P.J. DICK INCORPORATED

CONTRACT NO. V101CC0111	**VABCA-5597, 5836-5850, 5951-5965**
VA MEDICAL CENTER	**6017-6031, 6061-**
ANN ARBOR, MICHIGAN	**6075, 6080-6082, 6483**

William E. Dorris, Esq., Kirkpatrick Stockton LLP, Atlanta, Georgia, for the Appellant.

Kenneth B. MacKenzie, Esq., Trial Attorney; ***Charlma J. Quarles, Esq.,*** Deputy Assistant General Counsel; and ***Phillipa L. Anderson, Esq.,*** Assistant General Counsel, Washington, D.C., for the Department of Veterans Affairs.

OPINION BY ADMINISTRATIVE JUDGE KREMPASKY

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INTRODUCTION

These timely appeals arise out of Contract Number V101CC0111 (Contract) between the Appellant, P. J. Dick Incorporated (PJD), and the Respondent, Department of Veterans Affairs (VA), for construction of a clinical addition to the Department of Veterans Affairs Medical Center at Ann Arbor, Michigan

(VAMC Ann Arbor). PJD seeks to recover costs incurred by it and its subcontractors for alleged suspensions of work and for labor inefficiencies allegedly encountered by its electrical subcontractor.

The appeal in VABCA-5597 involves a claim for 38 days and $362,384 in costs resulting from a suspension of work (SOW) in construction of a cut-off wall; we will refer to this appeal as "Cut-Off Wall." The appeals in VABCA-5836-5850 relate to SOW claims totaling 59 days and $866,619 involving the VA's response to a Request for Information (RFI) from PJD; these appeals will be referred to as "Underground Conduit – RFIs 433 and 560." PJD's claims for 201 days and $3,132,255 for the SOW relating to construction of areas of the hospital housing specialized equipment define the appeals in VABCA-5951-5965, which will be referred to as "Combined Directives." The appeals in VABCA-6017-6031 relate to SOW claims in the amount of $578,674 and 46 days relating to the construction of the clinical addition's Cardiology and Radiology areas; these appeals will be referred to as "Cardiology and Radiology." The appeals in VABCA-6061-6075 involve PJD's total claim of 99 days and $1,320,063 for a SOW stemming from the redesign of the ventilation and air conditioning system; these appeals will be referred to as "Chiller." Finally, the appeals in VABCA-6080-82 involve claims totaling $1,625,865 for additional labor costs of PJD's electrical subcontractor; these appeals will be referred to as the "Electrical Inefficiency." PJD's claims aggregate to a total of $7,885,860.

The Record before the Board consists of: The NOTICES OF APPEAL, which incorporate the FINAL DECISIONS when one was issued (cited as NOA), the Pleadings; an Appeal File for each of the six groups of appeals and a Joint Appeal File; the Appeal File in VABCA-5596 (this appeal was the subject of an ORDER OF JUDGMENT issued by the Board pursuant to the parties' stipulated settlement) incorporated into the Record by joint motion of the parties during the course of

the hearing; 74 exhibits introduced into evidence at the hearing by PJD (cited as "Exh. A-__"); 20 exhibits introduced into evidence at the hearing by the VA (cited as "Exh. G- __"); two Joint Exhibits stipulating facts and quantum, (cited as "Exh. J-_"); the *seriatim* MAIN, RESPONSE, and REPLY BRIEFS (cited as MAIN, RSPNSE, or RPLY at ___); and, the 8 volume transcript of the hearing in this matter, held in Washington, DC (cited as "Tr. [vol. #]:__"). Citation to the Appeal Files will be by reference to the first docket number of the group and the exhibit number in that file (*i.e.* "5836 R4, tab __"); the Joint Appeal File will be cited: "Jt. R4, tab ___."

Both entitlement and quantum are before the Board.

PRELIMINARY MATTERS

Subsequent to the hearing on the appeals relating to claims for delay and electrical inefficiency, PJD filed a NOA from a Contracting Officer's deemed denial of its claim for payment of amounts withheld for liquidated damages. PJD's certified claim for payment of $121,939 withheld by the VA for liquidated damages was received by the Contracting Officer on September 5, 2000. The Board docketed this appeal on November 13, 2000 as VABCA-6483. The Board directed the parties to file the COMPLAINT and ANSWER in the appeal and on February 5, 2001 suspended further proceedings in the appeal in VABCA-6483 in recognition of the proceedings of the other appeals with which we contend here.

After further consideration, we have determined that the appeal in VABCA-6483, as defined by the COMPLAINT and ANSWER, will be disposed of by our decision here regarding the additional performance time to which PJD is entitled. In the interests of judicial economy, we see no useful purpose to conducting additional proceedings in VABCA-6483 when all issues relevant to the appeal will be decided here. The Government acknowledges this fact in its

BRIEF. The VA concedes that it has withheld $123,900 in liquidated damages and has reduced its liquidated damages claim to $13,650. (RSPNSE at 33) The VA informs us that it has now paid PJD $110,250 of the amount withheld for liquidated damages. Therefore, we will include the appeal in VABCA-6483 within the scope of this decision.

FINDING OF FACTS

GENERAL

The VA awarded PJD the $68,462,000 Contract for construction of a Clinical Addition to VAMC Ann Arbor on February 9, 1995. PJD received the Notice to Proceed with the construction on April 18, 1995; under the Contract terms, the project was to be completed by January 12, 1998. (Exhibit J-1)

The Clinical Addition is an eight-story structure attached to the main hospital building at VAMC Ann Arbor. The structure consists of occupied floors and interstitial spaces. The first, third, fifth, and seventh floors were occupied; the second, fourth, sixth, and eighth floors were interstitial spaces. Interstitial spaces are full height areas where hospital utilities are placed and arranged to permit easy access and maintenance. In addition, the Clinical Addition had a basement consisting of an occupied floor and an interstitial space; the basement level was attached to existing Building 1 at VAMC Ann Arbor. The occupied floors provided space for the pharmacy, supply processing and distribution (SPD), medical administration, radiology, magnetic resonance imaging (MRI), cyclotron, ambulatory care, audiology and speech pathology, laboratory, surgical service, intensive care units and cardiac laboratory and respiratory care. (Exh. J-1)

The Contracting Officer (CO) and Project Manager for the project were located in the VA Central Office (VACO) in Washington, D.C. The principal VA

person on site was the Senior Resident Engineer (SRE). The CO delegated limited Contract modification authority to the SRE. The SRE was given authority to issue change orders or negotiate supplemental agreements in the amount of $25,000 or less (later raised to $50,000) and the SRE could extend the Contract performance time by no more than three days in any one change or an aggregate of ten days per month. Contract changes issued by the CO were known as Central Office Change Orders (COCO); changes issued by the SRE were denoted Field Change Orders (FCO). Bilateral modifications of the Contract executed by the CO and PJD were labeled Central Office Supplemental Agreements (COSA) and Field Supplemental Agreements (FSA) respectively. The CO also issued unilateral change orders identified as Settlements by Determination (SD). (Exh. J-1; Tr. vol. VII: 176-77)

There were a total of 439 FCOs, COCOs, FSAs, COSAs, and SDs issued modifying the Contract. A substantial portion of these modifications were FCOs and COCOs that were subsequently superseded and cancelled by FSAs, COSAs, and SDs. All these modifications increased the Contract price by $3,601,006 to $72,063,006, a 5.3% increase. The VA also, by Contract modifications, recognized a total of 107 days of additional Contract performance time extending the Contract completion date to April 29, 1998; the Contract was substantially completed on September 29, 1998, 260 days after the original Contract completion date and 153 days after the extended date. (Jt. R4, tabs 22, 32; Exhs. J-1, J-2)

In the supplemental agreements it executed, PJD included "reservation of rights" language preserving its right to seek additional impact and suspension costs. This reservation language was essentially the same as the reservation

included in COSA-1K, which stated as follows:

> P. J. Dick reserves its right to recover any cost caused by the five (5) days of time extension considered to be under the suspension clause as set forth in paragraph "a" above. P. J. Dick also reserves its right to recover under the suspension clause any cost caused by the thirty-eight (38) days of time extension granted in paragraph "b" above. P. J. Dick further reserves its right to recover from the impact of these changes and suspensions on the cost and time to perform the unchanged work, including additional cost due to working out of sequence, disruption, hindrances, interferences, acceleration, compression, loss of efficiency, breach of contract, extended or unabsorbed field and home office overhead and/or other impact costs as allowable by law. Without limiting the foregoing, it is understood that P. J. Dick reserves and does not settle in this supplemental agreement it proposals for field and home office overhead referenced above.

(5597 R4, tab 63; Exh. A-69; Tr. vol. V: 11)

The Contract includes the standard Federal Acquisition Regulation ("FAR"), 48 C.F.R. Chapter 1, and Department of Veterans Affairs Acquisition Regulation ("VAAR"), 48 C.F.R. Chapter 8, clauses usually found in VA construction contracts, including the following clauses relevant to these appeals in effect at the time of award:

> COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK, FAR 52.212-3 (APR 1984)
> CHANGES, FAR 52.243-4 (AUG 1987)
> CHANGES -- SUPPLEMENT, VAAR 852.236-88(a) (JUN 1987)
> CHANGES -- SUPPLEMENT, VAAR 852.236-88(b) (JUN 1987)
> DIFFERING SITE CONDITIONS, FAR 52.236-2 (APR 1984)
> DISPUTES (ALTERNATE I), FAR 52.233-1 (APR 1984)
> INSPECTION OF CONSTRUCTION, FAR 52.246-12 (JUL 1986)

INSPECTION OF CONSTRUCTION, VAAR 852.236-74 (APR 1984)
LIQUIDATED DAMAGES – CONSTRUCTION, (FAR 52.212-5, ALTERNATE I) (APR 1984), ($3,000 PER DAY LIQUIDATED DAMAGES)
REPRESENTATIVES OF CONTRACTING OFFICERS, VAAR 852.270-1, (APR 1984)
SPECIAL NOTES, VAAR 852.236-91 (JAN 1988)
SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION, FAR 52.236-21 (APR 1984)
SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION, VAAR 852.236-71 (APR 1984)
SUBCONTRACTS AND WORK COORDINATION, VAAR 852.236-80 and 852.236-81 (APR 1984)
SUPERINTENDENCE BY THE CONTRACTOR, FAR 52.236-6 (APR 1984)
SUSPENSION OF WORK, FAR 52.212-12 (APR 1984)

(Jt. R4, tabs 17, 19)

DELAY/SUSPENSION OF WORK

ENTITLEMENT

CONTRACT SCHEDULING REQUIREMENTS

Section 01311 of the Contract Specifications, "NETWORK ANALYSIS SYSTEM" (NAS), provides for PJD to develop and maintain a plan and schedule for the Contract work using the Critical Path Method (CPM) showing the completion of Contract by the date specified in the Contract. PJD was required to acquire the services of an independent CPM consultant, subject to the CO's approval, to prepare and maintain an "i-j computer produced" CPM schedule. Schedule inputs were the responsibility of PJD's approved schedule consultant and the VA would provide both the computer processing and the schedule reports produced therefrom. PJD's approved CPM consultant was Automated Construction Technologies, Inc. (ACT). (Jt. R4, tab 19; Exh. J-2)

A CPM schedule identifies all the construction, procurement and submittal activities necessary to complete a project and establishes the logical sequence in which those activities must be completed, determining when an activity must begin and the time necessary to complete the activity. The longest continuous path of activities where the start of an activity is dependent on the completion of a prior activity and for which there is no "float" is identified as the "critical path." The schedule is in the form of an "arrow" diagram with each activity identified by an "i" node depicting the beginning of the activity and a "j" node depicting the completion of the activity. The schedule establishes early start (ES), late start (LS), early finish (EF) and late finish (LF) dates for each activity. ES is the earliest date an activity can start. EF is the ES date plus the number of days necessary to complete the activity. LF is latest date the activity can be completed without delaying the completion date of the project; LS is determined by subtracting the number of days of the activity duration from the LF date. Arrows to the relevant nodes depict the path from the preceding activity through the activity to the next succeeding activity.
(Tr. vol. I: 232, Tr. vol. V: 36-37, 52-54)

"Float"or "Total Float" in a CPM schedule is the number of days difference between either an activity's ES and LS or the EF and LF. Where the ES and LS and the EF and LF dates are the same; there is no "float" and the activity is "critical." (Tr. vol. V: 52-54)

The Contract required PJD to submit an "interim" CPM schedule within 21 days of the Notice to Proceed for the CO's approval; PJD met this requirement. The interim schedule was timely approved by the VA and is dated April 18, 1995. The interim schedule provided a detailed schedule for the first 120 days of performance and activities related to the procurement of long-lead items plus a summary schedule for the remainder of the project. Because of the nature of the

VAMC Ann Arbor project, the interim schedule was more elaborate than usual both in the length of time it covered and the number of activities included. There were seven or eight updates to the interim schedule.
(Jt R4, tab 20; Tr. vol. I: 203-204; Tr. vol. VI: 129)

The final schedule is the complete arrow diagram and CPM for the project and it was required to be submitted 120 days after the Notice to Proceed. The final schedule was timely submitted and approved and is referred to as the "Day 1" schedule. The VA's approval of the Day 1 schedule indicated its agreement with the schedule form, logic and durations assigned to each activity. The "day one" schedule included thousands of separate activities and showed a completion date of January 12, 1998. (Jt. R4, tab 1: Tr. vol. I: 2; Tr. vol. VI: 128-29)

Under the NAS specification, the CPM schedule is cost loaded and provides the basis for determining both Contract progress payments and any changes to the contract performance time. Any Contract change or other delaying event occurring during the period before approval of the final schedule is input in the first update of the approved final schedule. The specification prescribed detailed procedures for the monthly updates. The process included producing a "look-ahead" report, projecting completion percentages of schedule activities, and remaining durations of activities. The VA and PJD met monthly to reach agreement on the project status and the schedule inputs to produce the updated schedule. PJD complied with Contract requirements for updating the schedule throughout the Contract term.
(Tr. vol. I: 122, 207-210)

With regard to analyzing the schedule to determine whether the Contract completion date would be extended, the NAS specification states at Paragraph 1.13, Adjustment of Contract Completion:

> A. The contract completion time will be adjusted only for causes specified in this contract. Request for an extension of the contract completion date by the Contractor shall be supported with a justification, CPM data and supporting evidence as the Contracting Officer may deem necessary for determination as to whether or not the Contractor is entitled to an extension of time under the provisions of the contract. Submission of proof based on revised activity logic durations and costs is obligatory to any approvals. The schedule must clearly display that the schedule has used, in full, all the float time available for work involved in this request. The Contracting Officer's determination as to the total number of days of contract extension will be based upon the current computer-produced calendar-dated schedule for the time period in question and all other relevant information.
>
> B. If the time period(s) in question occurred during the interim diagram update(s), such update(s) must be converted to the approved complete project arrow diagram, which will then be used as the basis for the time extension request(s). Actual delays in activities which, according to the computer-produced calendar-dated schedule, do not affect the extended and predicted contract completion dates shown by the critical path in the network, will not be the basis for a change to the contract completion date. The Contracting Officer will within a reasonable time after receipt of such justification and supporting evidence,

review the facts and advise the Contractor in writing of the Contracting Officers decision.

C. The Contractor shall submit each request for a change in the contract completion date to the Contracting Officer in accordance with the provisions specified under Article, CHANGES, in the Section GENERAL CONDITIONS. The Contractor shall include, as part of each change order proposal, a sketch showing all CPM logic revisions, duration changes, and cost changes, for work in question and its relationship to other activities on the approved arrow diagram.

(Jt. R4, tab 19)

The NAS specification also details PJD's responsibility for completing the Contract and for amending the schedule, stating at Paragraphs 1.11 and 1.12:

1.11 RESPONSIBILITY FOR COMPLETION

A. Whenever it becomes apparent from the current monthly progress review meeting or the monthly computer-produced calendar-dated schedule that phasing or contract completion dates will not be met, the contractor shall execute some or all of the following remedial actions:
   1. Increase construction manpower in such quantities and crafts as necessary to eliminate the backlog of work.
   2. Increase the number of working hours per shift, shifts per working day, working days per week, the amount of construction equipment, or any combination of the foregoing to eliminate the backlog of work.
   3. Reschedule the work in conformance with the specification requirements.

B. Prior to proceeding with any of the above actions, the Contractor shall notify and obtain approval from the Contracting Officer for the proposed

schedule changes. If such actions are approved, the CPM revisions shall be incorporated by the Contractor into the arrow diagram before the next update, at no additional cost to the Government.

1.12 CHANGES TO ARROW DIAGRAM AND SCHEDULE

A. Within 30 calendar days after receipt of any computer-produced schedule, the Contractor will submit a revised arrow diagram and a (I-J) list of any activity changes for any of the following reasons:

1. Delay in completion of any activity or group of activities indicate an extension of the project completion by 20 working days or 10 percent of the remaining project duration, whichever is less. Such delays which may be involved with contract changes, strikes, unusual weather, and other delays will not relieve the Contractor from the requirements specified unless the conditions are shown on the CPM as the direct cause for delaying the project beyond the acceptable limits.
2. Delays in submittals, or deliveries, or work stoppage are encountered which make replanning or rescheduling of the work necessary.
3. The schedule does not represent the actual prosecution and progress of the project.
4. Activity costs are revised as the result of contract modification.

B. CPM revisions made under this paragraph which affect the previously approved computer-produced schedules for Government furnished equipment, vacating of areas by the VA Medical Center, contract phase(s) and sub-phase(s), utilities furnished by the Government to the Contractor, or any other previously contracted item, must be furnished in writing to the Contracting Officer for approval.

C. Contracting Officer's approval for the revised arrow diagram and all relevant data is contingent upon compliance with all other paragraphs of this section and any other previous agreements by the Contracting Officer or the VA representative.

D. The cost of revisions to the arrow diagram resulting from contract changes will be included in the proposal for changes in work as specified in Article, CHANGES of the GENERAL CONDITIONS, and will be based on the complexity of the revisions or contract change, man hours expended in analyzing the change, and the total cost of the change.

E. The cost of the revisions to the arrow diagram not resulting from contract changes is the responsibility of the Contractor.

(Jt. R4, tab 19)

PJD updated the CPM monthly as required by the NAS specification throughout the Contract term and both PJD and VA used the schedule for project planning and Contract payments. (Tr. vol. I: 211)

CONTRACT TIME EXTENSION ANALYSIS

The parties agree that extensions to the Contract completion date will be as determined by the computer after appropriate inputs into the CPM schedule. The parties also agree that the inputs relating to Contract changes or other events will be placed into the schedule current as of the date of a change "event." Since schedule updates were produced monthly and generally were dated as of the last day of the month, any event occurring in the succeeding month would be analyzed in the preceding month schedule update. For example: The schedule impact of a change event occurring June 15 will be analyzed by inputting the

schedule data relating to the change into the schedule update as of May 31. Under the NAS specification, PJD provided schedule input data in a computer format to the VA and the VA performed the computer processing to provide the schedule update. However, ACT, at PJD's direction, maintained a parallel schedule, performing its own computer processing and producing its own schedule update. (Tr. vol. I: 212)

Requests for Contract time extensions were processed in the same manner as Change Order Requests (COR). PJD would submit a Time Extension Request (TER) to the RE. The TER would include the data required by the NAS specification. PJD and the RE, in some cases, would negotiate the TER, often producing a mutually agreeable "fragnet." A fragnet graphically portrays activities involved in the event, durations for them and how they logically tie into the existing schedule. The data for the fragnet is placed into the schedule current on the date of the event for which the fragnet was prepared. The NAS computer program then calculates what the projected completion date is with the fragnet included. Finally, a comparison of the two schedules is made. If the one with the fragnet included shows a later project completion date than the schedule update without the fragnet, then the event is deemed to have delayed the project for the number of days between the completion dates in the two schedules. This approach to analyzing delays is consistent with the scheduling specifications for the project. The RE would then forward the TER to scheduling office in VACO to confirm the extension to which the parties had agreed. In other cases, the TER would be forwarded directly to VACO for schedule evaluation. (Tr. vol. I: 212-14; Tr. vol. V: 47-49)

As provided in the NAS, no analyses of Contract time extensions were performed using the interim schedule. Upon approval of the final schedule, which is prepared regardless of the actual status of the work prior to its

approval, the first update of the final schedule incorporates all the information relating to the job progress status of the then current, updated interim schedule. Once that is accomplished, the information relating to the event for which a time extension analysis is to be performed is input into the schedule.
(Tr. vol. I: 214-16, Tr. vol. V: 47)

PJD performed its delay analyses by first having its project manager, Mr. Bandura, provide a "fragnet" of the changed activity to ACT. A fragnet is the graphical depiction of the logic input to the CPM schedule to determine if the predicted completion date will be affected. The fragnet will generally depict an "i" node identifying the activity shown as beginning on a particular date. This "i" node date acts as a restraint in the schedule analysis, telling the computer program the date when it begins to look for a schedule impact. The "j" node on the fragnet will be the activity, which is restrained, or cannot start until the changed activity is completed. The fragnet will depict, between the "i" and "j" nodes, the duration necessary to complete the change activity. The change activity logic (fragnet) is inserted into the appropriate schedule update with the indication that the change order work cannot start any earlier than its issuance date. In other words, one computer run does not include the change order logic and the other run does. The difference between the two predicted completion dates would be the number of calendar days by which the change order affects the contract's schedule. (Tr. vol. V: 57-58)

Mr. Meyer of ACT provides a succinct description of a fragnet and its use

in schedule analysis in the following colloquy from his direct examination:

> Q Would you briefly describe the process by which time extension and time impact analysis are performed on the VA projects that you've been involved with?
>
> A A time extension analysis basically would require a fragnet, which is basically just a group of activities, single activity or multiple activities to describe the events that occurred in a particular situation. That fragnet of activities were reassigned durations. Then, according to the requirements of the specification, the fragnet, or the logic for a time extension request would be analyzed into the update that wherever the change originally developed, or if the work was done before a change order was issued, it would be analyzed in the appropriate update that was in existence at the time the delay occurred.
>
> Q Now, how do you determine the amount of delay that is caused by that particular fragnet or chain of events?
>
> A Typically, if you were dealing with an update, I would generate a critical path. I would show what the project completion is without the change. You would create the input, and we would always provide an input data sheet, the same kind of transaction listing that we would provide in a normal update. That's saying that the fragnet is a graphical representation. The transaction listing is an input that was used to generate the change. Then a second computer run would be processed to show the effect of a time delay, if it was appropriate.
>
> The schedule, typically you would show that there is a difference in the project completion date. In many cases, we would show a difference in working days that would be affected. If the project was on schedule and there was a ten working day delay, it would show as potentially a minus ten days of delay, working days, and those working days would then be converted to calendar days because the contract completion would be adjusted by calendar.

Q The analysis is then performed by looking at a particular update and what it projects as completion of the job, and then putting the fragnet into that update and seeing what happens to the end date?
A That's correct.
Q And then the difference between those two, if there was an extension, would be the length of the delay?
A That's correct.

(Tr. vol. I: 114, 183-84, 212-14;)

The VA's approach to implementing the NAS provisions was articulated by Mr. Robert Clontz, Director of Consulting Support Services at the VA Central Office (VACO). This organization includes the CPM scheduling section. The CPM section administers scheduling as it applies to VA construction contracts, including reviewing of contractors' schedule submissions, determinations of the acceptability of contractors' consultants and reviewing and analyzing time extension requests submitted by contractors. (Tr. vol. V: 30-31)

In regard to the monthly CPM updates, Mr. Clontz testified that, when updating for a particular month, the parties take the updated schedule from the previous month and update it with the progress of work that has been completed since the last update. These updates reflect changed activity durations, the percentage of work that has been completed and also any changes that were issued since the last schedule update. The procedures of updating the schedule are the same, whether the schedule is the final or interim schedule.
(Tr. vol. V: 44-46)

Mr. Clontz also testified regarding how the NAS is implemented regarding time extensions. When determining whether a contractor is entitled to a time extension due to a contract change that was issued in writing, the change is analyzed against the current computer-produced, updated project schedule in force at the time the change was issued. If the change causes the predicted

completion date of the schedule to slip or be extended, the time by which the predicted schedule is extended represents the time by which the change impacts the schedule. If a contractor is given verbal direction to proceed with the change order work prior to the issuance of a written change order, the date of the verbal direction would be the date the contractor was authorized to do the work. In the circumstance where a contractor commences work before being directed to do so, the change would be analyzed using the date the contractor received direction from the Resident Engineer as the issuance date. When a change order is issued as the result of an RFI, the first step in the analysis is to evaluate the change against the schedule in force at the time the change was issued. If the activity affected by the resulting change order is the first activity on the critical path, the analyst must determine if the schedule was slipping while the contractor waited for an answer to the RFI. To do that, the analyst must go back to the previous update in force, and keep going back until the activity shows up as not critical. The analyst would then determine the date at which the activity became critical and would add the time during which the activity was critical to the time required to perform the change to determine the total impact on the schedule. When an RFI does not result in a change order, the analysis is the same as that for the issuance of a change, except that the "event" date of issuance is the date the RFI was answered. When a contractor claims that work it performed was changed work and where the VA initially disagreed but subsequently agrees, the issuance date would be the date the work commenced and would be analyzed against the update in force at that time. When more than one change is issued during a period when one update is in force, the analyst would insert the change order logic for each change and insert all of them in block into the update in force. The analyst then compares the predicted completion date without the changes to the predicted completion date with all of the changes to determine the

impact on the schedule. If verbal direction to proceed with the change order work is given prior to the issuance of the written change order, the date of the verbal direction would be the date the contractor was authorized to do the work In the circumstance of change work beginning before direction is given, the schedule effect of the change is analyzed using the date the contractor received direction as the issuance date. (Tr. vol. V: 51-52, 60-72)

According to Mr. Clontz, time impact may be calculated either manually or by computer. When doing the calculation manually, the analyst need only look at the float on the activity that is affected by the change. If the float is greater than the duration of the change activity there would be no delay. (Tr. vol. V: 56-57)

When the calculation is done by computer, the appropriate update is run without the change. Then the change activity logic (fragnet) is inserted into that update with the indication that the change order work cannot start any earlier than its issuance date. In other words, one computer run does not include the change order logic and the other run does. The difference between the two predicted completion dates would be the number of calendar days by which the change order affects the contract's schedule. (Tr. vol. V: 57-58)

CUT-OFF WALL (VABCA-5597)

Specification Section 02363 required PJD to design and construct an auger-placed concrete pile cut-off wall that was to be used for temporary protection of the existing hospital. The wall was to be placed between the existing building and the construction of the new addition and was part of the construction of the "West Link" structure between the new addition and the existing building. The specification further required PJD to submit its design calculations along with

working drawing details to the (SRE) for VA review and approval. (5597 R4, tab 3; Exh. J-1)

An auger-placed pile is a pile formed by the rotation of a continuous flight hollow-shaft auger into the ground to the indicated pile depth. Grout is injected through the auger shaft as the auger is being withdrawn in such a way as to exert removing pressure on the withdrawing earth-filled auger, as well as lateral pressure on the soil surrounding the hole. (Ex. J-1)

The cut-off wall was a temporary shoring system to keep the existing building from moving while excavating for the new construction next to it. After the new foundation walls were backfilled, the top of the wall was to be cut off and buried below the concrete slab on grade. (Tr. vol. I: 37)

Drawing S3. W1 showed the general location of two cut-off walls. One wall was to be constructed in a west-east direction and the other, the subject of this appeal, was to be constructed in a north-south direction. The drawing further indicated that PJD was to "locate auger cast pile shoring wall to avoid interference with proposed building foundation." A detail in the Contract drawings indicated that PJD was to provide temporary shoring adjacent to the existing structure in order to provide lateral restraint. This detail also indicated that the Building 1 footing was integral to the structure and that the top of the footing was located at elevation 810 ft. 9 in. There were no dimensions showing the size of the existing foundation or how far it extended beyond the existing building. (Exh. J-1)

PJD's initial, September 6, 1995, submittal for the cut-off wall was rejected by the VA because it was not signed by the engineer who sealed the drawings. The VA approved PJD's September 29 resubmittal on November 20, 1995. (Exh. J-1)

PJD's approved cut-off wall submittal depicted the cut-off wall and shoring in relation to the existing building and the new addition. The submittal also represented the existing footing in the same manner as shown on the Contract drawing. Note 3 on the submittal drawing stated that the location of the cut-off wall was dependent on the location and condition of the existing foundations. Although the Contract drawing depicted the existing footing, it provided neither the footing dimensions nor the extent to which the footing extended from the side of Building 1. The only precise information provided by the Contract documents was the elevation of the footing. By implication, the Contract documents indicated that the cut-off wall could be installed between the existing footing and the Clinical Addition foundation. (Exh. J-1)

PJD excavated to an approximate elevation of 810 feet, which was close to where the drawings showed the top of the existing footings to be. This excavation located what appeared to be the existing footings. PJD's subcontractor began forming the concrete template through which the auger piles would be placed on October 26, 1995. Drilling the piles for the cut-off wall began on November 6, 1995. On November 7, 1995, drilling ceased. (Tr. vol. I: 48; Exh. J-1)

PJD stopped drilling because the elevation of the existing foundation as shown on the Contract drawing was incorrect. The actual elevation of the top of the footing was at approximately 800 ft., or about ten feet lower than shown on the plans. As a result of encountering the top of the footing at the lower elevation, PJD submitted the complete redesign of the cut-off wall for approval on November 29, 1995. VA approved the redesign on December 6, 1995 and informed PJD at the same time that it was redesigning the foundation system for the Clinical Addition. (Exh. J-1)

Having installed the drilling templates according to the approved redesign, PJD again commenced drilling on December 6, 1995. PJD encountered impenetrable cobble the next day and suspended drilling. After it ceased drilling, PJD met with the VA to discuss the problem. At this meeting, the VA provided PJD with a preliminary sketch deleting a portion of the cut-off wall and replacing certain of the pile foundations with a spread footing foundation system. (Exh. J-1)

On December 11, 1995, the Senior Resident Engineer (SRE) directed PJD to proceed with the construction of the spread footing foundation system and to delete the north-south leg of the cut-off wall. The east-west leg of the wall was not deleted. This direction was formalized by the issuance of FCO-1T on December 21, 1995. (Exh. J-1)

In keeping with the VA's direction, PJD proceeded with work in the area. However, certain other work had to be completed before spread footings could be poured. First, on December 13 and 14, 1995, PJD completed installing some of the auger cast pile foundations at the radius wall of the West Link. The Contract plans for the foundations for the perimeter wall of the new building were unchanged and had to be installed before excavation for the spread footings. (Exh. J-1)

PJD completed the east-west cut-off wall by installing the tie-backs and forming and pouring the concrete whaler to which the tie-backs were attached and stressing the tie-backs in the period between December 15-26. (Exh. J-1)

PJD commenced excavation of the cobble layer for the spread footings on December 26, 1995. In the course of excavation, it was discovered that the cobble layer sloped downward and deepened as the excavation moved from west to east, eventually ending in what the parties termed the "bottomless pit" in the northeast corner of the area where it appeared that good bearing material could

not be found beneath the cobble layer. The VA was immediately notified of this problem, a problem the parties agree was neither disclosed in the Contract documents nor could have been reasonably anticipated. P.J. Dick continued to excavate to locate a solid bottom. On January 2, 1996, P.J. Dick met with the RE, who decided to have the VA's soils engineer investigate. On January 3, 1996, the VA's soils engineer tested the bottom of the so-called "bottomless pit." Based on the engineer's inspection and determination that the bottom of the pit was adequate, the VA directed P.J. Dick to install crushed concrete in the pit, essentially creating an artificial cobble layer there. P.J. Dick did so on January 4, 1996, and poured the spread footings on Friday, January 5 and Monday, January 8, 1996. (Exh. J-1)

The installation of the spread footings required seventeen days to complete after the VA issued FCO-1T. The cut-off wall had been scheduled to take twenty days to install. FCO-1T was subsequently superceded by COCO-05, which provided 32 days of additional Contract time for the cut-off wall problem, and FCO-3R, which provided an additional $7,500 for work related to the cut-off wall resolution. (5597 R4, tabs 30, 36, 38)

PJD and the VA executed COSA-1K on January 25, 1998. COSA-1K superceded FCO-1T, FCO 3R and COCO-05. COSA-1K increased Contract performance time by a total of 48 days; 38 days of the additional performance time were attributed to the cut-off wall. The additional performance time was arrived at using PJD's CPM analysis.
(5597 R4, tabs 64, 65; Exh. J-1, Tr. vol. I: 224-45)

PJD's Cut-Off Wall CPM analysis utilized Update #5 to the Interim Schedule, dated October 30, 1995. Interim Update #5 was used since that was the schedule in effect at the time the cut-off wall pile drilling was first stopped on November 7, 1995. The cut-off wall (and the subsequent spread footing) work

was on the critical path of the project and restrained the installation of grade beams for the link structure. The PJD analysis demonstrated that the cut-off wall revisions delayed completion of the project by 27 workdays; 27 workdays translates to 39 calendar days. The agreement on the 38 day time extension reflects the fact that the VA and ACT programs had slight differences in the way working days were calculated and PJD accepted the VA calculation. The PJD analysis asserts a delay period was November 7, 1995 to January 8,1996. (5597 R4, tab 11; Exh. A-40; Tr. Vol. I: 217)

In its internal reviews of PJD time extensions and change order requests from 1996-1998 for the cut-off wall, the VA, at various times, either found that no additional performance time was warranted or that various time extensions less than requested by PJD could be justified. The VA analyses generally were based on Interim Update #6 (November 30, 1995) of the Schedule and used the date FCO-1T was issued, December 21, 1995, as the start point for cut-off wall revisions. At one point, the VA considered recognizing 10 of a 38 day time extension provided for cut-off wall revisions as suspension of work (SOW) time, considering five days each for cut-off wall redesign and spread footing design. However, the VA eventually rejected treating any of the cut-off wall time extension as SOW time since neither PJD nor its subcontractors suspended work and PJD was able to productively employ its forces while the cut-off wall problems were resolved. PJD acknowledged that it employed its forces on other work during the period in which the solution to the cut-off wall situation was pending. (5597 R4, tabs 16, 17, 23, 25, 27, 28, 35, 47, 65, 66; Tr. vol. I: 195)

At trial, Mr. Barbaza, the VA's CPM analyst for the Contract, acknowledged that Update #5 was the appropriate update to use to perform a schedule analysis of the cut-off wall revisions. He testified that, using Update #5,

PJD was delayed 40 calendar days due to the cut-off wall revisions, 21 of which are attributable to the VA's failure to approve the cut-off wall submittal. (Exhs. G-21, G-23; Tr. vol. VII: 33-36)

The parties agree that the cut-off wall revisions resulted from a design error or omission. PJD asserts that 21 days of the cut-off wall delay (October 30,1995 – November 30, 1995) can be attributed to the VA's submission approval delay and 17 days (November 21, 1995 – December 11, 1995) result from the spread footing redesign and PJD characterizes all 38 days of the cut-off wall revision time extension as a SOW resulting from the VA's defective specifications. PJD requested a final decision on a certified claim of $362,384 for extended home office and field overhead. The SOW, according to PJD, occurred in the period between October 30, 1995 and December 21, 1995 when the VA issued FCO-1T directing that the cut-off wall be replaced with spread footings. The CO received the claim on March 18, 1998 but never responded. The appeal in VABCA-5597 was taken from the CO's failure to issue a final decision. (5597 R4, tabs 24, 38, 64; REPLY, at 8; Tr. vol. VII: 101)

COMBINED DIRECTIVES (VABCA-5951-65)

The Contract required PJD to prepare coordination drawings and submit those drawings to the VA for approval before beginning work in the interstitial spaces. Coordination drawings are particularly critical for the interstitial spaces because of the complexity of installing building utilities in those spaces. PJD began its coordination drawing effort in August 1995 and almost all coordination drawings from the basement through the sixth floor interstitial spaces had been submitted and approved by August 1996. (Jt. R4, tab 19; Exh. A-60; Tr. vol. I: 98-102)

Preparation of coordination drawings involved the sheet metal subcontractor, as the trade with the largest size utility installation, first preparing background drawings and locating its ductwork installation on those drawings. The ductwork drawings are then used as background drawings by the other trades, who, progressively, would prepare overlay drawings of their respective work in those areas. This permitted resolution of any conflicts in the installation of various trades prior to the finalization of the coordination drawings. (Tr. vol. I: 97-98)

Because it changed various equipment items to be installed at VAMC Ann Arbor, the VA issued a series of Contract changes that began in November 1995, but were principally issued in August and September 1996, affecting utility installations on the project. These changes required PJD to re-engineer utility installations and prepare new coordination drawings for the affected areas before the construction could begin. These changes primarily affected the Magnetic Resonance Imager (MRI), Cyclotron, and Supply Processing and Distribution (SPD) installations and they disrupted PJD's installations in the interstitial spaces because of the need to re-coordinate the revised equipment installations. (5951 R4, tabs 13, 19, 20; Tr. vol. I: 102)

Redesign of the Cyclotron, SPD and MRI occurred in a piecemeal fashion over the course of many months. Revisions were made to the Cyclotron foundations, by way of FCO-1P, dated November 8, 1995. On June 2, 1996, the VA issued FCO-2K to revise the underground plumbing at the Cyclotron. On August 30, 1996, the SRE issued FCO-2U, which made other substantial revisions to the design of the Cyclotron area. (Exh. J-1)

In the MRI area, the VA issued FCO-1X on April 1, 1996 to revise the structural loading at the MRI Suite Area. This modification was cancelled by

FCO-1Z on April 15, 1996. On August 6, 1996, the SRE issued FCO-2R finalizing the major mechanical and electrical requirements for the MRI. (Exh. J-1)

The VA issued FCO-2I in June 1996 to revise the underground plumbing at the SPD area. The Contracting Officer subsequently issued COCO-3 on August 29, 1996 finalizing the mechanical and electrical requirements for the SPD area. (Exh. J-1)

After receiving the SPD, MRI and Cyclotron revisions, Appellant, on September 3, 1996, wrote the VA, requesting that it withdraw these modifications stating:

> Often it is not the added or changed work that delays a project, it is the timing of the issuance of the directive. It is likely that the poor timing of all or some of the aforementioned directives will delay completion of the project. In addition to schedule impacts, our engineering, coordination and procurement efforts have been significantly set back by these untimely directives.

The VA responded that the changes would stand and questioned whether they would impact the completion to the project to the extent claimed by PJD. PJD, by letter dated October 8, 1996 detailed the impact on the engineering and coordination drawing work resulting from the changes.
(5951 R4, tabs 22, 31, 36; Exh. J-1)

PJD submitted separate TERs for the Cyclotron, MRI and SPD design revisions on April 25 and May 1, 1997 and February 19, 1998 respectively. These TERs sought 98 days for the Cyclotron changes, 115 days for the MRI changes and 143 days of Contract time extensions for the SPD revisions. The VA did not agree with the additional performance time requested and requested that PJD and the VA SRE meet for the purpose of coming to agreement on the fragnets to

be used in analyzing the schedule to determine whether any additional performance time was warranted under the NAS specification due to the MRI, SPD and Cyclotron changes. Mr. Bandura, PJD's project manager, and Mr. McMasters, the SRE, met and reached an agreement on the fragnets for the changes. These agreed-upon fragnets are reflected in the SDs, SAs and COs executed by the VA for the Cyclotron, MRI and SPD changes.
(5951 R4, tabs 117, 121, 177, 210, 225, 226; Tr. vol. I: 105-111)

Mr. Bandura and Mr. McMasters, the respective, principle PJD and VA on-site representatives, both assessed that the primary impact of the Cyclotron, MRI and SPD revisions was on completion of the coordination drawings for the interstitial spaces and that the impact on the coordination drawing process resulted from the piecemeal release of the revisions. The actual additional time and expense required to effect the actual changes was relatively inconsequential. (Tr. vol. I: 102; Tr. vol. VII: 253-255)

In March 1999, PJD revised its analysis of the impact of the Cyclotron, MRI and SPD changes to the Contract completion date to consider these changes together instead of separately. PJD considered all these fragnets to be related, since their combined effect was to prevent the progression of work in the interstitial spaces. PJD analyzed the combined effect of all these revisions by placing the agreed-upon fragnets all in the same update. This combined analysis resulted in a TER of 249 days resulting from the combined impact of the Cyclotron, MRI and SPD changes and represents a delay of 201 calendar days beyond the extended project completion date of March 1, 1998 established by the extension for the asbestos and cutoff wall issues reflected in COSA-1K. The period of the delay, under PJD's analysis, is October 1, 1995 to February 7, 1997. The analysis of the combined events was performed using the October 1995 CPM

update because that was the update current when Cyclotron foundation changes, the first of the Cyclotron, MRI and SPD revisions, were issued.
(5951 R4, tab 227; Exhs. A-40, A-60; Tr. vol. I: 111-12, 117-18, 228-29, 248)

The VA initially concluded that 61 calendar days of delay had been caused by the Cyclotron, MRI and SPD revisions. Additional performance time, based on the VA's analysis, was due only for the Cyclotron conduit revision, FCO-2U, which was analyzed in the CPM in effect on August 30, 1996. Because PJD had requested only 59 calendar days of additional performance time for the Cyclotron revisions, the VA unilaterally granted a 59 calendar day time extension in SD-1, dated January 27, 1999. At the hearing, the VA acknowledged that, in fact, the Cyclotron changes had created additional delay to the Project. Mr. Barbaza, the VA central office schedule analyst responsible for VAMC Ann Arbor, testified that there were 11 calendar days of critical path delay to the project prior to the issuance of FCO-2U because the affected schedule activity became critical on August 19, 1996, 11 calendar days before the change was issued. (5836 R4, tabs 28, 29, 68; 5951 R4, tab 226; Tr. vol. VI: 186-87)

Based on a new computer analysis using the Schedule in effect as of July 31, 1996 instead of August 30, Mr. Barbaza determined that PJD is entitled to 69 calendar days of additional performance time; he further acknowledged that at least 11 of those days were pre-change order performance time.
(Tr. vol. VI: 191-92)

The primary difference between the PJD and VA schedule analyses lies in when they show actual construction work to implement the Cyclotron changes could begin. The VA's analysis is based on work beginning on October 14, 1996 whereas PJD's analysis shows the construction work not being able to begin until February 3, 1997. (Tr. vol. VI: 206-07)

PJD's Mr. Bandura testified that the February 3, 1997 date was the date construction work on the Cyclotron began and set forth the chronology leading to that date: The sheet metal coordination drawings were re-engineered by December 3, 1996; Coordination drawings were fully complete on January 17, 1997; and, Materials were fabricated and delivered on January 31, 1997. Consequently, work proceeded in the interstitials on the next workday, February 3, 1997. This information was all set forth in the fragnets, on which agreement was reached with the SRE. The date of February 3, 1997 as the beginning date of the changed construction work is confirmed in SD-1, COSA-1L and COSA-1D and the record CPM reflects February 3, 1997 as the date when work on the Cyclotron activities actually commenced. (5951 R4, 210, 225-26; Exhs. A-16, A-60; Tr. vol. I: 106-11, 114-16, 121-22)

Mr. Barbaza acknowledged that, if he had used the February 3, 1997 date contained in the fragnet in the SD-1 in his analysis as the date the changed Cyclotron construction work began, he would have shown a delay of 181 calendar days. (Tr. vol. VI: 210-211, 220, 222)

The VA initially directed the Cyclotron changes by FCO-2U, funded at $25,000, on August 30, 1996; FCO-2U was supplanted by COCO-04 on October 10, 1996 funded by the VA in the amount of $110,750. COCO-08 replaced COCO-04 on September 30, 1997; COCO-08 was funded at $124,000. The parties negotiated the direct costs of the Cyclotron changes in June 1998 and reached agreement on the amount of $257,196 for the work. The VA provided PJD with a proposed Cyclotron supplemental agreement (COSA-1N) at the negotiated amount in November 1998. The parties could not reach agreement on reservation language in the COSA and the VA eventually issued SD 1 on January 27, 1999 in the amount of $257,196 for the direct cost of the Cyclotron changes. (5951 R4, tabs 151-52, 207, 212, 219, 224, 226; Exh. J-1)

Although there were minor MRI field changes issued in April 1996, the major MRI changes progressed from FCO-2R, August 6, 1996 through COCO-09, November 11, 1997 to COSA-1L executed on July 10, 1998. The VA funded COCO-09 at $93,000; the parties, as reflected in COSA-1L, negotiated the price for the MRI changes as $92,056. COSA-1L provided no additional performance time. (5951 R4, tabs 13, 166, 210; Exh. J-1)

The relevant SPD changes were first implemented in COCO-03, August 29, 1996, which the VA funded at $65,000. The parties negotiated the price for the direct costs of the changed SPD work in June 1998 and executed COSA-1O on January 7, 1999 for the amount of $108,844. (5951 R4, tabs 19, 225; Exh. J-1)

The prices negotiated for the Cyclotron, MRI and SPD changes all included amounts for overhead and profit computed in accordance with the VAAR CHANGES – SUPPLEMENT clause. PJD reserved its rights to claim additional Contract performance time and for the costs of delay, suspensions and impact in the supplemental agreements (COSAs 1l and 1O) negotiated for the MRI and SPD changes. (5951 R4, tabs 210, 225; Exh. J-1)

The VA's policies concerning selection of equipment at its hospitals are contained in Veterans Health Administration (VHA) Directive 10-92-039, dated March 31, 1992, which was distributed by the Project Manager to the A/E, SRE and VAMC on April 7, 1992 and May 11, 1993. To improve the VA's ability to reduce the number of changes involving equipment acquisition by the medical centers, while maintaining the ability to provide state-of-the art medical equipment in its facilities, the directive required the establishment of an EMT (Equipment Management Team), organized and lead by the Project Manager in the VACO for non-delegated projects such as this one. The directive charges the EMT to coordinate with the users and the A/E to insure that designs for changes

to equipment requirements during the course of construction be accomplished to minimize cost and schedule impacts. (Exh. A-17; Tr. vol. II: 118-26)

The Cyclotron changes, of which PJD was first made aware in October 1995, were planned before the VAMC Ann Arbor project was put out to bid in December 1994. However, the VA, apparently because of funding restraints, did not arrange for its A/E to evaluate the new vendor's drawings of the cyclotron installation for their impact on the electrical design until well after award of the Contract. (Exh. A-17; Tr. vol. I: 117-18; Tr. vol. II: 115-16; 126-30)

On March 8, 1999, PJD submitted a certified claim in the amount of $3,132,255 for extended overhead costs and a Contract time extension of 249 days for the Cyclotron, MRI and SPD changes. In the claim, PJD stated:

> This time extension request is a refinement and consolidation of previous requests, which addressed the events described herein. It is an assessment of the combined impact of the untimely issuance of those directives, which forced recoordination and reengineering of virtually all interstitial floors. The modifications had to be coordinated with each other as well as with unchanged work. This delay is due to the impact of the untimely issuance of the directives on our ability to proceed with unchanged work in the interstitial spaces. Until the recoordination effort was completed, our work in the interstitial spaces was constructively suspended.

This claim, received by the CO on March 24, 1999, was submitted prior to approval of any other time extension requests; thus, it did not account for any overlapping time related to other time extensions. The CO denied the claim, which he had received on March 24, 1999, on May 18, 1999. The CO based his denial on the NAS provisions asserting that using the schedule update current when the Cyclotron, MRI and SPD change orders were issued the computer generated schedule shows no entitlement to additional performance time for the

Cyclotron, MRI and SPD changes beyond the 59 days granted for the Cyclotron changes in COCO-08. The final decision finds no entitlement to extended overhead costs. (5951 R4, tab 229; NOA;Exh. J-1)

The VA concedes a time extension of 74 days resulting from the multiple directives; 11 of those days being SOW time. (RSPNSE at 17)

CHILLER (VABCA-6061-75)

The Contract provided for a conventional, film x-ray installation in the Clinical Addition. Such an installation required construction and fit out of rooms for the x-ray machine; several rooms for the development and storage of film images and a silver recovery system when the x-ray images were no longer needed and discarded. However, prior to award of the Contract, the VA decided to install a pictureless archiving computer x-ray system (PACS) in lieu of a film system. (Jt. R4, tabs 19, 39, 40; Exh. J-1))

Since a film storage and silver recovery system was not necessary for the PACS, the VA, by FCOs 3W and 4C, in early 1997, deleted those items from the Contract work. After a redesign process lasting over a year, the VA issued COCO-11 to PJD on March 18, 1998 increasing the Contract price by $100,000 directing PJD to make the air conditioning changes in the two rooms to be used by the PACS. The air conditioning changes were required because of the heat loads generated by the large computers integral to the PACS. (6061 R4, tabs 7, 8; Exhs. A-28-30, J-1; Tr. vol. VII: 146-47, 149-50)

By March 1998, PJD was nearing completion of the project. It was performing final finish activities such as installing ceiling tile and mopping floors in a lot of areas. The CPM schedule current at that time showed final completion occurring in June 1998. The SRE acknowledged that, in March 1998, PJD and his

office were working toward turning over the project to the medical center within a couple of months. (6061 R4, tab 21; Tr. vol. I: 168; Tr. vol. VII: 146)

The sketches and revised drawings incorporated in COCO-11 were not issued to the contractor on March 18, 1998; rather, the SRE had them available for review in his office. The VA did not provide a sufficient number of copies of the sketches for PJD to distribute them to the subcontractors until a few days later. (Exh. J-1; Tr. vol. I: 167)

As originally issued, COCO-11 called for PJD to replace a 15-ton chiller it had installed earlier in the project with a 25 ton chiller. Subsequent to the issuance of COCO-11, the VA decided to leave the 15 ton unit in place and add a new 10 ton chiller unit. (Exh. J-1; Tr. vol. VII: 151)

The VA informed P.J. Dick of this redesign of COCO-11 by way of a letter dated April 10, 1998. That April 10 letter stated, in part:

> "Provisions have been made, as of this date, to supply all required drawings and schedules necessary to provide an independent 10 ton chilled water system to satisfy the requirements of AC-5 & 6. Drawings will be issued in the immediate future."

PJD responded on April 14, 1998, stating:

> "In accordance with your letter of April 10, 1998, we have suspended activity on those aspects of COCO-11 dealing with 1-ACRCU-5 [the chiller to replace the existing one]. Submittals had been prepared and piping work was underway. Chiller activity will resume when and if the Department of Veterans Affairs provides further direction."

(Exh. J-1)

On April 13, 1998, the SRE informed PJD that a chiller approved for a previous installation at VAMC Ann Arbor was approved for installation as part of COCO-11. P.J. Dick responded with RFI-936, dated April 15, 1998, pointing

out that new information on the pumps was needed and that an expansion tank, rolairtrol and a water treatment system would have to be added to the scope of the modification. The VA's response that day was that the requested information would be furnished "immediately, upon its availability." (Exh. J-1)

By way of a transmittal dated April 22, 1998, the Architect sent to the SRE revised and additional sketches. After reviewing the various revised and additional sketches, and having even further revisions made, the VA issued a new description of work for COCO-11 to PJD in its letter of April 27, 1998. Of the 16 sketches referenced in the original COCO-11 description, nine were revised and four were voided. Eight new sketches were added to the COCO-11 description of work. (Exh. J-1)

Because no design for the steel necessary to support the additional chiller had been provided, PJD had to prepare a sketch of the support steel on May 14, 1998 and submit it for approval. Also, on May 14, 1998, PJD submitted RFI 942, asking whether a safety valve needed to be installed on the new chiller and pumps. The safety valve should have been shown on the revised drawings. (6061 R4, tab 17; Exhs. A-35, J-1; Tr. vol. I: 174)

The VA did not respond to RFI 942 until June 18, 1998. The VA added a safety valve at that time and indicated that costs for it should be charged to COCO-11. (Ex. A-35; Tr. vol. I: 174)

Because of the necessary revisions to COCO-11, PJD was unable to commence procuring materials for COCO-11 when it was issued. Equipment for implementing COCO-11 was delivered to the project as follows: (a) Pumps, May 19, 1998; (b) Chiller, June 12, 1998; (c) Steel, June 12, 1998; and, (d) Air conditioning units, August 7, 1998. (Exhs. A-36, 37, 38; Tr. vol. I: 167-68, 175-78)

On September 24, 1998, PJD submitted a proposal for $147,344 for the direct cost of implementing COCO-11. PJD's proposal indicated that a claim for

a time extension and delay compensation would be submitted following a schedule analysis. The direct costs of COCO-11 changes were resolved in COSA-1Q, dated February 12, 1999, for $147,344. This COSA did not change the contract completion time, but PJD included its standard reservation language, reserving its right to assert, among other things, a claim for an extension of performance time and monetary damages for delay. COSA-1Q also set forth the agreement reached between the SRE and P.J. Dick of the logic and duration of the CPM activities affected by this situation, including the fact that actual installation of the chiller would require ten days. (Ex. J-1)

On July 2, 1999, PJD submitted a claim for the untimely redesign of the chiller requesting an equitable adjustment pursuant to the Contract SUSPENSION OF WORK clause of a 105 calendar day time extension and $1,320,063 in extended field and home office overhead. The CO received the claim on July 6, 1999. The claim was based on PJD's schedule analysis, dated July 1, 1999, in which PJD determined that completion of the project had been delayed 105 calendar days by the VA's delay in redesigning of Rooms D309 and D317 for the PACS air conditioning installation. (6061 R4, tab 21; Ex. J-1; Tr. vol. I: 240)

PJD analyzed the chiller problem in the CPM update using the February 28, 1998 update, the update current when COCO-11 was first issued. That schedule predicted project completion on June 22, 1998. The information included in PJD's schedule analysis was generally consistent with the agreed upon CPM logic set forth in COSA 1Q. The analysis reflected the fact that Appellant could not proceed with the changed work as of March 18, 1998, due to the additional revisions to COCO-11. (6061 R4, tabs 20, 21; Exh. A-42; Tr. vol. I: 239-40)

Inserting the COCO-11 logic into the February 28, 1998 update results in the computer generated schedule showing the Contract completion date as

October 7, 1998. This is 105 calendar days later than June 22, 1998, the completion date projected by the February 28, 1998 update. (6061 R4, tab 21; Tr. vol. I: 240)

The VA also analyzed the impact of COCO-11 on the schedule and concluded that COCO-11 delayed project completion 35 calendar days. The VA's analysis used the same update, February 28, 1998, to analyze this event. It also used the same CPM logic as PJD's analysis. However, because it used different dates for when the changed work could begin, the VA's analysis shows a completion date of July 27, 1998, 35 calendar days later than the February 28, 1998 schedule update of record. (6061 R4, tab 25; Exh. G-19; Tr. vol. VI: 52)

The primary difference between the two analyses is that the VA's analysis is based on the contractor being able to release all the equipment for fabrication on the date of the change order, March 18, 1998. PJD's analysis is based on different fabrication release dates for the various items because of revisions to COCO-11 after March 18, 1998. For example, for the air conditioning units, the VA's analysis is based on their release for fabrication on March 18, 1998, delivered on April 29, 1998 and installation by May 13, 1998. PJD's analysis, however, is based on installation of the air conditioning units not being able to begin until July 14, 1998, or project workday 824, an analysis consistent with the COSA-1Q logic showing installation of the air conditioning units as project workday 823, or July 13, 1998. (6061 R4, tabs 20, 21; Exh. G-19; Tr. vol. VI: 88, 92-94, 111-14)

The VA's scheduler, Mr. Barbaza, acknowledged that the difference as to when PJD could begin the changed work was the primary difference between the two delay analyses. He testified that, if he used the Notice To Proceed date of July 14, 1998 for the air conditioning units, his analysis would show 70 to 75 calendar days of delay, in addition to the 35 calendar days shown in his analysis.

Mr. Barbaza testified that he used the information provided by the SRE in his analysis and that he made no further factual investigation to determine if the information was correct. He acknowledged that, if additional revisions were made to COCO-11 after March 18, 1998, further delay may have occurred beyond what he determined. Mr. McMasters, the SRE, never explained where he got the information he gave Mr. Barbaza regarding these events and agreed that there were major revisions to COCO-11 after it was issued to PJD.
(Exhs. A-36, 37, 38; Tr. vol. I: 175-78; Tr. vol. VI: 104, 106-07; Tr. vol. VII: 151)

The parties agree that, had the changes reflected in COCO-11 been issued in the spring of 1997 when the need to revise the cooling in Rooms D-309 and D-317 was clear, there would have been no delay to the project.
(Exh. A-39; Tr. vol. I 179-80; Tr. vol. VII: 153)

By way of its unilateral Settlement by Determination No. 3 (SD-3), dated September 7, 1999, the VA increased the contract sum by $571 and the contract time by 35 calendar days for the COCO-11 work. SD-3 was mailed to Appellant on October 4, 1999. (Ex. J-1)

The CO issued his final decision denying PJD's claim for the additional Contract performance time and extended overhead costs related to the Chiller changes on September 19, 1999; the appeals in VABCA-6061-6075 resulted.
(Ex. J-1)

CONTRACT BILLINGS

Of the total of fifty progress payment requests submitted by PJD, thirty-nine requests reflect work during the period of performance from the Notice To Proceed in April 1995 to substantial completion on September 29, 1998. The

following table reflects PJD's billings in this period:

Period Ending	PP #	$ Amount
6 / 29 / 95	1	727,833
7 / 28 / 95	2	71,541
8 / 30 / 95	3	186,120
9 / 30 / 95	4	358,348
10 / 30 / 95	5	1,460,993
11 / 30 / 95	6	687,464
1 / 03 / 96	7	1,035,792
1 / 31 / 96	8	1,041,733
2 / 29 / 96	9	438,193
3 / 29 / 96	10	2,363,777
4 / 30 / 96	11	1,603,809
5 / 31 / 96	12	1,173,867
6 / 30 / 96	13	1,581,300
7 / 31 / 96	14	2,928,353
8 / 29 / 96	15	2,748,490
9 / 30 / 96	16	2,074,150
10 / 31 / 96	17	3,299,836
11 / 29 / 96	18	2,929,857
12 / 31 / 96	19	2,066,963
1 / 31 / 97	20	1,939,082
2 / 28 / 97	21	2,472,763
3 / 31 / 97	22	3,354,584
4 / 30 / 97	23	3,284,028
5 / 30 / 97	24	3,681,075
6 / 30 / 97	25	3,623,212
7 / 31 / 97	26	3,254,194
8 / 31 / 97	27	1,733,972
9 / 30 / 97	28	2,732,306
10 / 31 / 97	29	2,353,754
11 / 28 / 97	30	1,571,963
12 / 31 / 96	31	1,320,179
1 / 31 / 98	32	1,217,324
2 / 27 / 98	33	1,485,762
3 / 31 / 98	34	1,488,722
4 / 30 / 98	35	1,271,335

Period Ending	PP #	$ Amount
5/29/98	36	1,218,062
6/30/98	37	1,111,590
7/31/98	38	1,123,860
8/31/98	39	861,334

(Jt. R4, tab 22)

UNDERGROUND CONDUIT – RFIS 433 & 560 (VABCA-5836-50) AND RADIOLOGY AND CARDIOLOGY (VABCA-6017-31)

PJD recognizes that the delays claimed for the Underground Conduit and Cardiology and Radiology events are concurrent with the Cut-Off Wall and Combined Directives events. Since, as is fully explained in the Discussion below, we agree with PJD with regard to the Cut-Off Wall and Combined Directives delays, it is unnecessary for us to detail the facts related to the Underground Conduit and Combined Directives delays. We note, however, that we have fully reviewed the portions of the record dealing with the Underground Conduit and Cardiology and Radiology events. The evidence in the record supports the reasonableness of PJD's schedule analyses and PJD's pursuit of additional performance time for these events in the face of the VA's refusal to recognize additional performance time for concurrent Government-caused delays to which PJD was entitled during the period in which the Underground Conduit and Cardiology and Radiology events occurred.

DELAY AND SUSPENSION SUMMARY

PJD, recognizing that the delays it claims for the various delaying events involve concurrent time periods, summarizes it claim to entitlement for delay as

follows:

Delay Issue	**Days of Delay Period of Delay**	**Contract Completion Date**
Cut-off Wall	38 days. 1/12-3/1/98	March 1, 1998 (includes 10 days for asbestos)
Combined Directives	201 days 3/1/-9/18/98	September 18, 1998 (21 Days of Change Order work)
RFI for under-ground conduit at Cyclotron	59 days 3/1-4/17/98	No extension to Contract completion date, Multiple Directives controls.
Cardiology and Radiology	46 days 4/20-6/5/98	No extension to Contract completion date, Multiple Directives controls.
Revised Chiller capacity	105 days 6/23-10/7/98	September 29, 1998 (date of substantial completion, Multiple Directives Controls, 11 days 9/18-9-29 entitlement)

(Exhs. J-1, A-40, A-41; Tr. vol. I: 241-255)

The VA concedes that PJD is entitled to a time extension of 247 calendar days, to September 16, 1998. (RSPNSE at 33)

QUANTUM

CUT-OFF WALL DELAY (VABCA-5597)

The parties have stipulated the daily rates to be applied if PJD is found entitled to recover for delay under the SUSPENSION OF WORK clause. The daily rates to be multiplied by any number of days of Cut-Off Wall delays to which the

parties have stipulated are represented in the following table:

VABCA-5597	CUT-OFF WALL	DAILY RATES
P.J. Dick	Field Overhead	$1,586
	Home Office	$2,712
Robert Irsay	Field Overhead	$1,283
	Home Office	$1,165
Kent Electric	Field Overhead	$1,683
	Home Office	$845

(Exh. J-2)

The parties could not agree on the amount of the equitable adjustment for PJD's steel subcontractor, A-1, Inc., should a suspension of work due to Cut-Off Wall activities be found. Based on the fact that A-1 was required to be on site approximately one additional month, PJD has claimed $8,600 charged it by A-1 for additional costs, an amount derived from the following A-1 cost rates: (a) Superintendent wages for one month ($7,800); (b) Apartment rental for one month ($1,000); and (c) Trailer rental for one month ($400). Mr. Bandura testified that, due to the delay to steel erection caused by the cut-off wall, A-I's superintendent remained on the job an extra month resulting in an extra month of apartment and job trailer rental. He also testified that A-1's charges were fair and reasonable. This testimony was uncontroverted by the VA.
(5597 R4, tab 18; Exh. J-2; Tr. vol. I: 94-95)

COMBINED DIRECTIVES (VABCA-5951-65)
CHILLER (VABCA-6061-75)

The parties have stipulated daily rates for PJD and its subcontractors for the Combined Directives and Chiller redesign claims. The STIPULATION ON QUANTUM provides that for "any days of delay for which it is determined that Appellant is entitled to compensation under the Suspension of Work Clause … Appellant's recovery shall be calculated by multiplying that number of days of delay by the following daily rates without the need for further proof of costs or damages." The following table reflects the stipulated daily rates for the Combined Directives claims:

VABCA-5836-5850; 5951-5965; 6017-6031; 6061-6075	Type of Overhead	DAILY RATES
P. J. Dick	Field	$2,251
	Home Office	$2,712
Robert Irsay	Field	$1,283
	Home Office	$1,165
EMI	Field	$824
	Home Office	$0
Kent Electric	Field	$1,683
	Home Office	$845
Laso	Field	$369
	Home Office	$603

(Exh. J-2)

OTHER COSTS

PJD also claims for costs it paid to ACT, the scheduling consultant. The STIPULATION ON QUANTUM made it clear that it did not resolve the amount, if any, due PJD for ACT's costs of preparing time extension analyses. While the

VA has paid some of ACT's charges, the following costs, totaling $4,357, paid by PJD to ACT have not been paid by the VA: (a) $581 for the underground conduit issue; (b) $3,167 for the Cyclotron, SPD, MRI and combined directive analysis; and, (c) $609 for the radiology and cardiology delay analysis.
(5836 R4, tab 29; 5951 R4, 229; 6017 R4, tab 76; Tr. vol. V: 17-18)

The parties' quantum stipulation also provides that PJD is entitled to be paid at the rate of 0.38% for additional liability insurance costs on the total compensation calculated pursuant to the stipulated daily rates, plus any of the AI and ACT charges to which PJD is found to be entitled (Exh. J-2)

The daily home office overhead rates in both tables above are rates determined in accordance with the ***Eichleay*** calculation for unabsorbed home office overhead costs. (5587 R4, tab 51; 5836 R4, tabs 22, 23, 25)

ELECTRICAL LABOR INEFFICIENCY (VABCA-6080-6082)

ENTITLEMENT

ELECTRICAL SUBCONTRACT AWARD

The Government pre-bid estimate for the electrical work for the project was $7,203,000. PJD, as part of its bid preparation, estimated that the price for the electrical work for the Clinical Addition would be approximately $10 million. (Exhs. A-52, J-1; Tr. vol. II: 182)

PJD received quotes from three companies for the electric portion of the Contract: (1) Coken Company, $11,962,000; (2) Shaw Electric Company, $13,900,000; and (3) Superior Electric Company, $13,500,000. Believing it was not receiving the local subcontractors' best quotes, PJD included $11,075,000 in its bid for the electrical work on the Project. (Ex. J-1)

PJD, after discussions, determined that it was not comfortable with working with the Coken Company and decided to subcontract with Superior Electric Company with whom it had worked before. (Tr. vol. II: 184-85)

Following submission of its bid to the VA, PJD had discussions with Superior Electric (Superior) and other prospective subcontractors. Superior had estimated the electrical work on the job at slightly more than $12.7 million, including overhead and profit. Though it had quoted PJD a price of $13.5 million at bid time, Superior's bidding notebook indicates that it had quoted approximately $12.7 million to several of the local general contractors bidding the job. Following the bid, Superior revised its estimate to $12.4 million to reflect cost savings on equipment and labor wage rates. Superior was knowledgeable about working at VAMC Ann Arbor since it was performing the electrical work for the contractor on the preceding phase of this project. (Exh. J-1; Tr. vol. III: 124)

Superior provided PJD with several options. One was to establish a subcontract with a guaranteed maximum price of $12.4 million with PJD receiving 30% of any savings under that amount. Another was a subcontract price of $12.0 million with a 50% split of any savings or overruns. PJD chose this second option and gave Superior a letter confirming its intent to award Superior a subcontract. On that basis, Superior proceeded with the work. (Ex. J-1)

PJD sent Superior a proposed subcontract; however, Superior objected to some of the terms. PJD became concerned about its ability to close on a subcontract with Superior and contacted a potential subcontractor, Kent Electric Services (KES) of Jackson, Michigan. KES had not originally bid on the project because it did not have the financial capacity for the job, though it believed it had the technical ability to do the electrical work for the project. KES' representative, Doug Walz, coordinated with Superior to make sure it had no objection to KES talking to PJD about the job in the event PJD and Superior were unable reach

agreement on subcontract terms. Mr. Walz, who was then General Manager for KES and is now President, had been performing electrical work in the Ann Arbor area since 1973, when he had started as an apprentice. He had worked for a number of large electrical contractors and had performed projects for the University of Michigan in 1986 where the combined electrical contracts had been approximately $12 million. (Exhs. A-51, A-58; Tr. vol. II: 160-62; Tr. vol. III: 6, 10-11)

PJD and Superior were unable to reach agreement on the terms of a subcontract. PJD and Superior agreed that Superior would be reimbursed for its costs to date and that Superior would do no further work on the project. Superior agreed to cooperate with the transition to KES, including KES taking over Superior's files, project management team and tradesmen. (Ex. J-1)

The transition to KES occurred in early-September 1995. All of the Superior job site staff and electricians working on the project transferred to KES. The head of the job site staff was David Botbyl who was experienced overseeing electrical installations at hospitals and other mechanically and electrically intensive projects, and had previously handled electrical subcontracts in the $10 million range. Superior's project engineer also joined KES' staff. The journeyman electricians working for Superior at the time of the transition remained on the VAMC Ann Arbor project upon KES' take-over. (Exh. A-59; Tr. vol. II: 163-166; Tr. vol. III: 11-12; Tr. vol. IV: 21, 117-18)

KES entered into a cost-reimbursement subcontract with PJD on September 6, 1995. Under the subcontract terms, KES was to be reimbursed its actual costs for all labor, material and equipment used on the project and receive

a management fee of $10,000 a month. KES was also entitled to incentive payments if the costs it incurred were less than a target cost of $12 million. (6080 R4, tab 1)

KES established man-hour budgets for the project based on the Superior estimate. When KES became involved in the project, it obtained Superior's entire estimating file. Mr. Walz of KES studied Superior's estimate in detail. Superior's estimate contained a large number of takeoff sheets where Superior's representatives had determined the quantities of material and equipment to be installed from the electrical bid drawings. Superior applied labor units to the materials and equipment required to determine the number of man-hours of labor to include in its bid.
(Exh. A-43; Tr. vol. III: 12-14, 33, 36-38, 126-27)

The Superior estimate was divided into nineteen separate phases, the results of which were summarized on a bid recap sheet dated December 16, 1994. The recap shows that, for all the electrical work, Superior estimated $12,792,450, inclusive of a $773,605 profit. The estimate also shows that on April 25, 1995, it was revised to reflect savings of $370,198 after Superior had received some lower than anticipated quotes on materials and determined there would be a labor rate savings from its original estimate. As a result, on April 25, 1995, Superior ran a new recap of the nineteen phases showing a total estimate of $12,402,624, with $751,373 in profit. The estimate called for 132,153 hours of labor to complete the project. The total man-hours include all union labor to perform the electrical work, including foreman and general foreman, but did not include the salaried project manager, engineer and superintendent. (Exh. A-43; Tr. vol. III: 17-19, 22-26)

Mr. Walz reviewed the labor units applied by Superior and, in his view, the units used were appropriate for a hospital job and tracked favorably with

KES' labor productivity experience. Mr. Walz also agreed with Superior's estimate of the materials required. This led Mr. Walz to conclude that the estimate for branch circuit installation was reasonable and realistic. (Tr. vol. III: 31- 35, 34-35, 111-12)

Mr. Walz also testified that, since both Superior and KES were union contractors, they would use the same labor pool from the local serving the Ann Arbor area. Mr. Walz was familiar with the labor pool of electrical workers in Ann Arbor and their productivity, in light of his working in the electrical contracting business there since 1973. He also explained that KES had at least one advantage over Superior regarding labor on this project. Since Superior was located in Detroit, which is a different local of the union, it could bring only four of its regular electricians from Detroit to the project. However, since KES was located in the same jurisdiction as the Ann Arbor local, KES could use as many of the union electricians it normally employed as it wanted on the project. Accordingly, KES was able to put electricians on the job that had been with it "for years." (Tr. vol. III: 35-37)

Mr. Botbyl, the on-site KES project manager, reviewed the Superior estimate in great detail for the purpose of establishing detailed labor budgets for the various types of work in different areas of the building. His task was to establish labor budgets for the various types of work in the different areas of the building. KES established these budgets as a management tool for the project so that it could track how its actual performance compared to what was anticipated during the estimating process. Since the estimate had not been prepared on an area-by-area basis, Mr. Botbyl spent considerable time determining how many man-hours had been included for each category of work in the various areas of the building. Accordingly, Mr. Botbyl worked extensively with Superior through early-1996 to break the estimate down into man-hour budgets for

different types of work on an area-by-area basis. Mr. Botbyl testified in detail about his labor budget development from Superior's estimate. (Exh. A-44; Tr. vol. III: 37-38, 126-29; Tr. vol. IV: 25-26)

Mr. Botbyl's work resulted in a total KES labor budget of 132,202 man-hours, 24,321 of which were for installation of branch circuits. Beginning with the week of March 6, 1996, KES utilized the budgets and categories developed by Mr. Botbyl to track its labor. From that point in the job, all of the union labor expended by KES was assigned by the foremen on a daily basis to the cost codes Mr. Botbyl had established and reviewed regularly for accuracy by KES' superintendent. The information was given to KES' home office and incorporated into its job cost accounting system.
(Exhs. A-44, A-45; Tr. vol. III: 130-41; Tr. vol. IV: 157)

KES adjusted its labor budgets as change orders were issued. The final adjusted man-hour estimate for branch work was 27,152.4. The actual number of man-hours expended by KES for branch circuit work was 70,498.
(6080 R4, tab 1; Exh. A-45; Tr. vol. IV: 127, 150-156)

PJD expended a total of $17,409,144 for KES' electrical work on the Contract. This amount is $3,851,157 more than the electrical budget dollar estimate adjusted for changes. (6080 R4, tab 1)

KES' productivity expert, Mr. Apprill, reviewed the estimate and the budgets. He testified that the estimate was prepared in accordance with industry standards and that the labor units he checked compared favorably with the labor units published by the National Electrical Contractors Association (NECA). Mr. Apprill worked closely with Mr. Botbyl to understand how the estimated man-hours had been broken out into the budgets established by Kent Electric. Based on his review, Mr. Apprill testified that the budgets were an accurate reflection of what had been estimated. (Tr. vol. IV: 141-44)

ACCELERATION

PJD, shortly after construction started, began asserting that the VA was constructively accelerating the work because it refused to grant additional performance time and extended overhead. PJD provided the VA with numerous notices that it was being forced to accelerate. (Exh. A-50)

For example, in a July 24, 1996 letter, PJD notified the VA that it considered itself to be constructively accelerated. PJD had requested two Contract time extensions prior to then, one in an April 29, 1996 letter regarding the asbestos at the wet lab, another on June 7, 1996 for the cut-off wall. PJD's letter of July 24, 1996, confirmed that the VA had stated that it was willing to grant an extension for the asbestos request, but no additional compensation and had yet to respond to the cut-off wall stating:

> We have no alternative but to treat the VA's refusal to provide compensation per FAR 52.212-12 and failure to grant a time extension as a constructive acceleration of the work.

(5596 R4, tab 11; 5597 R4, tab 12; Exh. A-50)

Following another letter from PJD regarding constructive acceleration, the VA responded, on August 23, 1996, indicating that the VA had not directed the acceleration and that it was still considering the request for additional time and money. PJD responded on August 28, 1996, complaining that its requests had been pending for several months, closing the letter by stating:

> We have not yet received a contract modification extending the contract performance period. Until such time as P.J. Dick Inc. receives a formal time extension and compensation for the costs associated with the extended performance period, we have no choice but to accelerate, as P.J. Dick Inc. cannot absorb the extended field and home office overhead caused by the above-

> mentioned suspension of work. The Department of Veterans Affairs, by its action or inaction, has forced P.J. Dick Inc. to take these measures.

In response, the VA maintained that any acceleration was solely at Appellant's discretion and that "any associated additional costs will not be borne by the Government." (Exh. A-50)

On November 25, 1996, the VA issued COCO-05, increasing Contract performance time by 42 days and increasing the Contract price by $1,100.00 for the asbestos and cut-off wall. PJD protested this action in a letter dated December 3, 1996, asserting that it had shown entitlement to 48 days and $262,810. PJD further stated:

> COCO-05 is unilateral, revocable and does not provide sufficient compensation to allow P.J. Dick Incorporated and its subcontractors to remain on site beyond the original completion date. Until we receive a supplemental agreement which extends the contract performance period and provides fair compensation for the cost incurred to remain on site for an extended duration, we remain constructively accelerated.

(5597 R4, tab 30; Ex. A-50)

The VA consistently maintained that it was not directing PJD to accelerate; however, in a letter dated February 10, 1997, the CO complained about PJD's rate of progress and called PJD's performance "unsatisfactory" because the schedule then predicted completion on May 15, 1998. The CO, directing that PJD take corrective action, began to withhold 10% retainage from Contract payments. (Jt. R4, tab 35)

PJD, by letter dated March 5, 1997, strongly protested the CO's actions, asserting that it was actually ahead of schedule considering the time extensions due it and again put the VA on notice it was being constructively accelerated. The SRE even acknowledged that a contractor who had retainage withheld

would construe the retainage as an indication that the VA would assess liquidated damages if the job is not completed by the then extended completion date. Though the CO eventually discontinued holding retainage, he informed PJD that the VA was closely monitoring this situation on a "month-by-month" basis. (Jt. R4, tabs 36, 37; Tr. vol. VII: 158)

The SRE, in cross examination, acknowledged PJD's efforts in the last three quarters of 1997 and 1998 to complete the project:

> Q: And then you knew that P.J. Dick was saying that they were having to try to accelerate and there in '97 and on into early '98 P.J. Dick was working hard to get the job done.
> A: I'll have to say yes.
> Q: I mean, we weren't having a contractor that just was saying we're having to accelerate and then didn't do anything about it. They actually were pushing their subs to work all of the available spaces that were open to them whenever they could, weren't they?
> A: That's correct.

(Tr. vol. VII: 156)

In September 1997, PJD developed a formal "accelerated schedule" for the remainder of the project. It sent the VA a copy of this accelerated schedule along with its letter of October 2, 1997, stating:

> On several occasions we have advised the Department of Veterans Affairs (VA) of the unacceptable financial consequences of delays without compensation, and our efforts to accelerate the project to overcome them and avoid costs associated with an extended performance period. Although the VA has issued COCO-05 and COCO-08, which extend the contract performance period 101 calendar days, we have yet to receive a supplemental agreement formally extending the contract performance period. Additionally, the VA's current position regarding compensation for time will leave P.J. Dick Incorporated and its subcontractors economically harmed.

P.J. Dick Incorporated has no alternative but to attempt to overcome the VA caused delays by whatever means possible. To that end, we have developed the enclosed Target Bar Chart. The Target Bar Chart is essentially an accelerated version of the project CPM. With this bar chart we have performed some "what if" evaluations and the bar chart predicts what would occur if we were to compress selected activity durations and stack trades in certain areas.

While we doubt the optimistic results predicted are attainable, we intend to use this Target Bar Chart in an attempt to reduce the impact of VA caused delays. We will use a short term "Look Ahead" schedule derived from this Target Bar Chart in our weekly subcontractor coordination meetings as a tool in an effort to accelerate the project.

This Target Bar Chart has been derived from the Project CPM and therefore it's overall logic and sequence of work is consistent with the CPM. This is not a new schedule nor is it a new logic approach – it is simply an accelerated version of the CPM presented in a field usable format. The CPM is the Project Schedule and, as always, will be progressed and updated monthly to insure its accuracy.

The optimistic completion date reflected on the bar chart is the result of both very aggressive acceleration of certain work activities and the exclusion of many restraints which are included in the CPM. Those restraints are real and probably render the bar chart completion date impossible to achieve. However, considering the financial consequences of an extended performance period, we have no choice but to attempt extraordinary measures such as these to minimize the inevitable financial harm that we will experience.
The monthly CPM updates will indicate whether our efforts are successful. As previously advised, P.J. Dick Incorporated will seek reimbursement from the VA for all costs associated with its acceleration efforts.

(Exh. A-50)

Mr. Lostetter, PJD's Vice-President For Operations during the course of the VAMC Ann Arbor project, testified that the accelerated schedule involved deleting restraints in the CPM so that activities planned to be performed sequentially could be performed concurrently, and that subcontractors would have to be performing the same activities on multiple floors with separate crews concurrently. (Tr. vol. II: 179-80)

The SRE responded on October 6, 1997, again stating that he had not directed PJD to accelerate and stated that the only reason a supplemental agreement had not been signed was PJD's unwillingness to sign a COSA absent compensation for the delay. He also contended that the CPM did not reflect any acceleration. (Exh. A-50)

PJD promptly responded, confirming that the acceleration efforts would have to continue and addressing the other points made by the SRE, as follows:

> Your statement that the only reason a COSA has not been issued is P.J. Dick Incorporated's unwillingness to execute such a document is not entirely accurate. At our meeting of September 17, 1997, at Central Office, it was agreed that a Supplemental Agreement would be issued by the Department of Veterans Affairs addressing those aspects of the Asbestos and Cut-off Wall issues which P.J. Dick Incorporated and the Department of Veterans Affairs agree upon. Those aspects include:
>
> > Ten (10) calendar days of additional time due to asbestos at the wet labs; five (5) days under the Changes clause and five (5) days under the Suspension of Work clause

> 48 calendar days of additional time due to events at the cut-off wall.
>
> Direct costs associated with events at the cut-off wall.
>
> Mr. Paul Embroski, The Department of Veterans Affairs' General Counsel, indicated such an agreement would include a reservation of rights that would allow P.J. Dick Incorporated to pursue those issues which are not in agreement. To date P.J. Dick Incorporated has not received such a Supplemental Agreement.
>
> We also do not agree with your assertion that the "current CPM does not support the theory that any acceleration has occurred to date." Our time extension request dated May 1, 1997, indicates the untimely completion of the design of the MRI suite and systems serving the MRI suite extended project completion to 11JUN98. The CPM update of 31AUG97 indicates a predicted completion date of 21APR98. Clearly P.J. Dick Incorporated's acceleration efforts have overcome a significant portion of the delay.
>
> The economic realities of the Department of Veterans Affairs' position regarding compensation for time leaves P.J. Dick Incorporated and its subcontractors no alternative but to continue our efforts.

(Ex. A-50)

PJD's Narrative Report No. 29, dated November 4, 1997, stated: "Elevator installation, MEP rough-in and branch wire pulling will continue this month, with work proceeding on all floors." This note had appeared on previous reports since at least March 5, 1997. A similar note was included on subsequent narrative reports through May 11, 1998. (Jt. R4, Exh. 29; Exh. A-50)

In an internal VA weekly update of December 29, 1997, the following is indicated regarding the Clinical Addition:

> Today is Contract Day 986 of 1123; 137 days to go, 20 weeks from last Friday. Construction is at 84% mark; elapsed contract time is at 88% with Project Completion Date at 5/15/98.

A margin note on the weekly update states: "Suggests PJD needs to accelerate their work." (Exh. A-50)

In a letter of February 25, 1998, the CO voiced concern that the schedule had slipped by three weeks and that PJD was apparently not concentrating on critical path activities. The CO provided a spreadsheet of the "required completion dates" for the many deferred rooms and warned that, if "the contract dates are not achieved, the VAMC will incur considerable delay and impact costs." The CO further requested PJD to submit its proposed schedule changes to "ensure compliance with the current completion dates." The CO resumed withholding of retainage. (5951 R4, tab 181)

In a lengthy response, PJD characterized the resumption of withholding retainage as "punitive" and stated:

> Imposing additional retainage at a time when the goal is to increase the level of performance is nothing less than counter productive.
>
> We understand that it is the VA's direction for us to complete this project by the earliest date. P.J. Dick will continue to accelerate selected key activities when practical to achieve that end. To the extent that additional costs are incurred, we will present them to you when they can be determined.

(5951 R4, tab 184)

Mr. Lostetter testified that PJD's acceleration efforts significantly shortened the length of the project, but that the benefits of PJD's acceleration were ultimately obscured because of the Chiller redesign.
(Tr. vol. VII: 156; Tr. vol. II: 180-82)

ELECTRICAL DESIGN PROBLEMS

The electrical branch work in any particular area of the project was shown on several different drawings. "Branch" work involves installing conduit, pulling wire through the conduits, running conduit and wire from the interstitial spaces to occupied spaces from electrical distribution boxes fed by large, electrical feeder lines and connecting the branch circuits to outlets and devices in the occupied spaces. In accordance with standard industry practice, KES prepared, in addition to the Contract coordination drawings, working drawings for its own crews to use while installing the work. These working drawings normally combined the work shown to show all of the electrical work in particular areas of the building on a single drawing. (Tr. vol. III: 44-47; Tr. vol. IV: 126, 257-60)

KES began preparing working drawings in the spring of 1996, but began to encounter extensive discrepancies in the power and lighting drawings. KES began generating RFIs to resolve these discrepancies, and by late-June 1996, David Botbyl presented PJD with approximately 40 RFIs pertaining to electrical installations on the first floor. In its meetings with PJD, Mr. Botbyl expressed frustration with what he considered to be the large number of first floor RFIs and the fact that he anticipated an additional 20-30 RFIs on the first floor power and lighting alone. (Tr. vol. III: 48-49; 148-52; Tr. vol. V: 4-7)

Because of the number of RFIs, PJD arranged to present the package of 40 RFIs to the A/E. This resulted in a representative of the A/E going to meet with

KES to review the problems with the Contract electrical drawings on July 1, 1996. (Exh. A-63; Tr. vol. III: 151-52; Tr. vol. IV: 4-6; Tr. vol. V: 4-7)

In late-July 1996, the VA began issuing revised electrical drawings as part of FCO-2N. Through the end of September 1996, the VA issued revised power and lighting drawings for the first, third, fifth and seventh floors in the Clinical Addition. (Exh. A-69; Tr. vol. III: 152-55)

Similar revisions were needed for power and lighting work in the basement. The A/E, however, incorporated corrections to the electrical drawings for the various areas in the basement through the other major changes that were being issued in this time frame for the basement, including the Cyclotron and SPD changes. (Tr. vol. III: 155-56)

The direct costs of the electrical revisions on the first, third, fifth and seventh floors were resolved in COSA 1V for $126,939.00. PJD reserved its right in COSA 1V to assert a number of claims, including claims for acceleration, compression, loss of efficiency or breach of contract or other impact costs occurring because of the changed work, the pre-change order events or the impact of the changed work on the unchanged work. The basement changes were either settled in supplemental agreements containing the same reservation or were the subject of unilateral settlements by determination.
(Exh. A-69; Tr. vol. V: 9-10)

Even with the major FCO-2N revision of the electrical drawings, KES had to expend substantial efforts to get proper working drawings to its field forces. The revised drawings issued did not always identify the changes made; this forced KES to engage in a detailed review of a drawing to identify changes. In addition, the A/E continued to provide KES with a large number of "sketches" revising the electrical drawings even after FCO-2N. Generally, these "sketches" were on normal sized paper and provided a minimum of detail. With some

difficulty, KES translated the changes provided by the sketches to the Contract electrical drawings from which it could prepare revised working drawings. The electrical drawing changes and revisions occurred throughout 1997 and 1998, when the major branch circuit installation effort was underway. The VA paid for KES' extraordinary drafting efforts in various supplemental agreements. (6080 R4, tab 1; Exhs. A-46, A-48, A-68; Tr. vol. III: 49-50, 153-54, 160-234; Tr. vol. IV: 7, 172-73, 177)

PERFORMANCE PROBLEMS

Some branch circuit work began in May 1996. Through November 1996, however, most of this work consisted simply of installing some distribution boxes on the ceilings and "poke throughs" from the functional floors to the interstitials above. Not until December1996 was any substantial effort expended on installing branch circuitry. (Tr. vol. IV: 173-74)

In 1997 and 1998, KES progressed its branch circuit installation working concurrently on all the floors as they became available. This circumstance, along with the design problems, led to branch circuit installation difficulties characterized by KES' Vice-President, Mr. Waltz as follows:

> Q: How did the branch circuit work go in terms of Kent Electric being able to meet its budgets for the branch work?
> A: Went terrible.
> Q: And why is that?
> A: We could never finish anything. It was very disruptive. We would go into an area to start our work and there were conflicts. We needed information. We could never finish a room and it started out even before we went into an area to do the work in just trying to lay-out the work.
> We ran into several conflicts on the drawings or lack of

> information, and that whole thing just pyramided throughout the job and never got better.

(Jt. R4, tab 29; Tr. vol. III: 43-44; Tr. vol. IV: 4-14)

PJD's productivity expert, Mr. Apprill, opined that KES' lower than budgeted productivity for branch circuit installation can be attributed to the continuous revision of branch circuit drawings and to "acceleration." In reaching this opinion, Mr. Apprill interviewed PJD and KES personnel and reviewed the project documents from the files of Appellant and Kent Electric. His review included the electrical drawings, the Superior Electric estimate and Kent Electric's establishment of the man-hour budgets from that estimate. He also made extensive analyses of KES' costs and man-hour reports from the project. Mr. Apprill prepared the electrical inefficiency claim.
(6080 R4, tab 1; Tr. vol. IV: 132-44, 161-162)

Characterizing the electrical drawings as "defective", Mr. Apprill concentrated on the extent to which the design problems continued to have an impact on the job, even after the FCO-2N drawings were finished being issued in September 1996. This was because substantial man-hours started being worked on the branch circuitry in December 1996. He noted that Kent Electric had complained about the revised drawings in its letter of October 17, 1996. He also noted that in a December 5, 1996 letter, Kent Electric had complained specifically about the problem with keeping track of all of the revisions to the documents in the form of sketches, RFIs, bulletins, FCOs or CORs. (6080 R4, tab 1;
Tr. vol. IV: 173-74)

The electrical drawing revisions caused KES supervision to spend more time than would otherwise have been necessary overseeing the changes to its working drawings, instead of being in the field to supervise the work. At one time, Kent Electric had its job site supervision work six days a week and added a

new general foreman on the project just to try to supervise the crews while the regular job site supervision was managing the revision of working drawings. Mr. Walz described the problem as follows:

> Q: And who was the superintendent you are referring to?
> A: Dave Murphy was the superintendent, and John Crawford was the general foreman.
> Q: And your superintendent and general foreman, what's their typical function on the job?
> A: To oversee the manpower in the field. They [lay] out work for the crews to be productive.
> Q: And were they able to perform in a normal function on this job?
> A: No. We had to spend way too much time in the trailer sorting out what we were building, instead of supervising the people that were building it. . . .

(Tr. vol. III: 53-54)

Regarding the foremen, Mr. Walz indicated that they were unable to effectively lay-out work for and manage their crews because they were also constantly having to track down answers to conflicts and other questions. (Tr. vol. III: 54-56)

Inspection problems absorbed substantial supervision time. As the design was revised and the numerous sketches issued, VA inspectors would frequently decline to approve an installation, contending that the work did not conform to the drawings. KES had to locate the various sketches and changes, which had revised the design and on which it had based its working drawings to then prove the current Contract requirement. (Tr. vol. III: 63-64)

Mr. Walz testified:

> We continually had foremen wandering around with the inspector to get an inspection and having to go dig through paperwork to prove that what we had done was right.

This affected KES because its "foreman was tied up with the inspector instead of laying out work." (Tr. vol. III: 64)

KES' labor estimate was predicated on the sequence by which it planned to install the branch circuit work. KES planned to have a crew begin rough-in in the basement and then move up the building performing rough-in of branch wiring on the first, third, fifth and seventh floors. Another crew would follow, pull wire and go from floor to floor behind the rough-in crew. A crew would then come through and put in plugs and install switches. KES' intent was to have people familiar with a particular task perform that task on a repetitive basis throughout the building in order to achieve productivity. Mr. Walz stated:

> Q: Is following that type of sequence that you described important for obtaining labor productivity on a job of this type?
> A: Yes, because you've gone through the learning curve of how we're going to physically do this work, what kind of supports we're using, what kind of materials we're using, reading the drawings as far as how everything has to be done. And you're using the same people that are trained, they're tooled up, they've got everything on their carts that they need for piping, and they can just continue to go…area to area. And you see,…the guy on the assembly line doing one item is more productive than the one guy that's going to try to build the whole car by himself. You want him to, here's your task, do it throughout the job.

(Exh. A-75; Tr. vol. III: 58-60; Tr. vol. IV: 11)

KES' sequencing plan was reflected in the Day-1 CPM. KES could not, however, follow this planned sequence for branch circuit installation. KES received several or almost all the floors at the same time and PJD directed KES to work on them concurrently. PJD also directed KES to accelerate its work. Thus, KES had crews working on the separate floors and was unable to move a crew

from floor to floor doing the same task, but had to have separate crews on each of the floors doing all of the various tasks. This resulted in a situation, as characterized by Mr. Walz:

> Well, again, you end up training a lot more people to do the same task. You have a lot more people going through the learning curve."

(Exh. A-75; Tr. vol. III: 60-61; Tr. vol. IV: 9-12)

The drawing revisions and sequencing problems caused problems in assigning workers and finishing areas before moving on to other areas. As stated by Mr. Walz:

> Our biggest concern was that the interferences, the conflicts, the not being able to finish anything and the go-backs. And we were continually go[ing] back to finish something later. Go back and go back.

According to Mr. Walz and Mr. Botbyl, this circumstance severely decreased productivity and resulted in the reassignment of workers to other areas on a daily basis. KES believed that these problems reduced the morale of their labor and adversely affected the attitude of their workers because of the frustrations of not finishing areas and having to redo work because of the difficulty the forces in the field had of determining what the Contract requirements were. KES finds evidence of this morale problem in the increased incidence of errors and omissions by its electricians. (Tr. vol. III: 64-66, 68; Tr. vol. IV: 15-18)

Mr. Apprill, in evaluating the alleged inefficiency, developed a graph showing the number of branch hours worked per month. Along that same time line, he included several different pieces of information. First, by a series of yellow numbered "flags," he identified when problems were addressed in the

representative sample of KES' daily reports. Mr. Apprill explained his reasoning for showing those on this timeline:

> I had actually read the daily reports pretty much in total. And in the process of that there were a number of them that I felt demonstrated to me that these problems – problems with the drawings, problems with multiple sources of information, . . . crews coming to a point where they had to stop work and move on and reporting that they were going to have to return to do work were reflected in the daily logs prepared by the people out in the field.
> And I thought it would be useful to see that against the timeline to show that certainly the ones that we looked at demonstrate that that problem continued right on through 1997 and on into 1998.

(Exhs. A-46, A-64; Tr. vol. IV: 175-176)

Mr. Apprill testified that the 34 daily reports referenced on his timeline were not the only ones that referred to the problems he described, but had been selected by him to demonstrate that the nature of the problem was continuing throughout the branch circuit work. As he explained:

> We know that there was considerable difficulty with the drawings back in 96, and I thought the more important thing to express was that it didn't stop back there, it continued here. So I focused on 1997 and 1998 to see what the record showed, and just tried to find comments that demonstrated that, indeed, these problems were being experienced out in the field.

(Tr. vol. IV: 176-77)

In addition, Mr. Apprill included information on his timeline from KES' "HEPY" log showing the number of items reported each month, in the period January 1997 through March 1998. KES maintained the "HEPY" log to identify

and track the numerous questions and revisions to be resolved by the VA's A/E. He explained his reason for graphing this information thusly:

> But my emphasis and my interest, again, was to see continued correlation between the time of the branch work being done, expression by the field that the problems, indeed, are being felt there, and expression in some way that there is a continuing flow of information about the electrical design that the people preparing the working drawings are having to deal with, and that this continues right on through this time period. (Exh. A-64; Tr. vol. IV: 172-73, 178-179)

Mr. Apprill also produced on a separate time line, a monthly listing of the revisions to the working drawings. This information was taken from the information in KES' logs and put on a time line showing dates when working drawings for the power and lighting were first sent to the field and then the revisions to them because of RFIs, CORs or sketches. Mr. Apprill explained why he had put the revision dates to the working drawings on a monthly basis on the timeline and what the timeline shows regarding the drawing revisions:

> For much the same reason that I prepared the other information on a timeline, to demonstrate first to myself, that there indeed was a time correlation to the time being charged to the branch circuit work, and their experience with problems with the drawings.
>
> * * * * *
>
> Yes, it definitely indicated to me that since none of the dates on here really – the only revision date that pre-dates December of 96 is the group for some of the first floor drawings, when there is a series of revisions there.
> But all the rest of the revisions happened some time in '97 or '98. So that means, just as Doug Walz was testifying, and Dave Botbyl, the working drawings were constantly being revised, constantly being sent to the field.
> And I think we also saw, in those daily reports, some expression of frustration about will these drawings ever be

> finished. And to me those things confirm one another that, yes, indeed it was happening, yes indeed it was being felt in the field, and it was happening in the time frame '97, '98.

(Exhs. A-46, A-68; Tr. vol. IV: 180-83)

Mr. Apprill concluded it was the fact that the revisions were being made during the same time KES was having to try to install the branch circuit work in almost all of the areas of the building at the same time rather than the number of sketches, RFIs and CORs being issued that adversely impacted KES because the electrical requirements were in a constant state of flux. As he stated:

> But more than that is the multiple sources of information that they were trying to deal with in understanding, really, what is the design, really what are we going to install.
> You know, I use the analogy of Dave Botbyl standing out and getting hit by meteors from all sides, because the first time I met with him, that is kind of the impression I got, of just this bombardment from all directions, not really ever knowing should I turn this way to deflect, or that way to deflect.
> Trying to absorb all this stuff from multiple sources just creates an almost impossible situation of really being confident, yes, this is what we are supposed to install, get out to the field and do it.

(Tr. vol. IV: 186)

Noting that even the VA and A/E had trouble keeping track of what the current electrical design work was, Mr. Apprill testified that the number of design revisions continuing during the branch circuitry installation work affected the productivity on this job:

> I think there were many ways that it affected it. Certainly the contractor should be able to, within a reasonable amount of time, put together the design intent into a workable form, so that he can go out, do his work with some planning ahead of time, line up his people to work with some pre-planning, and then go execute that plan.

> My view of this constant infiltration of new design information tells me that they never really got that chance, to really have a single unified source of good information to go out there, plan their work, and execute that plan.
> I think it greatly, greatly distracted the supervision that Kent had on the job. They tried, I think, very hard to deal with the problem. I think they took it upon themselves, to a greater extent than I might have expected, to try to manage the problem, and try to really mitigate the problem, and not just stand back and say this isn't our problem, we are not doing anything until somebody straightens this out.
> They really, I think, took a proactive attempt to deal with it. But in doing so their supervision was greatly distracted and diluted. And I believe that the morale of the people on the job would be affected by something like this.
> Workmen want to have a quality product to work from if they're going to be expected to create a quality product, they want quality tools, they want quality drawings, they want a chance to go out and do a quality job.
> So I do sincerely believe that this kind of thing will hurt a workman's morale.

(Tr. vol. IV: 187-188, 205-206)

In analyzing the acceleration / sequencing issue, Mr. Apprill looked at when the branch circuit work was actually performed on the various floors and compared that together on several time lines. He took that information and plotted it graphically, showing the hours per month per floor. Mr. Apprill combined all this information to produce a graphic representation, Figure 3A, Exhibit A-65, showing, as he states:

> The Figure 3A, which has the composite of the information below tells me that they were working and charging hours into multiple floors concurrently. It demonstrates that they started first floor and second interstitial first.
> After that . . . third and fourth interstitial about two months later starts to have time charged. Shortly after that the

> seventh and eighth floor interstitials start to have time charged.
> The next is basement and basement interstitial, and the last is fifth and sixth interstitial. But in a span going roughly from . . . September of 96 through March of 97 they've gotten to the point where they are working on all these floors at the same time.
> And after that it is evident that they continue to work on all the areas pretty much all the time and to me this was an exact corollary to what Doug Walz and Dave Botbyl were expressing, that rather than being able to work sequentially up through the floors, they basically were encouraged and pressed hard to go ahead and move people onto floors to try to get whatever progress they could.
> And that once they got there they, for a lack of a better word, sort of got stuck there and never really got to where they had any kind of meaningful sequencing of their work.

(Exh. A-64, A-65; Tr. vol. IV: 190-92, 196-97)

Mr. Lindsey, the VA's expert on labor inefficiency, testified that, in his opinion, KES did experience inefficiencies in the performance of the Contract. He attributed these inefficiencies to four causes: (1) KES' management; (2) KES' labor management; (3) Building access; and, (4) adverse weather. (Tr. vol. VII: 181)

Mr. Lindsey pointed out that neither KES nor Mr. Botbyl had performed a job of this size before and that this was their first VA project. It was his view that this fact would affect KES' ability to manage the different issues they were going to have on a job of this magnitude and its understanding of the processes. Mr. Lindsey testified, however, that he could only give "kind of the general context" of the matter. He provided no specific instances where KES' performance or labor expenditure reflected any incorrect technical or management decision made by KES due to a lack of experience on jobs of this size or KES' inexperience on VA projects. (Tr. vol. VII: 181-82)

Mr McMasters, the VA SRE, observed that Mr. Botbyl obviously was well-versed in the electrical contracting business and that he had no reason to question his competency to serve as KES' project manager. Mr. Botbyl had previous experience directly managing electrical jobs as large as $10 million. Also, KES' General Manager, Mr. Walz, who oversaw the project, had performed electrical contracts just as large on the University of Michigan replacement hospital in the mid-1980s. (Exhs. A-54, A-55, A-58; Tr. vol. III: 6; Tr. vol. IV: 21; Tr. vol. VII: 161-62)

Mr. Lindsey described his perception of KES' "labor problem" as being twofold, pointing first to the fact that, until June 10, 1997, workers were restricted to using stairs to get to upper floors. Mr. Lindsey observed that it was "unusual" in his experience for a multi-story project not to have a mechanical means for access for labor and material for that long on the project. The SRE indicated that he heard complaints from all the trades about having to walk the stairs prior to the elevator coming on line on June 10, 1997. Branch circuit work on the upper floors at VAMC Ann Arbor began shortly before the elevator became available and the lack of an elevator did not significantly impact branch circuit installation. (Tr. vol. V: 13-14; Tr. vol. VII: 74, 182-83)

The second labor issue mentioned by Mr. Lindsey involved the fact that KES distributed its labor throughout the building, testifying:

> And then finally, on the labor side, on the inefficiency side, having the labor distributed throughout the building the way it was, the management of that labor force. I say that based on the testimony that there was not adequate labor available from the hall, from the union hall,
>
> So to the degree that you're distributing that throughout the building, that would present another problem.

Mr. Lindsey explained that his concern was Kent Electric had not been able to obtain enough general foremen or foremen to properly supervise labor distributed throughout the building, because of the unavailability of labor in the union hall. (Lindsey, Tr. 7-184, line 20 to 7-185, line 22) He testified:

> Q: So did the labor shortage affect the hiring of the foremen or general foremen?
> A: Well, if there's a labor shortage in the hall, it's surely going to be an across the board issue. I don't have any specific issues that I can put my finger on here because I'm not privy to that – the mechanics of that labor issue.

(Tr. vol. VII: 183-185)

Regarding the third category he identified as adversely affecting KES' labor productivity, which he denoted "material access," Mr. Lindsey acknowledged that PJD had a crane available to assist subcontractors in feeding materials into the building. He also acknowledged that PJD had made it clear to the subcontractors that, when its crane was tied up constructing work PJD was performing with its own forces, the subcontractors would be responsible for providing the means for getting their materials into the building. However, he indicated that, if the crane were unavailable, it would require substantial effort to bring material in by using the stairs. (Tr. vol. VII: 186-187)

The SRE testified that all the trades complained at some point or another to him regarding problems with getting materials into the building. Mr. Bandura provided testimony and a photograph showing PJD's crane and the landing platforms it had constructed for feeding materials into the building. He also explained how PJD had made it clear to all the subcontractors that they were primarily responsible for providing mechanical means for getting their materials into the building. (Exh. A-70; Tr. vol. V: 12, 14-16)

KES rented a crane and a large fork truck (a "lull") in conjunction with PJD's mechanical subcontractor to be used for bringing materials into the building. KES established a separate material handling cost code to track all of its costs in bringing materials into the building and handling materials. The claim for branch circuit labor inefficiency does not include any time or charges from the material handling cost code. (6080 R4, tab 1; Tr. Vol. IV: 123, 125-26)

Mr. Lindsey, in explaining his fourth category of causes of KES' labor inefficiency, testified that, though the building was closed-in by plastic, he opined that winter conditions would reduce KES' labor productivity. Prior to being permanently closed with the installation of exterior panels and windows, the building was enclosed with plastic and PJD provided natural gas powered heaters on the floors. While some areas of the building were cool under this arrangement, temperatures seldom went below freezing. Neither Mr. McMasters nor Mr. Lindsey testified that these conditions were unusual for a project in Ann Arbor, Michigan or were not anticipated in KES' labor budget for the project. (Tr. vol. VII: 79-80, 187)

PJD, by letter dated July 28, 1999, forwarded a claim for labor inefficiency in the installation of branch circuits in the amount of $1,625,865. The letter, received by the CO on July 30, 1999 also demanded a final decision. (6080 R4, tab 1)

QUANTUM

GENERAL

PJD's claim for VA caused inefficiency in installation of branch circuits is based on a "measured mile" analysis. At the hearing, PJD offered an alternate method of calculating the amount of the labor inefficiency. This method applied

the Mechanical Contractors Association of America, Inc. (MCAA) bulletin PD-2, "Factors Affecting Productivity" to determine the number of man-hours of labor incurred by KES attributable to VA caused inefficiency. Using this methodology, PJD asserts an alternate labor inefficiency claim of $1,307,289. (6080 R4, tab 1; Exhs. A-49, A-66)

Since the KES subcontract was a cost-reimbursement agreement, PJD has reimbursed KES for all of its incurred labor costs. Consequently, appeal of the denial of the electrical inefficiency claim is not a sponsored or ''pass-through" claim with KES as the real party in interest as would ordinarily be expected under these circumstances. (Tr. vol. II: 168; Tr. vol. III: 41)

At the hearing, the parties stipulated to a composite $37.39 hourly direct labor rate for KES labor. (Tr. vol. IV: 221-22)

MEASURED MILE ANALYSIS

PJD's expert consultant, Mr. Apprill described the measured mile analysis methodology in this manner:

> The intent of a measured mile is to establish, on a given project, the ability of workmen to perform against some measurement.
> The primary advantage, if it is possible to do a measured mile, if you can show that on this project, under many similar things that might affect productivity, that the contractor could achieve some demonstrable level of efficiency, you could then compare that to an area that was impacted, or more impacted by a condition, to try to establish, for lack of better terminology, a but-for comparison.
> That but-for the problem we are looking at, this contractor has shown that with these workmen, at this site, under a number of other things that might otherwise be considered as having an effect on

> productivity, that he was able to perform at some established level.

(Tr. vol. IV: 208-209)

After reviewing the project records, Mr. Apprill determined that, in his opinion, there was no period during installation of the branch circuit work during which the work was unaffected by design problems or acceleration. (Tr. vol. IV: 209-210)

Mr. Apprill examined other electrical work performed in an attempt to find work that was sufficiently similar to the branch circuit work to support a branch circuit measured mile analysis. After consulting with Mr. Walz and Mr. Botbyl of KES, Mr. Apprill concluded that installation of "feeder" circuits was sufficiently similar to the branch circuit installation to support a measured mile analysis. (Tr. vol. IV: 209-211)

Both branch and feeder circuit installations were performed by union electricians from the Ann Arbor local and used the same basic materials of conduit and wire. However, feeder circuit installation involves larger sizes of conduit and was installed in longer continuous runs. In addition, feeder work was confined to the interstitial spaces, penetrating floors only to run up the building and did not involve device installations. Installation of feeder circuits generally preceded the branch circuit installation by a month or two. Both feeder and branch work were performed largely at the same time during most of the job and were, therefore, subject to the same weather conditions. They were installed in the same or similar areas of the building. In addition, budget estimates for both were established using the same methodology although the estimates took into account that installing feeder circuits involved larger materials and longer runs. (Tr. vol. III: 70-71; Tr. vol. IV: 90-92, 211-13; Tr. vol. VII: 193-94, 257-60)

The feeder circuit work was, for the most part, installed in a manner more consistent with KES' plans than was the branch conduit. The feeder circuits were primarily installed by one crew moving from floor to floor to perform that work permitting this crew to achieve the type of efficiency gained from performing these tasks on a repetitive basis. (Tr. vol. IV: 90-91)

Mr. Apprill took KES' budget, as adjusted for change orders, for the feeder work and compared it to the actual number of man-hours worked on feeders. He divided the actual man-hours worked on feeders by the adjusted budget for feeders to arrive at a "demonstrated efficiency" factor of 1.147. That is: To earn each man-hour in the budget for the feeders, Kent Electric had to work 1.147 hours. Mr. Apprill testified that, in his opinion, this was the level of efficiency KES had shown it could actually achieve on a similar work item on this project with its workers and management and could properly be used in branch circuit measured mile analysis. (Exh. A-67; Tr. vol. IV: 212-16)

Thus, the efficiency factor calculated for the feeder work was used to adjust the budget for the branch work. The final branch budget, as adjusted for change orders, was 27,152.4 hours. Multiplying this budget by the demonstrated efficiency factor of 1.147, results in an adjusted branch budget of 31,143.8 man-hours. Deducting this adjusted budget from the actual branch hours of 70,498, results in 39,354.2 unproductive man-hours. At the stipulated hourly wage rate, the unproductive man-hours results in additional labor costs of $1,471,453 attributable to VA caused inefficiency. Applying Contractual mark-ups, the total damages calculated by the measured mile analysis total $1,625,865.
(6080 R4, tab 1; Exh. A-67; Tr. vol. IV: 219-23)

Mr. Lindsey, the VA's labor productivity expert, took exception to use of the measured mile analysis using the feeder-branch circuit comparison because it violated a fundamental precept of a measured mile analysis in that the Apprill analysis does not measure the productivity for an activity in an unaffected period against the productivity for the same activity in an affected period. Since, as PJD and Mr. Apprill both indicated, there was no period of branch circuit installation that was not impacted by either the design problems or acceleration, Mr. Lindsey opined there was no way to make a valid measured mile analysis in this case. Mr. Lindsey's principle objection to comparing feeder work to the branch work was the difference in crews and crew continuity. (Tr. vol. VII: 192-97)

MCAA Analysis

The MCAA bulletin identifies sixteen productivity factors and includes a narrative description of each factor. For each factor, the bulletin assigns a percentage productivity loss for three condition categories (minor, average, severe). Mr. Apprill testified that the MCAA factors are, based on his experience, as applicable to electrical work as they are to mechanical work. (Exhs. A-49, A-66; Tr. vol. IV: 272)

Mr. Apprill assigned six of the sixteen MCAA factors to the VAMC Ann Arbor project. Below are these factors as described in the MCAA bulletin and the assigned percentage of the adverse productivity impact:

Mr. Apprill applied the MCAA factors to the adjusted branch circuit labor

hour budget as follows:

MCAA FACTOR HEADING	IMPACT OF DESIGN DEFECTS Factor Used	Hours	IMPACT OF ACCELERATION Factor Used	Hours
MORALE AND ATTITUDE: Excessive hazard, competition for overtime, over-inspection, multiple contract changes and rework, disruption of labor rhythm and scheduling, poor site conditions, etc.	15%	4072.8	5%	1357.6
REASSIGNMENT OF MANPOWER: Loss occurs with move-on, move-off men because of unexpected changes, excessive changes, or demand made to expedite or reschedule completion of certain work phases. Preparation not possible for orderly change.	10%	2715.2	5%	1357.6
CONCURRENT OPERATIONS: Stacking of a contractor's own force. Effect of adding operation to already planned sequence of operations. Unless gradual and controlled implementation of additional operations made, factor will apply to all remaining and proposed contract hours.	5%	1357.6	15%	4072.8
DILUTION OF SUPERVISION: Applies to both basic contract and proposed change. Supervision must be diverted to (a) analyze and plan change, (b) stop and re-plan affected work, (c) take off, order and expedite material and equipment, (d) incorporate change into schedule, (e) instruct foremen and journeymen, (f) supervise work in progress, (g) revise punch lists, testing and start-up requirements	5%	1357.6	15%	4072.8
LEARNING CURVE: Period of orientation in order to become familiar with changed condition. If new men are added to project, effects more severe as they learn tool locations, work procedures, etc. Turnover of crew.	25%	6788.0		

MCAA FACTOR HEADING	IMPACT OF DESIGN DEFECTS Factor Used	Hours	IMPACT OF ACCELERATION Factor Used	Hours
ERRORS AND OMISSIONS: Increases in errors and omissions because changes usually performed on crash basis, out of sequence or cause dilution of supervision or any other negative factors.	3%	814.6	3%	814.6
RIPPLE: Changes in other trades' work affecting the work such as alteration of pour schedule. A solution is to request, at first job meeting, that all change notices / bulletins be sent to the Contract / Project Manager.	10%	2715.2		
Total Unproductive Hours	**19,821.0**		**11,675.4**	

(Exhs. A-49, A-66)

The Contract CHANGES – SUPPLEMENT (FOR CHANGES COSTING $500,000 OR LESS), VAAR 852.236-88(b) clause limits overhead and profit percentages to the party performing the work by placing ceilings on the rates for those mark-up items. In addition, only one fee, limited by percentages, is permitted for the prime contractor or upper tier subcontractor. The VAAR ceilings for overhead, profit and fees are as follows:

First $20,000:	10%
Next $30,000	7.5%
Remaining Balance	5%

In its claim presentation, PJD utilized the VAAR ceiling rates on mark-ups. Applying the stipulated labor rate and the VAAR mandated limitation on mark-ups to the combined total of 31,496 man-hours results in the following claimed

amount:

Impact Hours	31,496.00
Stipulated Rate	$ 37.39
Labor Costs	$1,177,635.00
Overhead Per VAAR	60,832.00
Subtotal	$1,238,467.00
Profit Per VAAR	$ 63,873.00
Subtotal	$1,302,340.00
General Liability Insurance (0.0038%)	$ 4,949.00
TOTAL	$1,307,289.00

The VAAR 852.236-88(a), CHANGES – SUPPLEMENT (FOR CHANGES COSTING OVER $500,000), clause places no ceiling on overhead or profit rates on changes with a price in excess of $500,000.

DISCUSSION

DELAY AND SUSPENSION OF WORK

DELAY ENTITLEMENT

GENERAL

We find ourselves in the rather unique situation of being asked to determine the number of days of additional Contract performance time to which PJD is entitled by referencing a CPM that both parties agree was properly constituted in its logic and assiduously and properly maintained throughout Contract performance. This circumstance is in sharp contrast to the usual problems we encounter in dealing with CPMs where warring "as built" schedules are constructed by the parties after the fact because the CPM was either never properly or timely prepared or was not updated in accordance with contract scheduling requirements.

That being said, it would seem our task, given the agreed validity of the original schedule and updates, should be a simple one, defined by the algorithmic certainty provided by the scheduling computer program that objectively determines the impact on Contract performance time of the activities at issue here. Despite both parties' excellent efforts in their trial presentations and briefs to explicate the intricacies of the CPM and the application of scheduling techniques according the Contract terms, our seemingly simple task, given the facts and the parties' arguments requires us to apply the evidence to what seems to be more the "art" of computerized, critical path method scheduling than an objective computer driven exercise providing the answer to the question of whether the Contract completion date should be extended.

Since there is no dispute concerning the validity of the CPM, these appeals present the circumstance where we have said in the past that we will let the parties "live or die" by analysis of the CPM to determine the number of days of additional contract performance time. ***Santa Fe, Inc.***, ASBCA No. 2168, 87-3 BCA ¶ 20,104; ***Coffey Construction Company, Inc.***, VABCA Nos. 3361, 3432, 3473, 93-2 BCA ¶ 25,788.

The disputes regarding the number of days of Contract time extension due PJD center on the proper CPM update to be used in performing the schedule analysis. Both parties properly acknowledge that the Contract NAS specification establishes a bright line test by which the Contract completion date will be established or adjusted. The part of the NAS critical to our determination here

states:

> The Contracting Officer's determination as to the total number of days of contract extension will be based upon the current computer-produced calendar-dated schedule for the time period in question and all other relevant information.

The question posed in these appeals, in terms of this NAS provisions is: What is the "time period in question?"

Determination of the "time period in question" is the bright line test to establish the number of days of delay, assuming that the cause of the schedule adjustment extending the completion time entitles the contractor to an equitable time adjustment under either the CHANGES or SOW clause. Establishing the time period in question determines the proper schedule update in which the fragnet containing the logic and durations of the change activities is to be inserted. The CPM computer program, and its algorithms, provides the answer of whether and by how many days the critical path of the project has been affected.

The VA takes the position that the "time period in question" is determined by use of certain implementation procedures established by the VA office responsible for overseeing approval and use of CPMs on major construction projects. The procedures are not in the Contract, and amount to no more than VA, internal CPM scheduling application policies. The Contract is clear; the "time period in question" means the date an action or activity occurred on which a time extension request is based. We therefore reject any notion that our deliberations here should be guided by the VA's non-Contractual, internal CPM scheduling policies.

CUT-OFF WALL (VABCA-5597)/CHILLER DELAY (VABCA-6061-75)

The parties agree that PJD is entitled to a 38-day Contract time extension for the Cut-Off Wall and 105-day time extension for delays related to installing the additional chiller supporting the PACS installation. We also note the parties' agreement to a 10-day time extension for asbestos abatement, an issue not within the scope of these appeals. Thus, the parties agree to a 153-day extension to the Contract completion time for the asbestos, Cut-Off Wall, and Chiller.

COMBINED DIRECTIVES (VABCA-5951-65)

The three issues to be resolved in our determination of whether PJD is entitled to a Contract time extension for delays related to the MRI, Cyclotron, and SPD installations are: 1) Should the changes for the MRI, Cyclotron and SPD be analyzed together or as separate changes for the purpose of a schedule analysis; 2) What is the time period in question when the changes occurred; and, 3) When could the installation work begin? The resolution of the second issue depends on the answer to Issue 1.

The evidence here convinces us that these revisions should be viewed as separate elements of a single change. Both the principal VA and PJD site representatives agree that the primary impact of the revisions was to the completion of the coordination drawings. Thus, we agree with PJD's position that the time period in question, for the purpose of schedule analysis under the Contract NAS provisions, is November 1995, the date the VA issued the Cyclotron foundation revision. The VA, resting its position on the VACO NAS implementation policy to perform schedule analyses using schedule updates current on the date a change is issued, propounds that Contract NAS provisions demand that the Combined Directives revisions be analyzed separately on the dates the various changes were issued. We find no support in the Contract NAS

language compelling schedule analyses to utilize the schedule update current when the formal, written change is issued by the CO to ascertain the schedule impact of a particular change. In the facts presented here, PJD has demonstrated that the true schedule impact of the Combined Directives revisions can be found only by analyzing the revisions together and that the appropriate update to use in that analysis is the update current when the initial revision was ordered. In fact, the VA representative closest to the work acknowledged the validity of PJD's approach. Since November 1995 is the "time period in question", the October 31, 1995 schedule update is the appropriate update to analyze whether PJD is entitled to a Contract time extension resulting from the Cyclotron, MRI and SPD revisions.

Having resolved the first two issues necessary for us to determine the number of days the Contract completion date should be extended, we turn to the issue of when the work could begin. This issue is critical because the date the work could begin is the restraint reflected in the fragnet that is input into the CPM computer program to determine if the project completion date is affected. Mr. McMasters, at direction of the VACO CPM Office, met with Mr. Bandura and agreed on February 3, 1997 as the date the installation work could begin and developed the fragnets for the Combined Directives revisions based on that agreement. Moreover, the February 3 date is used by the VA in the fragnet it issued with SD #1 granting 59 days of additional Contract performance time for one of the Cyclotron revisions, FCO-2U. For reasons neither explained nor otherwise supported by the VA, the VACO CPM analyst for the project, Mr. Barbaza elected, instead to use October 14, 1996 as the date installation work could begin in his Combined Directives schedule analyses. In the absence of any evidence presented to the contrary, we are persuaded PJD has proven that February 3, 1997 is the date work could begin and is the proper date to insert into

the Combined Directives fragnets. The agreement of the VA's designated representative to that date and the fragnet incorporating the February 3, 1997 date precludes the VA from now asserting a different construct for the fragnet.

Having resolved our three questions we can now determine the contract extension to which PJD is entitled. The VA has not contested the validity of the parallel program used by PJD in its schedule analyses. Consequently, based on the run of its CPM scheduling program, PJD's conclusion that the Multiple Directives revisions extended Contract completion time by 201 days (249 days minus the 48 days granted for the asbestos and Cut-Off Wall delays) is consistent with the Contract provisions relating to the way extensions to Contract completion time will be determined.

DELAY SUMMARY

Applying the method specified in the Contract to determine entitlement to additional Contract performance time and accounting for concurrencies in the additional performance time for the Chiller and Combined Directives delays, we conclude that PJD is entitled to an extension of Contract performance time to September 29, 1998, the date of substantial completion. This is a time extension of 260 calendar days from the original contract completion date of January 12, 1998. We note that the VA concedes that PJD is entitled to 247 days of additional performance time.

LIQUIDATED DAMAGES (VABCA-6483)

Finding that PJD is entitled to 260 days of additional Contract performance time resolves PJD's appeal of the VA's withholding of liquidated damages. Thus, PJD is entitled to payment of the $13,650 still withheld by the VA for liquidated damages.

SUSPENSION OF WORK

ENTITLEMENT

GENERAL

PJD must provide proof meeting a four-part test to establish its entitlement to recover an equitable adjustment under the SUSPENSION OF WORK clause. First there must be a delay of unreasonable length extending the Contract completion time. Second, the delay must have been proximately caused by the VA's action or inaction. Third, the delay resulted in some injury and fourth, there is no delay concurrent with the suspension that is the fault of PJD. FAR 52.212-12; ***Laburnum Construction Corp. v. United States***, 325 F.2d 451 (Ct. Cl. 1963); ***C & D Lumber***, VABCA Nos. 2877, et al., 91-1 BCA ¶ 23,544; ***J.D. Hedin Construction Co., Inc. v. United States***, 347 F.2d 235, 246-47 (Ct. Cl. 1965); ***Merritt-Chapman & Scott Corp. v. United States***, 528 F.2d 1392, 1397 (Ct. Cl. 1976); ***Dawson Construction Company, Inc.***, VABCA Nos. 3306, *et al.*, 93-3 BCA ¶ 26,177; ***Wunderlich Contracting Company v. United States***, 351 F.2d 956, 967 (Ct. Cl. 1965).

A formal written suspension order is not required. If the delay is the result of some Government act or failure to act, it may be considered a "constructive suspension" of work for purposes of the SOW clause. ***John A. Johnson & Sons, Inc. v. United States***, 180 Ct. Cl. 969, 984-85 (1967); ***Fire Security Systems, Inc.***, VABCA No. 3086, 91-2 BCA ¶ 23,743.

We need not explore the third and fourth tests for entitlement to recovery under the SOW clause here. The parties' stipulation on quantum resolves the injury issue and the VA has neither asserted nor provided evidence of any concurrent delay on the part of PJD.

PJD argues that a substantial portion of the 260 days of excusable delay to which it is entitled should be considered to be a suspension of work and that its

equitable adjustment should include its daily field overhead costs and its unabsorbed overhead costs computed pursuant to the ***Eichleay*** formula. This Board is continually confronted with resolving similar claims because of the Contract CHANGES – SUPPLEMENT clause published in the VAAR as an approved supplement to FAR CHANGES clause and used in all VA construction contracts.

The VA clause severely limits the recovery of both field and home office overhead and profit on contract changes of $500,000 or less (10% on the first $20,000 of a change, 7.5% on the next $30,000, 5% on any amount over $50,000). These limitations on overhead and profit have been consistently upheld by our controlling circuit which has also made it clear that the limitation applies to any equitable time adjustment to which a contractor is entitled under a VA contract's CHANGES provisions. As a result, contractors often find it to their advantage to attempt to characterize any delay as SOW time because, despite the fact that no profit can be recovered, the actual field and unabsorbed home office overhead costs often provide a larger financial recovery than an equitable adjustment under VA contract changes provisions. ***Santa Fe Engineers, Inc. v. United States***, 801 F.2d 379 (Fed. Cir. 1986); ***Reliance Insurance Company v. United States***, 931 F.2d 863 (Fed. Cir. 1991); ***Linda Newman Construction Co., et. al. v. United States***, 2000 WL 1704485 (Fed. Cl. Nov. 13, 2000).

Quite understandably, we have developed an extensive body of jurisprudence concerning the apportionment of contract extension time between SOW time and time considered to be part of an equitable adjustment under a contract's CHANGES provisions. That body of jurisprudence generally provides that any unreasonable delay to completion of a contract not actually involved with performing changed work is a SOW and permits recovery of actual overhead, including unabsorbed home office overhead, unlimited by the VA overhead limitations on contract changes. Where the delay is the result of

defective design or specifications, all time before the design or specification revisions are implemented and the changed work performed will be considered as "unreasonable" *per se*. ***Chaney and James Construction Co. v. United States***, 421 F.2d 728, 731 (1970); ***Essex Electro Engineers, Inc. v. Danzig***, 224 F.3d 1283 (Fed. Cir. 2000); ***Davho Company, Inc.,*** VABCA No. 1005, 72-2 BCA ¶ 9683; ***Miles Construction***, VABCA No. 1674, 84-1 BCA ¶ 16,697; ***Bromley Contracting Co., Inc.***, VABCA 1617, 84-3 BCA ¶ 17,704; ***Berrios Construction Company, Inc.***, VABCA No. 3152, 92-2 BCA ¶ 24,828; D***awson Construction Company, Inc.***, VABCA Nos. 3306-3310, 93-3 BCA ¶ 26,177.

PJD, citing ***Davho*** and ***Bromley***, argues correctly that any increase in contract completion time prior to performing changed work attributable to defective specifications or designs and any unreasonable pre-change work delay resulting from a differing site condition is SOW time. Such result is grounded in the concept that the Government cannot prevent, hinder or delay a contractor's performance. In ***Davho***, the VA issued a formal stop work order when it discovered that it had included incorrect wage rates and labor standards provisions in the contract. Work was suspended for five workdays until the VA corrected its error. In finding the contractor entitled to recover daily equipment rental costs and minor additional labor costs we said:

> Consideration of the rights and obligations of the Government under the Suspension of Work clause must begin, in our judgment, with recognition of the established general principle of law that in every contract it is an implied provision that neither party will prevent, hinder or delay the other party's performance, with breach of contract being the result if a party violates the legal prohibition. One of the two provisions that are included in the Suspension of Work clause now incorporated in Government contracts changes this to allow the Government to suspend or delay the contractor's

> work without committing a breach of contract. But so far as the contractor's right to compensation for such interference is concerned, another provision of the Suspension of Work clause independently provides that the contractor shall have a contractual right to be compensated for the delay costs if the suspension of work is for an unreasonable period of time. In this manner the contractor's right to receive reimbursement for the delay consequences of the Government's interference with the work is preserved and made a matter of contract right. It has been held that the Suspension of Work clause was intended to incorporate and go beyond the principle that it is an implied provision of any contract that neither party will do anything to prevent, hinder or delay performance by the other party.
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> * * * * * * * * *
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> Here the period of the suspension was relatively short, considered in terms of workdays, and there is nothing to indicate the Government was dilatory in making its determinations of what it wanted to do. However, it is obvious that, but for the error made by the Government in its drafting of the original contract, there would simply have been no occasion for it to have elected to suspend the work and there would have been no interruption at all. Clearly this was a case where the suspension of work derived from an error of the Government and the interruption of Appellant's work by the Government was for the sole purpose of determining what, if anything, should be done to rectify that error. (footnotes omitted)

Davho Company, Inc., 72-2 BCA ¶ 9683, *at* 166085-166086.

Bromley involved a circumstance where the VA, shortly after it issued the Notice to Proceed, informed the contractor that there would be substantial changes to the contract requirements because of other contracts then ongoing at the facility. The contractor deferred beginning of work or ordering materials until the VA was able to definitize the changes. Finding that the contractor's

actions were reasonable, we found the contractor entitled to recover under the SOW clause, citing the rationale expressed in ***Davho***, because of the VA's negligent preparation of Bromley's contract despite its knowledge that the other contracts at the facility would affect Bromley's work. We found this negligent contract preparation was equivalent to a defective design or specification and permitted recovery under the SOW clause.

PJD argues that the VA's actions in preparing the Contract specifications and designs and its Contract administration entitle it to recover under the SOW clause for the delays incurred prior to the performance of the changed work.

We have not been confronted with apportioning an equitable adjustment between CHANGES clause time and SOW time subsequent to the Federal Circuit's clarification of the circumstances under which unabsorbed home office overhead can be recovered in ***All State Boiler, Inc. v. West***, 146 F.3d 1368 (Fed. Cir. 1998). Close review of ***All State*** and its progeny convinces us that the Federal Circuit has now clearly established a secondary element to the SOW entitlement equation. That secondary element involves a determination of whether a contractor is entitled to recover unabsorbed home office overhead (***Eichleay***) costs as part of an equitable adjustment under the SOW clause.

The Court has made it clear that, in order to recover ***Eichleay*** costs, a contractor must meet two tests. First, a contractor must be on "standby"; in other words, the contractor's work on a project must be suspended for an uncertain duration due to a SOW and the contractor can be required to return to work immediately at any time. The second test that must be met is that the contractor was unable to take on other "replacement" work during the period from the beginning of the suspension to the end of the contract. ***All State Boiler, Inc. v. West***, 146 F.3d 1368, 1373; ***Melka Marine, Inc. v. United States***, 187 F.3d 1370 (Fed. Cir. 1999).

In ***Melka Marine***, the Federal Circuit upheld the Court of Federal Claims' determination that the contractor was not entitled to recover unabsorbed home office overhead costs for periods in which the Government had formally suspended work on a major part of the contract, but during which the contractor was able to continue working on other activities required by the contract stating:

> If work on the contract continues uninterrupted, albeit in a different order than originally planned, the contractor is not on standby.

Although neither the Court of Federal Claims nor the Federal Circuit in ***Melka Marine*** directly addressed whether the other work involved critical path work, it is clear that both courts understood the suspensions increased the Contract performance time. Moreover, a compensable suspension under the SUSPENSION OF WORK clause, by definition in the clause, is on the critical path. The Court's holding that, in a period where other substantial work could be undertaken during a suspension, there is no entitlement to ***Eichleay*** damages makes it clear that proof of being on standby is a necessary prerequisite to recovering ***Eichleay*** damages. In ***Sauer Incorporated*** the Court reiterated that failure to prove it was on standby precluded a contractor from recovering ***Eichleay*** damages. ***Melka Marine, Inc.***, 187 F.3d 1370 *at* 1376; ***Sauer Incorporated v. Danzig***, 224 F.3d 1340 (Fed. Cir. 2000).

The ASBCA, in ***Carousel Development, Inc*** , ASBCA No. 50719, 01-1 BCA ¶ 31,262, found the contractor entitled to an equitable adjustment under the SUSPENSION OF WORK clause because of the Government's delay in releasing a block of housing units for contract work. However, the ASBCA found no entitlement to ***Eichleay*** damages because the contractor was performing "substantial amounts of work" while awaiting release of the units. Similarly, in ***Gavosto Associates, Inc*** , PSBCA No. 4058, 01-1 BCA ¶ 31,389, the PSBCA cited

Melka Marine in denying a claim for ***Eichleay*** damages because the contractor did not prove it was on standby. The GSBCA, in ***Young Enterprises of Georgia, Inc*** , GSBCA No. 14437, 00-2 BCA ¶ 31,148 rejected a claim for ***Eichleay*** damages for a SOW stemming from defective drawings, in part, because of the contractor's failure to prove it was on standby.

As we explained in our decision in ***All State Boiler Work***, home office overhead expenses are indirect, general costs of a contractor's facilities and business operation that a contractor recovers by allocating the costs against its contract revenue. The Federal Circuit echoed this analysis upholding our ***All State Boiler Work*** decision. When a contractor is able to bill for contract work, the price of the work includes some portion allocable to pay home office overhead expenses. Thus, even though a contractor's work on one part of the contract may be suspended, if it can bill for other contract work it is not on "stand-by" and home office expenses are "absorbed." ***All State Boiler Work, Inc.,*** VABCA No. 4537, 95-2 BCA ¶ 27,831; *aff'd.*, ***West v. All State Boiler, Inc.,*** 146 F.3d 1368 (Fed. Cir. 1998).

That the Federal Circuit in ***All State*** and ***Melka*** were establishing this secondary entitlement test for SOW ***Eichleay*** damages is clear since, in its discussion, the Court clearly felt the need to further definitize the standby test it established in ***Altmayer v. Johnson,*** 79 F.3d 1129 (Fed. Cir. 1996). In ***Altmayer***, the Court defined standby in terms of the uncertainty of a suspension, the uncertainty preventing the reallocation of a contractor's resources to permit absorption of home office overhead. The Court recognized that entitlement to ***Eichleay*** damages would not be affected if a Contractor performed "minor" work during the suspension period. Even the ***Altmayer*** test allowing recovery of unabsorbed home office overhead, where a work is not fully suspended but the completion date is extended, does not categorically result in entitlement for

"extended" overhead simply because there was an SOW and completion time was extended. ***Safeco Credit v. United States,*** 44 Fed. Cl. 406 (1999)

By expressly requiring proof of standby beyond the ***Altmayer*** "uncertainty" test as a prerequisite to ***Eichleay*** entitlement in ***All State*** and ***Melka***, it is clear that simply showing an indeterminate suspension of work on the critical path is not enough to establish standby.

PJD has provided neither evidence nor allegation that it was on standby. PJD apparently relies on our pre-***All State Boiler*** precedent of *per se* entitlement to unabsorbed overhead for a SOW as the basis of entitlement. The evidence before us shows conclusively that PJD was able to progress other parts of the work during the time periods it alleges it was suspended. This fact is corroborated by PJD's billings, which were consistent until the date of substantial completion and show no appreciable diminution during the alleged suspension periods. Moreover, as is discussed *infra.*, PJD accelerated its performance with the consequent increase of billable contract work. The acceleration period was contemporaneous with most of the alleged periods of suspension and reflects PJD's reallocation of resources permitting it to pay its "home office" bill. Thus, we conclude that PJD was not on stand-by and, consequently, is not entitled to recover unabsorbed home office (***Eichleay)*** costs for any period of compensable suspension delay to which we find it entitled.

However, for any period for which we find PJD's Contract performance was suspended, PJD would be entitled to an equitable adjustment under the SOW clause for the direct costs attributable to the SOW. Since there is a direct "day to dollar" correlation of field overhead costs, daily field overhead expenses are included in the direct costs recoverable as part of an SOW equitable adjustment.

We will, therefore, analyze each of the delaying events in light of the discussion above. In addition, since we have found PJD entitled to additional performance time for the Cut-Off Wall, Combined Directives, and Chiller events and PJD acknowledges that these three events are the "controlling delays", our determination of what part of the additional performance time, if any, is compensable under the SOW clause will look only at these three events.

CUT-OFF WALL (VABCA-5597)

PJD argues that all of the 38 days of extension to the Contract completion time to which the parties have agreed should be characterized as SOW time. PJD bases this argument on its schedule analysis and the fact that the spread footing installed required less time to actually install than the time scheduled for constructing the cut-off wall. According to PJD, the SOW occurred between October 30 and November 20, 1995 (21 days) because of the VA's failure to approve its resubmittal and November 21 and December 11, 1995 (17 days), the time taken to redesign the spread footing.

The VA, on the other hand, contends that there is no SOW time resulting from the cut-off wall arguing that the delayed resubmittal approval did not delay PJD and that PJD has failed to prove that the spread footing redesign was on the critical path of the schedule. The VA maintains that all 38 days of the extension to Contract completion reflect time for the spread footing change beginning on December 11, 1995 because the relevant nodes in the November 30, 1995 CPM update show float time existing in the activities and thus were not on the critical path.

Both parties rely somewhat on the artificialities inherent in the NAS schedule analysis system to support their positions concerning whether or not PJD's work was suspended and they both conveniently ignore other parts of the

schedule and facts when they do not support their position. As we have found, the parties agreed to "live or die" by the NAS schedule analysis with regard to whether PJD was entitled to additional Contract performance time and we have found that PJD is entitled to 260 calendar days of additional performance time. The NAS schedule analysis does not, however, provide the allocation of the additional performance time between time spent to perform changed work and time that is attributable to a SOW. For that analysis, we must look to the facts of what occurred during the time periods in question.

The VA's delay in approving the resubmittal of the cut-off wall design did not delay PJD since PJD performed the Contract cut-off work despite the lack of an approved submittal. This action was not as rash as it may first appear since both parties understood that the design was fine and that it was rejected simply for the deficiency of not having a required signature. It appears that neither party had any particular sense of urgency in relation to proceeding with the critical path cut-off wall work with regard to getting the VA's formal approval returned. In the face of these facts, PJD's assertion that the schedule restraint in the NAS for submittal approval in the October 30, 1995 entitles it to an equitable adjustment under the SOW for 21 days until November 20, 1995 rings hollow and formalistic.

It is clear that the cut-off wall was on the critical path of the project and the unforeseen configuration of the foundation of Building 1 and the VA's redesign to a spread footing did suspend PJD's work. PJD had to cease drilling the auger piles for the cut-off wall on November 7, 1995 because of the unforseen foundation problem; PJD's cut-off wall redesign was approved December 6, 1995. Consequently, that time was a 29-day SOW. Recommencing the work, PJD once again had to cease its performance due to the unexpected cobble layer on December 7 resulting in the VA's December 11, 1995 direction to abandon the

cut-off wall in favor of a spread footing. The 4 days period from December 7 to December 11 is also a SOW. We find, therefore, PJD entitled to recover its and its subcontractors' (including the costs of its steel erection subcontractor, A-1, Inc.) actual field overhead for 33 days due to the Cut-Off Wall delays. Since the Cut-Off Wall activities resulted in a Contract change, the costs incurred by PJD for its CPM contractor are also recoverable.

COMBINED DIRECTIVES (VABCA-5951-5965)

PJD asserts that it is entitled to an equitable adjustment under the SOW clause for 180 of the 201 days of delay to which we have found it to be entitled for the Cyclotron, MRI and SPD changes. PJD reaches this position on the basis that the actual changed work relating to the Cyclotron, MRI and SPD took 21 days to complete.

PJD bases its claim of entitlement to SOW time for the Combined Directives relating to the Cyclotron, MRI and SPD on the VA's failure to follow its internal policies regarding timely equipment selection for hospital construction projects and its failure to efficiently implement redesign of the project to reflect the equipment selections made. Equating these alleged VA transgressions to the same type of problems in ***Davho*** and ***Bromley***, for which we had found the VA liable under the SOW clause, PJD urges us to treat all 180 days of the delay not involved with performing the changed work as SOW time. ***Davho Company, Inc.,*** 72-2 BCA ¶ 9683; ***Bromley Contracting Co., Inc.***, 84-3 BCA ¶ 17,704

While it is clear that the Combined Directives delay would have been minimized had the VA been more efficient in its equipment decision making and decision implementation, we are not prepared to make Government efficiency in

its decision making the test of whether a contractor is entitled to an equitable adjustment under the SOW clause.

The Contract provides the VA the right to make changes and obligates it to reimburse PJD, in time or money, for the impact of those changes. Whether or not the VA's determination to change the Contract is either timely or efficiently made cannot determine, in itself, the parameters of the amount of the equitable adjustment to be paid for that change. Although it appears that the VA was considering at least some of the equipment changes involved in the Combined Directives claim prior to PJD's bid on the Contract, this case is distinguishable from ***Davho*** and ***Bromley*** because the circumstances in those two cases involved essentially administrative errors by the VA that actually stopped work very early in Contract performance. Here, the VA was exercising its right, under the Contract, to change the type of equipment it would install at VAMC Ann Arbor. Although it must pay the additional costs of exercising that right, how the VA decided to make the change, the timeliness of the decision or the manner in which it effects the change cannot *per se* determine how an equitable adjustment will be computed.

The parties agree that the primary impact of the Combined Directives was that it necessitated the complete revision of the coordination drawings. From the evidence in the record, PJD had essentially completed its one year coordination drawing effort in August 1996; the various changes and directives involved with the Combined Directives claim began in earnest with the MRI changes on August 6, 1996. The revision of the coordination drawings was completed on January 12, 1997, making the revision of the coordination drawings to accommodate the multiple directives changes a 164-day effort. The VA paid nearly $500,000 for the Cyclotron, MRI and SPD changes. The bulk of this amount was for the effort of PJD and its subcontractors to revise the coordination

drawings, since both parties agree that the actual changed work was minor. The preparation of coordination drawings was part of the Contract work required of PJD. Thus, PJD was performing changed work in that 164-day time period for which it received an equitable adjustment under the CHANGES clause. When the 21 days required to perform the physical, changed work for the Combined Directives is added to the 164 days of coordination drawing revision, 185 days of the 201 day Combined Directives delay is attributable to performing changed work. Thus, PJD, and the affected subcontractors, are entitled to an equitable adjustment under the SOW clause for Combined Directives for 16 days of suspension. In addition, PJD is entitled to recover the costs of its schedule consultant relating to the Combined Directives schedule analysis.

CHILLER (VABCA-6061-6075)

The VA has conceded that the installation of a new chiller as part of the VA's change from a conventional x-ray installation to a PACS system entitled PJD to 105 days of additional Contract performance time. Citing the VA's dilatory and less than stellar efforts in providing necessary design information for the installation of the additional chiller, PJD reiterates the argument made for the Combined Directives and characterizes all of the 105 days as SOW time.

For the most part, the Chiller delay is concurrent with the Combined Directives delay that PJD characterizes as "controlling" until mid-September 1998, when the Chiller becomes the "controlling" delay. PJD recognizes that and agrees that the total amount of Chiller delay for which they are entitled to an equitable adjustment will be reduced if entitlement to the Combined Directives delay is recognized. For the three "controlling" delays preceding the Chiller issue we have recognized 249 days of delay. Thus, we are evaluating the circumstances relating to the Chiller to determine if PJD is entitled to an

equitable adjustment for 11 additional days of extended contract performance time under the SOW clause.

We recognize that the time to perform the actual work of installing the Chiller was 10 days. However, the story of the VA's disjointed efforts to provide the information necessary to allow PJD to order materials leads us to conclude that the entire 11 days should be compensable under the SOW clause. Were we to evaluate the Chiller issue independent of the concurrent multiple directives delay, it is clear that a substantial amount of the agreed to 105 day delay would be considered as an SOW under our precedent. But for the SOW, the Chiller work would have been finished well before the combined directive delay was resolved. Thus, PJD is entitled to compensation for the Chiller delay of 11 days under the SOW clause. In addition, PJD is entitled to recover the costs of its schedule consultant attributed to the CPM analysis of the Chiller delay.

UNDERGROUND CONDUIT (VABCA-5836-5850)
RADIOLOGY AND CARDIOLOGY (VABCA-6017-6031)

As noted in the Findings of Facts above, the claimed delays for Underground Conduit and Radiology and Cardiology are concurrent with the SOW and changed work delays associated with the Cut-Off Wall, Combined Directives and Chiller. Consequently, since the total equitable adjustment for delay to which PJD is entitled is delimited under those three changes, there is no additional delay equitable adjustment due for the concurrent Underground Conduit or Radiology and Cardiology events. However, we find PJD entitled to recover the costs it incurred for the services of its schedule analysis consultant for these two events as provided in the Contract NAS provisions since the schedule analyses were performed in compliance with the Contract and PJD had to pursue them due to the VA's unwillingness to recognize the appropriate amount of delay otherwise due it under the NAS provisions.

QUANTUM

PJD's monetary SOW claims, as defined in its COMPLAINTS, aggregate to approximately $6.3 million. However, this amount derives from the number of days of delay to which PJD claims entitlement for each individual delaying event. PJD acknowledges that there are concurrencies in the delays claimed for these events and that the net SOW claim will be less than the total of the amounts in its COMPLAINTS. Using the parties' stipulated amounts for field and home office overhead for the number of days of delay we recognize here, PJD's aggregate, actual SOW monetary claim amounts to $2,859,658.

In determining any amounts due PJD, we will round numbers to nearest dollar.

CUT-OFF WALL (VABCA-5597)

We have found PJD entitled to an equitable adjustment for 33 days of field overhead under the SOW clause. The following table reflects the stipulated field overhead rates.

CONTRACTOR	DAYS	DAILY FIELD OVERHEAD RATE	TOTAL
P.J. Dick	33	$1,586	$52,338
Robert Irsay	33	$1,283	$42,339
Kent Electric	33	$1,683	$55,539
Total			$150,116

PJD also claims $8,600 for the costs of its steel erector, A-1 Inc to which we have found PJD to be entitled. We find the costs to be reasonable and the VA has questioned neither the incurrence nor reasonableness of the costs. Since these costs are direct costs of the Contract change to the spread footing, not the SOW,

PJD is entitled to apply overhead and profit rates, in accordance with the Contract SUPPLEMENTAL CHANGES clause to them as follows:

A-1 Costs	$ 8,600
PJD Overhead @10%	860
Subtotal	9,460
PJD Profit @ 10%	946
Total	10,406

The parties have stipulated that PJD is entitled to recover additional liability insurance costs at a rate of .38% of any equitable adjustment to which we find PJD entitled. PJD's equitable adjustment for the Cut-Off Wall totals $160,522; at the stipulated rate PJD is entitled to $610 (we will round to nearest whole dollar in any quantum calculation) for additional liability costs. Thus, PJD's total equitable adjustment for the Cut-Off Wall is $161,132 plus payment of interest under the CONTRACT DISPUTES ACT from March 18, 1998; the date the CO received the claim for the Cut-Off Wall.

COMBINED DIRECTIVES (VABCA-5951-5965)

PJD is entitled to recover for 16 days of field overhead under the SOW clause for the Combined Directives delay. The following table reflects the

stipulated field overhead rates and total field overhead due.

CONTRACTOR	DAYS	DAILY FIELD OVERHEAD RATE	TOTAL
P.J. Dick	16	$2,251	$ 36,016
Robert Irsay	16	$1,283	$ 20,528
Kent Electric	16	$1,683	$ 26,928
EMI	16	$ 824	$ 13,184
Laso	16	$ 369	$ 5,904
Total			$102,560

We have found PJD entitled to recover the $3,167 cost for the multiple directives schedule analyses. Since these costs are direct costs, PJD is entitled to apply overhead and profit rates, in accordance with the Contract SUPPLEMENTAL CHANGES clause to them as follows:

ACT Costs	$ 3,167
PJD Overhead @10%	317
Subtotal	3,484
PJD Profit @ 10%	348
Total	3,832

Applying the stipulated .38% rate for liability insurance to the Combined Directives equitable adjustment of $106,392, PJD is entitled to an additional $404. This makes PJD's total equitable adjustment for the Combined Directives $106,796 plus payment of interest under the CONTRACT DISPUTES ACT from March 24, 1999; the date the CO received the claim for the multiple directives.

CHILLER (VABCA-6061-6075)

PJD is entitled 11 days of field overhead for the suspension of work related to the Chiller change as follows:

CONTRACTOR	DAYS	DAILY FIELD OVERHEAD RATE	TOTAL
P.J. Dick	11	$2,251	$24,761
Robert Irsay	11	$1,283	$14,113
Kent Electric	11	$1,683	$18,513
EMI	11	$ 824	$ 9,064
Laso	11	$ 369	$ 4,059
Total			$70,510

Applying the stipulated .38% rate for liability insurance to the total multiple directives equitable adjustment of $70,510, PJD is entitled to an additional $268. This makes PJD's total equitable adjustment for the multiple directives $70,778 plus payment of interest under the CONTRACT DISPUTES ACT from July 6, 1999, the date the CO received the Chiller claim.

OTHER COSTS

PJD is also entitled to the direct costs of the amounts it expended for schedule analyses for the Underground Conduit and Radiology and Cardiology events, $581 and $609 respectively. PJD is also entitled to its profit and overhead

on the direct costs as follows:

Underground Conduit		Radiology / Cardiology	
ACT Costs	$ 581	ACT Costs	$ 609
PJD Overhead @10%	58	PJD Overhead @10%	61
Subtotal	639	Subtotal	639
PJD Profit @ 10%	64	PJD Profit @ 10%	67
Total	703	Total	737
Liability Insurance	3	Liability Insurance	3
Grand Total	706	Grand Total	740

In addition, PJD is entitled to payment of interest on the amount under the CONTRACT DISPUTES ACT for Underground Conduit from July 2, 1999 and for Cardiology and Radiology from July 6, 1999; the respective dates the CO received the claims for the Underground Conduits and Cardiology and Radiology delays.

ELECTRICAL LABOR INEFFICIENCY (VABCA-6080-6082)

ENTITLEMENT

GENERAL

PJD argues that deficiencies in the electrical drawings and the VA's acceleration of work caused KES' lower than planned labor productivity for the installation of branch circuits. Of course, PJD is obligated to prove, by a preponderance of the evidence, that the electrical drawings were deficient and that electrical work at VAMC Ann Arbor was accelerated. If successful in this endeavor, PJD must then prove that the deficient drawings and acceleration caused KES' labor installing branch circuits to be less efficient than planned. Thus, our inquiry will be to determine whether the evidence establishes that KES' labor productivity was disrupted due to a VA-caused change in working

conditions. ***The Clark Construction Group, Inc.***, VABCA-5674, 00-1 BCA ¶ 30,870; ***Centex Bateson Construction Company, Inc.***, VABCA Nos. 4613, *et. al.*, 99-1 BCA ¶ 30,153; ***Dawson Construction Company, Inc.***, VABCA Nos. 3306-08, 3309-10, 93-3 BCA ¶ 26,177, *aff'd sub nom*, ***Dawson Construction Company v. Brown***, 34 F.3d 1080 (Fed. Cir. 1994); ***Triple "A" South,*** ASBCA No. 46866, 94-3 BCA ¶ 27,194; ***Bechtel National, Inc.***, NASA BCA No. 1186-7, 90-1 BCA ¶ 22,549.

ACCELERATION

The VA did not directly order PJD to accelerate its performance of the Contract; thus, PJD argues that the VA constructively accelerated the work. In order to establish entitlement to an equitable adjustment based on a constructive acceleration, PJD has to prove that: 1) There is excusable delay in Contract completion; 2) It informed the VA of the delay; 3) The actions of the VA can be construed as an acceleration order; 4) It placed the VA on notice that it was being ordered to accelerate; and, 5) It incurred additional costs caused by the acceleration. ***Norair Engineering Corp. v. United States***, 666 F.2d 546 (Ct. Cl. 1981); ***Danac, Inc.***, ASBCA No. 33,394, 97-2 BCA ¶ 29,184; ***Green International, Inc.***, ENGBCA Nos. 5706, *et. al.*, 98-1 BCA ¶ 29,684; ***Riennes Construction Co.,*** IBCA Nos. 3572-96, *et. al.*, 98-2 BCA ¶ 29,821.

The evidence in the record and our prior discussion of PJD's entitlement to additional Contract completion time make it clear that PJD has met the first four of the above elements of proof necessary to entitle it to an equitable adjustment based on acceleration. PJD, early on, notified the VA that it believed it was being accelerated because of the VA's persistent refusal to extend the Contract completion date, notwithstanding the delay it had caused. The VA, when it became clear that the project would not be completed on the date it recognized as the completion date, communicated its misgivings to PJD and started

withholding retainage. Despite the VA's continued protestations to PJD during Contract performance that it was not directing acceleration of the work, we find that the VA made it clear that it expected PJD to complete the Contract on the date stated and would assess the Contractual penalties available to it were PJD not to complete the project on time. The VA SRE acknowledged that, in the face of the VA position, PJD undertook steps to accelerate its work. The VA constructively accelerated PJD's performance.

We are left therefore with determining whether PJD has sufficiently proven whether the VA's acceleration of the work caused it to incur additional costs in the installation of electrical branch circuits.

PJD claims that a substantial portion of the 160% overrun of KES' budgeted labor hours for branch circuit work is attributable to inefficiencies caused by the VA. PJD has proven, and the VA does not question, that KES' estimate that it would take 27,152.4 man-hours to install branch circuit work was reasonable. The evidence is also clear that this labor hour budget was predicated on the branch circuit work being installed sequentially starting in the basement and moving up the building floor-by-floor. KES' planned installation method envisioned using three task-dedicated crews performing circuit rough-in, pulling the wire for the circuits and a crew installing fixtures and devices respectively. This sequential methodology would permit each crew to become proficient and efficient in its task.

The VA's acceleration of the work resulted in PJD directing KES to work on floors concurrently in an attempt to make up the time the VA had delayed completion. As a result, KES was forced to assign multiple crews on each floor that were required to perform all aspects of branch circuit installation. We find Mr. Apprill's assessment, echoing the conclusions of KES' on-site project management, that this caused labor inefficiencies because it made KES' crew

training efforts more difficult and prevented it from realizing the learning curve benefits of sequential circuit installation by task dedicated crews to be persuasive. In addition, having its crews working on all floors concurrently affected the ability of KES to properly supervise the work, a factor that also contributed to labor inefficiency.

The VA's acceleration of the work changed the working conditions under which KES reasonably expected to install the branch circuits. This change in working conditions reduced KES' branch circuit installation productivity and increased the labor costs for the work. Consequently, PJD is entitled to an equitable adjustment for the additional labor costs for branch circuit installation caused by the VA's acceleration of the work.

ELECTRICAL DESIGN DEFICIENCIES

That the Contract electrical drawings and electrical requirements provided by the VA for the installation of equipment in deferred work areas were, to a great extent, erroneous, unclear and incomplete is conceded by the VA. This conclusion is unassailable based on the evidence in the record. It is also clear that KES expended extraordinary efforts to translate the designs into the working drawings necessary for its field forces to install the work. The VA paid PJD for these efforts.

PJD asserts that the electrical design problems also contributed to the overrun in the labor hours expended for branch circuit installation. The KES on-site project management convincingly detail the problems experienced progressing the branch circuit work. KES crew foremen and project supervision personnel were continually forced to leave work undone, or take time away from a crew while attempting to get questions resolved. In addition, the evidence is also established that the piecemeal and uncoordinated manner in which the

Contract electrical requirements were effected required an excessive amount of KES' foremen and project supervision time in inspections, particularly since the VA was unable to keep up with the "on-the-fly" manner in which the Contract electrical requirements were defined. This resulted in the VA often inspecting work based on outdated drawings and sketches, a situation that required KES supervisors to leave their crews to compile relevant information to prove to the inspector what the requirements actually were.

In addition to the diversion of KES supervision, PJD asserts that the constant effort to define the work in the face of the electrical design problems demoralized KES' work force. Mr. Botbyl and Mr. Walz, KES' on-site project supervisors, concluded that the frustration of being routinely reassigned to work in other areas during a work-day because of design questions and the fluid nature of the drawings created a situation where it often was not clear exactly what work was to be done. This condition adversely affected the attitude of its employees and the efficiency of its crews. Mr. Apprill, who we find to be both a credible and knowledgeable expert, made much the same conclusion. We conclude therefore, based on this record, that problems with the electrical designs reduced KES' branch circuit labor productivity.

OTHER ISSUES

The VA has not directly rebutted any of PJD's assertions of VA-caused productivity losses in branch circuit installation. The VA does, however, posit other causes of KES' increased labor costs for which it would not be liable. These causes (KES' inexperience in large projects, KES' labor management, building access and adverse weather) were essentially presented as conclusions by Mr. Lindsey, the VA's efficiency expert. Mr. Lindsey, however, did not support his conclusions with either evidence from the record or other objective data in

any organized manner. While we question neither Mr. Lindsey's expertise nor his credibility, simple conclusions by an expert, unsupported by reference to the record, are not evidence.

Moreover, PJD effectively rebutted Mr. Lindsey's conclusion in each instance and, in fact, Mr. Lindsey essentially retreated from his conclusions in cross-examination and agreed with PJD on the effect of the acceleration and design problems on KES' labor productivity. Thus, we conclude that there is no basis in fact supporting a finding that the four alleged causes cited by the VA rather than the acceleration and design problem, either changed the working conditions reasonably anticipated by PJD and KES or caused the branch circuit installation labor overrun.

QUANTUM

MEASURED MILE ANALYSIS

We, as most other courts and boards, recognize that quantifying the loss of labor productivity is difficult and that the determination of the dollar amount of damages for labor inefficiency with exactitude is essentially impossible. In recognizing this fact, we expect that measurement of the amount of inefficiency would usually be supported by expert testimony. The use of a "measured mile" analysis developed by a qualified expert is recognized as the most reliable, though not exact, methodology to quantify labor inefficiency. ***Clark Concrete Contactors, Inc.***, GSBCA No. 14340, 99-1 BCA ¶ 30,280; ***W. G. Yates & Sons Construction Company***, ASBCA No. 48,398, 01-2 BCA ¶ 31,428; ***U.S. Industries, Inc. v. Blake Construction Co.***, 671 F.2d. 539 (D.C. Cir. 1982); ***Luria Bothers & Co. v. United States***, 369 F.2d. 701 (Ct. Cl. 1966).

A measured mile (or good period versus bad period) analysis compares the actual labor costs or labor productivity of performing work during a time

period in which the work was not impacted by the actions causing labor inefficiency to the actual labor costs or actual productivity rate for performing work during a period that was so impacted. Such an analysis generally presumes that the labor costs or productivity rates being compared are for the same work and, ideally, results in a standard (the actual, unimpacted productivity of a contractor's labor) against which the effect of the Government-caused change to working conditions can be measured. ***Clark Concrete Contactors, Inc.***, 99-1 BCA ¶ 30,280; ***Danac, Inc.***, ASBCA No. 33394, 97-2 BCA ¶ 29,184.

There was no period during Contract performance in which KES' installation of branch circuits was not impacted by the acceleration or electrical design deficiencies. Because of this, Mr. Apprill developed a productivity standard for unimpacted branch circuit work by analyzing KES' productivity performance on feeder circuit work. He did this after review of the project requirements and documentation. Based on this review, he determined that feeder circuit work was impacted neither by the acceleration nor design problems experienced in the branch circuitry and that KES' feeder circuit installation essentially proceeded as planned and budgeted. As we have found, KES' bid / budget for Contract electrical work was reasonable and the evidence supports a finding that the performance of work by KES' labor was what a reasonably competent electrical subcontractor working with normal efficiency could expect. Thus, by comparing KES' budgeted labor costs for feeder circuit installation to the actual cost of the installation, Mr. Apprill derived an "efficiency factor" of 1.147 representing KES' experienced productivity rate for feeder circuit installation. Mr. Apprill applied this efficiency factor, to KES' budgeted labor hours for branch circuit installation in order to establish a

realistic budget for branch circuit installation based on KES' productivity experience in a period not impacted by the acceleration or design problems. Mr. Apprill then subtracted this "adjusted" branch circuit labor hour budget of 31,144 hours from the 70,498 labor hours actually incurred for branch circuits installation to reach the conclusion that 39,354 of labor hours expended by KES are attributable to the VA-caused inefficiency.

Mr. Lindsey, the VA's expert, expressed a general objection to Mr. Apprill's measured mile methodology on the basis that feeder circuit work is not the same as branch work. As more specifically argued by the VA, the primary objection to PJD's analysis is that measured mile methodology requires the comparison of good and bad period productivity performance of one crew performing the same work and that, since the feeder and branch circuit work involved different crews, PJD's measured mile analysis is fatally flawed.

We find no basis to conclude that either the productivity of the same crew or that exactly the same work is a prerequisite for a valid measured mile analysis to establish the amount loss of productivity. We agree with the GSA Board of Contract Appeals when it held in ***Clark Concrete Contactors, Inc.***, 99-1 BCA ¶ 30,280:

> [The Government] is correct in asserting that the work performed during the periods compared by [the Contractor] was not identical in each period. We would be surprised to learn that work performed in periods being compared is ever identical on a construction project, however. And it need not be; the ascertainment of damages for labor inefficiency is not susceptible to absolute exactness. (citation omitted) We will accept a comparison if it is between kinds of work which are reasonably alike, such that the approximations it involves will be meaningful.

On balance, we find that Mr. Apprill's approach to quantification of the VA-caused productivity loss is reasonable and valid. We recognize that feeder circuit work generally involves installation of larger sized electrical conduit and wire in longer, straighter conduit runs. However, KES' labor for feeder circuit installation was drawn from the same labor pool as that used for branch circuit work, the skills, knowledge and effort involved in feeder circuit work are reasonably similar enough to branch circuit work to permit a valid comparison and the work was performed in the working conditions planned and budgeted by KES. Consequently, we find PJD's measured mile analysis to be a reasonable approximation of the effect of the VA-caused inefficiencies under the ***Clark Concrete Contactors*** standard.

PJD's analysis uses the branch circuit budgeted labor hours as adjusted for changed work. PJD has entered into SAs for the changed electrical work reflecting its agreement with the VA on the direct labor costs of the work. These mutually agreed direct labor costs reflect the actual hours to perform the work under the impacted conditions. Consequently, for the purposes of a valid measured mile analysis, we find the productivity calculation should be in terms of the original branch circuit labor budget. There were 2,831 branch circuit change order hours and KES' original branch circuit budget was 24,321 hours. Applying the feeder circuit experienced productivity rate to the originally budgeted branch circuit hours results in an adjusted base budget 27,896 labor hours. To this we add the 2,831 change order hours, a total of 30,727 hours. This figure represents the reasonable estimate of the number of labor hours necessary to install the branch circuits. KES actually expended 70,498 hours to install the branch circuits. From this amount, we subtract the change order hours of 2,831 resulting in 67,667 hours since the change order hours represent the mutual agreement of the parties of the number of hours necessary to install changed

work. Subtracting the 30,727 hours KES' reasonably should have expended for branch circuit installation from 67,667 hours to install base Contract work results in a total of 36,940 hours. This total represents a reasonable approximation of the number of additional hours of labor caused by the acceleration and electrical design deficiencies.

Using the stipulated labor rate of $37.39 per hour, the following total equitable adjustment for the VA-caused change in working conditions is represented by the following computation:

Impact Hours	36,940.00
Stipulated Rate	$ 37.39
Labor Costs	$1,381,187.00
Overhead Per VAAR	71,009.00
Subtotal	$1,452,196.00
Profit Per VAAR	$ 74,560.00
Subtotal	$1,526,756.00
General Liability Insurance (0.0038%)	$ 5,802.00
TOTAL	$1,532,558.00

We note that PJD has presented its claim for inefficiency applying the VAAR overhead and profit limitations. However, these limitations apply to changes costing $500,000 or less. An equitable adjustment for a change in excess of $500,000 would properly include overhead and profit at the actual rate(s) not limited by the VAAR. The acceleration and electrical design defects would each be considered a constructive change and one or both of them are likely in excess of $500,000. However, because PJD has provided no evidence of its actual overhead rates, the allocation of the amount of inefficiency attributable to each of the constructive changes, or profit rates, we are constrained to apply the VAAR overhead limitations as claimed.

DECISION

For the foregoing reasons, the Appeals of P. J. Dick Incorporated under Contract No. V101CC0111 are **SUSTAINED** in part and **Denied** in part and P. J. Dick Incorporated is entitled to a total judgment of $1,886,360 plus interest pursuant to the CONTRACT DISPUTES ACT (CDA), as set forth below.

VABCA-5597 CUT-OFF WALL

The appeal in VABCA-5597 is **SUSTAINED** for which P. J. Dick Incorporated is entitled to a judgment of $161,132 plus interest from March 18, 1998, the date the Contracting Officer received the claim giving rise to this appeal.

VABCA-5836-5850 Underground Conduit

The appeals in VABCA-5836-5848 and are **DENIED**. The appeals in VABCA-5849 and 5850 are **SUSTAINED** for which P. J. Dick Incorporated is entitled to a judgment of $706 plus interest from July 2, 1999, the date the Contracting Officer received the claims giving rise to these appeals.

VABCA-6017-6031 Radiology And Cardiology

The appeals in VABCA-6017-6029 are **DENIED**. The appeals in VABCA-6030-6031 are **SUSTAINED** for which P. J. Dick Incorporated is entitled to a judgment of $740 plus interest from July 6, 1999, the date the Contracting Officer received the claims giving rise to these appeals.

VABCA-5951-5965 Combined Directives

The appeals in VABCA-5959, 5961, 5963 are **DENIED.** The appeals in VABCA-5951-5958, 5960, 5962, 5964, 5965 are **SUSTAINED** for which P. J. Dick Incorporated is entitled to a judgment of $106,796 plus interest from March 24, 1999, the date the Contracting Officer received the claim giving rise to these appeals.

VABCA-6061-6075 CHILLER

The appeals in VABCA-6063, 6065, 6067, 6069, 6071 and 6073 are **DENIED.** The appeals in VABCA-6061, 6062, 6064, 6066, 6068, 6070, 6072, 6074 and 6075 are **SUSTAINED** for which P. J. Dick Incorporated is entitled to a judgment of $70,778 plus interest from July 2, 1999, the date the Contracting Officer received the claim giving rise to these appeals.

VABCA-6080-6082 Electrical Labor Inefficiency

The appeals in VABCA-6080-6082 are **SUSTAINED** for which P. J. Dick Incorporated is entitled to a judgment of $1,532,558 plus interest from July 30, 1999, the date the Contracting Officer received the claim giving rise to these appeals.

VABCA-6483 Liquidated Damages

The appeal in VABCA-6483 is **SUSTAINED.** P. J. Dick Incorporated is entitled to payment of $13,650 of funds withheld by the VA from Contract payments for liquidated damages and not subsequently paid plus interest from August 22, 2000, the date the Contracting Officer received the claim giving rise to this appeal. In addition, PJD is entitled to CDA interest on the $110,250 of liquidated damages withheld from August 22, 2000 until the date this amount was paid.

DATE: **September 27, 2001**

_____
RICHARD W. KREMPASKY
Administrative Judge
Panel Chairman

We Concur:

_____
MORRIS PULLARA, JR.
Administrative Judge

_____
WILLIAM E. THOMAS, JR.
Administrative Judge