constituted economic waste.

building to DPC's elevations. According to the COE, DPC's elevations were "minimally acceptable" because water flowed properly over the Rev B Infield. The COE accepted DPC's elevations. (Findings 86-88)

By Modification No. A00044, the COE reduced the contract price by $77,512.80 for non-conforming elevations in the Rev B Infield and Taxiway A-2 (finding 89). DPC correctly points out in its brief that the COE never provided any accurate elevations. However, the deductions was calculated based on a comparison between the elevations Mr. Tracy calculated that were accepted by the COE and DPC's as-built elevations (finding 90). DPC failed to build to its own elevations. We conclude that DPC is liable for failing to build to its own elevations. We do not, however, adopt the COE's $77,512.80 and leave calculation of the dollar amount to quantum.

There is an issue relating to tolerances of the elevations that DPC entitles, "**Increased Performance Requirements for Finish Elevations of Concrete**" (app. br. at 42). DPC contends that the COE tightened tolerances on elevations causing it to incur greater costs. DPC's argument relies upon its "FOF 370" but "FOF 370" has no citation to evidence. (App. br., PFF ¶ 370) The COE responds in its brief (gov't br. at 93). DPC replies in its reply brief (app. reply br. at 27). The problem is that none of these briefs or proposed findings of fact cite to evidence of record.[72] We will not search for supporting cites to evidence left out by the parties. Since it is DPC's burden of proof, we find that DPC failed to meet its burden of proof because it failed to direct to Board to any record evidence supporting its argument on this point.

Taxiway A Work

Taxiway A is part of the Honolulu Airport (findings 6, 90). The contract required DPC to construct three ramps tying the Rev B Infield (A-2), Strat Ramp (A-1) and CWRF (A-0) into Taxiway A (findings 6, 91). DPC identifies three types of delays associated with work on Taxiway A: base course test strip, utility marking, and contaminated soil and related weather delays at Ramp A-2 (app. br., PFF ¶ 274).

DPC states that the base course test strip is "included in the 60 day delay period for rejected base aggregate" (tr. 10/76; app. br., PFF at 52, ¶ 276). Since we decided that the COE was justified in ordering removal of the third lift of base course at the Strat Ramp, we conclude that any delay caused by this "test strip" is the responsibility of DPC and included in the fifty days of delay we allocated to DPC for base course rejection.

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[72] Both parties' arguments suffer from a dearth of citation to the record for evidentiary support and we decline to hunt for the cites. Unsupported factual argument was not considered.

DPC contends that the COE had been marking utilities, but it directed DPC to mark them in the Taxiway A ramps causing delay (app. br., PFF ¶ 276). The COE does not dispute that it previously marked utilities, but contends that the contract required DPC to do the marking. The COE contends specification section 01900 Miscellaneous Provisions, paragraphs 1.4 Location of Underground Facilities, and 1.4.1 Notification Prior to Excavation, require the contractor to scan the construction site and mark utilities (gov't br. at 96). We agree that these two paragraphs appear to place the responsibility to mark utilities on DPC "not marked by Utility"[73] (finding 4). In Fragnet 6 Mr. Dean explains, "the utilities below Taxiway A were not owned by a military organization but rather by the Hawaii International Airport, who had refused to mark their utilities" (app. ex. 51 at PDF 402). We therefore agree with the COE and conclude that DPC was responsible for marking the utilities at the Taxiway A work site. DPC was therefore also responsible for any delay associated with said marking. Mr. Dean identified 13 days of delay attributable to utility marking (app. ex. 51 at PDF 69, 402) that we find is the responsibility of DPC.

The third source of delay alleged by DPC is contaminated soil at Ramp A-2. The COE agrees that contaminated soil was found at Ramp A-2. (Gov't br. at 59) Mr. Dean identifies 56 "net" days of delay as follows: 13 days for utility marking, 37 days for unplanned weather and wet grades, and 6 days for contaminated soil (finding 92). This is all included in the Fragnet 6 "contaminated soil" (AEX 59 at 69). While there is evidence that there was both contaminated soil and unsuitable soil (finding 92), there is no evidence of the allocation between the two and we allow the entire six days delay. We allow the 37 days for "unplanned weather and wet grades" because it is included in Fragnet 6 "contaminated soil" delay based on Mr. Dean's weather calendar. This is consistent with our decision not to address weather and wet grades separately.[74] The pictures of flooding at Taxiway A further support our decision (tr. 10/82; AEX 59 at 74-75). The total days of delay for weather / wet grades and contaminated soil is 6 + 37 = 43 days that is the responsibility of the COE.

Clear Water Rinse Facility (CWRF)

As of March 2009, the critical path ran through the CWRF. The COE specified CLA-VAL model 134-52 ACS DS.SS.SS.ENP valves but failed to recognize that the valves required end switches. On 17 March 2009, DPC asked the COE if it omitted the

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[73] Specification 1900, paragraph 1.4.1, does direct that the contractor to "Contact Utility 48 Hours prior to excavating" which infers that the Air Force would have the opportunity to mark utilities, however, the Air Force did not own taxiway A that was on Hawaii International Airport (HIA) property (tr. 10/85).

[74] We note that Fragnet 6 is the only Fragnet where the vertical blue lines indicating weather delay play a significant role in the critical path delay (AEX 59 at 20, 43, 59, 69, 81, 110). There were weather delays at the Rev B infield that were not on the critical path (AEX 59 at 61).

end switches. The COE authorized the purchase of end switches on 29 April 2009 and mandated that they be installed by a factory representative. The end switches were on site 28 May 2009 (finding 95). The COE is responsible for the 72 days of delay between 17 March 2009 and 28 May 2009. Testing of the CWRF could not start without the installation of the end switches. (Finding 95) A pump failure at the CWRF occurred between 14 May 2009 and 22 May 2009 or nine days of delay (findings 97-98). The pump failure delay of nine days was DPC's responsibility, it was concurrent with, but shorter than, the delay caused by the end switches that was the COE's responsibility. The 2 June 2009 power outage occurred when the CLA-VAL representative was on site to install the end switches and the installation had to be rescheduled. The CLA-VAL representative returned on 7 July 2009 and started installation of the end switches. (Finding 99) The power outage and rescheduling of the CLA-VAL representative caused a 35-day delay (2 June to 7 July) in installing the end switches which is the responsibility of the COE.

There was also a problem with the opening and closing speed of the valves. The problem was discovered on or about 13 June 2009. On 21 July 2009, the CLA-VAL representative returned to work on the valve speeds. On 23 July 2009 the work was complete but the speeds were not quite as desired but acceptable. (Finding 100) Since the COE specified the valves by part number, we conclude that the COE was responsible for delays caused by the opening and closing speeds. The COE is responsible for 40 days (13 June to 23 July) of delay that is partially concurrent with the delay caused by the power outage.

There were also problems with the PLC, the "brain" that controlled the automatic wash functions. The PLC had not been tested as of 25 June 2009. However, the PLC was operational on 8 July 2009, thirteen days later, before the CLA-VAL valve delays ended. (Finding 101) Delays associated with the testing of the PLC are DPC's responsibility but are concurrent with the COE's delays.

Mr. Dean's Fragnets seven and eight cover these delays. Fragnet 7, CLA-VAL Zone Control Limit Switches, identifies the same 72 days delay that we set forth above (AEX 59 at 81). Fragnet 8, Power outage & CAL-VAL Open/Close Speeds, identifies 61 days of delay (*id.*), less than what we identified above. The 61 days appears to include nine days attributed to waiting for an aircraft (app. ex. 51 at PDF 454). It is self-evident that the availability of the aircraft is within the control of the government, however, DPC failed to prove that nine days was unreasonable and we subtract these days from the 61 days. We rely on Mr. Dean's Fragnet 8 and decide that the COE is responsible for 52 ($61 - 9 = 52$) days of delay caused by the power outage and valve speed problems. During this time there was DPC's concurrent delay associated with the pump failure and PLC testing delay discussed above.

CWRF Substantial Completion

The first successful automated rinse of a C-17 aircraft occurred on 4 August 2009 (findings 102, 105). However, on 17 August 2009 the COE noticed that the 500 gpm nozzles installed at the CWRF did not have the contract specified flow rates (finding 103). Oahu Plumbing had adjusted the nozzles to the required rates, but COE was concerned that the field adjustment would void the warranty and directed that the 500 gpm nozzles be replaced (*id.*). COR McKittrick had previously agreed that substantial completion of the project would be when the first successful test occurred, but the discovery of the wrong nozzles changed his position (finding 104). The nozzles were replaced on 29 September 2009, but there was no difference in the performance of the 500 gpm nozzles and the replacement nozzles (*id.*). The COE did not rebut this contention (gov't br. at 63-64; gov't PFF ¶ 105)

In December 2009 COR Hinkle changed the COE's position on substantial completion. She took the position that substantial completion would not occur until the section 15899, paragraph 3.6, Water Recycling Setup, steps to calibrate the conductivity meter and set the float levels in the tanks were completed (findings 105, 107). ACO Phillips explains the COE's position on substantial completion in a 27 July 2012 letter. According to ACO Phillips, substantial completion occurred on 23 February 2010 when the conductivity meter was calibrated and the level switches were set. (Finding 110) However, in its brief the COE seems to contend that substantial completion occurred on 25 November 2009 (gov't br. at 97). The record reflects that there was a great deal of confusion on the part of the COE as to the correct date of substantial completion. (Findings 104-05, 107-10) There is also the issue that the government was having trouble obtaining a discharge permit to allow completion of calibration of the conductivity meter and setting the level switches (finding 106).

In considering the date for substantial completion of the CWRF, we first look to the contract. Specification section 15899, Clear Water Rinse System Start-Up and Water Recycling Set Up, sets forth the requirements for the CWRF. We think it significant that the six step water recycling setup procedure that includes calibration of the conductivity meter is not part of the final performance test paragraph. The final performance test is in paragraph 3.5.1 whereas the water recycling setup is in paragraph 3.6. Paragraph 3.5.1 Final Performance Test reads, "[t]he final performance test shall consist of performance of the system during actual washing of an aircraft." (Finding 4) This includes some operation of the water recovery and storage capability but not the calibration that takes place later. We interpret this language to mean just what it says – successful washing of an aircraft is the "final performance test." The entire water recycling setup and calibration process is not part of the final performance test. The recycling setup process determines how many times the water may be used. The drafters of the specification could have included the recycling setup process in the final performance test but did not. There is nothing in the CWRF specification that can reasonably be interpreted to include recycling setup as part of the final performance test. We conclude that as a matter of contract

interpretation the "final performance test" means just that and does not include the six-step water recycling setup procedure. To the extent that the relationship between the final performance test and recycling setup process creates an ambiguity, we would consider it latent, and apply "contra proferentum" to arrive at the same interpretation. *States Roofing Corp. v. Winter*, 587 F.3d 1364, 1372 (Fed. Cir. 2009). Therefore, ACO Phillips was wrong in requiring completion of the water recycling setup as part of the final performance test for substantial completion. In effect, COR McKittrick was right in his interpretation that substantial completion occurred when the first aircraft was successfully washed. That leaves the matter of the nozzles. We consider three facts in coming to our conclusion. First, the COE did not notice the out-of-specification 500 gpm nozzles until after the successful final performance test on 4 August 2008. (Findings 102-03) Second, there was no appreciable performance difference between the 500 gpm nozzles and the replacement nozzles (findings 103-04). Third, there was no immediate repeat of the final performance test with a C-17 aircraft after the nozzles were replaced on 29 September 2009 – the day COR McKittrick considered to be substantial completion. We therefore view the replacement of the nozzles as a punch list matter that does not affect substantial completion. *Ellis Environmental Group, LLC*, ASBCA No. 55375, 08-2 BCA ¶ 33,918 at 167,847 ("Appellant is entitled to remission of liquidated damages from 29 July through 4 August 2005 (seven days), the number of days the government assessed liquidated damages after substantial completion."); *Hom-Russ, Inc.*, ASBCA No. 46142, 94-2 BCA ¶ 26,635 at 132,477 ("We reach this conclusion because '[l]iquidated damages are not assessable once substantial completion occurs and only punch list items remain to be corrected.' *Sauter Construction Co.*, ASBCA No. 27050, 84-2 BCA ¶ 17,288 at 86,001."). Therefore, substantial completion of the CWRF occurred on 4 August 2008 (finding 102).

Extended CWRF Testing

In Fragnet 9, Extended CWRF Testing, Mr. Dean identifies 32 days of compensable delay. However, the 32 days starts on 4 August 2009 the date we have found to be substantial completion. Substantial completion cuts off liquidated damages. Essentially, the critical path ends at substantial completion. Therefore, for DPC to prove compensable delay after substantial completion, it may not use a critical path analysis, but must find some other theory to rely upon. Therefore, we need not consider Fragnet 9, and find there is no further compensable delay past substantial completion.

Seeding & Mulching at the CWRF

Bilateral Modification No. A00027 was issued on 19 June 2009 for seeding and mulching at the CWRF. It included a 60-day maintenance and establishment period. It included the language, "[t]he 60-day maintenance and establishment period will not be subject to liquidated damages." (Finding 111) We agree with ACO Phillips' interpretation of Modification No. A00027 (finding 110). The sentence relates only to the "maintenance and establishment period" of the seeding work and says nothing that can reasonably be interpreted as waiving liquidated damages based on other sources of delay. This language

is clear and unambiguous and has only one reasonable interpretation. The 60-day period does not toll liquidated damages based on other causes of delay.

Spalls on the Rev B Infield/Contract Balance

Our analysis of this issue boils down to weighing two pieces of evidence. DPC's most appealing evidence consists of Mr. Lafrenz's expert report containing pictures of heavy equipment from another contractor (Watts) installing a fuel line and fuel hydrant and a COE diagram mapping the locations and number of spalls on the Rev B Infield (findings 113-16). The COE diagram does indeed show the highest number of spalls in the area where Watts was working on the fuel hydrant (finding 114), and is fairly compelling circumstantial evidence supporting DPC's position that Watts caused the spalling. The COE's most compelling evidence is COR McKittrick's testimony, his 19 April 2010 letter to DPC and the punch list from the 21 January 2010 final inspection of the pavement surrounding the Watts' work area (finding 121). COR McKittrick testified that he personally participated in the 21 January 2010 inspection and he saw no spalls. COR McKittrick's testimony was credible and supported by the contemporaneous punch list that does not document any spalls. This evidence proves to our satisfaction that there were no spalls on the Rev B Infield pavement on 21 January 2010. The airfield was turned over to the Air Force for use on 21 January 2010 and spalls were found on 16 February 2010. (Findings 120-21) Since there were no spalls when the Rev B Infield was turned over to the Air Force, we must conclude that the use by aircraft caused the spalls. Therefore, the Rev B Infield spalling is the responsibility of DPC.

We reject DPC's argument that the COE accepted the Rev B Infield with knowledge of the spalls and is therefore unable to revoke acceptance and demand repair of the pavement. The Rev B Infield was substantially complete on 6 May 2009 at which point the warranty began to run and ended on 5 May 2010. (Finding 123) DPC acknowledged that the Rev B Infield was accepted on 7 May 2009 and that there were no spalls (finding 113). We found above that there were no spalls identified during the 21 January 2010 inspection of Watts' work. Contrary to DPC's argument, the spalls would be a classic latent defect, but we need not resort to that approach. The spalls were found during an inspection on 16 February 2010 within the warranty period. (*Id.*) DCP was notified of the warranty work needed but chose to contest its liability. We have now resolved liability for spalling against DPC.

Since we hold DPC responsible for the spalling at the Rev B Infield, we agree with the COE that FAR 52.232-27(a)(1)(i)(A) authorized the COE to withhold payment to cover the cost of repairing the spalls. We leave the calculation of the proper amount to quantum.

Liquidated Damages

The contract schedule divides the work into three items, Rev B Infield, Strat Ramp and CWRF (finding 1). Likewise the payment provision provides that final payment for

each of the three items would be made when each was "complete in place and ready for use" (finding 2). The contract gives the COE the right to take possession and commence use of part of the work (finding 3). The COE in fact took possession of the three areas of work incrementally (findings 123-24). Because of these facts we raise *sua sponte* the issue of apportionment of the liquidated damages[75] amongst the three major elements of work: Rev B Infield, Strat Ramp and CWRF. While the vast majority of situations where the Board raises issues *sua sponte* relate to jurisdiction, the Board has discretion to raise other matters *sua sponte*. *Osborne Construction Co.*, ASBCA No. 55030, 09-1 BCA ¶ 34,083 at 168,514 (Board raised *sua sponte* its concerns over errors and inconsistencies in contract documents in the Rule 4 file as furnished by the parties); *NMS Management, Inc.*, ASBCA No. 53444, 03-2 BCA ¶ 32,340 at 159,992 (Board *sua sponte* examined contemporaneous documents finding no support for appellant's allegations that overly stringent criteria were imposed or that any pervasive pattern of unreasonable inspections occurred); *Freedom NY, Inc.*, ASBCA No. 43965, 02-1 BCA ¶ 31,676 at 156,539 (Board *sua sponte* re-opened the appeal record, admitted a modification into the record as Board Exhibit 1, and used it to calculate quantum recovery); *Dave's Aluminum Siding, Inc.*, ASBCA No. 47350, 98-1 BCA ¶ 29,470 at 146,274 (Reviewed *sua sponte* contract drawing notes and determined that the Board's "earlier determination in ASBCA No. 34092 incorrectly stated that the removal of the wood strips at gable ends was additional work under the reprocurement contract."). We believe that apportioning the liquidated damage rate amongst Rev B Infield, Strat Ramp and CWRF is appropriate. In *Roberts Construction Co.*, ASBCA No. 35570, 89-2 BCA ¶ 21,870 we declined to apportion liquidates damages between two buildings completed at different times because there was "no creditable proof as to a definitive ratio" to apply and the contract did not apportion the liquidated damages. *Id.* at 110,007. Unlike in *Roberts* in this case there are obvious and "creditable" ratios to be applied. It is true that DPC's contract did not apportion liquidated damages, but not doing so likely resulted in a penalty. "Liquidated damages provisions are enforceable if the amount, determined in the light of known facts at the time the contract was entered into, bears a reasonable relationship to the foreseeable actual damages which would be suffered by delayed completion of the project." *D.E.W., Inc.*, ASBCA No. 38392, 92-2 BCA ¶ 24,840 at 123,935. In *D.E.W.* the contract involved construction of a "fuel cell shop" but the liquidated damages were based on another facility. The Board found that the liquidated damages provision was not enforceable. *Id.* To prevail on an argument that liquidated damages are unenforceable as a penalty the appellant has the burden of showing that the liquidated damages bear no reasonable relation to the probable loss that would be incurred by the government if performance were delayed. The reasonableness of the liquidated damages is evaluated at the time of contract formation. *JEM Development Corp.*, ASBCA

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[75] The so called "rule" against apportionment of liquidated damages applies to concurrent delays. *Sunshine Construction & Engineering, Inc. v. United States*, 64 Fed. Cl. 346, 372 (2005).

No. 42645, 92-1 BCA ¶ 24,428 at 121,915. The daily liquidated damage rate in DPC's contract is $2,298.00 (findings 1, 3). We calculate the apportioned amounts below.

We rely on the warranty dates for substantial completion of the Rev B Infield and Strat Ramp.[76] We state the substantial completion date for two of the three areas as "approximate" to allow the parties flexibility during the quantum phase should they mutually agree on some other date.[77] The Rev B Infield was substantially complete on approximately 6 May 2009.[78] The Strat Ramp was substantially complete on approximately 19 May 2009. We found above that the CWRF was substantially complete on 4 August 2009. (Finding 123) Case law is clear that liquidated damages may not be assessed past substantial completion. *Ellis Environmental Group, LLC*, ASBCA No. 55375, 08-2 BCA ¶ 33,918 at 167,847 (appellant is entitled to remission of liquidated damages from 29 July through 4 August 2005 (seven days), the number of days the government assessed liquidated damages after substantial completion).

All of the information needed to apportion the liquidated damages was available during the formation process (finding 1). The contract schedule provides a convenient and logical method of apportioning the daily liquidated damage of $2,298 amongst the three items of work (findings 1, 3). The Strat Ramp is 36.7% of the project price ($9,700,000/$26,440,000), the Rev B Infield is 19.3% of the project price ($5,105,000/$26,440,000), and the CWRF is 44% of the project price ($11,637,000/$26,440,000) (finding 1). Applying these percentages to the $2,298 daily rate results in a liquidated damage daily rate for the Strat Ramp of $843.37, the Rev B Infield of $443.51, and the CWRF of $1,011.12. In the quantum proceeding the parties may apply these rates using the substantial completion dates and taking into account the various delays we have found above. The $2,298 daily rate bears no reasonable relation to the probable loss that would be incurred by the government after the Rev B Infield and Strat Ramp are substantially complete. It is clear to us that allowing the daily rate of $2,298 to run after the Rev B Infield and Strat Ramp are substantially complete results in a penalty of $1287 ($843 + $444) per day assessed against DPC. Accordingly, assessing the full amount of daily liquidated damages after substantial completion of the Rev B Infield and Strat Ramp is unenforceable.

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[76] We recognize that the warranty letter divides the project up into five areas, but we consider only the three main items reflected in the schedule (finding 122).

[77] This is in case we misinterpreted the warranty letter. No evidence was presented on incremental substantial completion dates.

[78] We recognize that the Rev B Infield was not turned over to the Air force until 21 January 2010, but that was due to the Watts' work on the fuel line (finding 120).

Modification No. A00043

Modification No. A00043 deducted $100,000 as a credit for the COE's allowing Paradigm to leave non-conforming base course in place at the Strat Ramp, zone 1, lifts 1 and 2, and zone 2, lift 1 (finding 125). As before, the Hirata test data (finding 67), that includes four sample bags from zone 2, persuades us that the base course did not conform to contract requirements and the COE was justified in ordering DPC to remove it. Therefore, the COE was also justified in taking a deduction for allowing non-conforming base course to remain in place. We leave consideration of the validity of the method and logic used to arrive at a deduction of $100,000 to the quantum phase.

CONCLUSION

We considered all of each party's factual assertions and legal arguments. The briefs are extensive including many arguments, far too many for us to individually discuss herein. The following briefly summarizes our entitlement decision:

ASBCA No. 58150 (Mods. A00043, 00044)—The COE was justified in withholding for accepting nonconforming base course and PCC grades. We do not comment on the amount withheld and leave that to quantum.

ASBCA No. 58151 (contract balance)—The COE was justified in withholding an amount to provide for the repair of spalls at the Rev B infield. Liquidated damages will be adjusted in accordance with this decision.

ASBCA Nos. 58174 and 57675 (compensable delay for airfield waiver, low profile hydrants, weather, base course, taxiway A, CWRF)—Sustained in part, denied in part.

ASBCA No. 58149 (unsuitable soils)—DPC failed to prove at what depths unsuitable soils were encountered and therefore the Board cannot apportion responsibility.

ASBCA No. 57806 (base course, removal of PCC)—The COE was justified in ordering DPC to remove and replace base course, but not justified in ordering removal of the PCC.

The appeals are remanded to the parties to resolve quantum.

Dated: 15 December 2015

CRAIG S. CLARKE
Administrative Judge
Armed Services Board
of Contract Appeals

I concur

MARK N. STEMPLER
Administrative Judge
Acting Chairman
Armed Services Board
of Contract Appeals

I concur

RICHARD SHACKLEFORD
Administrative Judge
Vice Chairman
Armed Services Board
of Contract Appeals

I certify that the foregoing is a true copy of the Opinion and Decision of the Armed Services Board of Contract Appeals in ASBCA Nos. 57675, 57806, 58149, 58150, 58151, 58174, Appeals of Dick Pacific Construction Co., Ltd., rendered in conformance with the Board's Charter.

Dated:

JEFFREY D. GARDIN
Recorder, Armed Services
Board of Contract Appeals