

COMMONWEALTH OF PENNSYLVANIA

BALFOUR BEATTY CONSTRUCTION, INC. : BEFORE THE BOARD OF CLAIMS  
: VS. :  
: COMMONWEALTH OF PENNSYLVANIA, :  
DEPARTMENT OF TRANSPORTATION : DOCKET NO. 2553

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**FINDINGS OF FACT**

**A. Parties and Project Description**

1. The Plaintiff is Balfour Beatty Construction, Inc. (“Balfour Beatty”). (Complaint para 2).
2. The Defendant is Commonwealth of Pennsylvania, Department of Transportation (“PennDOT”). (Complaint para 3)
3. Balfour Beatty and PennDOT entered into Contract No. 042208 (“Contract”) dated December 30, 1994 for the construction of the State Route, (“SR”) 81, Section MA1 (“Project”) in Lackawanna County Pennsylvania. (N.T. 517; Ex. D-1)
4. The Publication 408 Specifications (1990 Edition) are a part of Balfour Beatty’s Contract with PennDOT for this Project. (N.T. 210, 517; Ex. D-2)
5. The Project required the construction of thirteen (13) major structures including five (5) concrete girder structures, six (6) steel girder structures and one (1) tunnel like rigid frame. In addition there were approximately eighteen (18) wall structures, nine (9) ramps and temporary roads included in this Contract. (N.T. 74-75; Ex. P-39)
6. The Project also included the expansion and reconstruction of an existing highway facility including: treatment of existing mine voids, highway lighting and signing, construction of new plain cement concrete pavement and widening of existing roadways, shoulders, guide rail, drainage, temporary roadways, removal of municipal waste, construction of high mast lighting and four (4) noise walls and reconstruction of an interchange. (Ex. D-1, pg. 15)
7. The Project required an estimated 713,000 plus cubic yards (cy) of Class 1 Excavation, Item 0203-0001 (dirt and rock). (Ex. D-3, sheet 43 of 289)
8. The actual volume of Class 1 Excavation was approximately 808,000 cy. (N.T. 76-77)

9. Urban Engineers, Inc. (“Urban”) was the consulting firm that PennDOT hired to perform construction management services for the Project. (N.T. 583, 623)

10. Key Balfour Beatty Project personnel were: Raymond W. Jaynes, Project Manager and Colin Hetherington, Business Manager. (N.T. 63, 370-371)

11. Key PennDOT Project personnel were: Richard Cochrane, Project Manager, Construction Services for the Lakawanna Valley Industrial Highway (LVIH), Joe Compton, Inspector-in-Charge, and David Skrocki, Assistant District Engineer - Construction. (N.T. 206-207, 209, 231)

12. Urban’s Project Manager for the Project was Stephen Barlow. (N.T. 622)

### **B. Early Delays and Acceleration Agreement**

13. There were four surrounding contractors who had also started work near the Project. In 1995, when Balfour Beatty initiated its work, the work of other contractors impacted Balfour Beatty’s schedule causing a lack of access to the area of Bridge 5N. This delayed the Project considerably. (N.T. 77-78, 194)

14. In the first half of 1996, Balfour Beatty submitted a revised baseline schedule. PennDOT and Balfour Beatty reached an agreement to accelerate the work to overcome the impacts caused by the lack of access to Bridge 5N and to complete the Project by May 19, 1999 for a negotiated sum of money. (N.T. 77-78; 142)

15. Before the Acceleration Agreement, Balfour Beatty expected to have 3 major pieces of equipment on site which included 1 crawler crane, 1 large truck crane and 1 hydraulic crane along with back dumps and 1 grader. After the Acceleration Agreement, Balfour Beatty added another crawler crane, additional back dumps, another truck crane, another hydraulic crane and an extra loader. (N.T. 79)

16. Prior to the Acceleration Agreement, Balfour Beatty anticipated having approximately 60 - 70 hourly workers on site. After the Acceleration Agreement, Balfour Beatty had more than 100 hourly workers on site. (N.T. 78-79)

17. The Critical Path Method (CPM) update HU-41, submitted by Balfour Beatty prior to the “Stop Blasting” directive, shows Balfour Beatty performing activity “Excavate embankment 81N and Station 442 to 20N.” (N.T. 142-143)

18. Mr. Jaynes established that in late January and early February, Balfour Beatty was working double shifts at Station 442 to 20N on excavation. Balfour Beatty wanted to maintain the schedule and get the excavation done for the erection of the bridge on the “E” Line, Bridge 20N. (N.T. 82, 143)

19. Mr. Jaynes explained they wanted to get as much material across the old bridge that was to be torn down as they could, as quickly as possible, to maintain the schedule and they had available back dumps. (N.T. 143-144, Ex. D-8A)

### **C. Blasting Plan**

20. At the time Balfour Beatty entered into the Contract for the Project, they planned to perform the mass excavation activities by blasting and this method of excavation was acceptable to PennDOT. (N.T. 85)

21. Balfour Beatty's baseline schedule was based upon the ability to use blasting for its excavation. Additionally, PennDOT was aware that the baseline schedule was based upon blasting since the beginning of this Project. (N.T. 194)

22. As established by PennDOT Project Manager, Mr. Cochrane, blasting was an integral part of Balfour Beatty's plan for mass excavation. (N.T. 548-549)

23. Blasting is the fastest, most efficient, most productive and most economical means of mass rock excavation then the mechanical means of mass rock excavation. (N.T. 86, 195-196)

24. By early February, 1997, Balfour Beatty was performing mass rock excavation and blasting. They were drilling and blasting a large cut for the realigned Interstate 81 North and South, south of the Bridge 20N and drilling and blasting pipe trenches. (N.T. 80-82; Ex. P-36 photo 5/20/07, D-8A)

25. Balfour Beatty scheduled all the excavation south of Bridge 20N to be completed before erection of structural steel. It did this to take advantage of an old bridge called "existing bridge 21N" which was out of service and awaiting demolition. This allowed Balfour Beatty to use existing 21N as part of its haul road for the rock excavation from this area. (N.T. 80-84; Ex. P-36 photo 5/20/97, D-8A)

### **D. Stop Blasting Order**

26. On Saturday, February 8, 1997, PennDOT ordered Balfour Beatty to stop blasting on the Project. The cause of this stop blasting order was the discovery of carbon monoxide poisoning of a resident in a home located in a residential development near the Project site. (N.T. 82-83, 525)

27. In February, 1997, when blasting was stopped, Balfour Beatty was excavating for Interstate 81 in the vicinity of Bridge 20N (South). (N.T. 519-520; Ex. D-8A)

28. The February 8, 1997 suspension of Balfour Beatty's blasting operations was at the direction of PennDOT's Project Manager, Mr. Cochrane. (N.T. 547-548)

29. On Monday, February 10, 1997, at the direction of Mr. Cochrane, PennDOT confirmed, in writing, the temporary postponement of blasting. (Emphasis Added) (N.T. 184, 548-549; Ex. P-7)

30. At the time the stop blasting order was issued, Balfour Beatty had approximately 80,000 cubic yards of excavation left in the area of Bridge 20N. (N.T. 184)

31. As of February 10, 1997, Balfour Beatty and PennDOT understood the suspension of blasting was to be temporary. The moratorium on blasting, at the time issued, was for an indeterminate period of time, but Balfour Beatty was under the impression it would be short lived, maybe for about a week. (N.T. 83-84, 161-162, 197, 219)

32. The suspension of blasting affected all classes of excavation that involved the excavation of rock. (N.T. 85)

33. As a result of PennDOT's suspension of blasting, Balfour Beatty did suspend its blasting operations. (N.T. 84)

34. By memorandum dated Monday, February 17, 1997, PennDOT postponed the resumption of blasting by rescheduling the test shot to Wednesday, February 19, 1997, with production blasting to resume on Monday, February 24, 1997. (N.T. 86; Ex. P-9)

35. PennDOT issued memos on Thursday, February 20, 1997 and Monday, February 24, 1997 that postponed the scheduled resumption of blasting. The next possible date to resume blasting was Thursday, February 27, 1997. (N.T. 89-91, 200-201; Ex. P-11, P-12)

36. PennDOT was meeting with residents of the community and their representative in the weeks following the stop blasting order in an attempt to resolve the safety issues associated with the release of poisonous carbon monoxide gas into homes adjacent to the Project. (N.T. 526)

37. PennDOT's suspension of blasting (Stop Blast Order) was a suspension of work pursuant to Section 110.02(c). (N.T. 548, 697-698)

38. As of Monday, March 24, 1997, PennDOT continued to view the suspension of blasting as temporary while trying to resolve the carbon monoxide problem. In fact, the suspension of blasting remained temporary until September 17, 1997 when PennDOT applied the ban on blast to all remaining rock excavation. (N.T. 105, 550; Ex. P-18, P-40 Tab 1)

39. PennDOT's March 24, 1997 letter did not direct Balfour Beatty to proceed with mechanical mass rock excavation instead of blasting. (N.T. 105; Ex. P-18)

40. On Friday, February 28, 1997, PennDOT asked Balfour Beatty to quote a price for completing the Class 1 Excavation on the Project without blasting. (N.T. 527)

41. On Thursday, March 6, 1997, Balfour Beatty quoted PennDOT a price of \$35.00 per cubic yard for completing the Class 1 Excavation without blasting. (N.T. 527; Ex. D-13)

42. On March 7, 1997, Balfour Beatty rescinded its quote of \$35.00 per cubic yard for completing the Class 1 Excavation without blasting and replaced it with a quote of \$35.00 per cubic yard for breaking the rock only without blasting; an additional amount, not specified by Balfour Beatty at the time, would be added to the quoted price for moving the rock. (N.T. 527-528, 843-844, Ex. D-14)

43. After receiving these quotes, PennDOT attempted to initiate negotiations. Balfour Beatty delayed meeting until one of its officials, Mr. Jack Palmer, was able to attend, which could not be arranged until Thursday, March 20, 1997. (N.T. 528-529, 706)

44. The parties met on March 20, 1997, at which time Balfour Beatty informed PennDOT that it expected to receive the following with respect to the changeover to excavation without blasting:

1) \$35.00 per cubic yard for breaking the rock plus an unspecified amount for trucking the broken rock

2) additional amounts totaling almost a million dollars to accelerate the Project so as to finish by the Contract completion date. Also, included was the hauling of the broken rock using tri-axle trucks, or on-road vehicles. (N.T. 529-530, 707)

45. After PennDOT suggested that there was reason for Balfour Beatty to negotiate concerning the position it articulated, Balfour Beatty's representatives walked out of the meeting. (N.T. 530; Ex. D-15)

46. The following day, March 21, 1997, Balfour Beatty rescinded all proposals concerning the completion of excavation without blasting. (N.T. 530, 845; Ex. D-15)

47. One week later, on Friday, March 28, 1997, Balfour Beatty for the first time claimed that there was a "differing site condition" in regard to the cessation of blasting. (N.T. 531; Ex. D-16)

48. On Thursday, April 3, 1997, Urban generated an analysis of blasting alternatives that was intended to move the decision making process along to a decision as to whether blasting would resume or whether excavation should proceed by some other means. (N.T. 208, 710)

49. Within two weeks of its notification of a "differing site condition," on Wednesday, April 9, 1997, PennDOT directed Balfour Beatty to complete the excavation without blasting and agreed to pay for such excavation, as extra work, pursuant to Section 110.03 of the Contract Specifications. (N.T. 531-532; Ex. D-17)

50. With respect to differing site conditions Mr. Cochrane acknowledge that it is defined in the Contract Specifications under Section 110.02(b) and payment is under Section 110.03. (N.T. 563)

51. The Contract Specifications provide for differing site conditions and suspension of work under Section 110.02 in full as follows:

110.02(a) **General.** If differing site conditions, changes in quantities, or alterations of the construction drawings will significantly increase or decrease the cost of performing the work directly affected, perform such work only when authorized in writing, as specified in Section 110.03(a). (Emphasis Added) Payment for such work will be made under Section 110.03. (Emphasis Added) (Ex. D-2 at p. 77)

110.02(b) **Differing Site Conditions.** During the progress of the work, if subsurface or latent physical conditions are encountered at the site, differing materially from those indicated or if unknown physical conditions of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in the work, are encountered at the site, the party discovering such conditions is responsible for promptly notifying the other party in writing of the specific differing conditions before they are disturbed and before the affected work is performed.

Upon written notification, the Engineer will investigate the conditions, and if it is determined that the conditions materially differ and cause an increase or decrease in the cost or time required for the performance of any work under the contract, an adjustment, excluding loss of anticipated profits, will be made as specified in Section 110.02(a). The Engineer will notify the Contractor of the determination whether or not an adjustment of the contract is warranted.

No contract adjustment which results in a benefit to the Contractor will be allowed unless the contractor has provided the required written notice.

No contract adjustment will be allowed under this section for any effects caused on unchanged work. (Ex. D-2 at p. 78)

110.02(c) **Suspensions of Work Ordered by the Engineer.** If the performance of all or any portion of the work is suspended or delayed by the Engineer in writing, in accordance with Section 107.16(d), for an unreasonable period of time (not originally anticipated, customary, or inherent to the construction industry) and the Contractor believes that additional compensation and/or contract time is due as a result of

such suspension or delay, submit to the Engineer, in writing, a request for adjustment within 7 calendar days of receipt of the notice to resume work. Set forth the reasons, and support for such adjustment, in the request.

Upon receipt, the Engineer will evaluate the Contractor's request. If the Engineer agrees that the cost and/or time required for the performance of the contract has increased as a result of such suspension and the suspension was caused by conditions beyond the control of and not the fault of the Contractor, its suppliers, or subcontractors, and not caused by weather, the Engineer will make an adjustment, excluding profit, in accordance with Section 110.03 (Emphasis Added) and Section 108.06, as applicable. The Engineer will notify the Contractor of the determination whether or not an adjustment of the contract is warranted.

No contract adjustment will be allowed unless the Contractor has submitted the request for an adjustment within the time prescribed.

No contract adjustment will be allowed under this clause to the extent that performance would have been suspended or delayed by any other cause, or for which an adjustment is provided for or excluded under Section 107.16(d). (Ex. D-2 at p. 78)

52. Under Section 110.02(b), PennDOT, as the party discovering the condition, was responsible for promptly notifying Balfour Beatty in writing of the differing site condition. PennDOT notified Balfour Beatty on February 8, 1997 of the differing site condition (discovery of carbon monoxide) and in writing on February 10, 1997. (N.T. 183-184, 548)

53. By letter dated Wednesday, April 9, 1997, PennDOT stated that Balfour Beatty had notified PennDOT that a changed condition existed with respect to Class 1 Excavation and PennDOT's investigation determined that a differing site condition existed. (N.T. 110, 229-230, 594; Ex. P-20)

54. PennDOT's letter dated April 9, 1997, was the first written authorization directing Balfour Beatty to proceed with mechanical rock excavation and payment would be in accordance to contract specifications for Force Account, Section 110.03. Balfour Beatty received this letter on Tuesday, April 15, 1997. (N.T. 109-112, 154, 226, 561, 701-702; Ex. D-17)

55. Section 110.03(c) "Extra Work" states:

This includes only the following:

\*work arising from changes described in Section 110.02 which result in a significant increase or decrease in the cost of performing that work or

\*work, having no quantity and/or price included in the contract, which is determined by the District Engineer to be necessary or desirable to complete the project.

Perform all such work only when authorized in writing by the District Engineer, as stated in Section 110.03(a). All extra work will be paid only as stated in Section 110.03(a).

(Emphasis Added) (Ex. D-2, pg. 81)

56. Section 110.03(a) provides in pertinent part:

If the District Engineer and Contractor cannot agree on a tentative price for the extra work and if the work is such that force account records can be kept by the Department, the District Engineer's writing will state that such work is to be paid on a force account basis. Force account records will be kept as stated below.

Payment for additional work, extra work, and extra work on a force account basis is accepted as payment in full for all profit and for all equipment, labor, material, field overhead, home office and general administrative expenses, (Emphasis Added) and every other expense incurred as a result of the additional or extra work. No claims for additional compensation of any kind arising out of or relating to such work can be asserted against the Department with the Board of Claims.

(Ex. D-2 at p. 80)

57. After receiving PennDOT's direction to proceed with mechanical excavation on Tuesday, April 15, 1997, Balfour Beatty's Mr. Jaynes contacted PennDOT's Inspector In-Charge, Mr. Compton, and discussed the types and number of pieces of equipment PennDOT was authorizing Balfour Beatty to use. (N.T. 111-112)

58. In its May 7, 1997 letter, PennDOT also declared that a differing site condition existed with respect to rock excavation for Class 2, Class 3 and Class 4 Excavation. For these three (3) other classes of excavation, PennDOT directed that the rock excavation proceed by mechanical means and without blasting under force account. PennDOT made payments under Section 110.03 for this extra work. (N.T. 113, 154-155, 533; Ex. D-21)

### **E. Mitigation of Impact from the Stop Blasting Directive and Extension of Time**

59. Between the “Stop Blasting” order of February 8, 1997 and PennDOT’s letter dated April 9, 1997 that directed Balfour Beatty to complete the excavation without blasting, it was not practical nor reasonable for Balfour Beatty to mobilize hoe rams and begin mechanical rock excavation since the “Stop Blasting” was temporary. (N.T. 92-93, 199, 202; Record)

60. On February 10, 1997, when blasting was suspended, Balfour Beatty had approximately two (2) or three (3) days of broken-up rock that could be excavated on the “E” Line 442 to Bridge 20N. Then Balfour Beatty shifted its excavation to other areas that did not require blasting to try to keep the Project moving. (N.T. 84, 92, 851; Ex. P-13 Sheets 3 & 4)

61. By letter dated February 10, 1997, Balfour Beatty advised PennDOT that the “Stop Blasting” order would begin to have an adverse effect on the Project’s mass excavation by February 12, 1997. (N.T. 84-85; Ex. P-8)

62. PennDOT’s Mr. Compton and Mr. Cochrane agreed that through February 20, 1997, Balfour Beatty was taking all reasonable steps to mitigate any delays resulting from the suspension of blasting. (N.T. 222-223)

63. Between PennDOT’s letter of February 28, 1997 requesting a quote from Balfour Beatty for mechanical rock excavation and PennDOT’s directive of April 9, 1997 to remove the rock without blasting, Balfour Beatty took reasonable steps to mitigate any delays the Project was experiencing by continuing to work on Contract, work not requiring blasting of rock. (N.T. 90-91, 202-203, 851)

64. PennDOT never expressed any dissatisfaction with Balfour Beatty’s efforts to mitigate the effects of any delays. (N.T. 109)

65. After Balfour Beatty began excavation by mechanical means, PennDOT represented to Balfour Beatty, at several meetings, that PennDOT was satisfied with the manner in which Balfour Beatty was progressing the mechanical excavation. (N.T. 577-578)

66. By letter dated June 23, 1997, Balfour Beatty notified PennDOT that the then current delay to Project completion caused by the suspension of blasting and differing site condition was 89 days. Balfour Beatty also requested an extension of time and recovery of additional costs incurred as a result of the differing site conditions/suspension of work. (N.T. 120; Ex. P-27)

67. After Balfour Beatty, on July 18, 1997, requested a 102-day extension of time because of what it termed the “suspension of blasting operations,” and \$1,009,915.26 to reimburse it for what it characterized as the “costs” of that “suspension,” PennDOT, on August 12, 1997, granted an 89-day extension of time and denied any additional reimbursement of costs beyond that specified in the Contract Specifications Sec. 110.03. (N.T. 534-538; Ex. D-18, D-19)

68. On this Project, Balfour Beatty was required to develop and use CPM scheduling as specified for Item 9999-9999 Project Scheduling. Balfour Beatty developed the sequential logic, estimated activities' duration and provided the data for timely updates. PennDOT reviewed the data provided by Balfour Beatty and Urban imputed this data into the scheduling system every two weeks. (N.T. 583, 627-628; Ex. D-1, pg. 244)

69. According to Balfour Beatty's January 29, 1997 contractual schedule update (designated "HU-41"), the excavation in the area between Station 442 and the bridge known as "Bridge 20N" was followed by the demolition of existing Bridge 21N and then the erection of the structural steel for the southern half of Bridge 20N; these activities were on the Project's critical path, according to the HU-41 schedule update. (N.T. 729-730; Ex. D-49, Tab 1)

70. In requesting an extension of time and delay compensation because of the stoppage of blasting, Balfour Beatty represented that the excavation between Station 442 and Bridge 20N had been delayed 102 days; as of the HU-41 schedule update, Balfour Beatty was contending that it was 13 days ahead of the scheduled contract completion date of May 31, 1999. However, the claimed 102-day delay to the excavation - which was, according to the HU-41 update, on the Project's critical path - but extended the Project's completion by only 89 days (Emphasis Added) beyond the contractual completion date to August 28, 1999, which is why PennDOT granted an 89-day extension of time. (N.T. 534-538, 551-552; Ex. P-34, D-19)

71. On direct-examination, Mr. Jaynes established that the double shift was part of the negotiated acceleration agreement. On cross-examination, Mr. Jaynes could not recall if Balfour Beatty contemplated the double shifting activity at Station 442 to 20N when the acceleration schedule was negotiated. (N.T. 82, 144)

72. Mr. Daniel G. Quakenbush, Balfour Beatty's claims and delay expert, established that the Project's CPM schedule had several different calendars. A five day, six day, seven day and others and that this Project's completion activities had a seven-day a week calendar. Also, there are calendars for winter shutdown and holidays. (N.T. 272-273, 314-315; Ex. P-40 Tab 2)

73. Mr. Quakenbush explained that depending on which calendar is used, the Project was ahead thirteen days, twelve days or eleven days on some items. "So it won't necessarily be a plus 13 straight through. That's one of the confusing things about multiple calendars." He also recalled that for this Project "there's seven" calendars. (N.T. 274-275, 313-315)

74. While the CPM progress report of January 29, 1997 indicates that on that date the Project was 13 days ahead of schedule on one calendar, but some activities showed 11 days on another calendar and there were at least seven calendars used, the 13 days is not exclusive. (Emphasis Added) Also, Balfour Beatty and PennDOT had negotiated an accelerated schedule and compensation agreement to maintain the original Contract completion date of May 31, 1999 and the "Stop Blasting" order added 89 days to this May 31, 1999. (Record)

75. There was no credible testimony that, but for the “Stop Blasting” order, the Project would have been completed 13 days before May 31, 1999. In addition, there was no evidence presented that established that only Balfour Beatty was responsible for the 13 days float on the seven day calendar critical path “snap shot” presented in HU-41. PennDOT had compensated Balfour Beatty under an Acceleration Agreement that included double shifting that may have included double shifting rock excavation on the “E line” Station 442 to Bridge 20N, a critical path work activity. So the Project was delayed only 89 days not 102 days. (Emphasis Added) (Record)

#### **F. Alleged Concurrent Delay**

76. The Department asserted that a concurrent delay occurred with respect to the fabrication and delivery of the structural steel for Bridge 20N. (N.T. 123; Ex. 30, pg. 2)

77. Using the revised baseline schedule, Balfour Beatty’s January 29, 1997 contractual schedule update (designated “HU-41”), showed the excavation in the area between Station 442 and the bridge known as “Bridge 20N” was followed by the demolition of existing Bridge 21N and then the erection of the structural steel for the southern half of Bridge 20N; some of these activities were on the Project’s critical path, according to the HU-41 schedule update. (N.T. 321-324, 729-730; Ex. D-49, Tab 1)

78. The structural steel for Bridge 20N was fabricated for Balfour Beatty by its subcontractor Tampa Steel Erecting Company (Tampa). In April of 1996 Balfour Beatty notified Tampa that it required the steel for Bridge 20N (South) delivered to the Project prior to October 1996 and steel for Bridge 20N (North) delivered prior to July, 1997. (N.T. 612-613; Ex. D-30)

79. In October, 1996, Balfour Beatty resequenced its work plan and advised Tampa that it needed the steel for Bridge 20N (South) delivered to the Project by March 1, 1997, and the steel for Bridge 20N (North) delivered to the Project by June 1, 1997. (N.T. 613-614; Ex. D-31)

80. According to Balfour Beatty’s schedule update (HU-41) dated January 29, 1997, the erection of the structural steel for the south half of the Bridge 20N (Activity ID 21-686120) had 12 days of float and the erection of structural steel for the north half of Bridge 20N (Activity ID 22-706120) had 30 days of float. (Ex. D-10A, pgs. 40-41)

81. The Critical Path is defined by those activities that have zero float as calculated by the computer. (N.T. 274)

82. Mr. Quackenbush established that CPM schedules are active, living documents that go through change and status updating on some timely basis. CPM is the framework for the contractor to plan his operations in a step-by-step sequence, scheduling start dates, activities’ durations and finish dates. (N.T. 253-254)

83. As of January 29, 1997, the erection of structural steel for the south half of Bridge 20N was not on the critical path since it had float. (Record)

84. The structural steel needed to begin erection of the south half of Bridge 20N, according to the erection sequence submitted to PennDOT by Balfour Beatty, would not be on the Project until July 8, 1997. (N.T. 541-543; Ex. D-6, D-7)

85. Mr. Davis Williamson, PennDOT's scheduling expert acknowledged that construction projects are dynamic and schedule dates change all the time. He also acknowledged that if Tampa could have expedited the fabrication and painting of girders, his analysis would be affected. (N.T. 750-752)

86. If Balfour Beatty needed the structural steel for Bridge 20N earlier, Balfour Beatty could have taken several steps to obtain earlier delivery of the girders. These included, but were not limited to, shipping the girders without having them painted in the shop and even without the steel being primed; shipping the girders and cross frames by truck rather than rail; shipping the girders without the studs attached (attaching in the field instead); and sending someone to the fabrication plant to aggressively manage the fabricator. However, it was not necessary to implement any of these procedures because the girders and cross frames were not needed any earlier than when they actually arrived on site. (N.T. 123-124, 126)

87. Mr. Williamson, on cross-examination, acknowledged that he was not aware that Balfour Beatty could have transported the girders and cross frames by other means to expedite their delivery and earlier delivery of the structural steel would have affected his analysis. (N.T. 744, 746, 748-749)

88. Balfour Beatty could have erected the structural steel girders for the southern half of Bridge 20N using temporary cross frames. In fact, the northern half of Bridge 20N was erected with temporary cross frames. (N.T. 125)

89. Mr. Quackenbush established the criteria that must be satisfied to constitute a current delay as follows:

- 1) Both delays must be critical;
- 2) The two delays must not be related either physically or managerially

(N.T. 263-264)

90. As of January 29, 1997 (HU-41), the critical path for Bridge 20N was, in order of performance: (1) the completion of excavation/embankment of 81 North and South; (2) the demolition of existing Bridge 21N; (3) the installation of the south half girders for Bridge 20N. If the excavation/embankment of 81 North and South was delayed, then the installation of the girders for Bridge 20N would be delayed on a day-for-day basis. (N.T. 340, 342)

91. Since delivery of structural steel was not on the critical path on January 29 and had a managerial sequencing to the delayed rock excavation there was no concurrent delay as alleged by PennDOT. (Emphasis Added) (N.T. 289, 291, 293, 295; Record)

### **G. Damages**

#### **a) Revision to Temporary Road T-13**

92. Prior to the “Stop Blast” order, in late 1996, Balfour Beatty and PennDOT discussed revisions to temporary roads T-3 and T-13 which would expedite the Project and could move the completion date ahead of the May 19, 1999 date, maybe as much as a month. (N.T. 137; Ex. D-28)

93. T-13 was a temporary roadway that was used during the construction of the Project to get Interstate 81 northbound traffic through the Project. (N.T. 543)

94. T-13R is the designation used to identify the revision to T-13 requested by Balfour Beatty. (Emphasis Added) (N.T. 137, 543-544)

95. The construction of T-13 was Contract Item No. 8800-0013 temporary road T-13. It was bid as a Lump Sum (L.S.) priced item at \$198,983.00. (N.T. 544; Ex. D-1, pgs. 41, 198)

96. The construction of T-13R was performed as part of Balfour Beatty’s mitigation efforts. T-13R relocated T-13 away from Pier 3 footing for Bridge 12N, eliminated one traffic switch and moved up the completion of Bridge 12N. (N.T. 137, 429, 846)

97. T-13R narrowed T-13 from a two lane road to a one lane roadway (Emphasis Added) and shifted its alignment to line up with the adjoining section. It also required tie-ins with T-3. (N.T. 429, 545)

98. Balfour Beatty is claiming \$67,159.57 in damages for its implementing the construction of T-13R as follows:

Engineering of Shoring	\$ 2,650.00
Shoring and Bracing piers	\$54,550.66
Cost of Tie-in	\$ 9,958.91

(N.T. 429-430; Ex. P-54, P-55)

99. PennDOT agreed to Balfour Beatty’s request to revise T-13 and approved the construction of T-13R. The plan information was sent to Balfour Beatty on December 12, 1996. Also, any shoring required at Pier 3 of Bridge 12N “shall be at no additional cost” (Emphasis Added)

to PennDOT. PennDOT agreed to pay Balfour Beatty the full L.S. bid price of \$198,983.00 for a narrower roadway. (N.T. 545-547; Ex. D-28)

100. Balfour Beatty was in fact paid, in full, the contractual Lump Sum Price of \$198,983.00 for constructing T-13 (T-13R). (N.T. 547)

101. Balfour Beatty was in fact paid for shoring and bracing and its required engineering as per the mutually agreed to revisions to T-13. However the additional tie-in work was not specifically covered by the Agreement to revise T-13. Therefore, Balfour Beatty is entitled to damages of \$9,959.00. (Emphasis Added)

**b) Extended Site and Home Office Overhead, Bond and Insurance**

102. Balfour Beatty is claiming Extended Site office overhead of \$496,984.80. (N.T. 375; Ex. P-42)

103. PennDOT's accounting expert, Mr. Rubino, reviewed the claim and the claim supporting documents and some of the change orders that occurred on the Project. (N.T. 765-766)

104. Mr. Hetherington, Balfour Beatty's construction cost accounting expert, used the time period of January 1 through June 21, 1997 (172 days) to capture site office overhead expenses. From the COINS integrated cost accounting system used for this Project, and based on a series of cost code detail history reports he demonstrated how the totals from cost code details were summarized to compute the total for site office overhead expenses which was \$838,052.80 for the 172 day period. (N.T. 374-376, 379-381; Ex. P-56, P-57)

105. Mr. Hetherington computed a daily site office overhead of \$4,872.40 ( $\$838,052.80 \div 172$  days). Balfour Beatty claims a delay of 102 days and computed the claim for site overhead at the daily rate, times 102 days, which equals \$496,984.80 ( $\$4,872.40 \times 102$ ). (N.T. 375; Ex. P-42, P-56)

106. Mr. Rubino, on cross-examination, acknowledged that by and large the theory used by Balfour Beatty to calculate extended site office overhead was appropriate. However, he was not convinced that all items included were appropriate time related costs. (N.T. 768-769, 810-811)

107. Mr. Rubino noted that the allotment, (Item (981040) for \$31,500) was admitted by Mr. Hetherington as being a bonus payment and he questioned whether bonus payments were an appropriate time related expenditure. (N.T. 391, 767-768; Ex. P-56)

108. The allotment item (bonus) of \$31,500 is not an appropriate time related cost. Mr. Hetherington's computed daily rate is adjusted to \$4,689.26 per day ( $\$838,052.50 - 31,500.00 \div 172$  days). (Record)

109. Recomputing the extended site overhead, based on the Board's adjusted daily rate of \$4,689.26 is \$478,293.30 (Emphasis Added) ( $\$4,689.26 \times 102$  days) (Record)

110. Balfour Beatty's claim for an absorbed home office overhead is based upon the Eichleay Formula and totals \$300,587.88. (N.T. 459)

111. With regard to the values used in the Eichleay calculation, the \$14,734,000.00 figure for total home office overhead as well as the \$209,200,000.00 figure for company wide revenue were derived from Balfour Beatty's audited statement of operations for the fiscal year 1996. (N.T. 394-395; Ex. P-46, P-47)

112. For the unabsorbed home office overhead calculation, the \$15,257,865.00 figure for Project revenue (1996) was derived from Balfour Beatty's heavy civil unit contract performance sheet. (N.T. 395; Ex. P-46, P-48)

113. Using the figures necessary for the Eichleay calculation, a daily rate of \$2,946.94 resulted. This daily rate multiplied by Balfour Beatty's claimed 102 day extended duration caused by the suspension of blasting and differing site conditions results in the total unabsorbed home office overhead claim of \$300,587.88. (N.T. 395-396; Ex. P-46)

114. Recomputing extended site overhead and home office overhead using the actual Project delay and time extension of 89 days, the site overhead is \$417,344.14 (Emphasis Added) ( $\$4,689.26 \times 89$  days) and home office overhead is \$267,277.66 (Emphasis Added) ( $\$2,946.94 \times 89$  days). (Record)

115. During the "Stop Blasting" order, other Project work proceeded. Mr. Rubino established that if it were not a total suspension of work then revenue was generated during the approximate 6 month period used to compute the extended site overhead and the home office overhead using the Eichleay formula. (Emphasis Added) There was a delay and PennDOT extended time and there was reduction in the income stream to meet overhead cost, but not a total suspension of work. (Emphasis Added) (N.T. 774, 781, 783-785)

116. Mr. Rubino established that after the change to excavation without blasting, Balfour Beatty was paid \$8,296,774.00 on a force account basis for excavation without blasting. (N.T. 775-776; Ex. D-42)

117. Had Balfour Beatty been paid the contract unit price for the claimed excavation, it would have been paid \$2,610,912.00. (Ex. D-42)

118. Mr. Rubino testified that "To get an apples for apples comparison you have to compute what the mark-up that would have been included in the contractor's prices for the work that

was deleted.” He established that Balfour Beatty’s mark-ups were 8.16% for margin and 10.8% for indirect cost taken from Balfour Beatty’s Bid Estimate Summary Report. (N.T. 777-779, 798; Ex. D-29)

119. Of the \$2,610,912.00 for rock excavation that would have been paid for at the contract unit price, \$196,977.00 represented margin or profits and \$280,705.00 represented indirect cost or profit (Emphasis Added) as computed by Mr. Rubino using the mark-up percentages listed in Balfour Beatty’s Bid Summary. The total as bid compensation for overhead and profit deducted from the Contract was \$477,682.00 ( $\$196,977 + \$280,705.00$ ). (N.T. 777-778; Ex. D-42, pg. 1, Mark-Ups Column “Deducts at Contract Unit Prices”)

120. Of the \$8,296,774.00 paid to Balfour Beatty for excavation without blasting on change orders, \$1,244,572.00 was paid by PennDOT as mark-ups on force account for indirect costs such as overhead, home office and profit. This amount was \$766,890.00 ( $\$1,244,572.00 - \$477,682.00$ ) (Emphasis Added) more than the overhead and profit that Balfour Beatty had figured into its contract unit prices for the work. (N.T. 776-777; Ex. D-2, pg. 80, Sec. 110.03(a), Ex. D-42)

121. Balfour Beatty also claims \$40,288.00 for additional Bond and Insurance which Mr. Hetherington established was not included in its other claimed items related to the differing site conditions and suspension of blasting. (N.T. 441-443, 483; Ex. P-42, P-56, P-64)

122. Balfour Beatty’s claimed overhead and profit as adjusted for 89 days by the Board with the claimed insurance and bond totals \$724,909.80 ( $\$417,344.14 + \$267,277.66 + 40,288.00$ ). (Emphasis Added) (Record)

123. On direct-examination, Mr. Rubino testified that the Eichleay Formula assumes there is essentially a shut down at the site and it reimburses the contractor as if there is no revenue stream being produced at the site during a claimed period of delay, for which indirect costs, including home office overhead, is absorbed. (N.T. 769)

124. Mr. Rubino opined that in this claim there was not a total shut down at the Balfour Beatty site. From documents reviewed, Mr. Rubino concluded that work was being performed and revenue was being earned by the contractor and home office overhead was being absorbed. (N.T. 769-770)

125. On cross-examination, Mr. Rubino agreed that “Suspension or delay of contract performance results in interruption or reduction of contractor’s stream of income from direct costs incurred”. (N.T. 784-785)

126. Mr. Rubino recognized that there was a reduction during the delay period on this Project but the methodology used assumes that there was a total reduction which doesn’t take into account that there was overhead costs absorbed through other work performed on the Project. (N.T. 785-786)

127. On cross-examination, Mr. Rubino acknowledged that he has used the Eichleay Formula to compute home office overhead where there is not a total suspension. But to his knowledge, he has always considered the credit that would be associated with indirect cost recovered through other means during the suspension for both site and home office overhead. But such decisions would be factually based on the notion that you have recovery under Eichleay. (N.T. 789-790)

128. Mr. Rubino acknowledged that in a previous case involving a contractor's claim, (Appeal of Danae, Inc.), he employed Eichleay, but couldn't recall any credit for home office overhead but there may have been a credit for site overhead involved which is why you have to look at both site and home office overhead before you look at the credits to be consistent. (N.T. 791-793)

129. Mr. Hetherington, on cross-examination, admitted that every time a contractor is paid for performance of contract work, a portion of site overhead is reimbursed and as long as the contractor is earning revenue, overhead is being absorbed. (N.T. 452-454, 457-458)

130. Mr. Hetherington admitted that between February 10, 1997 and April 23, 1997, a 72 day period of stop blasting, Balfour Beatty was working performing contract work and earning revenue. Mr. Hetherington did not perform any analysis in the preparation of Balfour Beatty's claim comparing the extent to which site overhead cost were absorbed by forced account payments for excavation without blasting. (N.T. 455-459)

131. The Board finds that PennDOT reimbursed Balfour Beatty \$41,981.80 (\$766,890.80 - \$724,909) more than the adjusted claimed amount including bond and insurance, therefore, there is no award due for site and home office overhead, bond and insurance. (Record)

**c) Equipment - Extended External**

132. Balfour Beatty's claim for extended external equipment is based upon alleged extended duration of 102 days that this equipment was on the Project in 1997 as a result of the "Stop Blasting" order, but not related to any force account work. (N.T. 398, 866-867)

133. Mr. Hetherington established that the claimed amount for external equipment was based on actual vendor invoices for the time period January through June, 1997, as shown on a summary spread sheet (Ex. P-61) which indicates Balfour Beatty expended \$72,098.00. (N.T. 398-400; Ex. P-61, P-63)

134. Mr. Hetherington explained that there were 175 days in the period January to June and he divided \$72,098.00 by 175 days to compute a daily rate of \$411.99 ( $\$72,098 \div 175$ ). (N.T. 401-403; Ex. P-61, P-42)

135. Mr. Hetherington computed Balfour Beatty's external equipment extended duration costs incurred in 1997 by multiplying the \$411.99 by the alleged 102 days for the claimed \$42,022.98. (N.T. 401-403; Ex. P-61, P-42)

136. Mr. Hetherington established that as part of its bid, Balfour Beatty intended to have certain equipment on the Project for a certain duration of time and some of that time would be idle time which idle time has a cost and when equipment is on site longer than planned due to a delay, even if idle, there is a cost. (N.T. 493-494)

137. When equipment is idle, it is not generating revenue if it is not working. (N.T. 494)

138. In Balfour Beatty's claim for extended equipment, both external and internal, Mr. Hetherington understood that these costs were incurred sometime in the middle of the Project. (N.T. 494)

139. Mr. Rubino opined that in a suspension or delay claim the equipment damages of a contractor would typically be the cost of equipment planned to be working but idled by the owner - caused delay. (N.T. 771)

140. The basis of Balfour Beatty's Claim for the external equipment is that it was kept on the Project longer because of the "Stop Blasting" order and change to excavation without blasting at some daily average cost, times the alleged extend time of 102 days. (Record)

141. In its initial claim summary (P-33) Balfour Beatty's external equipment summary sheet shows that some equipment was only used in April and May for 35, 88 and 58 days and only two pieces indicate usage of more than 102 days. Also, the light plant was not used after February, 1997 and the manlift invoice was for 1/11/97 to 1/21/97 and not used at all during February, March or April. Only the IRSD100 Roller and Tractor trailer were actually paid for during the entire 72 day February to April time period when PennDOT was deciding what to do. (N.T. 455-459; Ex. P-33)

142. There was no testimony establishing what the planned external equipment requirements were prior to the stop blasting delay and what was the actual idle time experienced by the "Stop Blasting" order since some rented equipment was terminated in February 1997 and other equipment rented after the start of the "Stop Blasting" order and for only two months. (Ex. P-33; Record)

143. Mr. Jaynes, on direct-examination, inferred that PennDOT had paid for different work such as drilling and moving equipment around but couldn't remember if some standby had been paid. (N.T. 97-98)

144. On cross-examination, Mr. Jaynes admitted that PennDOT requested Balfour Beatty submit information regarding the costs for idle equipment and labor (Ex. P-13) resulting from the

“Stop Blasting” order from February 10, 1997 to February 28, 1997. However, Mr. Jaynes revised his direct testimony and was “not 100 percent sure” that they were paid for any part of the March 4, 1997 request. (N.T. 165-166)

145. It is established that Balfour Beatty did what was required to mitigate the impacts from that “Stop Blasting” order and it would not bring in rented equipment it did not intend to utilize or keep on the Project equipment no longer required, such as a light plant when the night shift was ended prior to February 17, 1997. (N.T. 87-88; Ex. P-13 sheet 5, P-33; Record)

146. Most of Balfour Beatty’s claim for external extended equipment cost is not supported by the facts. Most of the claimed equipment was either removed from the Project prior to or brought on the Project almost 6 weeks after the “Stop Blasting” order and obviously worked on contract work and earned revenue. (N.T. 467-468, 851; Ex. P-61, P-63; Record)

147. The Board’s award for extended external equipment is zero. (Record)

**d) Equipment - Extended Internal**

148. Mr. Hetherington established that to calculate its extended internal equipment costs, Balfour Beatty identified the internal (company-owned) equipment that was on site from January through June, 1997. Additionally, Balfour Beatty identified, for each month during that period, the number of hours that each piece of equipment worked. Next, Balfour Beatty identified, for each month during that period, the number of hours each piece of internal equipment spent idle during that time period. Finally, Balfour Beatty identified the corresponding blue book rates for each piece of equipment (both working and standby rates). All of this information for the internal equipment is summarized in the spreadsheet labeled Exhibit P-59. (N.T. 404-405; Ex. P-59, P-60)

149. To determine the number of hours that each piece of equipment on the internal equipment spreadsheet worked, Mr. Hetherington reviewed the daily time and equipment sheets for the period of week ending January 5 through June, 1997. The various daily time and equipment sheets reflect the hours that the equipment was reported used by various crews working on any given day. These time sheets were prepared by Balfour Beatty’s foremen out in the field. (N.T. 410, 415; Ex. P-53, P-59)

150. Section 110.03(d) “Force-Account Work”, provides in pertinent part:

**3. Equipment.** Reasonable rental rates for equipment, including machinery and trucks, mutually considered necessary, will be allowed, computed as follows:

For equipment, either rented or owned, including pumps and compressors, an hourly rental rate will be determined using the monthly rental rates taken from the current edition (updated supplements will be authorized for use statewide on specified dates)

of the Rental Rate Blue Book for Construction Equipment dividing by 176. An allowance will be made for operating costs for every hour the machinery or equipment is operating, in accordance with rates listed in the rental book. If machinery or equipment is required at the work site, but is not operating, compensation will be at 50% of the hourly rental rate, exclusive of operating costs.

(Ex. D-2, Sec. 110.03(d) 3 pg 82)

151. Balfour Beatty used the 176 hours specified for determining reasonable hourly rental rates for equipment using a monthly rental rate taken from the Rental Rate Blue Book for Construction Equipment as its baseline for determining idle time. (N.T. 411; Ex. D-2, Sec. 110.03(d))

152. The idle hours per month were determined by subtracting the hours worked from 176 hours contained in the Specifications. (N.T. 411; Ex. P-2; D-2)

153. The total hours worked and idle during this time period was compiled and averaged to ascertain a percentage of time working and a corresponding percentage of time idle for each piece of equipment. These percentages were multiplied by the daily Blue Book Rates for working and standby equipment to reach daily costs for each piece of equipment. These daily costs were then added to ascertain a daily rate for the entire cross section of non-force account equipment that Balfour Beatty had on site between January and June, 1997. The total daily rate equals \$11,925.29 per day. (N.T. 404; Ex. P-59)

154. Mr. Hetherington used the Blue Book to establish the daily working and daily standby rates for Balfour Beatty's claim as specified under Sec. 110.03(d). (N.T. 404-406)

155. The standby rates were calculated by taking 50% of the ownership cost for working rate. Operating costs are **not** included in the standby rate. (N.T. 406)

156. Using the internal equipment spreadsheet, once all of the hours worked and idle were totaled, a percentage of time working versus idle was determined. These percentages were multiplied against the respective working and idle daily Blue Book Rates to reach average daily costs for each piece of equipment. These average costs were totaled to reach the aggregate value of \$11,925.29 per day. This daily rate was then multiplied by the alleged 102-day extended duration to reach the total cost claimed for internal equipment resulting from the "Stop Blasting" order and differing site condition as \$1,216,379.58. (N.T. 415 - 417; Ex. P-59)

157. Balfour Beatty is not claiming that all of its equipment was idle for a period of 102 days because of PennDOT's "Stop Blasting" order, but it is alleging that the non-force account equipment was on the Project longer than anticipated. (N.T. 850; Ex. P-50)

158. With the exception of six pieces of equipment that show 1,056 total idle hours (176hr. x 6mo.), the equipment listed on Exhibit P-59 shows that the equipment was working at various times throughout the six month period. (N.T. 466-468; Ex. P-59)

159. On cross-examination, Mr. Hetherington established that the equipment listed on Exhibit P-59 was working on contract items, earning contract revenue for the six month period January 1997 to June 1997. He also admitted that Balfour Beatty did not plan, in its estimate that all equipment would be working 176 hours each month, and there is planned idle time. (N.T. 467-468, 493-494; Ex. P-59)

160. The six pieces of equipment listed that were shown as idle the entire six months (Emphasis Added) are: ICR 3080 Power Auger, @\$141.28 per day; concrete spider, @\$50.00 per day; Hercules H-15 Augere, @\$163.76 per day; Lowboy, @\$16.32 per day; 12 cu. yd. bedding box @\$10.48 per day and a drainage laser @ \$6.48 per day for a total daily idle charge of \$388.32 or 16% of the daily idle rate (Emphasis Added). Mr. Hetherington admitted that he performed no analysis to determine why equipment was idle for the time shown on the Exhibit P-59. He also admitted that he did not do anything to determine the effect of the “Stop Blasting” order on the amount of time the equipment worked or was idle. (N.T. 468-469; Ex. P-59)

161. As part of the Plaintiff’s rebuttal case, Mr. Jaynes, on cross-examination, admitted it was not the contractor’s intent to have every piece of equipment listed on Exhibit P-59 on the Project until the completion date and Balfour Beatty’s intent was to have some of the equipment off the Project before the completion date and some listed equipment was off the Project before completion. (N.T. 865)

162. Mr. Jaynes, on cross-examination, admitted that he did not go through the listed equipment on Exhibit P-59 to make a determination of which piece of equipment, if any, were in fact on the Project longer than anticipated and for how much longer. (N.T. 865)

163. The “Stop Blasting” order impacted activities on the critical path of CPM Schedule but not all of the Project activities. By definition it affected those activities with no float. The testimony established that Balfour Beatty did everything possible to mitigate the damages by shifting to contract activities not associated with rock excavation and continued to earn revenue. (Record)

164. Mr. Rubino, PennDOT’s accounting expert, established that in a suspension or delay claim there may be idle equipment and that equipment should be identified as planned to be working and now idle and the owner should pay for idle equipment if the owner caused the delay. (N.T. 771)

165. Mr. Rubino, on cross-examination, agreed with the concept that a contractor may recover extended equipment costs incurred if it is rendered idle during a delay and if the equipment that was reduced to non-revenue producing equipment was planned to be revenue producing. (N.T. 821-822)

166. Mr. Rubino acknowledged that when equipment is performing contract work over an extended period of time the contractor's revenue stream for absorbing the cost of the equipment is decreased. There is "some under absorption". (N.T. 824)

167. The premise put forward for the claimed "Extended Internal Equipment" is that every piece of equipment listed as being on the Project in January, 1997, was kept on the Project an extra 102 days in the six-month period selected for Exhibit P-59. (Record)

168. Mr. Hetherington, on cross-examination, first testified that the 102 consecutive days were between the commencement of the Contract, 1995, and the end in August, 1999. (N.T. 451) He later testified that he believed the 102 day delay period used was between January 1, 1997 and June 1997. (N.T. 451-452, 454-455)

169. On cross-examination, Mr. Hetherington admitted that the 102 day period was just a fact handed to him by Mr. Jaynes and he could not recall who selected January 1997 to June 1997 but he believed it was selected because it included the time period that the "Stop Blasting" order process was issued in February 1997. (N.T. 451-452, 454)

170. There was no evidence submitted at trial to document what equipment usage was anticipated between January 1997 and June 1997 prior to the "Stop Blasting" order and how and to what extent the 89 day extension of the Contract had on each and every piece of equipment listed on Exhibit P-59 as being on the Project longer than planned. The fact is that Mr. Jaynes and Mr. Hetherington admitted that no such analysis was performed. (Record)

171. On re-direct-examination, Mr. Hetherington expressed his understanding that the extended durations for equipment were incurred mostly in the middle of the Project. (N.T. 493-494)

172. Mr. Hetherington did not know when the 102 day period of delay occurred during the six months, January 1997 to June 1997 but the suspension of work (blasting) was February 10th and recommencement of Class 1 Excavation was on April 23, 1997, which is 72 days, and that 72 days is part of the 102 days. (N.T. 455-456)

173. Balfour Beatty had failed to document what impact if any the "Stop Blasting" order had on the anticipated utilization of the non-force account equipment that was working on contract items, earning revenue versus the usage documented on Exhibit P-59. It has assumed that every piece of equipment was under utilized and had to stay on the Project 102 days longer because of a "Stop Blasting" order that related only to rock excavation. There is no evidence or analysis that support this assumption to any degree of reliability. The Board finds the award for extended equipment to be zero for lack of sufficient supporting documentation. (Emphasis Added) (Record)

e) **Disruption**

174. While the “Stop Blasting” order was in effect, prior to the order to excavate without blasting, Balfour Beatty moved its men and equipment to various areas of the Project to try and keep the Class 1 Excavation progressing. Balfour Beatty moved its men and equipment to different areas of the Project whether or not those areas were ready to be worked upon. Additionally, Balfour Beatty worked in smaller areas to try and progress the work. (N.T. 87-88)

175. The moving of men and equipment around the Project site caused Balfour Beatty’s production rates to decline. (N.T. 90)

176. The disruption of Balfour Beatty’s labor forces’ productivity was caused by having to move workers around from area to area to keep them busy because the “Stop Blasting” order was on-going from February 10, 1997 until April 23, 1997, 72 days of no decision on resumption of rock excavation. The moving around of Balfour Beatty’s forces involved unanticipated demobilization and remobilization, which costs money. (N.T. 133-134)

177. As a result of the “Stop Blasting” order, Balfour Beatty’s operations were disrupted from February 10, 1997 through June 1997 as determined by Mr. Hetherington’s testimony. Mr. Jaynes alleged that the disruption was on going until August 1999 because “I can’t see under the ground”. (N.T. 152, 157, 455-456, 467-468)

178. Balfour Beatty is only claiming disruption during the time period February 1997 to July 1997. (N.T. 157)

179. Mr. Jaynes was accepted as an expert witness on the management of heavy and highway construction projects, and as such, has knowledge as to the efficient utilization of labor and equipment and the effects of out of sequence work and winter inefficiencies. (N.T. 129-130)

180. Between February 1997 and July 1997, based upon Mr. Jaynes’ experience and personal observations of the work progress, Balfour Beatty’s labor productivity was disrupted as a result of the differing site condition and the Department’s suspension of blasting. The level of disruption was at least 20%. (N. T. 132)

181. During the initial stages of the “Stop Blasting” order, February 10, 1997 to February 28, 1997, Mr. Jaynes expressed to PennDOT that productivity was off by 50%. (Ex. P-13, sheets 3 to 7)

182. From February 9, 1997 through July 20, 1997, Balfour Beatty incurred \$1,353,579.00 in direct labor costs. This amount does not include labor costs that were associated with force account work or mechanical excavation. (N.T. 433, 435, 438, 440; Ex. P-66)

183. The total direct labor costs incurred by Balfour Beatty from February 9, 1997 through July 20, 1997 (\$1,353,579.00) were multiplied by a disruption factor of 20% which results in Balfour Beatty's disruption claim of \$270,716.00. In Mr. Hetherington's opinion and experience, this amount represents Balfour Beatty's disruption damages resulting from the differing site condition and "Stop Blasting" order for which Balfour Beatty had not been paid by the Department. (N.T. 440-441; Ex. P-66)

184. The amounts summarized in the disruption calculation were taken directly from the cost report excerpts included in Exhibit P-67. (N.T. 435, 437; Ex. P-66, P-67)

185. The cost report excerpts contained in Exhibit P-67 are substantiated by and derived from the certified payrolls and daily time sheets contained in Exhibits P-52 and P-53. (N.T. 437)

186. The force account labor costs were deducted from the gross labor costs for this time period because the Department had already paid for the force account labor. Leaving that labor in this calculation would amount to duplicating those costs. (N.T. 440-441)

187. The Project schedule in place at the time of the "Stop Blasting" order was based on an agreement to accelerate the work not the schedule Balfour Beatty envisioned at the time of bid when its unit cost and lump sum pricing was accomplished. (Record)

188. Although Mr. Rubino was critical during his direct testimony of Balfour Beatty's use of inefficiency factors (percentages), he acknowledged that such a methodology is proper where there is an absence of the ability to compare actual versus estimated cost. Further, Mr. Rubino acknowledged that he had previously used percentages to advocate inefficiency costs. (N.T. 772-773, 826)

189. As a result of the suspension of blasting, Balfour Beatty shifted its labor and equipment all around the Project site trying to find productive work. In doing so, Balfour Beatty's labor and equipment were working on at least 20 different non-force account activities. (Emphasis Added) Some of these activities were for unit price items of work and others were for lump sum bid items. Accordingly, Mr. Jaynes opined that there was not any other reasonable or practical way in which Balfour Beatty could have calculated its disruption damages. (N.T. 851-852; Record)

190. The Board finds Balfour Beatty is entitled to \$270,716.00 for the reasonable disruption costs it has claimed. (Emphasis Added) (Record)

**f) Winter Inefficiencies**

191. Based upon Mr. Jaynes' experience and personal observations of the work in progress, the Department's suspension of blasting and resulting delay of 89 days affected Balfour

Beatty's follow-on activities. Specifically, it pushed work on Bridges 12N, 20N and 1W2E into the winter. The concrete work and form work and all bridge associated items such as footers, piers and caps were pushed from fair-weather months into the winter. (N.T. 134-135)

192. Rescheduling activities from fair-weather months to winter months increases the cost of performing the work. For Balfour Beatty's work that was pushed into the winter, the labor production rates experienced at least a 30% loss of productivity. Mr. Jaynes' opinion as to this productivity loss is based upon his experience and personal observations of the work in progress as well as a study of the effect of temperature on productivity. (N.T. 135-136; Ex. P-51)

193. Balfour Beatty incurred \$172,175.00, \$175,804.00, \$150,232.00 and \$217,951.00 in gross labor costs for the months of December, 1997 through March, 1998, respectively. Additionally Balfour Beatty incurred gross labor costs for the operation of cranes in the amounts of \$5,500.00 and \$6,763.00 for the months of January and February, 1998, Balfour Beatty incurred a total of \$729,479.00 in direct labor costs. (N.T. 418-419; Ex. P-49)

194. The gross, direct labor costs Balfour Beatty incurred for the months December, 1997 through March, 1998 were determined from Balfour Beatty's custom cost analysis and activity reports included in Exhibit P-50. (N.T. 423-424)

195. The labor costs reported on the cost accounting system contained in Exhibit P-50 are substantiated by and derived from the certified payrolls and the daily time sheets for the same period of time. (N.T. 427-428; Ex. P-52, P-53)

196. From the total direct labor costs incurred, Balfour Beatty deducted the costs incurred for the work that was scheduled to be performed during December, 1997 and March, 1998. Specifically, Balfour Beatty incurred \$68,259.00 for activities that it planned to perform in the winter during December, 1997 and \$52,563.00 in direct labor for activities that it planned to perform in March, 1998. (N.T. 419, 421; Ex. P-49)

197. From the gross, direct labor costs incurred, Balfour Beatty also deducted the direct labor costs associated with mechanical excavation. These costs were deducted because Balfour Beatty was paid for them on a force account basis. During the months December, 1997 through March, 1998, Balfour Beatty incurred force account, mechanical excavation labor costs in the amounts of \$88,754.00, \$82,241.00, \$69,969.00, and \$74,572.00, respectively. These force account labor costs total \$315,536.00. (N.T. 421-422; Ex. P-49)

198. The costs for the direct labor that Balfour Beatty planned on performing in December, 1997 and March, 1998 are reported on cost code detail history reports contained in Exhibit P-50. The same is true for the force account labor costs incurred between December, 1997 and March 1998. (N.T. 425-426; Ex. P-49, P-50)

199. By deducting the direct labor costs that Balfour Beatty planned to incur during December, 1997 and March, 1998, as well as the direct labor costs associated with mechanical excavation from the total direct labor costs from December, 1997 through March, 1998, a net total of \$293,121.00 remains. This amount represents the direct labor costs Balfour Beatty incurred for work that was pushed into the winter as a result of the suspension of work/differing site condition. To this amount, Balfour Beatty applied a 30% inefficiency factor which results in the labor element of Balfour Beatty's winter inefficiencies claim in the amount \$87,936.00 ( $\$293,121.00 \times .30$ ). (N.T. 422; Ex. P-49)

200. Another element of Balfour Beatty's winter inefficiencies claimed involves the temporary materials that were incurred during the winter period that would not have been used if this work was performed in fairer weather. The temporary material costs incurred were \$20,591.00. Additionally, Balfour Beatty incurred costs for using hot water in the concrete so that the concrete could be poured during the winter. A total of 383 cubic yards of concrete was poured during this winter period at a cost of \$4.00 per cubic yard for the hot water. Accordingly, Balfour Beatty incurred costs of \$1,532.00 for this hot water. (N.T. 421-423; Ex. P-49)

201. The temporary material cost for January and February 1998 were obtained from the first four (4) pages of Exhibit P-50. (N.T. 424; Ex. P-49, P-50)

202. Combining the direct labor costs with the temporary material costs, the total damages claimed for winter inefficiencies were \$110,059.00 ( $\$87,936.00 + \$20,591.00 + \$1,532.00$ ) not \$110,099.00 which Mr. Hetherington opined were the added costs for work pushed into the winter as a result of the "Stop Blasting" order and differing site conditions that Balfour Beatty has not been compensated by PennDOT for these cost. (N.T. 422-423; Ex. P-42)

203. Although Mr. Rubino was critical of Balfour Beatty's claim for winter inefficiencies, he did not dispute one way or the other that Balfour Beatty was subjected to winter inefficiencies as a result of the suspension of work. (N.T. 828)

204. It must be noted that during the months of December, 1997 through March, 1998 Balfour Beatty was still performing mechanical excavation on a force account basis and that Balfour Beatty did complete the Project on schedule. (Record)

205. Balfour Beatty is entitled to \$110,099.00 for winter inefficiency costs incurred. (Emphasis added) (Record)

**g) Additional Mark-up**

206. The force account provisions for overhead and profit provided for in the Specifications Section 110.03(d)7 states: Except as specified in Section 110.03(d)4, to cover all administration, general superintendence, other overhead, bonds, insurance, anticipated profit, and use of small tools and equipment for which no rental is allowed, add 40% to the labor costs, add 25%

to the material cost, add 5% to the equipment cost, and, when applicable, add 8% to the total force-account invoice for subcontract work. (Emphasis Added) (Ex. D-2, pg. 82)

207. Section 101.03 of the Specifications defines “Subcontractor” as follows:

**Subcontractor** - Any individual, partnership, firm, corporation, or joint venture, complying with the requirements of Section 102.01, who/which undertakes, with prior consent of the Department, the partial or total construction of one or more items of project work (Emphasis Added) under the terms of the contract, with and responsible to the prime Contractor by virtue of an agreement.

(N.T. 233; Ex. D-2, pg. 8)

208. Class 1 Excavation is a contract pay item as defined by Section 101.03 of the Specifications and the hauling of excavated material performed by J.L. Hartley was partial construction of the Class 1 Excavation pay item. (N.T. 232-233)

209. PennDOT’s Assistant District Engineer, Mr. Skrocki, admitted that the hauling of excavated material for Class 1 Excavation by J.L. Hartley made J.L. Hartley a “subcontractor” under the Specifications. (N.T. 233-234)

210. By transmittal dated May 21, 1997, the Department rejected Balfour Beatty’s request for an 8% mark-up on the force account work performed by J.L. Hartley. Instead, the Department paid Balfour Beatty a 2% mark-up as a “service by others.” (N.T. 445-446; Ex. P-24)

211. Mr. Richard Cochrane admitted that the only reason (Emphasis Added) the claim for the additional mark-up on J.L. Hartley’s services was denied was because J.L. Hartley was performing “services by others” and was not a subcontractor. (N.T. 576)

212. Section 110.03(d)4 of the Specifications, which governs the mark-up to be paid for “services by others” states, in pertinent part:

For any service such as maintenance and protection of traffic signing, engineering services, or specialized construction analysis not considered as subcontract work requiring prequalification, the Contractor will be compensated at the invoice price plus 2% to cover administration and all other costs.

(Ex. D-2, Sec. 110.03(d)4, pg. 82)

213. The parties do not dispute that, for the work that J. L. Hartley performed on this Project, J.L. Hartley did not perform any:

- a. Maintenance and protection of traffic;
- b. Engineering services; or
- c. Specialized construction analysis.

(N.T. 234, 484)

214. For J.L. Hartley to perform its work as a subcontractor, PennDOT required that Hartley had to be prequalified. (N.T. 205-206)

215. J.L. Hartley was prequalified to perform work for PennDOT. (N.T. 444)

216. Balfour Beatty applied to PennDOT to use J.L. Hartley as a DBE contractor on this Project and the application was approved by PennDOT. (N.T. 204-205, 444-445; Ex. P-4, P-5)

217. By letter dated May 29, 1997, Balfour Beatty gave notice of its intent to submit a claim to the Department for the additional 6% mark-up on J.L. Hartley's force account work. (N.T. 446-447; Ex. P-25)

218. For force account applications involving the work of "Inspector In charge" CI-152, Balfour Beatty requested payment for the work done by two separate subcontractors: J.L. Hartley and Interlock Steel Workers. (N.T. 486-487; Ex. P-45)

219. David Elmer, a representative of the Department, modified Balfour Beatty's force account submission to separate the work done by J.L. Hartley and apply a 2% mark-up from the work of Interlock Steel Workers for which he applied an 8% mark-up. (N.T. 486-488; Ex. P-45)

220. Balfour Beatty's force account application for J.L. Hartley's subcontract work included time sheets for the truck drivers who operated the Hartley supplied trucks, portion of the subcontract agreement between Balfour Beatty and Hartley and invoices for the work accomplished. (N.T. 485-486, 488; Ex. P-45)

221. The force account application involving CI-152 submission, with regard to the work of Interlock Steel Workers, included only excerpts from the subcontract agreement between Balfour Beatty and Interlock Steel Workers. The subcontract between Balfour Beatty and Interlock Steel Workers provided that Interlock was to be paid a certain rate per pound of steel that was provided with this submission. (N.T. 488-489; Ex. P-45)

222. Even though the only backup for Interlock Steel Workers' force account work was an excerpt from their subcontract agreement with Balfour Beatty, Balfour Beatty still received an 8%

mark-up on the work performed by Interlock in recognition that Interlock was a “subcontractor”. (N.T. 489-490; Ex. P-45)

223. The Department’s Assistant District Engineer for this Project, Mr. Skrocki, admitted that there is some ambiguity in the Specification for services by others under the force account provisions. (N.T. 235)

224. For this Project, J.L. Hartley has performed \$463,737.24 in force account work. Balfour Beatty has been paid a 2% mark-up by the Department for this work. Therefore, the remaining 6% unpaid mark-up equals \$27,824.23 ( $\$463,737.24 \times .06$ ) which PennDOT has refused to pay. (N.T. 447, 450; Ex. P-43, P-44)

225. The Board finds Balfour Beatty is entitled to \$27,824.23 for additional mark-up on subcontract work performed by J.L. Hartley. (Emphasis Added) (Record)

226. Under cover letter dated September 17, 1997, Balfour Beatty provided the Department with its claim submission seeking additional compensation in the amount of \$3,221,832.48 under Sections 110.02(b) and (c) of the Specifications. This claim submission included a description of the types of additional costs Balfour Beatty sought, as well as the manner in which the additional costs were calculated. (N.T. 127, 128; Ex. P-33)

### **CONCLUSIONS OF LAW**

1. The Board of Claims has jurisdiction over the parties.
2. The Board of Claims has jurisdiction over the subject matter of the claim submitted in this matter.
3. Discovery of elevated levels of carbon monoxide caused a suspension of blasting and work under the Contract Specifications.
4. The suspension of blasting and the resulting delays was in fact a “differing site condition” entitling the contractor to recover costs.
5. The amount of delay as established by PennDOT was properly calculated at 89 days.
6. The erection of structural steel was not a concurrent delay with the suspension of blasting since both delays by definition must be critical and the erection of structural steel was not critical.
7. The claim for damages for site overhead, home office expenses, and insurance and bond expenses, were not established because the expenses were concurrent and were absorbed by the normal revenue stream of the company.

8. The claim for damages for revision of Temporary Road T-13 is denied as having been paid according to the terms of the Contract except for the sum of \$9,958.91 for the cost of tie-in not covered by the Contract.

9. The claim for extended equipment usage is denied as evidence shows that most of the equipment was either removed prior to the "Stop Blasting" order, or brought onto the Project after the "Stop Blasting" order. There is insufficient evidence to establish such claims.

10. The claim for disruption and winter work is allowed in the sum of \$270,716.00 for disruption as there is no dispute that work was disrupted and labor and equipment were shifted around.

11. The claim for winter work is allowed in the sum of \$110,099.00 as Contractor was subjected to winter inefficiencies as defined in the Contract.

12. The claim for additional workup is allowed as J.L. Hartley meets the definition of subcontractor and thus the additional sum of \$27,824.23 should be paid based on the mark-up of 6%.

13. Interest on the allowed claims should be calculated from the date of the submission of Plaintiff's Claim to the Defendant, which was by letter dated September 17, 1997.

### **OPINION**

Plaintiff and Defendant entered into a Contract dated December 30, 1994, for construction work on State Route (SR) 81 in Lackawanna County, Pennsylvania. The Project required construction of thirteen (13) major structures, including five (5) concrete girder structures, six (6) steel girder structures and one (1) tunnel-like rigid frame. In addition, there were approximately eighteen (18) wall structures, nine (9) ramps and temporary roads included in the Contract. The Project also included the expansion and reconstruction of an existing highway facility.

At the time Plaintiff entered into the Contract for the Project, they planned to perform mass excavation activities by blasting and this method of excavation activities by blasting and their method of excavation was acceptable to Defendant. By early February, 1997, Plaintiff was performing mass rock excavation and blasting. On Saturday, February 8, 1997, Defendant ordered

Plaintiff to stop blasting on the Project. The cause of this “Stop Blasting” order was the discovery of carbon monoxide poisoning discovered on a resident in a home located in a residential development near the Project site. On Monday, February 10, 1997, Defendant confirmed, in writing, the temporary postponement of blasting. At the time the “Stop Blasting” order was issued, Plaintiff had approximately 80,000 cubic yards of excavation left in an area known as Bridge 20N. As a result of Defendant’s suspension order, Plaintiff did stop its excavation of rock.

The parties thereafter attempted to negotiate the basis for proceeding to excavate without blasting and eventually agreed to proceed without blasting on a “differing site condition” basis. Payment for proceeding was to be on an extra work basis pursuant to the Contract Specifications. Both parties agreed that they were to take all reasonable steps to mitigate any delays from the suspension of blasting.

Plaintiff requested an extension of time and delay compensation of 102 days even though the actual completion was to be delayed for 89 days. The reason for such additional 13 day claim was based on the fact that Plaintiff was 13 days ahead of schedule when blasting was suspended. The Board agrees with Defendant’s assessment of an 89 day delay as the record does not establish the reasons for the “float” of 13 days. The burden was on the Plaintiff to clearly establish this fact.

Plaintiff seeks additional compensation in the sum of \$2,572,062.04 as a result of the delay based on damages claimed in seven different areas. We will address each such area.

Defendant alleges that a concurrent delay situation arose since Plaintiff delayed delivery of certain steel needed for the construction of the bridge identified as Bridge 20N, and that such a delay was to be considered a critical delay. Under a concurrent delay situation, Plaintiff is

not to be entitled to extra compensation for having caused such additional delay; however, previous holdings by this Board and case law have established that to establish a concurrent delay, both delays must be critical and must not be related either physically or managerially. Tyger Construction Co., Inc. v. U.S., 31 Fed Ct. 177, 258 (U.S. Ct. Fed. Claim 1994) Appeal of Cogefar - Impresit USA, Inc. v. DOT, CA-13W02721, 97-2BCA 1997.

Since delivery of structural steel was not on a critical path in this matter, there was not a concurrent delay as alleged by Defendant.

Plaintiff claims damages due to revisions to Temporary Road T-13 in the amount of \$67,159.57. However, in the plan information sent to Plaintiff on December 12, 1996, it stated that any shoring required at this location shall be at no additional cost. In this regard, Plaintiff was paid in full the contractual sum of \$199,993.00, but was not paid for items classified as “Cost of Tie-In”, and is therefore, entitled to be paid this sum in the amount of \$9,958.91.

Plaintiff claims Extended Site overhead costs in the sum of \$496,984.80. Plaintiff, however, does not take into consideration the fact that all work did not cease during the “Stop Blasting” period. Accordingly, overhead costs would have occurred even if no stoppage had taken place. Plaintiff was performing contract work and earning revenue during the stoppage period. Therefore, Plaintiff’s claim for Extended Site overhead cost is denied.

During the time the “Stop Blasting” order was in effect, and prior to the order to excavate without blasting, Plaintiff moved men and equipment to various areas of the Project to keep other portions of the Project progressing. This caused Plaintiff’s production rates to decline. Plaintiff is therefore entitled to be compensated for such movement which, by the testimony, has been calculated to be 20% of direct labor costs, or the sum of \$270,716.00.

Plaintiff is entitled to additional compensation for items referred to as winter inefficiencies, as rescheduling work from fair weather months to winter months due to the delays increasing the cost of performing the work. Based on the record in this matter, we find that Plaintiff is entitled to the sum of \$110,099.00 for winter inefficiencies.

Due to the delays and subsequent excavation activities, Plaintiff utilized the services of the J.L. Hartley Company, to haul excavated materials. Defendant claims such services entitle Plaintiff to an extra 2% mark-up since they were not qualified as a subcontractor under the Specifications, which would permit Plaintiff to charge an 8% mark-up. It is clear that the J.L. Hartley Company was properly qualified to perform work for Defendant and should be considered a subcontractor entitling Plaintiff to the 8% mark-up and an additional sum of \$27,824.23.

Accordingly, Plaintiff is entitled to the following:

Duration Costs =	\$270,716.00
Additional Tie-In Costs=	9,958.91
Winter Inefficiencies =	110,099.00
Additional Subcontracting Work =	27,824.23
<b>TOTAL =</b>	<b><u>\$418,598.14</u></b>

**ORDER**

**AND NOW**, this 21st day of September, 2000, based on Plaintiff's claim in this matter, the responses thereto, and after hearing the testimony presented by the parties, it is **ORDERED** and **DECREED** that Plaintiff is entitled to an award in the sum of Four Hundred Eighteen Thousand Five Hundred Ninety-Eight Dollars and Fourteen Cents (\$418,598.14), with interest at the statutory rate of six percent (6%) per annum from September 17, 1997.

Upon receipt of said award, Plaintiff shall forthwith file with the Board of Claims a Praecipe requesting that this matter be marked "closed, discontinued and ended with prejudice".

Each party to bear their own costs and attorneys' fees.

BOARD OF CLAIMS

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David C. Clipper  
Chief Administrative Judge

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Louis G. O'Brien, P.E.  
Engineer Member

Opinion Signed

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James W. Harris  
Citizen Member